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ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE SOUTHWEST WILLOW FLYCATCHER

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LIST OF ACRONYMS AND ABBREVIATIONS

Act	Endangered Species Act
AUMs	animal unit -months
AZGFD	Alamo Wildlife Area by Arizona Game and Fish
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CAP	Central Arizona Project
CEQA	California Environmental Quality Act
CHD	critical habitat designation
Corps	US Army Corps of Engineers
CRIT	Colorado River Indian Tribes
DOI	U.S. Department of the Interior
Flycatcher	Southwestern willow flycatcher
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FMI	Freeport-McMoRan, Inc.
FMMP	Farmland Mapping and Monitoring Program
GRIC	Gila River Indian Community
HCP	Habitat Conservation Plan
IEc	Industrial Economics, Incorporated
ITP	Incidental Take Permit
LAA	likely to adversely affect
LADWP	Los Angeles Department of Water and Power
MSCP	Multiple Species Conservation Program
MSHCP	Multi-Species Habitat Conservation Plan
NAICS	North American Industry Classification System
NCS	New Conservation Space
NLAA	not likely to adversely affect
NPDES	National Pollutant Discharge Elimination System

OCWD	Orange County Water District
OHV	off-highway vehicle
OMB	U.S. Office of Management and Budget
PDC	Phelps Dodge Corporation
RFA	Regulatory Flexibility Act
RGWCD	Rio Grande Water Conservation District
SANDAG	San Diego Association of Governments
SBA	Small Business Administration
SBREFA	Small Business Regulatory Enforcement Fairness Act
SCAG	Southern California Association of Governments
SCIDD	San Carlos Irrigation and Drainage District
SCIP	San Carlos Irrigation Project
Service	U.S. Fish and Wildlife Service
SRP	Salt River Project
TRCMP	Tribal Resource Conservation Management Plan
USBR	U.S. Bureau of Reclamation
USFS	U.S. Forest Service
Valley District	San Bernardino Valley Municipal Water District
Western	Western Municipal Water District of Riverside County

EXECUTIVE SUMMARY

1. The purpose of this report is to evaluate the potential economic impacts associated with the designation of critical habitat for the federally listed Southwestern willow flycatcher (*Empidonax traillii extimus)*. This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service (Service).

2. The Service listed the Southwestern willow flycatcher (hereafter "flycatcher") as endangered under the Endangered Species Act (the Act) on February 27, 1995. Critical habitat has been designated twice previously for the species, first in 1997, and then again in 2005.[1] The latter rule, which remains in effect currently, designated 737 stream miles in five States, including Arizona, California, Nevada, Utah, Arizona, and New Mexico.

3. In response to legal action initiated by the Center for Biological Diversity, on August 15, 2011, the Service published a revised proposed critical habitat rule. The proposal includes stream segments in 29 Management Units, as defined by the 2002 Recovery Plan for the flycatcher, totaling about 2,112 stream miles. The proposed designation spans six States, including the previous five, plus Colorado.[2] In addition to the approximately 2,112 stream miles, the proposed designation includes "the lateral extent [of the proposed stream segments] including the riparian areas and streams that occur within the 100-year floodplain or flood-prone areas."[3] This area includes approximately 532,635 acres in total.

4. The previous designation of critical habitat focused on lands that support large flycatcher populations.[4] In the current proposed rule, the Service also proposes to designate lands outside of the geographical area occupied at the time of listing, which the Service has determined to be essential for the conservation of the flycatcher. For the purposes of this analysis, we group the proposed acres into three categories, including: (1) areas where flycatcher territories have been detected and where flycatcher presence is well known (approximately 1,838 miles or 87 percent of current proposed rule); (2) areas where flycatcher territories have been previously detected but where the presence of flycatcher is not currently addressed by action agencies and project proponents (approximately 72

[1] 1997 Final Rule, 62 FR 39129; 1997 Final Rule, 62 FR 44228; and 2005 Final Rule, 70 FR 60886.

[2] 2011 Proposed Rule, 76 FR 50554. This analysis forecasts potential impacts in the areas proposed in the August 15, 2011 proposed rule. The current Notice of Availability makes some minor changes to the areas proposed for designation. Specifically, Carson Slough in the Amargosa management unit is no longer proposed, and the area proposed in the Ash Meadows Riparian Areas has been reduced. In the Santa Cruz management unit, new areas along Cienega Creek and Empire Gulch have been added to the proposed designation. Review of the affected areas suggests that estimated economic impacts presented in this report for that management unit are unlikely to be affected by these changes.

[3] 2011 Proposed Rule, 76 FR 50542.

[4] 2004 Proposed Rule, 69 FR 60706.

miles, or 3.4 percent); and (3) areas where flycatcher territories have not been detected in previous surveys (approximately 202 miles, or 9.5 percent).

FRAMEWORK FOR THE ANALYSIS

5. This analysis estimates economic impacts of flycatcher conservation efforts associated with the following categories of economic activity: (1) water management activities; (2) livestock grazing; (3) residential and related development; (4) Tribal activities; (5) transportation; (6) oil and gas development; (7) mining; and (8) recreational activities. For most activities, we estimate economic impacts from 2012 (expected year of final critical habitat designation) to 2031 (a 20-year period of analysis). This 20-year analysis period reflects the maximum amount of time under which future activities and economic impacts associated with the Proposed Rule can be reliably projected, given available data and information. In the case of water management activities, where facility operators have entered into agreements with the Service for longer periods of time (up to 50 years), impacts are projected over this longer period.

6. Importantly, relative to the economic analysis supporting the 2005 critical habitat designation, the Service now distinguishes the *incremental* impacts of designation from *baseline* impacts. The previous economic analysis evaluated all co-extensive impacts (i.e., those resulting from both species listing and critical habitat designation). This analysis characterizes all projected impacts as either baseline costs (i.e., those impacts expected to occur absent the designation of critical habitat) or incremental impacts (i.e., those impacts expected to occur as a result of critical habitat designation).[5]

7. The Service provides guidance on distinguishing the incremental impacts of the designation, as described in greater detail in Chapter 2 and Appendix C of this report. In summary, this analysis assigns costs to the baseline or incremental scenarios based on the geographic location of the anticipated economic activity. In proposed areas where flycatcher territories have been detected and where flycatcher presence is currently addressed by action agencies and project proponents, impacts are considered to be part of the baseline (they would occur even absent future critical habitat designation). Given the occupancy status of these areas and a history of consultation with the Service, project proponents are compelled to take steps to protect the flycatcher even without critical habitat.

8. For those stream segments where flycatcher territories have been detected but where flycatcher presence is not currently addressed by action agencies and project proponents, the Service notes that these segments "might receive more agency awareness, and therefore, the agencies may consult with the Service on actions for which they may have

[5] This analysis considers and estimates the impacts of the rule as currently proposed and as if the existing 2005 critical habitat designation does not exist. In other words, this analysis considers and estimates the impacts associated with designating areas as critical habitat versus not designating these areas. This analysis is intended to assist the Secretary of the Department of the Interior in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation. These particular areas include those already designated as critical habitat under the 2005 designation and subject to re-examination by the Secretary. As a result, costs incurred as a result of the 2005 designation are not separately documented in this analysis.

previously not considered as needing consultation."[6] That is, in these areas, the designation of critical habitat may provide new information to project proponents that results in section 7 consultation that would not have occurred absent critical habitat. Therefore, conservation efforts undertaken in these areas are attributed incrementally to the revised critical habitat designation.

9. Finally, in stream segments where flycatcher territories have not been detected since surveys began in 1991, conservation efforts are also considered to be incremental impacts of the revised designation. That is, because flycatchers are not known to be present in these areas, the analysis assumes that agencies would not implement conservation efforts to protect the flycatcher and its habitat absent critical habitat. The total area that may be subject to incremental impacts, including areas where flycatcher territories have and have not been identified, accounts for approximately 13 percent of the proposed rule. For detailed information and maps further describing the areas proposed for designation, see Chapter 1 of this report.

KEY FINDINGS

10. Exhibit ES-1 summarizes the total impacts likely to occur if all of the units proposed are designated as critical habitat. The total present value impacts, assuming a seven percent discount rate, anticipated to result solely from this designation range from $11 million to $19 million over the first 20 years following the designation, with an additional cost of $200,000 to $1.4 million in the following ten years. If we assume the social rate of time preference is three percent, present value impacts increase to $14 million to $25 million in the first 20 years, followed by $490,000 to $3.5 million in 2032 through 2041. The annualized incremental impacts of critical habitat are likely to range from $910,000 to $1.7 million, depending on the discount rate assumption. These incremental impacts are associated with: (1) areas where flycatcher territories have not been detected; (2) areas where critical habitat may result in increased agency awareness because flycatcher presence is not currently well known or addressed by project proponents; and (3) administrative costs of considering adverse modification in section 7 consultation in all other areas.

11. Absent the designation of critical habitat, efforts are likely to be undertaken to protect the flycatcher based on its status as a listed species under the Act. Depending on the discount rate applied, we estimate that these baseline costs will range from $260 million to $500 million in the first 20 years, $28 million to $120 million over the following 10 years, and $14 to $56 million between 2042 and 2061. On an annualized basis, baseline impacts are likely to range from $22 million to $34 million.

[6] U.S. Fish and Wildlife Service. 2011. "Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Re-Designate Critical Habitat for the Southwestern Willow Flycatcher (*Empidonax traillii extimus)* (flycatcher)," October 21, 2011, *Ibid*, p. 18. (See Appendix C of this report.)

EXHIBIT ES-1. SUMMARY OF TOTAL ECONOMIC IMPACTS (2010$)

DISCOUNT RATE ASSUMPTION	PRESENT VALUE (MILLIONS)			ANNUALIZED
	2012 - 2031	2032 - 2041	2042 - 2061	
INCREMENTAL IMPACTS				
7%	$11 - $19	$0.20 - $1.4	N/A	$0.94 - $1.7
3%	$14 - $25	$0.49 - $3.5	N/A	$0.91 - $1.6
BASELINE IMPACTS				
7%	$260 - $380	$28 – $46	$14	$23 - $34
3%	$340 - $500	$69 – $120	$56	$22 - $32

Note: For most activities, impacts are estimated for the time period 2012 through 2031 (20 years from anticipated publication of the final rule). For water management activities, dam operators typically enter into agreements with the Service lasting 30 years; thus, we predict future incremental impacts through 2041. In addition, in four units, impacts are estimated over 50 years or the remaining length of a 50-year permit. Finally, while we identify grazing activities that may be affected over a 20-year time period, we note that the measure used to value lost grazing opportunities is a perpetuity value.

12. Given that the presence of flycatcher territories is well known along the vast majority of the stream miles identified in the proposed rule, future baseline costs are anticipated to exceed incremental costs. The largest cost category in this analysis is the implementation of conservation activities by the entities operating water management structures and projects. Most of the relevant structures are located in areas where flycatcher territories have been known to occur and that have long histories of section 7 consultation. Thus, of the 27 water facilities identified in this analysis, only three are found in areas where incremental impacts may occur. For the remaining 24 facilities, their conservation activities, and the associated costs, will occur regardless of whether critical habitat is designated.

13. Exhibits ES-2 and ES-3 show the distribution of incremental and baseline impacts across proposed management units (in the remainder of the Executive Summary, impacts are presented assuming a seven percent discount rate; see Appendix B for values assuming a three percent discount rate). In addition, Exhibits ES-4 and ES-5 rank the units experiencing incremental impacts under our low and high impact assumptions, respectively. The Mohave Management Unit and the San Francisco Management Unit may experience the largest incremental impacts on a relative basis.

14. The Mohave Management Unit is located in southern California. One water project at the Mojave Dam in the San Bernardino Mountains may implement conservation activities to protect critical habitat. Flycatcher territories have not been previously detected near Mojave Dam; therefore, all impacts to this facility are assumed to be incremental. In addition, forecast impacts include potential administrative costs for section 7 consultations on development, transportation, and grazing activities.

15. Flycatcher territories have been previously detected in the San Francisco Management Unit; however, the Service believes the proposed designation may result in incremental impacts due to increased agency awareness. The majority of all incremental costs estimated in this unit result from impacts to transportation projects. Using GIS analysis, we identify five locations where roads intersect proposed stream reaches in this management unit, and we assume some construction or maintenance activity will occur in each location over the next 20 years. We forecast incremental impacts of $250,000 associated with monitoring and education activities, fencing, habitat restoration and creation, timing restrictions, and administrative activities.

16. In addition to transportation impacts, the analysis forecasts incremental impacts in the San Francisco Management Unit associated with fencing construction and maintenance as well as potential reductions in grazing activity across 23 grazing allotments. The management unit contains one small water management structure, which may incur incremental impacts associated with obtaining an incidental take permit (ITP). Similar to the Mohave Management Unit, the analysis also forecasts additional incremental administrative costs associated with section 7 consultations on these activities.

EXHIBIT ES-2. SUMMARY OF INCREMENTAL IMPACTS BY MANAGEMENT UNIT, 2012 TO 2041 (2010$, SEVEN PERCENT DISCOUNT RATE)

MANAGEMENT UNIT	PRESENT VALUE (2012-2031)		PRESENT VALUE (2032-2041)		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
Santa Ynez	$16,000	$16,000	$0	$0	$1,400	$1,400
Santa Clara	$570,000	$2,000,000	$37,000	$270,000	$50,000	$170,000
Santa Ana	$480,000	$480,000	$9,700	$9,700	$42,000	$42,000
San Diego	$200,000	$200,000	$3,900	$3,900	$18,000	$18,000
Owens	$5,500	$5,500	$0	$0	$420	$420
Kern	$19,000	$19,000	$2,900	$2,900	$1,700	$1,700
Mohave	$1,200,000	$7,200,000	$130,000	$1,100,000	$110,000	$630,000
Salton	$16,000	$16,000	$0	$0	$1,400	$1,400
Amargosa	$77,000	$77,000	$0	$0	$6,700	$6,700
Little Colorado	$680,000	$680,000	$0	$0	$60,000	$60,000
Virgin	$260,000	$260,000	$0	$0	$23,000	$23,000
Middle Colorado	$36,000	$36,000	$2,900	$2,900	$3,100	$3,100
Pahranagat	$37,000	$37,000	$0	$0	$3,200	$3,200
Bill Williams	$160,000	$160,000	$970	$970	$14,000	$14,000
Hoover to Parker Dam	$76,000	$76,000	$1,500	$1,500	$6,700	$6,700
Parker Dam to Southerly International Border	$45,000	$45,000	$1,500	$1,500	$4,000	$4,000
San Juan	$190,000	$190,000	$0	$0	$16,000	$16,000
Powell	$770,000	$960,000	$0	$0	$68,000	$84,000
Verde	$210,000	$210,000	$970	$970	$19,000	$19,000
Roosevelt	$77,000	$77,000	$970	$970	$6,800	$6,800
Middle Gila and San Pedro	$120,000	$120,000	$970	$970	$11,000	$11,000
Upper Gila	$360,000	$360,000	$0	$0	$32,000	$32,000
Santa Cruz	$580,000	$580,000	$0	$0	$51,000	$51,000
San Francisco	$3,800,000	$4,600,000	$1,300	$11,000	$330,000	$410,000
Hassayampa and Agua Fria	$3,900	$3,900	$0	$0	$340	$340
San Luis Valley	$130,000	$130,000	$0	$0	$11,000	$11,000
Upper Rio Grande	$200,000	$200,000	$0	$0	$17,000	$17,000
Middle Rio Grande	$260,000	$260,000	$2,900	$2,900	$23,000	$23,000
Lower Rio Grande	$130,000	$130,000	$0	$0	$12,000	$12,000
Total	**$11,000,000**	**$19,000,000**	**$200,000**	**$1,400,000**	**$940,000**	**$1,700,000**

EXHIBIT ES-3. SUMMARY OF BASELINE IMPACTS BY MANAGEMENT UNIT, 2012 TO 2041 (2010$, SEVEN PERCENT DISCOUNT RATE)

MANAGEMENT UNIT	PRESENT VALUE (2012-2031)		PRESENT VALUE (2032-2041)		PRESENT VALUE (2042-2061)		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
Santa Ynez	$400,000	$420,000	$0	$0	$0	$0	$35,000	$37,000
Santa Clara	$19,000,000	$20,000,000	$47,000	$290,000	$0	$0	$1,600,000	$1,800,000
Santa Ana	$26,000,000	$40,000,000	$340,000	$2,700,000	$0	$0	$2,300,000	$3,500,000
San Diego	$3,800,000	$7,700,000	$100,000	$770,000	$0	$0	$340,000	$680,000
Owens	$30,000	$140,000	$2,100	$18,000	$0	$0	$2,500	$12,000
Kern	$4,800,000	$4,900,000	$790,000	$790,000	$0	$0	$420,000	$430,000
Mohave	$5,600,000	$5,600,000	$0	$0	$0	$0	$500,000	$500,000
Salton	$47,000	$47,000	$0	$0	$0	$0	$4,100	$4,100
Amargosa	$800,000	$1,400,000	$4,600	$39,000	$0	$0	$70,000	$120,000
Little Colorado	$2,900,000	$3,200,000	$4,200	$35,000	$0	$0	$260,000	$280,000
Virgin	$6,600,000	$8,000,000	$0	$0	$0	$0	$580,000	$700,000
Middle Colorado	$120,000,000	$120,000,000	$20,000,000	$20,000,000	$12,000,000	$12,000,000	$11,000,000	$11,000,000
Pahranagat	$520,000	$1,000,000	$2,500	$21,000	$0	$0	$46,000	$90,000
Bill Williams	$6,400,000	$7,400,000	$710,000	$710,000	$0	$0	$560,000	$650,000
Hoover to Parker Dam	$7,800,000	$7,900,000	$470,000	$470,000	$280,000	$280,000	$690,000	$690,000
Parker Dam to Southerly	$1,700,000	$1,800,000	$270,000	$270,000	$160,000	$160,000	$150,000	$160,000
San Juan	$3,500,000	$4,100,000	$0	$0	$0	$0	$310,000	$360,000
Powell	$4,500	$18,000	$0	$0	$0	$0	$400	$1,600
Verde	$8,000,000	$9,500,000	$730,000	$730,000	$490,000	$490,000	$700,000	$840,000
Roosevelt	$13,000,000	$15,000,000	$1,600,000	$1,600,000	$1,200,000	$1,200,000	$1,100,000	$1,300,000
Middle Gila and San Pedro	$2,000,000	$2,700,000	$2,900	$2,900	$0	$0	$180,000	$240,000
Upper Gila	$8,600,000	$36,000,000	$620,000	$5,200,000	$0	$0	$760,000	$3,200,000
Santa Cruz	$39,000	$150,000	$0	$0	$0	$0	$3,500	$13,000

MANAGEMENT UNIT	PRESENT VALUE (2012-2031)		PRESENT VALUE (2032-2041)		PRESENT VALUE (2042-2061)		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
San Francisco	$110,000	$670,000	$0	$0	$0	$0	$9,800	$59,000
Hassayampa and Agua Fria	$17,000	$42,000	$0	$0	$0	$0	$1,500	$3,700
San Luis Valley	$4,000,000	$4,200,000	$0	$0	$0	$0	$350,000	$370,000
Upper Rio Grande	$3,200,000	$3,300,000	$0	$0	$0	$0	$280,000	$290,000
Middle Rio Grande	$12,000,000	$76,000,000	$1,500,000	$12,000,000	$0	$0	$1,100,000	$6,700,000
Lower Rio Grande	$4,000,000	$4,100,000	$0	$0	$0	$0	$350,000	$360,000
Total	**$260,000,000**	**$380,000,000**	**$28,000,000**	**$46,000,000**	**$14,000,000**	**$14,000,000**	**$23,000,000**	**$34,000,000**

EXHIBIT ES-4. ANNUALIZED LOW-END INCREMENTAL IMPACTS BY ACTIVITY BY MANAGEMENT UNIT (2010$, SEVEN PERCENT DISCOUNT RATE)

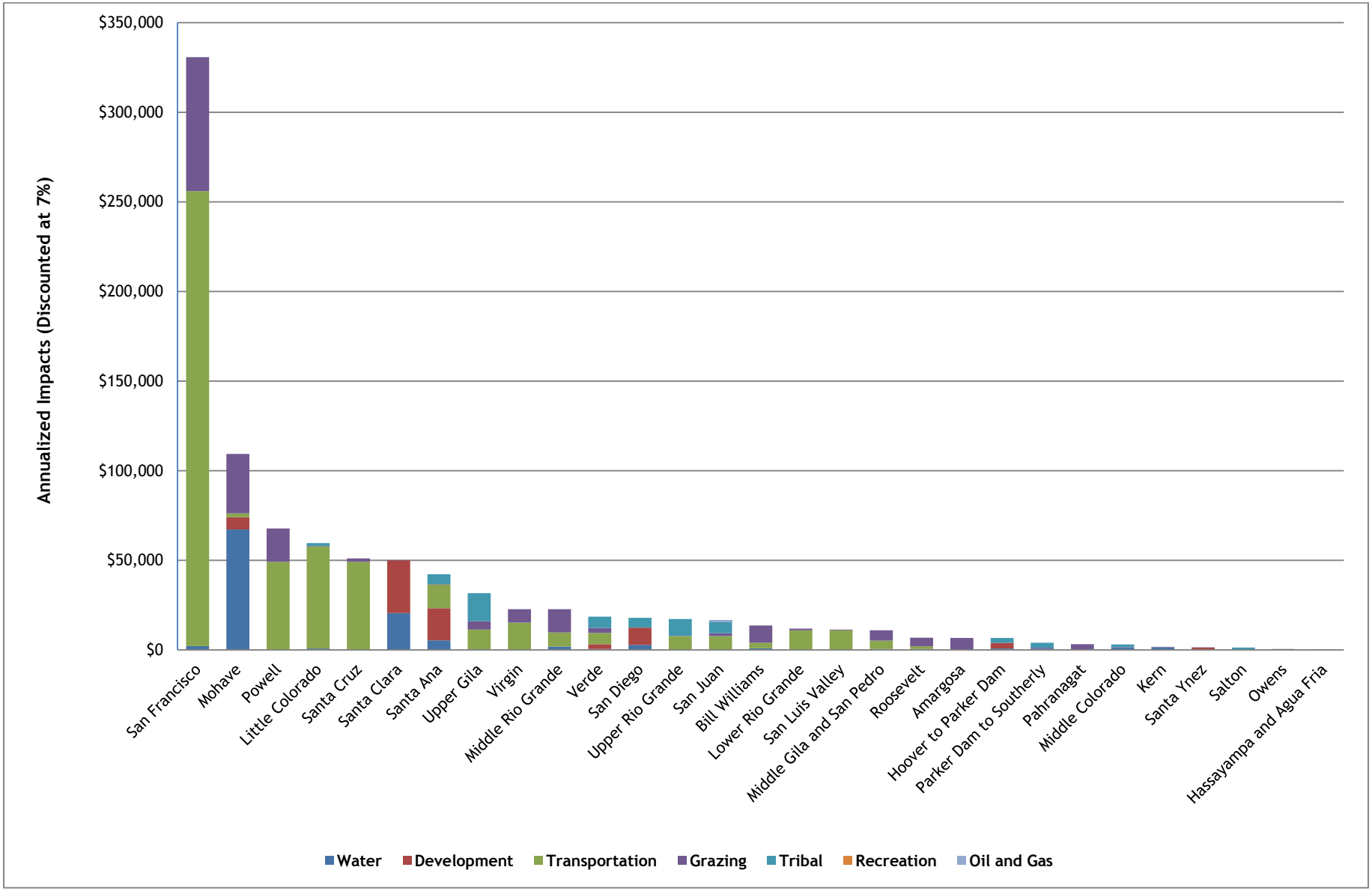
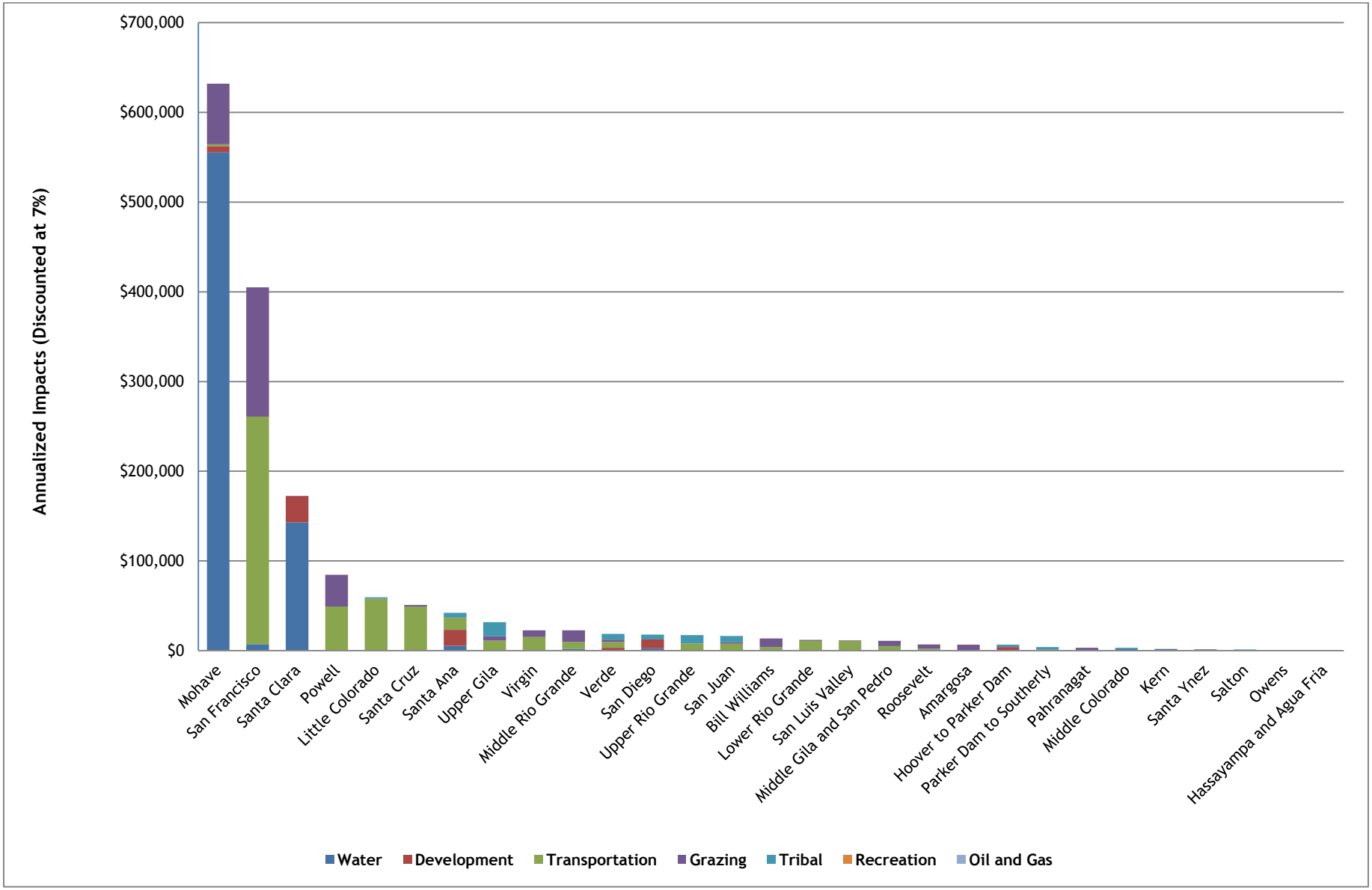


EXHIBIT ES-5. ANNUALIZED HIGH-END INCREMENTAL IMPACTS BY ACTIVITY BY MANAGEMENT UNIT (2010$, SEVEN PERCENT DISCOUNT RATE)



DISCUSSION OF IMPACTS TO SPECIFIC ECONOMIC ACTIVITIES

17. Exhibit ES-6 illustrates relative impacts by activity. Water management agencies and proponents of transportation projects are likely to experience the greatest impacts. Ranchers also may experience impacts; these costs are smaller but affect a larger number of entities. The Service identifies essential habitat on Tribal lands, but is considering excluding these areas from the final designation. The analysis considers potential impacts to all proposed areas including Tribal lands and areas being considered for exclusion from the final designation. In the following sections, we discuss each category of economic activity shown in Exhibit ES-6 in greater detail.

EXHIBIT ES-6. SUMMARY OF INCREMENTAL IMPACTS BY ACTIVITY (2010$, SEVEN PERCENT DISCOUNT RATE)

ACTIVITY	PRESENT VALUE		PERCENTAGE OF TOTAL IMPACTS	
	LOW	HIGH	LOW	HIGH
Transportation	$5,800,000	$5,800,000	53.26%	28.39%
Water*	$1,450,000	$9,620,000	13.30%	47.11%
Grazing	$2,160,000	$3,530,000	19.83%	17.26%
Development	$807,000	$807,000	7.41%	3.95%
Tribal	$664,000	$664,000	6.10%	3.25%
Oil and Gas	$10,900	$10,900	0.10%	0.05%
Recreation	$0	$0	0.00%	0.00%
Total	**$11,000,000**	**$20,000,000**	**100%**	**100%**

* Impacts to water management activities represent present value impacts over a thirty-year period (2012-2041). All other impacts are calculated over a twenty-year period (2012-2031).

Note: Totals may not sum due to rounding.

Transportation Activities

18. Our estimates suggest that transportation activities, such as road and bridge construction and maintenance, may experience the largest impacts. These projects were more difficult to forecast, and as a result, we primarily rely on a mapping exercise to identify roads that intersect stream reaches, assuming that some construction or maintenance activity will occur in each location over the next 20 years. However, we note that this approach results in an increased level of regulatory activity relative to the historical record of past conservation efforts for the flycatcher. Therefore, it is possible that we overstate future projects.

19. We assume transportation agencies at the Federal, State, and local level will incur costs associated with monitoring and education activities, fencing, habitat restoration and creation, timing restrictions, and administrative activities. In the baseline, we estimate present value impacts of $40 million over 20 years ($3.5 million on an annualized basis).

Incremental impacts may reach $5.8 million over 20 years (or $510,000 on an annualized basis).

Water Management Activities

20. Impacts to water management activities may be the next largest of any of the affected economic activities; however, the majority of the impact of conservation efforts to protect flycatcher will occur even if critical habitat is not designated for the species. Present value baseline impacts range from $200 million to $330 million over 30 years (assuming a seven percent discount rate). Incremental impacts over the same period may range from $1.4 million to $9.6 million.[7] On an annualized basis, impacts range from $14 million to $24 million in the baseline and $110,000 to $720,000 under the incremental scenario. We calculate these costs by identifying significant water management structures and projects in each management unit and assuming that each facility implements flycatcher conservation efforts such as land acquisition, habitat creation, and monitoring. This assumption is consistent with the historical record of actions taken by water operations affecting flycatchers and critical habitat.

21. The 2005 economic analysis also presented a second scenario, which assumed that water operators are forced to change the management regime of their facilities to avoid adverse effects on flycatchers and their habitat. Such action represented a scenario in which the Service or operators did not cooperate on an ITP, or where a third party intervened to force an operator to avoid habitat destruction prior to receipt of an ITP or completion of a section 7 consultation. Costs under such a scenario resulted from the assumed inability of affected reservoirs to maintain water levels above current levels in order to avoid inundation of flycatcher habitat, leading to a loss of storage capacity at these facilities. The Service believes this second scenario is not realistic, as discussed in greater detail in Chapter 3 of this report. Thus, the current analysis does not include such a scenario.

Livestock Grazing Activities

22. Impacts to grazing activities are likely to be smaller relative to the previous two activities, but affect a broader geographic area (approximately 41,000 acres, or 7.6 percent of the proposed designation). Grazing currently occurs in 27 of the 29 proposed critical habitat management units, and as a result, impacts are likely to be experienced in most units. On Federal lands, reductions in grazing allotments are possible depending on the specific conditions within the unit. Baseline costs may range from $9.3 million to $20 million over the 20-year period of the analysis. We estimate potential, present value incremental costs ranging from $2.2 million to $3.5 million over the same period. Impacts include the administrative costs of consultation with the Service, the lost value of grazing permits associated with reductions in authorized Animal Unit-Months (AUMs), costs of constructing and maintaining fencing, and cowbird trapping.

[7] Impacts in the Hoover to Parker, Parker to Southerly, Roosevelt, and Verde management units are forecast over 50 years or the remaining length of a 50-year permit.

Residential and Related Development

23. Impacts to residential and related development activities are likely to be smaller in magnitude than grazing impacts; however costs are concentrated over a smaller geographic area. Nearly all impacts to development activities occur in the California Management Units. The proposed critical habitat is located within the 100-year floodplain or similarly flood-prone areas. Generally, the Federal Emergency Management Agency (FEMA) regulates real estate development in floodplains, and additional restrictions may be imposed by individual, local jurisdictions. These regulations may require flood control facilities or other special engineering, often making development in floodways impractical and prohibitively expensive. Due to existing development restrictions, lands that can be feasibly developed are limited to areas within critical habitat where real estate demand is high enough to justify the costs associated with developing the floodplain.

24. Thus, while, in theory, potential exists for development activities to occur in many areas of proposed critical habitat, due to their rural nature, many areas included in the designation are not likely to experience development in the foreseeable future. This analysis identifies areas that are most likely to be affected by future residential and commercial development using GIS data to identify the overlap of private lands with critical habitat, as well as data on regional population projections. Areas likely to see the greatest development pressure include Mohave County in Arizona and Santa Barbara, Ventura, Los Angeles, Riverside, San Bernardino, and San Diego Counties in California.

25. We estimate lost land value associated with the need to set aside land on-site for the flycatcher; the need to implement additional project modifications, such as cowbird trapping, fencing, monitoring, and habitat management; time delays; and administrative costs. We estimate present value baseline impacts of $50 million. Incremental impacts are $810,000. Because of the availability of alternative, non-critical habitat lands in these regions, these costs are likely to be borne by existing landowners in the form of reduced value for their existing properties. The impacts will be felt immediately, in 2012, upon promulgation of the final rule, and reflect the change in the future, productive use of the properties.

Tribes

26. Lands belonging to 20 Tribes are included within the boundaries of proposed critical habitat, but all are under consideration for exclusion from the final designation. For this report, we contacted each Tribe to solicit information about the likely impacts of the designation. Information provided by the Tribes, along with publicly available information regarding the socioeconomic status of the each Tribe, are provided in the report. We quantify incremental impacts of approximately $660,000, associated with administrative impacts over the 20-year time frame of this analysis. However, of greater concern to the Tribes than administrative costs is the potential impact the designation could have on Tribes' abilities to make use of natural resources, including water rights, on their sovereign lands. The absence of some cost information related to potential impacts of flycatcher critical habitat on Tribal lands results in a probable underestimate of future costs to Tribal entities.

Oil and Gas Development

27. In 2005, potential impacts to oil and gas development was not identified as a significant issue and thus was not considered in the previous economic analysis supporting that designation. However, proposed expansion of critical habitat to include stream reaches in San Juan County, Utah and La Plata County, Colorado triggered concern regarding this industry. Both of these counties are located in the San Juan Management Unit. This area serves as a highly-developed source of oil and natural gas, with hundreds of existing wells. Due to the level of existing protections in riparian areas required by, or agreed to by oil and gas developers and land and resource managers, no project modification costs are expected as a result of the designation of flycatcher critical habitat. However, baseline administrative costs of $33,000 for one formal and six informal consultations are expected due to limited oil and gas activities, including seismic studies and pipeline construction and maintenance. In addition to baseline costs, the analysis forecasts $11,000 in incremental administrative costs to consider adverse modification as part of these consultations.

Mining

28. While few active mineral mining activities occur within the proposed critical habitat, the mining industry has previously expressed concern that water use by existing or potential mining operations could be affected by flycatcher conservation activities, particularly the designation of critical habitat. Critical to an understanding of the potential for impacts on water diversions or conveyance for mining purposes is an understanding of the probability and magnitude of any such changes. There are currently no data that indicate whether existing or future diversions of water for mining activities (including groundwater pumping) reduce stream flow or modify hydrologic conditions to the degree that adversely impacts flycatcher and its riparian habitat. As such, this analysis does not quantify the probability or extent to which water use for mining purposes would need to be curtailed or modified to remedy impacts to flycatcher. Additionally, impacts to extractive mining operations, such as sand and gravel pits, that cause direct habitat loss may occur as the result of critical habitat designation. However, project modification costs associated with these operations are uncertain due to the limited consultation history, and, as a result, this analysis is unable to forecast economic impacts for this specific activity.

Recreation

29. Incremental impacts to recreational activities are unlikely to result from the designation. In the baseline, activities may be affected at Lake Isabella and Lake Roosevelt; however, economic impacts in these areas are likely to be limited to $1.9 million over 20 years. In addition, management activities at a picnic site in the San Bernardino National Forest results in present value baseline costs of $39,000.

POTENTIAL BENEFITS

30. The primary purpose of this rulemaking is to enhance conservation of the flycatcher. The published economics literature has documented that social welfare benefits can result

from the conservation and recovery of endangered and threatened species. In its guidance to Federal agencies on best practices for preparing economic analyses of proposed rulemakings, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research. Rather than rely on economic measures, the Service believes that the direct benefits of the proposed rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking. In this report, we include a qualitative description of the categories of benefits potentially resulting from the listing and the designation and indicate the management units where such benefits may occur.

IMPACTS TO SMALL ENTITIES AND THE ENERGY INDUSTRY

31. Appendix A of this report includes an analysis of the distributional impacts of the proposed critical designation on small entities and the energy industry. Exhibit ES-7 presents the results of the threshold analysis developed to support the Service's determination regarding whether the proposed rule will have a significant economic impact on a substantial number of small entities, as required by the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).

32. In addition, Executive Order 13211 requires agencies to prepare and submit a "Statement of Energy Effects" for all "significant energy actions." As described in that appendix, the proposed rule is unlikely to increase the cost of energy production in the U.S. in excess of one percent.

EXHIBIT ES-7. RFA/SBREFA THRESHOLD ANALYSIS RESULTS SUMMARY

ACTIVITY	INDUSTRY/ENTITY (NAICS CODES)	NUMBER OF SMALL ENTITIES AFFECTED	PERCENT OF AFFECTED SMALL ENTITIES IN THE STUDY AREA	PER ENTITY ANNUALIZED COSTS AS A PERCENT OF ANNUAL REVENUES
Water Management	Luna Irrigation Company[1] (Water Supply and Irrigation (221310))	1	0.08%	0.01% to 0.15%
Grazing	Beef Cattle Ranching and Farming (112111)	3	0.49%	0.24% to 0.43%
		29	5.6%	0.12%
Development	New Single-Family Housing Construction (236115); New Multifamily Housing Construction (236116); New Housing Operative Builders (236117); Land Subdivision (237210)	1	<0.01%	5.72%
		6	<0.01%	0.05%
Tribes	Tribes are not considered to be small entities; rather, they are treated as sovereign nations under the RFA/SBREFA	N/A	N/A	N/A
Transportation	County and city governments serving populations less than 50,000	3	Unknown	<0.01% to 0.06%
Mining	Freeport, Grupo Mexico (Asarco), and BHP Billiton are not small entities (Mining (212))	0	N/A	N/A
Oil and Gas	Oil and Gas Extraction (211)	7	2.3%	<0.01%
Recreation	No incremental impacts.	N/A	N/A	N/A

Source: Detailed analysis presented in Appendix A.
Notes: (1) Because revenue information is not readily available, we assume this non-Federal water management entity is small. (2) For grazing and development, the analysis distinguishes between entities expected to bear project modification costs and those expected to bear only administrative costs because the expected magnitude of impacts differs significantly across the two groups.

KEY SOURCES OF UNCERTAINTY

33. At the end of each activity-specific chapter, we include a discussion of the key sources of uncertainty and major assumptions affecting the calculation of impacts. These uncertainties vary depending on the specific-activity in question. One issue that affects all activities is the question of whether conservation efforts undertaken in areas where flycatcher territories have previously been detected, but that were not previously designated as critical habitat, will only occur if critical habitat is designated in the future. It is possible that given historical survey results, some agencies may undertake conservation efforts in these areas in order to avoid jeopardizing the species. If so, our analysis is more likely to overstate, than understate, the incremental impacts of the proposed rule.

34. In addition, critical habitat is primarily protected through section 7 of the Act, which requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species or adversely modify critical habitat. For each activity, we discuss the potential for a Federal nexus to exist, compelling consultation under section 7 with the Service. Where we are uncertain, we err on the side of assuming a nexus is likely to exist, thus potentially overstating the degree to which conservation efforts will be undertaken.

35. Finally, in each section, we make assumptions about the typical conservation efforts likely to be undertaken, and their costs, based on information collected in support of the 2005 critical habitat rulemaking, more recent consultations with the Service, existing habitat conservation plans (HCPs), and activities undertaken for other species with similar habitat needs. To the extent that the suite of conservation efforts undertaken in the future varies from these assumptions, impacts may be under- or over-stated.

CHAPTER 1 | BACKGROUND

1.1 INTRODUCTION

36. This chapter provides an overview of the proposed critical habitat for the Southwestern willow flycatcher (*Empidonax traillii extimus*). It includes a summary of past legal actions that relate to the current proposal, maps of the area proposed for designation, and a description of activities that may affect or threaten the proposed critical habitat.

1.1.1 PREVIOUS FEDERAL ACTIONS

37. The Service listed the Southwestern willow flycatcher (hereafter "flycatcher") as endangered on February 27, 1995. The Service has designated critical habitat for the species twice previously. The current proposed rule represents the third critical habitat proposal for this species. Key regulatory milestones for the flycatcher include:

- **Listing:** The Service published a rule listing the flycatcher as threatened on February 27, 1995.[8]
- **Original critical habitat designation (CHD):** The Service published a final rule designating 599 stream miles of critical habitat for the flycatcher on July 22, 1997, corrected on August 20, 1997.[9]
- **Proposed rule revising critical habitat:** On October 12, 2004, the Service published a rule proposing to revise the designation of critical habitat to include approximately 376,095 acres, or 1,556 stream miles, as a result of legal action initiated by the New Mexico Cattle Grower's Association.[10]
- **Final revised critical habitat:** The Service published a final rule on October 19, 2005, revising critical habitat to include 737 stream miles.[11]
- **Proposed rule revising critical habitat:** The Service published the current proposed rule to revise the CHD on August 15, 2011, as a result of legal action initiated by the Center for Biological Diversity.[12]

[8] 1995 Final Listing Rule, 60 FR 10694.

[9] 1997 Final Rule, 62 FR 39129; 1997 Final Rule, 62 FR 44228.

[10] 2004 Proposed Rule, 69 FR 60706.

[11] 2005 Final Rule, 70 FR 60886.

[12] Center for Biological Diversity v. Kempthorne, et al., No. C-08-4594 PJH.

1.1.2 PROPOSED CRITICAL HABITAT DESIGNATION

38. The 2011 proposed revised CHD includes stream segments in 29 management units, as defined by the 2002 Recovery Plan for this species, totaling approximately 2,112 stream miles.[13] These units are located in California, Nevada, Utah, Colorado, Arizona, and New Mexico.[14] In addition to the 2,112 stream miles, the proposed designation includes "the lateral extent [of the proposed stream segments] including the riparian areas and streams that occur within the 100-year floodplain or flood-prone areas."[15] This area includes about 532,635 acres in total. Exhibit 1-1 provides information on land ownership within the proposed critical habitat. This exhibit shows that, overall, much of the habitat is federally- (36 percent) and privately-owned (31 percent). The remainder is owned by State and local governments, and Tribes.

39. The previous designation of critical habitat focused on lands that support large flycatcher populations.[16] In the current proposed rule, the Service also proposes to designate lands outside of the geographical area occupied at the time of listing, which the Service has determined to be essential for the conservation of the flycatcher. Exhibits 1-2 through 1-9 provide maps of the 2011 proposed revised CHD.[17]

1.2 ECONOMIC ACTIVITIES CONSIDERED IN THIS ANALYSIS

40. Review of the proposed rule, consultation history, existing conservation plans, and public comments submitted during the previous 2005 critical habitat rulemaking as well as this rulemaking identified the following economic activities that may incur impacts related to conservation of flycatcher and its habitat:

(1) **Water Management and Use,** including dam operation and maintenance, hydropower production, groundwater pumping, flood control, river channelization, bank stabilization, and other water diversions.

(2) **Livestock Grazing,** including reduced livestock grazing on public lands due to flycatcher-related restrictions.

(3) **Development,** in particular, real estate development within riparian areas.

(4) **Transportation,** particularly construction and maintenance of bridges and roads.

(5) **Tribal Activities,** including all uses of the Tribal land and water rights.

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[13] 2011 Proposed Rule, 76 FR 50554.

[14] 2011 Proposed Rule, 76 FR 50541.

[15] 2011 Proposed Rule, 76 FR 50542.

[16] 2004 Proposed Rule, 69 FR 60706.

[17] Note, the maps reflect stream segments proposed for designation in the August 15, 2011 proposed rule. The current Notice of Availability makes some minor changes to the areas proposed for designation. Specifically, Carson Slough in the Amargosa management unit is no longer proposed for designation, and the area originally proposed in the Ash Meadows Riparian Areas has been reduced. In the Santa Cruz management unit, new areas along Cienega Creek and Empire Gulch have been added to the proposed designation. Review of the affected areas suggests that estimated economic impacts presented in this report for that management unit are unlikely to be affected by these changes.

(6) **Mining,** including sand and gravel, geothermal, and mineral operations that may be affected by potential water restrictions.

(7) **Oil and Gas Exploration,** particularly land disturbance caused by oil and gas drilling.

(8) **Recreation,** including hiking, camping, fishing, hunting, boating, rafting, and off-highway vehicle (OHV) use.

1.3 ORGANIZATION OF THE REPORT

41. The remainder of this report is organized into eleven chapters and three appendices. Chapter 2 discusses the framework employed in the analysis, while Chapters 3 through 11 describe baseline protections currently afforded the flycatcher and its habitat and the potential incremental impacts of designating critical habitat, for each potentially affected economic activity.

- Chapter 2 – Framework for Analysis
- Chapter 3 – Potential Economic Impacts to Water Management and Use
- Chapter 4 – Potential Economic Impacts to Grazing Activities
- Chapter 5 – Potential Economic Impacts to Residential and Commercial Development
- Chapter 6 – Potential Economic Impacts to Tribes
- Chapter 7 – Potential Economic Impacts to Transportation Activities
- Chapter 8 – Potential Economic Impacts to Oil and Gas Development
- Chapter 9 – Potential Economic Impacts to Mining Operations
- Chapter 10 –Potential Economic Impacts to Recreational Activities
- Chapter 11 – Economic Benefits
- Appendix A – Small Business and Energy Impacts Analyses
- Appendix B – Sensitivity of Results to Discount Rate
- Appendix C – Incremental Effects Memorandum to IEc

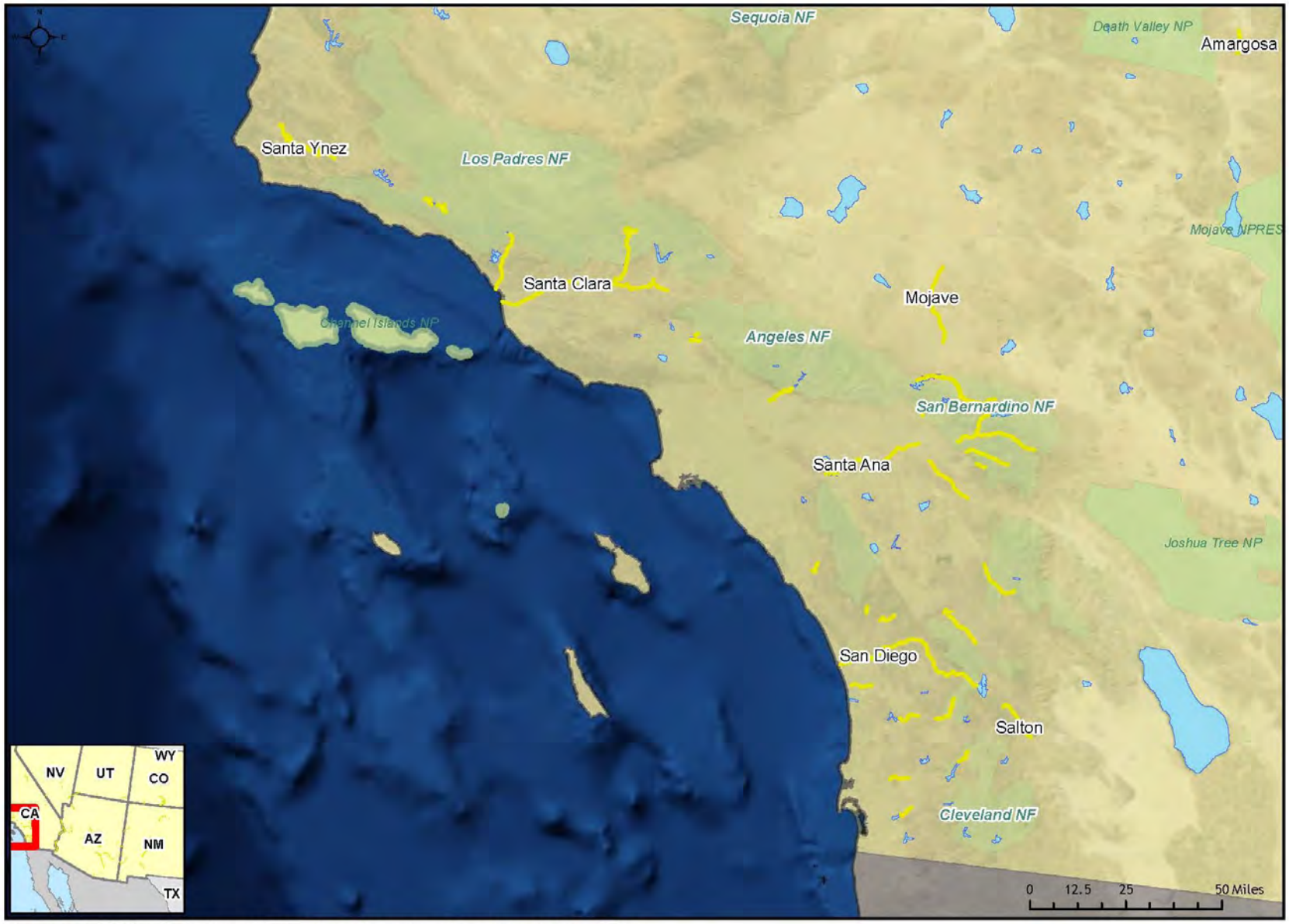
EXHIBIT 1-1. LAND OWNERSHIP IN PROPOSED CRITICAL HABITAT BY MANAGEMENT UNIT (ACRES)

MANAGEMENT UNIT	FEDERAL	STATE	PRIVATE	TRIBAL	OTHER	TOTAL
Santa Ynez	519.5	0	0	0	3,265.8	**3,785.3**
Santa Clara	399.0	189.2	0	0	14,351.2	**14,939.4**
Santa Ana	3,029.1	31.5	0	4.4	8,632.1	**11,697.1**
San Diego	129.1	149.6	0	825.6	8,417.2	**9,521.5**
Owens	42.3	0	0	0	20,564.7	**20,606.9**
Kern	1,482.2	363.3	121.2	0	3,487.6	**5,454.4**
Mojave	997.5	0	0	0	4,550.5	**5,547.9**
Salton	0.1	154.2	0	21.8	596.6	**772.8**
Amargosa*	9,795.2	69.5	28.6	0	239.1	**10,132.4**
Little Colorado	291.3	50.0	115.2	7,082.9	0	**7,539.5**
Virgin	5,497.4	1,719.6	6,156.8	0	2.2	**13,376.0**
Middle Colorado	8,666.0	0	0	1,752.2	0	**10,418.1**
Pahranagat	2,701.9	941.5	292.7	0	0	**3,936.1**
Bill Williams	5,305.3	3,762.6	6,052.5	0	0	**15,120.4**
Hoover-Parker	30,191.6	718.5	322.6	11,844.7	3,590.3	**46,667.6**
Parker-Southerly International Boundary	36,815.4	2,508.2	2,196.9	15,427.6	3,576.4	**60,524.5**
San Juan	2,195.2	74.8	2,291.5	8,251.4	0	**12,812.9**
Powell	1,135.1	0	144.3	0	0	**1,279.4**
Verde	6,828.3	486.3	3,845.2	219.9	0	**11,379.7**
Roosevelt	24,897.6	0	1,901.0	0	0	**26,798.7**
Middle Gila/San Pedro	3,270.4	3,019.3	20,781.8	192.8	0	**27,264.3**
Upper Gila	2,738.9	434.1	16,717.3	21,844.7	0	**41,734.9**
Santa Cruz*	926.4	64.0	4,575.9	0	0	**5,566.3**
San Francisco	2,158.4	0	1,869.3	0	0	**4,027.8**
Hassayampa/Agua Fria	398.9	477.3	1,278.5	0	0	**2,154.6**
San Luis Valley	8,028.1	221.8	71,331.9	0	1,420.5	**81,002.3**
Upper Rio Grande	526.4	0	1,693.8	4,837.1	0	**7,057.3**
Middle Rio Grande	12,816.2	25,435.3	30,123.4	0	0	**68,374.9**
Lower Rio Grande	218.4	317.6	4,778.2	0	0	**5,314.3**
Total	**172,001.2**	**41,188.3**	**176,618.6**	**72,305.0**	**72,694.1**	**534,807.2**

Notes:

1. Totals may not sum due to rounding.
2. Acreage estimates developed based on GIS data provided by the Service. Note, this table reflects stream segments proposed for designation in the August 15, 2011 proposed rule. The current Notice of Availability makes some minor changes to the areas proposed for designation in the Amargosa and Santa Cruz management units. Review of the affected areas suggests that estimated impacts are unlikely to increase because of these changes.
3. "Other" includes locally-owned lands and lands covered under various conservation plans, including the Riverside County Multiple Species Habitat Conservation Plan, the San Diego County Multiple Species Habitat Conservation Plan, the Southern California Habitat Conservation Plan, etc.

EXHIBIT 1-2. PROPOSED FLYCATCHER CRITICAL HABITAT: SANTA YNEZ, SANTA CLARA, SANTA ANA, SAN DIEGO, MOJAVE, AND SALTON MANAGEMENT UNITS



Management Units: Santa Ynez, Santa Clara, Santa Ana, San Diego, Mojave, Salton

Proposed Critical Habitat

Sources:
1. United States Fish and Wildlife Service
2. Environmental Systems Research Institute, Inc. (ESRI)

IEc INDUSTRIAL ECONOMICS, INCORPORATED

Projection: Albers Equal Area Conic
Geodetic Reference System: NAD 83

EXHIBIT 1-3. PROPOSED FLYCATCHER CRITICAL HABITAT: OWENS, KERN, AND AMARGOSA MANAGEMENT UNITS

Management Units: Owens, Kern, Amargosa

Proposed Critical Habitat

Sources:
1. United States Fish and Wildlife Service
2. Environmental Systems Research Institute, Inc. (ESRI)

IEc INDUSTRIAL ECONOMICS, INCORPORATED

Projection: Albers Equal Area Conic
Geodetic Reference System: NAD 83

EXHIBIT 1-4. PROPOSED FLYCATCHER CRITICAL HABITAT: HOOVER TO PARKER DAM, BILL WILLIAMS, AND PARKER TO SOUTHERLY INTERNATIONAL BOUNDARY MANAGEMENT UNITS

Management Units: Hoover-Parker, Bill Williams, Parker-S. Int'l Border

Proposed Critical Habitat

Sources:
1. United States Fish and Wildlife Service
2. Environmental Systems Research Institute, Inc. (ESRI)

IEc INDUSTRIAL ECONOMICS, INCORPORATED

Projection: Albers Equal Area Conic
Geodetic Reference System: NAD 83

EXHIBIT 1-5. PROPOSED FLYCATCHER CRITICAL HABITAT: PAHRANAGAT, VIRGIN, MIDDLE COLORADO, AND POWELL MANAGEMENT UNITS

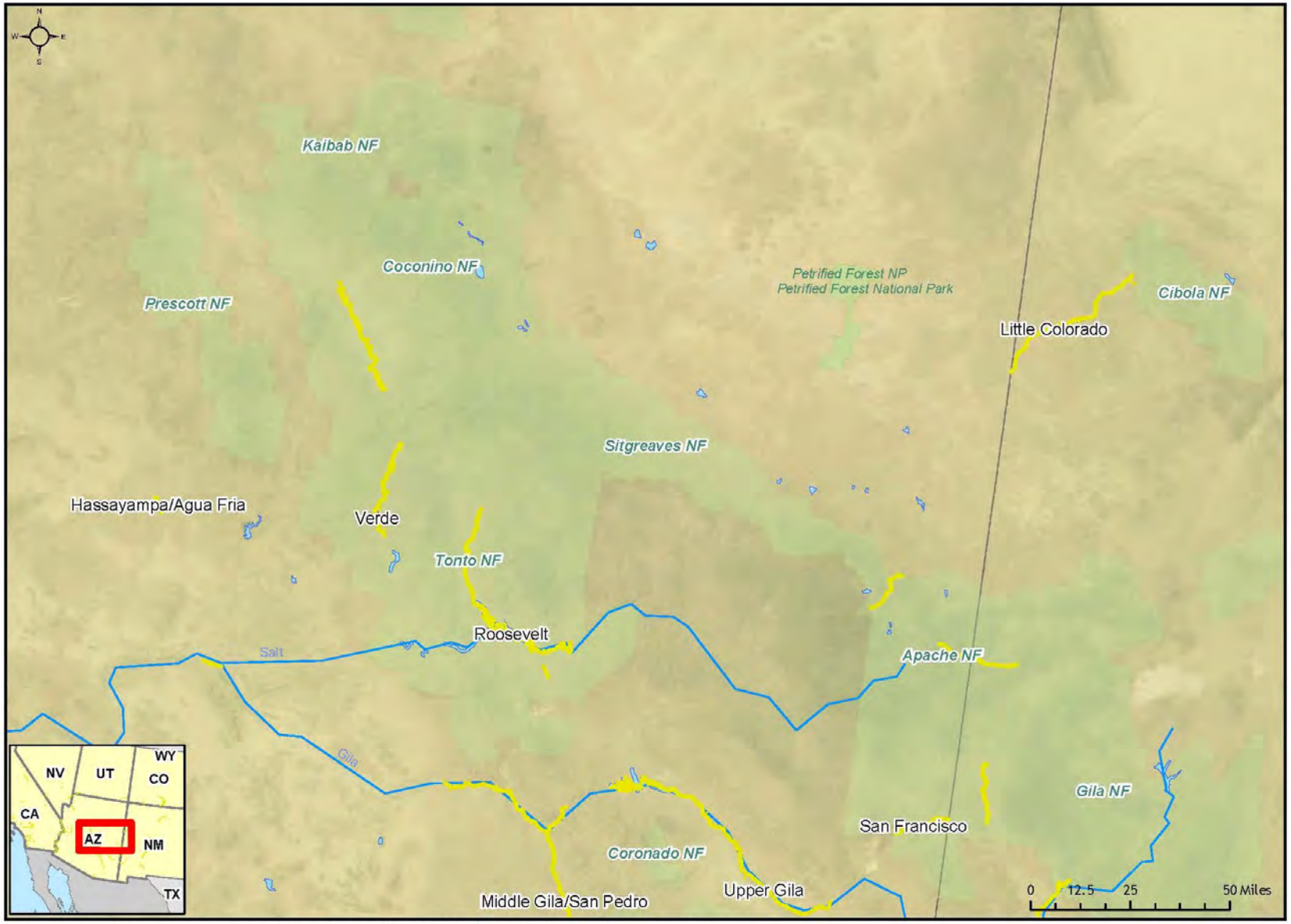
Management Units: Pahranagat, Virgin, Middle Colorado, Powell

Proposed Critical Habitat

Sources:
1. United States Fish and Wildlife Service
2. Environmental Systems Research Institute, Inc. (ESRI)

IEc
Projection: Albers Equal Area Conic
Geodetic Reference System: NAD 83
INDUSTRIAL ECONOMICS, INCORPORATED

EXHIBIT 1-6. PROPOSED FLYCATCHER CRITICAL HABITAT: HASSANYAMPA/AGUA FRIA, VERDE, ROOSEVELT, LITTLE COLORADO, AND SAN FRANCISCO MANAGEMENT UNITS



Management Units: Hassanyampa/Agua Fria, Verde, Roosevelt, Little Colorado, San Francisco

Proposed Critical Habitat

Sources:
1. United States Fish and Wildlife Service
2. Environmental Systems Research Institute, Inc. (ESRI)

IEc INDUSTRIAL ECONOMICS, INCORPORATED

Projection: Albers Equal Area Conic
Geodetic Reference System: NAD 83

EXHIBIT 1-7. PROPOSED FLYCATCHER CRITICAL HABITAT: MIDDLE GILA/SAN PEDRO, SANTA CRUZ, UPPER GILA, AND SAN FRANCISCO MANAGEMENT UNITS

Management Units: Middle Gila/San Pedro, Santa Cruz, Upper Gila, San Francisco

Proposed Critical Habitat

Sources:
1. United States Fish and Wildlife Service
2. Environmental Systems Research Institute, Inc. (ESRI)

IEc INDUSTRIAL ECONOMICS, INCORPORATED

Projection: Albers Equal Area Conic
Geodetic Reference System: NAD 83

EXHIBIT 1-8. PROPOSED FLYCATCHER CRITICAL HABITAT: MIDDLE RIO GRANDE AND LOWER RIO GRANDE MANAGEMENT UNITS

Management Units: Middle Rio Grande, Lower Rio Grande

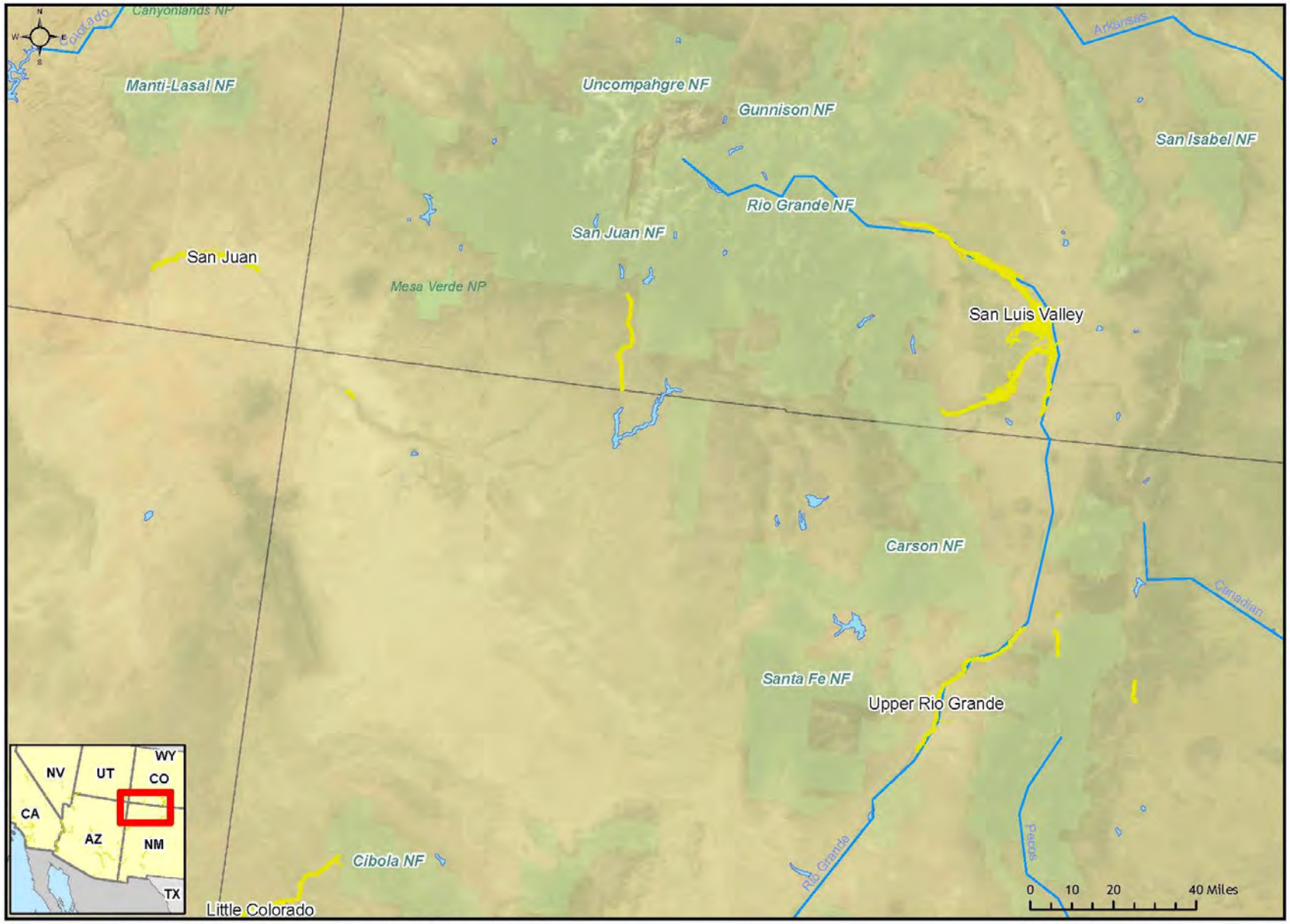
Proposed Critical Habitat

Sources:
1. United States Fish and Wildlife Service
2. Environmental Systems Research Institute, Inc. (ESRI)

IEc INDUSTRIAL ECONOMICS, INCORPORATED

Projection: Albers Equal Area Conic
Geodetic Reference System: NAD 83

EXHIBIT 1-9. PROPOSED FLYCATCHER CRITICAL HABITAT: SAN JUAN, SAN LUIS VALLEY, AND UPPER RIO GRANDE MANAGEMENT UNITS



Management Units: San Juan, San Luis Valley, Upper Rio Grande

Proposed Critical Habitat

Sources:
1. United States Fish and Wildlife Service
2. Environmental Systems Research Institute, Inc. (ESRI)

IEc INDUSTRIAL ECONOMICS, INCORPORATED

Projection: Albers Equal Area Conic
Geodetic Reference System: NAD 83

CHAPTER 2 | FRAMEWORK FOR THE ANALYSIS

42. The purpose of this report is to estimate the economic impact of actions taken to protect the flycatcher and its habitat. This analysis examines the impacts of restricting or modifying specific land uses or other activities for the benefit of the species and its habitat within the proposed critical habitat area. This analysis employs "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections otherwise accorded the flycatcher; for example, under the Federal listing and other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat for the flycatcher. The analysis forecasts both baseline and incremental impacts likely to occur after the proposed critical habitat is finalized.

43. This information is intended to assist the Secretary of the DOI in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.[18] In addition, this information allows the Service to address the requirements of Executive Orders 12866 (as amended by Executive Order 13563) and 13211, and the RFA, as amended by the SBREFA.[19]

44. This chapter describes the framework for this analysis. First, it describes the differences in framework applied in the 2005 and 2012 Economic Analyses. It then describes case law that led to the selection of the framework applied in this report. Next, we describe in economic terms the general categories of economic effects that are the focus of the impact analysis, including a discussion of both efficiency and distributional effects. This chapter then defines the analytic framework used to measure these impacts in the context of critical habitat regulation and the consideration of benefits. It concludes with a presentation of the information sources relied upon in the analysis.

45. Because the 2011 proposed rule identifies units of critical habitat that coincide with those previously evaluated for the 2004 proposed rule, this analysis draws on some of the economic cost information documented in the 2005 Economic Analysis.[20] However, this analysis applies a fundamentally different analytical approach from that applied in 2005.

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[18] 16 U.S.C. §1533(b)(2).

[19] Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993; Executive Order 13563, *Improving Regulation and Regulatory Review*, January 18, 2011; Executive Order 13211, *Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use*, May 18, 2001; 5. U.S.C. §§601 *et seq*; and Pub Law No. 104-121.

[20] Industrial Economics, Incorporated. 2005. *Final Economic Analysis of Critical Habitat Designation for the Southwestern Willow Flycatcher*, prepared for the U.S. Fish and Wildlife Service, September 28, 2005.

Exhibit 2-1 summarizes how this analysis reflects new elements and analytical approaches that the Service has provided or adopted since the 2004 proposed rule.

EXHIBIT 2-1. DIFFERENCES IN ANALYTICAL APPROACH BETWEEN THE 2005 AND CURRENT (2012) ECONOMIC ANALYSES

- The 2012 Economic Analysis distinguishes the *incremental* costs of designation from baseline costs whereas the 2005 Economic Analysis evaluated all "co-extensive" costs of all flycatcher conservation collectively. That is, the impacts estimated in the 2005 Economic Analysis capture costs of flycatcher conservation regardless of whether they resulted specifically from critical habitat designation.
- This 2012 Economic Analysis instead characterizes all potential future flycatcher conservation as either baseline (i.e., expected to occur absent the designation of critical habitat) or incremental (i.e., expected to occur as a result of critical habitat designation). The Service provided guidance on distinguishing the incremental costs of the designation, as described in Section 2.3.2 of this report.
- This analysis considers and estimates the impacts of the rule as currently proposed and as if the existing 2005 critical habitat designation does not exist. In other words, this analysis considers and estimates the impacts associated with designating areas as critical habitat versus not designating these areas. This analysis is intended to assist the Secretary of the DOI in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation. These particular areas include those already designated as critical habitat under the 2005 designation and subject to re-examination by the Secretary. As a result, costs incurred as a result of the 2005 designation are not separately documented in this analysis.

2.1 BACKGROUND

46. The U.S. Office of Management and Budget's (OMB) guidelines for conducting economic analysis of regulations direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action."[21] In other words, the baseline includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e., occurring over and above existing constraints) are attributable to the proposed regulation. Significant debate has occurred regarding whether assessing the impacts of the Service's proposed regulations using this baseline approach is appropriate in the context of CHDs.

47. In 2001, the U.S. Tenth Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, regardless of whether

[21] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, accessed at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

those impacts are attributable co-extensively to other causes.[22] Specifically, the court stated,

> "The statutory language is plain in requiring some kind of consideration of economic impact in the CHD [critical habitat designation] phase. Although 50 C.F.R. 402.02 is not at issue here, the regulation's definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless. We are compelled by the canons of statutory interpretation to give some effect to the congressional directive that economic impacts be considered at the time of critical habitat designation…. Because economic analysis done using the FWS's [Fish and Wildlife Service's] baseline model is rendered essentially without meaning by 50 C.F.R. § 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes. Thus, we hold the baseline approach to economic analysis is not in accord with the language or intent of the ESA [Endangered Species Act]."[23]

48. Since that decision, however, courts in other cases have held that an incremental analysis of impacts stemming solely from the critical habitat rulemaking is proper.[24] For example, in the March 2006 ruling that the August 2004 critical habitat rule for the Peirson's milk-vetch was arbitrary and capricious, the United States District Court for the Northern District of California stated,

> "The Court is not persuaded by the reasoning of *New Mexico Cattle Growers*, and instead agrees with the reasoning and holding of *Cape Hatteras Access Preservation Alliance v. U.S. Dep't of the Interior,* 344 F. Supp 2d 108 (D.D.C. 2004). That case also involved a challenge to the Service's baseline approach and the court held that the baseline approach was both consistent with the language and purpose of the ESA and that it was a reasonable method for assessing the actual costs of a particular critical habitat designation *Id* at 130. 'To find the true cost of a designation, the world with the designation must be compared to the world without it.'"[25]

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[22] *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

[23] *Ibid.*

[24] In explanation of their differing conclusion, later decisions note that in *New Mexico Cattle Growers*, the U.S. Tenth Circuit Court of Appeals relied on a Service regulation that defined "destruction and adverse modification" in the context of section 7 consultation as effectively identical to the standard for "jeopardy." Courts had since found that this definition of "adverse modification" was too narrow. For more details, see the discussion of *Gifford Pinchot Task Force v. United States Fish and Wildlife Service* provided later in this section.

[25] *Center for Biological Diversity et al., Plaintiffs, v. United States Bureau of Land Management et al., Defendants and American Sand Association, et al., Defendant Intervenors*. Order re: Cross Motions for Summary Judgment, Case 3:03-cv-02509 Document 174 Filed 03/14/2006, pages 44-45.

49. More recently, in 2010, the U.S. Ninth Circuit Court of Appeals came to similar conclusions during its review of CHDs for the Mexican spotted owl and 15 vernal pool species.[26] Plaintiffs in both cases requested review by the Supreme Court, which declined to hear the cases in 2011.

50. In order to address the divergent opinions of the courts and provide the most complete information to decision-makers, this economic analysis reports both:

- The baseline impacts of protections afforded the flycatcher absent CHD; and
- The estimated incremental impacts precipitated specifically by the designation of critical habitat for the species.

Summed, these two types of impacts comprise the fully co-extensive impacts of conservation in areas considered for CHD.

51. Several Courts of Appeal, including the Ninth Circuit and the Fifth Circuit, have invalidated the Service's regulation defining destruction or adverse modification of critical habitat.[27] At this time the Service is analyzing whether destruction or adverse modification would occur based on the statutory language of the Act itself, which requires the Service to consider whether the agency's action is likely "to result in the destruction or adverse modification of habitat which is determined by the Service to be critical" to the conservation of the species. To perform this analysis, the Service considers how the proposed action is likely to impact the function of the critical habitat unit in question. To assist us in evaluating these likely impacts, the Service provided information regarding what potential consultations could occur in the critical habitat units for the flycatcher and what projection modifications may be imposed as a result of CHD. The Service also provided a memorandum characterizing the effects of CHD over and above those associated with the listing (see Appendix C). A detailed description of the methodology used to define baseline and incremental impacts is provided later in this section.

2.2 CATEGORIES OF POTENTIAL ECONOMIC EFFECTS OF SPECIES CONSERVATION

52. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the flycatcher and their habitat (hereinafter referred to collectively as "flycatcher conservation efforts"). Economic efficiency effects generally reflect "opportunity costs" associated with the commitment of resources required to accomplish species and habitat conservation. For example, if the set of activities that may take place on a parcel of land is limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic

[26] Home Builders Association of Northern California v. United States Fish and Wildlife Service, 616 F.3d 983 (9th Cir. 2010), cert. denied, 179 L. Ed 2d 301, 2011 U.S. Lexis 1392, 79 U.S.L.W. 3475 (2011); Arizona Cattle Growers v. Salazar, 606 F. 3d 1160 (9th Cir. 2010), cert. denied, 179 L. Ed. 2d 300, 2011 U.S. LEXIS 1362, 79 U.S.L.W. 3475 (2011).

[27] *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, 378 F.3d 1059 (9th Cir. 2004); *Sierra Club v. U. S. Fish and Wildlife Service*, 245 F.3d 434 (5th Cir. 2001).

efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of flycatcher conservation efforts.

53. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether the effects of species conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts.

2.2.1 EFFICIENCY EFFECTS

54. At the guidance of OMB and in compliance with Executive Order 12866 "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect flycatcher habitat, these efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.[28]

55. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager may enter into a section 7 consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets -- that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price -- the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.

56. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, protection measures that reduce or preclude the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market.

2.2.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

57. Measurements of changes in economic efficiency focus on the net impact of conservation efforts, without consideration of how certain economic sectors or groups of people are

[28] For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich, Edward M., A Guide to Benefit-Cost Analysis (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, EPA 240-R-00-003, September 2000, accessed at http://yosemite.epa.gov/ee/epa/eed.nsf/ webpages/Guidelines.html.

affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.[29] This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

Impacts on Small Entities and Energy Supply, Distribution, and Use

58. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the RFA, might be affected by future species conservation efforts.[30] In addition, in response to Executive Order 13211 "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future impacts of conservation efforts on the energy industry and its customers.[31]

Regional Economic Effects

59. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreators) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreators). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.

60. The use of regional input-output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.

61. Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It

[29] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, accessed at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[30] 5 U.S.C. §§601 *et seq*.

[31] Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.

2.3 ANALYTIC FRAMEWORK AND SCOPE OF THE ANALYSIS

62. This analysis: 1) identifies those economic activities most likely to threaten the flycatcher and its habitat; 2) describes the baseline regulatory protection for the species; and 3) monetizes the incremental economic impacts to avoid adverse modification of the proposed critical habitat area. This section provides a description of the methodology used to separately identify baseline protections from the incremental impacts stemming from the proposed designation of critical habitat for the flycatcher. This evaluation of impacts in a "with critical habitat designation" versus a "without critical habitat designation" framework effectively measures the net change in economic activity associated with the proposed rulemaking.

2.3.1 IDENTIFYING BASELINE IMPACTS

63. The baseline for this analysis is the existing state of regulation, prior to the designation of critical habitat, which provides protection to the species under Act, as well as under other Federal, State and local laws and guidelines. This "without critical habitat designation" scenario also considers a wide range of additional factors beyond the compliance costs of regulations that provide protection to the listed species. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by the Service and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.

64. Baseline protections include sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections to the extent that they are expected to occur absent the designation of critical habitat for the species. This analysis describes these baseline regulations, and where possible, provides examples of the potential magnitude of the costs of these baseline protections. The primary focus, however, is not on baseline costs, since these will not be affected by the proposed regulation. Instead, the focus of this analysis is on monetizing the incremental impacts forecast to result from the proposed CHD.

- Section 7 of Act, absent CHD, requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. Consultations under the jeopardy standard result in administrative costs, as well as impacts of conservation efforts resulting from consideration of this standard.
- Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage

in any such conduct."[32] The economic impacts associated with this section manifest themselves in sections 7 and 10.

- Under section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop an HCP for a listed animal species in order to meet the conditions for issuance of an ITP in connection with a land or water use activity or project.[33] The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately avoided or minimized. The development and implementation of HCPs is considered a baseline protection for the species and habitat unless the HCP is determined to be precipitated by the designation of critical habitat, or the designation influences stipulated conservation efforts under HCPs.

Enforcement actions taken in response to violations of the Act are not included in this analysis.

65. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. If compliance with the Clean Water Act or State environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are categorized accordingly. Of note, however, is that such efforts may not be considered baseline in the case that they would not have been triggered absent the designation of critical habitat. In these cases, they are considered incremental impacts and are discussed below.

2.3.2 IDENTIFYING INCREMENTAL IMPACTS

66. This analysis quantifies the potential incremental impacts of this rulemaking. The focus of the incremental analysis is to determine the impacts on land uses and activities from the designation of critical habitat that are above and beyond those impacts resulting from existing required or voluntary conservation efforts being undertaken due to other Federal, State, and local regulations or guidelines.

67. When critical habitat is designated, section 7 requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to considering whether the actions are likely to jeopardize the continued existence of the species). The added administrative costs of including consideration of critical habitat in section 7 consultations, and the additional impacts of implementing conservation efforts (i.e., reasonable and prudent alternatives) resulting from the protection of critical habitat are the direct compliance costs of designating critical habitat. These costs are not in the baseline and are considered incremental impacts of the rulemaking. Exhibit 2-2 depicts the decision analysis regarding whether an impact should be considered incremental.

[32] 16 U.S.C. 1532.

[33] U.S. Fish and Wildlife Service. 2002. "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at http://endangered.fws.gov/hcp/.

68. Incremental impacts may be the direct compliance costs associated with additional effort for consultations, reinitiated consultations, new consultations occurring specifically because of the designation, and additional conservation efforts that would not have been requested under the jeopardy standard. Additionally, incremental impacts may include indirect impacts resulting from reaction to the potential designation of critical habitat (e.g., implementing flycatcher conservation in an effort to avoid designation of critical habitat), triggering of additional requirements under State or local laws intended to protect sensitive habitat, and uncertainty and perceptional effects on markets.

Approach to Identifying Incremental Impact

69. To inform the economic analysis, the Service provided a memorandum describing its expected approach to conservation for the flycatcher following CHD (Appendix C). Specifically, the Service's memorandum provides information on how the Service intends to address projects that might lead to adverse modification of critical habitat as distinct from projects that may jeopardize the species. The application of the memorandum's conclusions is depicted graphically in Exhibit 2-2.

70. Specifically, incremental impacts may vary by geographic area depending on: (1) whether flycatcher territories have previously been detected; (2) whether the relevant stream segment was designated as critical habitat in 2005 or proposed and excluded based on existing protections; and (3) whether the species has since been included in existing management plans, or its presence is otherwise addressed. Following the flow chart, for projects covered by a conservation plan, the analysis assumes that that direct incremental impacts are limited to additional administrative costs associated with new or reinitiated section 7 consultations. Past consultations on existing or draft HCPs may, for example, be reinitiated following CHD, resulting in administrative effort.

71. The analysis assumes that the primary incremental impacts of the designation will occur in or along stream segments where flycatcher territories have not be detected since surveys began in 1991 (12 stream segments). Specifically, the Service believes that "an incremental impact will be most likely to occur along designated streams where nesting flycatchers have yet to be detected."[34] The Service further asserts that it does "not anticipate that different types of activities in the future will undergo evaluation and consultation […] compared to those activities which previously occurred during our flycatcher consultation history."[35] To determine whether flycatcher territories have been previously detected, the analysis relies on the information provided by the Service in Table 1 of the Proposed Rule.[36] Because the Service states that "occupied breeding habitat is considered occupied year-round for project-related effects that degrade habitat quality," we make an additional simplifying assumption that all stream segments where

[34] U.S. Fish and Wildlife Service. 2011. "Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Re-Designate Critical Habitat for the Southwestern Willow Flycatcher (*Empidonax traillii extimus)* (flycatcher)," October 21, 2011, p. 17.

[35] *Ibid*, p. 17.

[36] 2011 Proposed Rule, 76 FR 50560-50561.

territories have previously been detected are considered occupied for purposes of section 7 consultation.[37]

72. For occupied stream segments that were designated as critical habitat in 2005, and stream segments which were proposed in 2005, but excluded from the final designation, future project modification costs in these areas are attributed to the baseline. The public is aware of the need to consider the effects of future projects on the species, and designation of these areas is unlikely to provide new information about the need to consult under section 7 of the Act. Furthermore, although incremental project modifications to avoid adverse modification of critical habitat during future section 7 consultations are possible, these project modifications are difficult to predict because, to some extent, they will overlap with the any project modifications required for avoiding jeopardy.[38] In addition, a review of the past consultation record both with and without critical habitat, the Service found "no instances where actual project modifications were previously required to avoid destruction or adverse modification of critical habitat."[39] Therefore, most quantified incremental impacts of future consultations in the areas occupied by the species are primarily limited to the additional, minor administrative costs of considering the potential for the project to adversely modify critical habitat. Furthermore, the Service does "not anticipate that Federal actions already evaluated for critical habitat effects would need to re-initiate consultation."[40] In total, 57 areas (stream segments) fall into this category of costs.

73. For occupied areas that were neither designated as critical habitat, nor proposed in the 2004 (14 total segments), incremental impacts may be possible. The Service notes that these segments "might receive more agency awareness, and therefore, the agencies may consult with the Service on actions for which they may have previously not considered [sic] as needing consultation".[41] However, a close review of these areas indicates that they are, for the most part, either covered by existing HCPs or the Service has been actively engaged with landowners, or agencies are otherwise knowledgeable about the presence of flycatchers. With the exception of the San Francisco River, this analysis therefore assumes that impacts in these areas are attributable to the baseline. The Service believes that any impacts in the San Francisco River should be considered incremental because it does not have a consultation history and the designation of critical habitat may increase agency awareness of the need to consult for actions affecting the flycatcher.[42] Exhibit 2-3 lists the stream segments proposed for designation and indicates whether impacts occurring in each segment are attributed to the baseline or incremental scenarios in this analysis.

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[37] U.S. Fish and Wildlife Service. 2011. "Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Re-Designate Critical Habitat for the Southwestern Willow Flycatcher (*Empidonax traillii extimus)* (flycatcher)," October 21, 2011, p. 16.

[38] *Ibid*, p. 21.

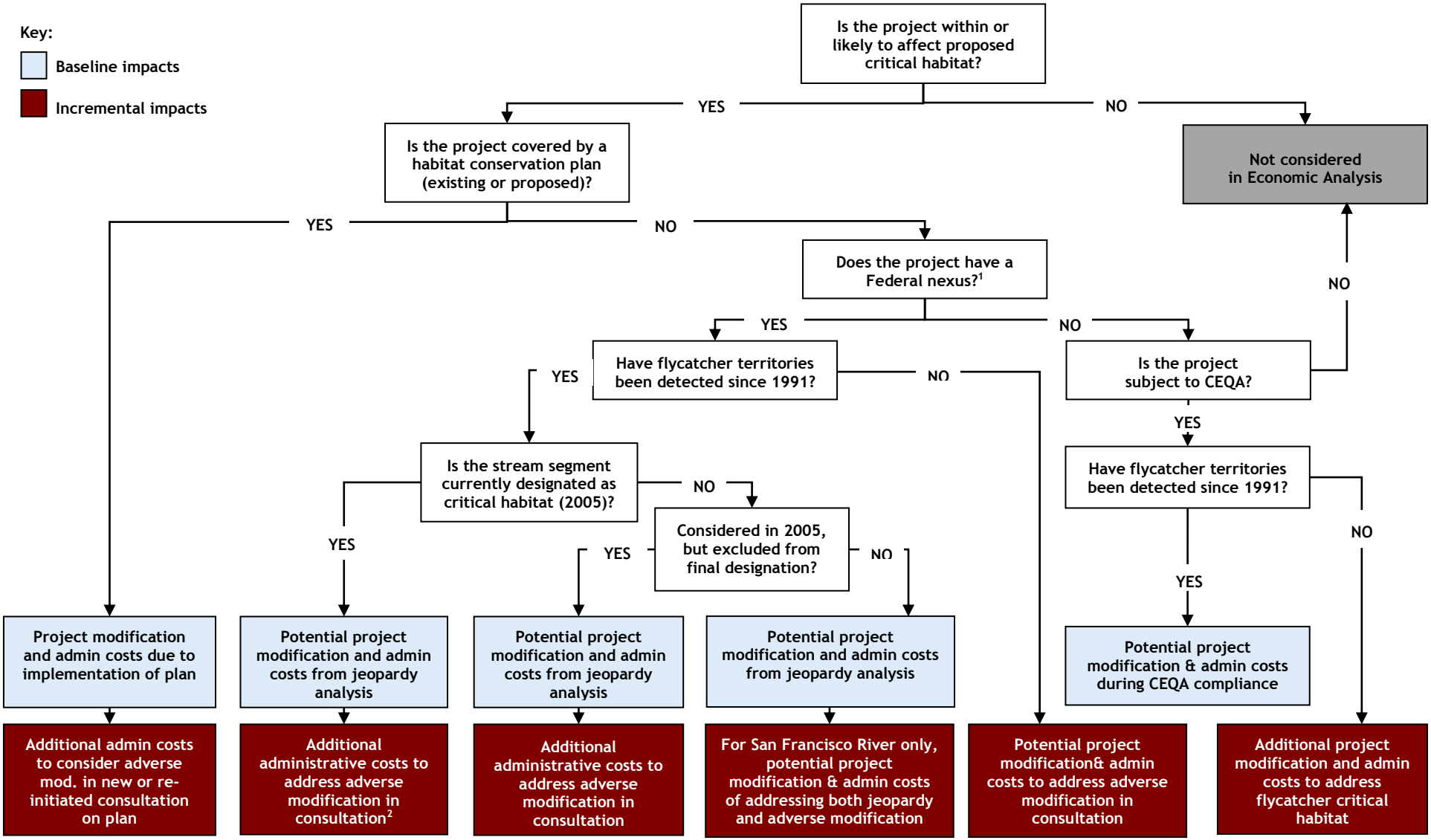
[39] *Ibid*, p. 20.

[40] *Ibid*, p. 17.

[41] *Ibid*, p. 18.

[42] Personal communication with the U.S. Fish and Wildlife Service Region 2 Field Office, on May 11, 2012.

EXHIBIT 2-2. FRAMEWORK FOR DETERMINING BASELINE AND INCREMENTAL IMPACTS



Notes:

1. The analysis assumes that all activities on Tribal lands have a Federal nexus.
2. While incremental project modifications are possible, they are difficult to quantify based on the consultation history.
3. The analysis assumes that there is the potential for the administrative process to result in regulatory delay impacts. Where identified, the analysis also will quantify these impacts.

EXHIBIT 2-3. POTENTIAL FOR ECONOMIC EFFECTS BY STREAM SEGMENT

STATE	MANAGEMENT UNIT	STREAM SEGMENT
ALL BASELINE, EXCEPT ADMIN COSTS (69 STREAM SEGMENTS TOTAL)		
California	Santa Ynez	Santa Ynez River (portion exempted) (Designated 2005)
California	Santa Clara	Piru Creek (Presence addressed/Species managed)
California	Santa Clara	San Gabriel River (Presence addressed/Species managed)
California	Santa Clara	Santa Clara River (Presence addressed/Species managed)
California	Santa Ana	Bear Creek (Designated 2005)
California	Santa Ana	Mill Creek (Designated 2005)
California	Santa Ana	Oak Glen Creek (Designated 2005)
California	Santa Ana	San Timoteo Creek (Presence addressed/Species managed)
California	Santa Ana	Santa Ana River (Designated 2005)
California	Santa Ana	Waterman Creek (Designated 2005)
California	Santa Ana	Bautista Creek (Presence addressed/Species managed)
California	San Diego	Agua Hedionda Creek (Designated 2005)
California	San Diego	Canada Gobernadora Creek (Presence addressed/Species managed)
California	San Diego	DeLuz Creek (portion exempted) (Designated 2005)
California	San Diego	Pilgrim Creek (portion exempted) (Designated 2005)
California	San Diego	San Dieguito River (Proposed 2005)
California	San Diego	San Diego River (Proposed 2005)
California	San Diego	San Luis Rey River (Designated 2005)
California	San Diego	Santa Margarita River (portion exempted) (Designated 2005)
California	San Diego	Santa Ysabel Creek (Designated 2005)
California	San Diego	Sweetwater River (Presence addressed/Species managed)
California	San Diego	Temecula Creek (Designated 2005)
California	Owens	Owens River (Proposed 2005)
California	Kern	Canebrake Creek (Presence addressed/Species managed)
California	Kern	South Fork Kern River (Designated 2005)
California	Kern	South Fork Kern River (Lake Isabella) (Proposed 2005)
California	Mohave	Holcomb Creek (Designated 2005)
California	Mohave	Mohave River (Designated 2005)
California	Salton	San Felipe Creek (Designated 2005)
California	Salton	Mill Creek (Designated 2005)
California, Nevada	Amargosa	Amargosa River (Presence addressed/Species managed)
Nevada	Amargosa	Ash Meadows Riparian Areas (Presence addressed/Species managed)*

STATE	MANAGEMENT UNIT	STREAM SEGMENT
Nevada	Amargosa	Carson Slough (Presence addressed/Species managed)*
Arizona	Little Colorado	Little Colorado River (Designated 2005)
New Mexico	Little Colorado	Rio Nutria (Presence addressed/Species managed)
New Mexico	Little Colorado	Zuni River (Presence addressed/Species managed)
Nevada, Arizona, Utah	Virgin	Virgin River (Designated 2005)
Arizona	Middle Colorado	Colorado River (Proposed 2005)
Nevada	Pahranagat	Muddy River (Proposed 2005)
Nevada	Pahranagat	Pahranagat River (Proposed 2005)
Arizona	Bill Williams	Big Sandy River (upstream of Alamo Lk) (Designated 2005)
Arizona	Bill Williams	Big Sandy River (Alamo Lk) (Proposed 2005)
Arizona	Bill Williams	Bill Williams River (below Alamo Dam) (Proposed 2005)
Arizona	Bill Williams	Bill Williams River (Alamo Lk) (Proposed 2005)
Arizona	Bill Williams	Santa Maria River (Proposed 2005)
California, Arizona	Hoover to Parker Dam	Colorado River (Proposed 2005)
Arizona	Hoover to Parker Dam	Bill Williams River (Proposed 2005)
California, Arizona	Parker Dam to Southerly International Border	Colorado River (Proposed 2005)
New Mexico	San Juan	San Juan River - NM (Presence addressed/Species managed)
Colorado	San Juan	Los Pinos River (Presence addressed/Species managed)
Utah	San Juan	San Juan River
Arizona	Verde	Verde River (Designated 2005)
Arizona	Roosevelt	Tonto Creek (Designated 2005)
Arizona	Roosevelt	Salt River (upstream of Roosevelt) (Designated 2005)
Arizona	Roosevelt	Roosevelt Lake (Proposed 2005)
Arizona	Roosevelt	Pinal Creek (Presence addressed/Species managed)
Arizona	Middle Gila and San Pedro	San Pedro River (Designated 2005)
Arizona	Middle Gila and San Pedro	Gila River (Designated 2005)
Arizona, New Mexico	Upper Gila	Gila River (Designated 2005)
Arizona	Santa Cruz	Cienega Creek (Presence addressed/Species managed)*
Arizona	Hassayampa and Agua Fria	Hassayampa River (Presence addressed/Species managed)
Arizona	Hassayampa and Agua Fria	Gila River (Designated 2005)
Colorado	San Luis Valley	Rio Grande (Proposed 2005)
Colorado	San Luis Valley	Conejos River (Proposed 2005)
New Mexico	Upper Rio Grande	Coyote Creek (Designated 2005)
New Mexico	Upper Rio Grande	Rio Fernando (Presence addressed/Species managed)

STATE	MANAGEMENT UNIT	STREAM SEGMENT
New Mexico	Upper Rio Grande	Rio Grande (Proposed 2005)
New Mexico	Upper Rio Grande	Rio Grande Del Rancho (Designated 2005)
New Mexico	Middle Rio Grande	Rio Grande (Proposed 2005)
New Mexico	Lower Rio Grande	Rio Grande (Proposed 2005)
SOME INCREMENTAL COSTS POSSIBLE (1 STREAM SEGMENT)		
Arizona, New Mexico	San Francisco	San Francisco River
ALL INCREMENTAL (NOT OCCUPIED, 12 STREAM SEGMENTS)		
California	Santa Ynez	Mono Creek
California	Santa Clara	Big Tujunga Canyon
California	Santa Clara	Castaic Creek
California	Santa Clara	Little Tujunga Canyon
California	Santa Clara	Ventura River
California	San Diego	Temescal Creek
California	Mohave	Deep Creek
California	Mohave	West Fork Mohave River
California	Amargosa	Willow Creek
Arizona	Little Colorado	West Fork Little Colorado River
Utah	Powell	Paria River
Arizona	Santa Cruz	Santa Cruz
EXEMPTED (6 COMPLETE STREAM SEGMENTS; PORTIONS OF OTHERS ALSO EXEMPT)		
California	San Diego	Cristianitos Creek
California	San Diego	Fallbrook Creek
California	San Diego	Las Flores Creek
California	San Diego	Las Pulgas Creek
California	San Diego	San Mateo Creek
California	San Diego	San Onofre Creek

* Note, this table reflects stream segments proposed for designation in the August 15, 2011 proposed rule. The current Notice of Availability makes some minor changes to the areas proposed for designation. Specifically, Carson Slough in the Amargosa management unit is no longer proposed for designation, and the area originally proposed in the Ash Meadows Riparian Areas has been reduced. In the Santa Cruz management unit, new areas along Cienega Creek and Empire Gulch have been added.

Source: Information provided to IEc by the Service Region 2 Office, on May 9, 2012.

Direct Impacts

74. The direct, incremental impacts of CHD stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct, incremental impacts of CHD are: 1) the administrative costs of conducting section 7 consultation; and 2) implementation of any conservation efforts requested by the Service through section 7 consultation to avoid potential destruction or adverse modification of critical habitat.[43]

75. Section 7(a)(2) of the Act requires Federal agencies to consult with the Service whenever activities that they undertake, authorize, permit, or fund may affect a listed species or designated critical habitat. In some cases, consultations will involve the Service and another Federal agency only, such as the U.S. Army Corps of Engineers (Corps). Often, they will also include a third party involved in projects that involve a permitted entity, such as the recipient of a Clean Water Act section 404 permit.

76. During a consultation, the Service, the Action agency, and the entity applying for Federal funding or permitting (if applicable) communicate in an effort to minimize potential adverse effects to the species and/or to the proposed critical habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, and the potential effects to the species and designated critical habitat associated with the proposed activity, the Federal agency, and whether there is a private applicant involved.

77. Section 7 consultations with the Service may be either informal or formal. *Informal consultation*s consist of discussions between the Service, the Action agency, and the applicant concerning an action that may affect a listed species or its designated critical habitat, and are designed to identify and resolve potential concerns at an early stage in the planning process. By contrast, a *formal consultation* is required if the Action agency determines that its proposed action may or will adversely affect the listed species or designated critical habitat in ways that cannot be resolved through informal consultation. The formal consultation process results in the Service's determination in its Biological Opinion of whether the action is likely to jeopardize a species or adversely modify critical habitat, along with an incidental take statement permitting take. In the case of jeopardy or adverse modification findings, the Biological Opinion includes reasonable and prudent alternatives to minimize those impacts. Regardless of the type of consultation or proposed project, section 7 consultations can require substantial administrative effort on the part of all participants.

[43] The term conservation efforts is intended to broadly capture efforts that stakeholders may undertake for the species, regardless of whether these efforts are explicitly called for in a section 7 consultation.

Administrative Section 7 Consultation Costs

78. Parties involved in section 7 consultations include the Service, a Federal "action agency," and in some cases, a private entity involved in the project or land use activity. The action agency (i.e., the Federal nexus necessitating the consultation) participates in the section 7 consultation with the Service and receives the resulting biological opinion. While consultations are required for activities that involve a Federal nexus and may affect a species regardless of whether critical habitat is designated, the designation may increase the effort for consultations in the case that the project or activity in question may adversely modify critical habitat. Administrative efforts for consultation may therefore result in both baseline and incremental impacts.

79. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:

1) **Additional effort to address adverse modification in a new consultation -** New consultations taking place after CHD may require additional effort to address critical habitat issues above and beyond the listing issues. In this case, only the additional administrative effort required to consider critical habitat is considered an incremental impact of the designation.

2) **Re-initiation of consultation to address adverse modification -** Consultations that have already been completed on a project or activity (but for which the project or activity is not yet completed) may require re-initiation to address critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and project modification costs are considered incremental impacts of the designation.

3) **Incremental consultation resulting entirely from critical habitat designation -** CHD may trigger additional consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the location of species habitat provided by the designation). Such consultations may, for example, be triggered in critical habitat areas that are not occupied by the species. All associated administrative and project modification costs of these consultations are considered incremental impacts of the designation.

80. The administrative costs of these consultations vary depending on the specifics of the project. One way to address this variability is to show a range of possible costs of consultation, as it may not be possible to predict the precise outcome of each future consultation in terms of level of effort. Review of consultation records and discussions with multiple Service field offices resulted in a range of estimated administrative costs of consultation. For simplicity, the average of the range of costs in each category is applied in this analysis (see Exhibit 2-4).

EXHIBIT 2-4. RANGE OF ADMINISTRATIVE CONSULTATIONS COSTS (2010$)

BASELINE ADMINISTRATIVE COSTS OF CONSULTATION					
CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
CONSULTATION CONSIDERING JEOPARDY (DOES NOT INCLUDE CONSIDERATION OF ADVERSE MODIFICATION)					
Technical Assistance	$428	n/a	$788	n/a	$1,220
Informal	$1,840	$2,330	$1,540	$1,500	$7,130
Formal	$4,130	$4,650	$2,630	$3,600	$15,000
Programmatic	$12,500	$10,400	n/a	$4,200	$27,100
INCREMENTAL ADMINISTRATIVE COSTS OF CONSULTATION					
CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
NEW CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION (TOTAL COST OF A CONSULTATION CONSIDERING BOTH JEOPARDY AND ADVERSE MODIFICATION)					
Technical Assistance	$570	n/a	$1,050	n/a	$1,620
Informal	$2,450	$3,100	$2,050	$2,000	$9,500
Formal	$5,500	$6,200	$3,500	$4,800	$20,000
Programmatic	$16,700	$13,900	n/a	$5,600	$36,100
NEW CONSULTATION CONSIDERING ONLY ADVERSE MODIFICATION (UNOCCUPIED HABITAT)					
Technical Assistance	$428	n/a	$788	n/a	$1,220
Informal	$1,840	$2,330	$1,540	$1,500	$7,130
Formal	$4,130	$4,650	$2,630	$3,600	$15,000
Programmatic	$12,500	$10,400	n/a	$4,200	$27,100
RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION					
Technical Assistance	$285	n/a	$525	n/a	$810
Informal	$1,230	$1,550	$1,030	$1,000	$4,750
Formal	$2,750	$3,100	$1,750	$2,400	$10,000
Programmatic	$8,330	$6,930	n/a	$2,800	$18,100
ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION (ADDITIVE WITH BASELINE COSTS, SHOWN ABOVE, OF CONSIDERING JEOPARDY)					
Technical Assistance	$143	n/a	$263	n/a	$405
Informal	$613	$775	$513	$500	$2,380
Formal	$1,380	$1,550	$875	$1,200	$5,000
Programmatic	$4,160	$3,460	n/a	$1,400	$9,030

Source: IEc analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2010, and a review of consultation records from several Service field offices across the country conducted in 2002.

Notes:

1. Estimates are rounded to three significant digits and may not sum due to rounding.
2. Estimates reflect average hourly time required by staff.

Section 7 Conservation Effort Impacts

81. Section 7 consultation considering critical habitat may also result in additional conservation effort recommendations specifically addressing potential destruction or adverse modification of critical habitat. For future consultations considering jeopardy and adverse modification, and for re-initiations of past consultations to consider critical habitat, the economic impacts of conservation efforts undertaken to avoid adverse modification are considered incremental impacts of CHD. For consultations that are forecast to occur specifically because of the designation (incremental consultations), impacts of all associated conservation efforts are assumed to be incremental impacts of the designation.

Indirect Impacts

82. The designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 under the Act. Indirect impacts are those unintended changes in economic behavior that may occur outside of the Act, through other Federal, State, or local actions, and that are caused by the designation of critical habitat. For example:

- **Triggering Other State and Local Laws**. Under certain circumstances, CHD may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws, such as the California Environmental Quality Act (CEQA). In cases where these impacts would not have been triggered absent CHD, they are considered indirect, incremental impacts of the designation.
- **Time Delays.** Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to reinitiate the section 7 consultation process and/or compliance with other laws triggered by the designation. To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation.
- **Regulatory Uncertainty or Stigma -** Government agencies and affiliated private parties who consult with the Service under section 7 may face uncertainty concerning whether reasonable and prudent alternatives will be recommended by the Service and what the nature of these alternatives will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. Where information suggests that this type of regulatory uncertainty stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation. In some cases, the public may perceive that CHD may result in limitations on private property uses above and beyond those associated with anticipated conservation efforts and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. As the public becomes

aware of the true regulatory burden imposed by critical habitat, the impact of the designation on property markets may decrease.

2.3.3 BENEFITS

83. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.[44] OMB's Circular A-4 distinguishes two types of economic benefits: *direct benefits and ancillary benefits*. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.[45]

84. In the context of critical habitat, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.[46] *Rather than rely on economic measures, the Service believes that the direct benefits of the proposed rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*

85. CHD may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements on which the species depends. To this end, CHD can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.

2.3.4 GEOGRAPHIC SCOPE OF THE ANALYSIS

86. Economic impacts of flycatcher conservation are considered across the entire area proposed for revised CHD, as defined in Chapter 1. Results are presented by proposed critical habitat management unit.

2.3.5 ANALYTIC TIME FRAME

87. Ideally, the time frame of this analysis would be based on the expected time period over which the critical habitat regulation is expected to be in place. Specifically, the analysis would forecast impacts of implementing this rule through species recovery (i.e., when the

[44] Executive Order 12866, Regulatory Planning and Review, September 30, 1993.

[45] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, accessed at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[46] *Ibid.*

rule is no longer required). Recent guidance from OMB indicates that "if a regulation has no predetermined sunset provision, the agency will need to choose the endpoint of its analysis on the basis of a judgment about the foreseeable future."[47] The "foreseeable future" for this analysis includes, but it not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. Forecasted impacts will be based on the planning periods for potentially affected projects and will look out over a 20-year time horizon for most activities (2012 through 2031). OMB supports this time frame stating that "for most agencies, a standard time period of analysis is ten to 20 years, and rarely exceeds 50 years."[48] We recognize that in some cases, the timeframe over which future impacts can be reasonably forecast may be longer than this period, and this is discussed where appropriate in the analysis.

2.4 INFORMATION SOURCES

88. The primary sources of information for this report are communications with, and data provided by, personnel from the Service, local governments and other stakeholders. In addition, this analysis relies upon the Service's section 7 consultation records, as well data on baseline land use obtained from county planning authorities. Finally, this analysis also relies on still pertinent information and data from the economic analysis prepared in support of the 2005 critical habitat rule.[49] A complete list of references is provided at the end of this document.

[47] U.S. Office of Management and Budget. 2011. "Regulatory Impact Analysis: Frequently Asked Questions (FAQs)," February 7, 2011. Accessed at http://www.whitehouse.gov/sites/default/files/omb/circulars/a004/a-4_FAQ.pdf on May 3, 2011.

[48] *Ibid.*

[49] Industrial Economics, Inc. 2005. *Final Economic Analysis of Critical Habitat Designation for the Southwestern Willow Flycatcher*, prepared for the U.S. Fish and Wildlife Service, September 28, 2005.

CALCULATING PRESENT VALUE AND ANNUALIZED IMPACTS

This analysis compares economic impacts incurred in different time periods in present value terms. The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in today's dollars. Translation of economic impacts of past or future costs to present value terms requires the following: a) past or projected future costs of critical habitat designation; and b) the specific years in which these impacts have been or are expected to be incurred. With these data, the present value of the past or future stream of impacts (PV_c) from year t to T is measured in 2010 dollars according to the following standard formula:

$$PV_c = \sum_{t}^{T} \frac{C_t}{(1+r)^{t-2012}}$$

C_t = cost of flycatcher critical habitat conservation efforts in year t

r = discount rate[a]

Impacts for each activity in each unit are also expressed as annualized values. Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods (T). For this analysis, activities employ a forecast period of 20 years. Annualized future impacts (APV_c) are calculated by the following standard formula:

$$APV_c = PV_c \left[\frac{r}{1-(1+r)^{-(N)}} \right]$$

N = number of years in the forecast period (in this analysis, 20 years)

[a] To discount and annualize costs, guidance provided by the OMB specifies the use of a real rate of seven percent. In addition, OMB recommends sensitivity analysis using other discount rates such as three percent, which some economists believe better reflects the social rate of time preference. (U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 *Federal Register* 5492, February 3, 2003.)

CHAPTER 3 | POTENTIAL ECONOMIC IMPACTS TO WATER MANAGEMENT ACTIVITIES

89. This chapter provides an analysis of potential economic impacts associated with flycatcher conservation efforts related to water management activities, including dam operations, hydropower production, water diversion, groundwater pumping, river channelization, and bank stabilization. We first summarize the results of this analysis, including forecast baseline and incremental impacts. Next, we outline the analytic method used to calculate potential future impacts. The following sections present the detailed results of our analysis. We conclude with a discussion of key sources of uncertainty.

3.1 SUMMARY OF IMPACTS TO WATER MANAGEMENT ACTIVITIES

90. This analysis identifies the significant water management structures and projects in each management unit and identifies future costs related to flycatcher management at those facilities. Specifically, we assume that each affected water facility implements flycatcher conservation efforts such as land acquisition, habitat creation, and monitoring through either a section 7 consultation or an HCP. This assumption is consistent with the historical record of actions taken by water operations affecting flycatchers and critical habitat.

91. The 2005 economic analysis also presented a second scenario, which assumed that water operators are forced to change the management regime of their facilities to avoid adverse effects on flycatchers and their habitat. Such action represented a scenario in which the service or operators did not cooperate on an ITP, or where a third party intervened to force an operator to avoid habitat destruction prior to receipt of an ITP. Costs under such a scenario resulted from the assumed inability of affected reservoirs to maintain water levels above current levels in order to avoid inundation of flycatcher habitat, leading to a loss of storage capacity at these facilities.[50]

92. The Service believes this second scenario is not realistic for several reasons, including the fact that management agencies may lack legal discretion to release water for flycatcher management purposes, as well as a history of legal decision upholding section 7 consultations allowing the raising of lake levels to be offset by off-site mitigation.[51]

[50] Note that the Recovery Plan states that both extended inundation and extended desiccation of flycatcher habitat should be avoided. This scenario would likely result in extended desiccation of habitat.

[51] U.S. Department of the Interior, Southwest Regional Solicitor's Office. 2004. "Summary Results of Legal Review of Draft Section 4 (ESA) Documents," December 15, 2004.

93. Exhibit 3-1 presents the anticipated incremental impacts of critical habitat on water management activities by management unit. The present value of incremental impacts to water management activities is estimated at $1.4 to $9.6 million assuming a seven percent real discount rate over 30 years. This figure represents an impact of approximately $110,000 to $720,000 on an annualized basis. These impacts include the costs of conservation efforts associated with section 7 consultations or the development of HCPs. Impacts also include administrative costs associated with future section 7 consultations to address adverse modification of habitat in unoccupied units, and to address jeopardy and adverse modification in the San Francisco management unit.

EXHIBIT 3-1. SUMMARY OF INCREMENTAL IMPACTS TO WATER MANAGEMENT ACTIVITIES BY MANAGEMENT UNIT, 2012 TO 2041 (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	PRESENT VALUE		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH
Santa Clara	$270,000	$1,900,000	$21,000	$140,000
Santa Ana	$71,000	$71,000	$5,400	$5,400
San Diego	$37,000	$37,000	$2,800	$2,800
Owens	$5,000	$5,000	$380	$380
Kern	$20,000	$20,000	$1,500	$1,500
Mohave	$890,000	$7,400,000	$67,000	$560,000
Amargosa	$5,000	$5,000	$380	$380
Little Colorado	$10,000	$10,000	$750	$750
Middle Colorado	$20,000	$20,000	$1,500	$1,500
Pahranagat	$5,000	$5,000	$380	$380
Bill Williams	$12,000	$12,000	$880	$880
Hoover to Parker Dam	$10,000	$10,000	$750	$750
Parker Dam to Southerly International Border	$10,000	$10,000	$750	$750
Verde	$6,600	$6,600	$500	$500
Roosevelt	$6,600	$6,600	$500	$500
Middle Gila and San Pedro	$6,600	$6,600	$500	$500
Upper Gila	$5,000	$5,000	$380	$380
San Francisco	$29,000	$94,000	$2,200	$7,100
Middle Rio Grande	$25,000	$25,000	$1,900	$1,900
Total	**$1,400,000**	**$9,600,000**	**$110,000**	**$720,000**

Note: Table may not sum due to rounding. Table presents only those management units with estimated impacts. The remaining ten management units do not have estimated incremental impacts to water management activities.

94. Estimated impacts are developed based on the maximum storage capacity of each reservoir or lake. We assume that incremental impacts will occur at those facilities that are not already subject to a conservation plan, and that are located either in areas where flycatcher territories have not been detected or where flycatcher presence is not well known.

95. Exhibit 3-2 summarizes the anticipated baseline impacts of critical habitat on water management activities by management unit. We estimate baseline impacts of $200 million to $330 million assuming a seven percent real discount rate. This figure represents an impact of approximately $14 million to $24 million on an annualized basis. These impacts include the costs of conservation efforts associated with section 7 consultations or the development of HCPs, as well as administrative efforts to consider potential adverse modification of habitat as part of future section 7 consultations.

3.2 ANALYTIC APPROACH

96. Water supply management agencies and water users have the potential to bear costs associated with implementation of conservation activities for flycatcher, as described in the previous section. This analysis estimates future impacts on dam and water management operations by assuming that, in areas where flycatcher territories have been detected water managers will pursue an ITP or statement for current operations as part of an HCP or section 7 biological opinion. In areas where flycatcher territories have not yet been detected, the analysis assumes that water managers implement the same types of conservation efforts as would be recommended under an ITP in order to avoid adverse modification. This is considered a reasonable assumption because the Service states that, "it is likely that conservation measures by the Federal agency that might be required to avoid jeopardy would be similar, if not identical, to those required to avoid adverse modification."[52]

[52] U.S. Fish and Wildlife Service. 2011. "Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Re-Designate Critical Habitat for the Southwestern Willow Flycatcher (*Empidonax traillii extimus)* (flycatcher)," October 21, 2011, p. 22.

EXHIBIT 3-2. SUMMARY OF BASELINE IMPACTS TO WATER MANAGEMENT ACTIVITIES BY MANAGEMENT UNIT (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	PRESENT VALUE		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH
Santa Clara	$340,000	$2,000,000	$25,000	$150,000
Santa Ana	$2,400,000	$18,000,000	$180,000	$1,400,000
San Diego	$730,000	$5,300,000	$55,000	$400,000
Owens	$30,000	$140,000	$2,200	$10,000
Kern	$5,400,000	$5,400,000	$410,000	$410,000
Amargosa	$47,000	$280,000	$3,500	$21,000
Little Colorado	$58,000	$270,000	$4,400	$20,000
Middle Colorado	$150,000,000	$150,000,000	$10,000,000	$10,000,000
Pahranagat	$32,000	$160,000	$2,400	$12,000
Bill Williams	$4,800,000	$4,800,000	$370,000	$370,000
Hoover to Parker Dam	$3,500,000	$3,500,000	$240,000	$240,000
Parker Dam to Southerly International Border	$2,000,000	$2,000,000	$140,000	$140,000
Verde	$5,500,000	$5,500,000	$370,000	$370,000
Roosevelt	$12,000,000	$12,000,000	$800,000	$800,000
Middle Gila and San Pedro	$20,000	$20,000	$1,500	$1,500
Upper Gila	$4,300,000	$36,000,000	$320,000	$2,700,000
Middle Rio Grande	$10,000,000	$85,000,000	$770,000	$6,400,000
Total	**$200,000,000**	**$330,000,000**	**$14,000,000**	**$24,000,000**

Notes:

1. Table may not sum due to rounding.
2. In the Hoover to Parker, Parker to Southerly, Roosevelt, and Verde management units, costs are forecast either over fifty years or the remaining length of a 50-year permit. All other costs are forecast over 30 years.
3. Table presents only those management units with estimated impacts. The remaining 12 management units do not have estimated baseline impacts to water management activities.

97. In general, conservation activities for flycatcher have focused on the acquisition and protection of off-site mitigation lands. For example, the Western Riverside Multi-Species Habitat Conservation Plan (MSHCP) area includes 10,580 acres of suitable habitat for the flycatcher. The management objectives and conservation measures focus on identifying flycatcher habitat and preserving undeveloped landscape adjacent to conserved habitat.[53] As part of an April 1997 biological opinion, the Corps agreed to protect 360 acres of flycatcher habitat upstream of Lake Isabella. The Lower Colorado Multi-Species Conservation Plan also budgeted $60 million for land acquisition. In addition to off-site mitigation, water managers have agreed to conduct ecological restoration, develop

[53] Riverside County. 2003. *Riverside County Integrated Project Multiple Species Habitat Conservation Plan (MSHCP), Volume 2 – The MSHCP Reference Document, Part B. MSHCP Species Accounts.*

survey, monitoring, and research programs, and conduct cowbird trapping. Conservation efforts prescribed by particular biological opinions or conservation plans are described in greater detail by management unit in Section 3.3.

98. In order to project the costs of developing and implementing an ITP, we rely on an analysis of historical HCP/biological opinion development and implementation costs, as well as projections by affected entities of future costs. Specifically, the analysis considers the total cost of developing an HCP or biological opinion and implementing the associated conservation efforts at reservoirs, reflecting both past and future costs. For facilities that have not yet contemplated the costs of these efforts, we developed a range of potential costs based on an estimated annual cost per acre-foot of water storage (see Exhibit 3-3). Thus, the analysis assumes that a larger storage facility will affect more flycatcher habitat, and therefore will be responsible for more extensive mitigation efforts as part of an HCP or biological opinion.

EXHIBIT 3-3. COSTS OF INCIDENTAL TAKE PERMITS AND ASSOCIATED CONSERVATION ACTIVITIES FOR FLYCATCHER (2010$, UNDISCOUNTED)

PROJECT NAME	STATE	STORAGE CAPACITY (ACRE-FEET)	# OF YEARS COSTS PROJECTED OVER	TOTAL COSTS	ANNUAL COSTS PER ACRE-FOOT
Lake Isabella[1]	CA	568,000	44	$27,830,000	$1.12
Lake Roosevelt[2]	AZ	1,331,000	66	$51,133,000	$0.47
Horseshoe Reservoir[3]	AZ	131,500	50	$20,308,000	$3.09
Lower Colorado[4]	AZ, NV, CO	31,003,300*	51	$582,099,000	$0.37
				Range of annual costs per acre-foot	**$0.37 to $3.09**

1. Costs for Lake Isabella include two land acquisitions in 1998 and 2000, as well as annual costs for habitat restoration, flycatcher surveys, cowbird control, invasive species management, and cattle exclusion fencing.

2. Costs for Lake Roosevelt include the acquisition of buffer lands, the acquisition of water rights to maintain riparian habitat, habitat monitoring, and flycatcher surveys.

3. Costs for Horseshoe Reservoir include land acquisition, habitat restoration, habitat management and maintenance, survey and monitoring, and research.

4. Total storage for the Lower Colorado system reflects the storage capacity of Lake Mead, Lake Mohave and Lake Havasu. Costs include program administration, land acquisition, habitat creation, conservation area management and maintenance, law enforcement staff, and water acquisition.

Sources: Appendix N, Detailed Implementation Cost Estimate Assumptions, Lower Colorado MSCP, June 18, 2004. Email communication from Mitch Stewart, Army Corps of Engineers, Sacramento District, on August 26, 2004. Written comments of Craig Sommers, ERO Resources, on behalf of the Salt River Project, to Industrial Economics, Inc., August 26, 2004.

Notes: All amounts have been inflated to 2010$ using the GDP deflator. Totals may not sum due to rounding.

99. The 2005 economic analysis considered the potential for flycatcher conservation to result in changes to dam operations in order to avoid adverse effects on flycatcher habitat. However, management agencies have asserted that they often lack legal discretion to release water for flycatcher management purposes. For example, in *Defenders of Wildlife v. Norton*, the Federal district court held that U.S. Bureau of Reclamation (USBR) lacked discretion to provide water for species in the Colorado Delta because USBR was

precluded from changing Colorado River operations by the Colorado River compact. Other court cases addressing section 7 consultation between USBR and the Service have upheld the use of off-site mitigation, as is often contemplated in ITPs for the flycatcher, and allowed USBR to raise the level of the lake above existing flycatcher habitat.[54] Based on these findings, it appears unlikely that flycatcher habitat will result in changes in dam operations beyond those conservation activities outlined in an ITP. Therefore, the analysis does not estimate the potential magnitude of impacts associated with changes in dam operations, such as maintaining water levels at an elevation at or below flycatcher habitat areas, or the cost of replacing water supplies.

100. The analysis also forecasts administrative costs associated with section 7 consultation for water management activities. For all facilities without a current ITP or biological opinion, the analysis forecasts one formal consultation per dam operator for each management unit. That is, the analysis assumes dams that are operated by one agency in concert with each other, such as Seven Oaks and Prado dams in the Santa Ana management unit, likely would undertake a single section 7 consultation for the system. In addition, the analysis forecasts consultations for smaller dams and diversions, emergency projects, or experimental water releases. Because of uncertainty about when and where these types of future projects may occur, the analysis estimates an annual average number of water-related consultations per management unit based on the consultation history, and distributes these consultations across a 30-year time horizon.

3.3 BASELINE IMPACTS

101. This section focuses on potential baseline impacts associated with water management activities. Exhibit 3-4 provides an overview of major water management facilities located within or affecting proposed critical habitat. Baseline impacts are anticipated to occur in those river segments where flycatcher territories have been detected in previous surveys and where the species presence is either currently addressed, or otherwise well known to project proponents and managing agencies (see Exhibit 2-3). As discussed above, in these areas, the analysis assumes that water managers seek to avoid adverse modification by implementing the same types of conservation measures that are typically part of an HCP. Notably, all but two of the dams identified in Exhibit 3-4, the Hansen Dam and the Mohave Dam, are located along river segments where flycatcher territories have been detected. Additionally, impacts to Luna Lake are considered incremental because the species' presence is not currently addressed in this management unit.

102. For each management unit, this section describes the water control structure of each dam as well as relevant baseline protections within the unit, including existing conservation plans and HCPs. We then apply the methodology discussed in Section 3.2 to estimate potential baseline impacts.

[54] U.S. Department of the Interior, Southwest Regional Solicitor's Office. 2004. "Summary Results of Legal Review of Draft Section 4 (ESA) Documents," December 15, 2004.

EXHIBIT 3-4. CHARACTERISTICS OF MAJOR DAMS AND RESERVOIRS WITHIN FLYCATCHER PROPOSED CRITICAL HABITAT

MANAGEMENT UNIT	FACILITY NAME	COUNTY, STATE	OWNER/OPERATOR	YEAR COMPLETED	PRIMARY PURPOSE(S)	STORAGE CAPACITY (AF)	HYDROPOWER-INSTALLED CAPACITY
Facilities with Expected Baseline Impacts							
Santa Clara	Santa Fe Reservoir	Los Angeles, CA	USACE	1949	Flood Control	45,409	0
Santa Ana	Seven Oaks Dam	San Bernardino, CA	USACE	1999	Flood Control	145,600	0
	Prado Dam	Riverside, CA	USACE	1941	Flood Control	295,581	0
San Diego	Hodges Reservoir	San Diego, CA	City of San Diego	1918	Water Storage, Recreation	64,700	40MW
	Vail Dam	Riverside, CA	Rancho California Water District	1949	Water Storage, Groundwater Recharge	62,000	0
Owens	Pleasant Valley Reservoir	San Bernardino, CA	City of Los Angeles	Unknown	Water Supply	2,989	0
Kern	Isabella Dam	Kern, CA	USACE	1953	Water Storage, Flood Control	568,000	0
Amargosa	Crystal Springs Dam	Nye, NV	Spring Meadows, Inc.	1971	Irrigation, Recreation	2,300	0
	Lake No. 3	Nye, NV	Nye County Land Company	Unknown	Irrigation, Recreation	1,200	0
	Lake No. 5	Nye, NV		Unknown	Irrigation, Recreation	3,000	0
Little Colorado	Black Rock	McKinley, NM	BIA	1908	Irrigation, Recreation	2,610	0
	River Reservoir #3	Apache, AZ	Round Valley Water Users, Inc.	1896	Irrigation	3,195	0
Middle Colorado	Lake Mead/Hoover Dam	Clark, NV Mohave, AZ	USBR	1936	Water Storage, Hydropower	28,357,000	2,080 MW
Pahranagat	Upper Pahranagat	Lincoln, NV	Fish and Wildlife Service	1937	Fish & Wildlife Pond, Recreation	3,457	0
Bill Williams	Alamo Dam	Mohave, AZ	USACE	1968	Flood Control	1,409,000	0
Hoover-Parker	Lake Havasu/Parker Dam	San Bernardino, CA La Paz, AZ	USBR	1938	Water Storage, Hydropower	651,000	120 MW
Parker-Southerly	Lake Moovalya/ Headgate Rock Dam	San Bernardino, CA La Paz, AZ	BIA	1942	Irrigation, Hydropower	200,000	19.5 MW

MANAGEMENT UNIT	FACILITY NAME	COUNTY, STATE	OWNER/OPERATOR	YEAR COMPLETED	PRIMARY PURPOSE(S)	STORAGE CAPACITY (AF)	HYDROPOWER-INSTALLED CAPACITY
	Imperial Diversion Dam	Imperial, CA Yuma, AZ	USBR/Imperial Irrigation District	1937	Water Diversion	160,000	0
	Laguna Dam	Yuma, AZ	USBR	1908	River Regulation, Debris Control	1,600	0
	Senator Wash	Imperial, CA	USBR/Imperial Irrigation District	1965	Water Diversion	10,721	7.2 MW (pumped storage)
Verde	Horseshoe	Yavapai, AZ	SRP	1938	Water Supply, Irrigation	131,500	0
Roosevelt	Theodore Roosevelt	Gila, AZ	SRP	1911	Recreation, Hydropower, Irrigation	1,331,000	36 MW
Upper Gila	Coolidge Dam	Graham, AZ	SCIP	1928	Irrigation, Water Supply	869,000	0
Middle Rio Grande	Elephant Butte Reservoir	Sierra, NM	USBR	1916	Irrigation	2,065,010	27.9 MW
Facilities with Expected Incremental Impacts							
Santa Clara	Hansen Dam	Los Angeles, CA	USACE	1940	Flood Control	44,900	0
Mojave	Mojave Dam	San Bernardino, CA	USACE	1971	Flood Control	179,400	0
San Francisco	Luna	Apache, AZ	Luna Irrigation Co.	1896	Irrigation	1,800	0

Source: Dams identified using GIS analysis and the USACE National Inventory of Dams database. Dam information obtained from the USACE National Inventory of Dams database. List excludes smaller dams with less than 1,000 acre-feet of storage.

3.3.1 SANTA CLARA

103. Located on the San Gabriel River southwest of the town of Azusa, the Santa Fe Dam was constructed in 1949 as a flood control facility with a maximum storage capacity of 45,409 acre-feet. The dam impounds water created by storm runoff and snowmelt in the San Gabriel Mountains, as well as holding back mud and debris flows from reaching downstream communities.[55] The upper portion of the Santa Fe Reservoir created by the dam serves as the Santa Fe Reservoir Spreading Grounds. Operated by the Los Angeles Department of Public Works, these spreading grounds cover 168 wetland acres, and help to recharge groundwater levels in the Main San Gabriel Basin.[56]

104. While the Santa Fe Dam was not previously designated as critical habitat, flycatcher territories have been detected along the San Gabriel River and flycatcher presence is well known. Associated impacts are therefore assumed to be baseline (see Exhibit 2-3). The analysis assumes that water managers seek an ITP as part of an HCP. With a maximum storage capacity of 45,409 acre-feet and an annual cost of potential conservation effort of $0.37 to $3.09, total impacts are estimated at $222,000 to $1.86 million in present value terms.

3.3.2 SANTA ANA

105. The Santa Ana River is one of the largest river systems in southern California with its headwaters and tributaries in the San Bernardino Mountains of San Bernardino County, California. Located along the Santa Ana River, Seven Oaks Dam and Prado Dam are both operated by Corps primarily for flood control purposes.

106. Seven Oaks Dam was initially constructed and operated as a single purpose flood control facility in 1999 by the Corps. The dam is located on the Santa Ana River in the upper Santa Ana Canyon about eight miles northeast of the City of Redlands, in San Bernardino County, California. Authorization for the project construction is contained in the Water Resources Development Act of 1986.

107. With a holding capacity of 145,600 acre-feet, Seven Oaks Dam operates in tandem with Prado Dam to provide flood protection to Orange County, California. During the early part of each flood season, runoff is stored behind the dam in order to build a debris pool to protect the outlet works. Small volume releases are made on a continual basis in order to maintain the downstream water supply. During a flood, Seven Oaks Dam stores water destined for Prado Dam for as long as the reservoir pool at Prado Dam is rising. When the flood threat at Prado Dam has passed, Seven Oaks begins to release its stored capacity. At the end of each flood season, the reservoir at Seven Oaks is gradually drained and the Santa Ana River flows through the project unhindered.

108. Prado Dam is a 106 foot-high rolled-earthfill structure with a maximum storage capacity of 295,581 acre-feet. While originally designed for flood control, the dam has also been operated for water conservation purposes since the late 1960s. As part of these efforts,

[55] CLUI Land Use Database, Santa Fe Dam, accessed at http://ludb.clui.org/ex/i/CA3526/ on December 12, 2011.

[56] Los Angeles Department of Water and Power, *San Gabriel River Corridor Master Plan*, June 2008. Accessed at http://ladpw.org/wmd/Watershed/sg/mp/docs/SGR_MP-Chapter2-3.pdf.

excess water is retained behind the dam for regulated releases that allow the Orange County Water District (OCWD) to percolate the discharge in its downstream spreading basin. The Orange County Water Basin provides water supplies to 23 cities and more than 2.3 million people in northern Orange County.[57] OCWD diverts water from the Santa Ana River to wetland ponds to filter out nitrates in the water prior to diversion to spreading basins. OCWD reports that the majority of its operations occur below Prado Dam.

109. The Service issued a Biological Opinion for the Prado Dam Water Conservation and Supply Study in July 2002 to address the full effects of water conservation on the flycatcher, as well as other endangered species. In accordance with this biological opinion, the Corps and OCWD mitigated for 37.2 acres of riparian habitat determined to be affected by the project. The mitigation was achieved through a contribution of $25,000 per acre to the Santa Ana River Conservation Trust Fund. In addition, the Corps and OCWD were required to submit a habitat restoration plan for the 37.2 acre site as well as develop an eradication plan for the removal of exotic and invasive species in the Prado Basin. Costs associated with this mitigation are not included in this analysis because they have already been incurred.

110. Both dams also fall within the planning area of the Western Riverside MSHCP, and flood control projects including new construction in the Prado basin are specifically noted as covered activities under the MSHCP.[58] The Western Riverside MSHCP is designed to create, manage and monitor a system of habitat preserves in Western Riverside County and provides a framework for complying with State and Federal endangered species regulations, while at the same time accommodating future growth.[59] The Western Riverside MSHCP covers 146 species, including the flycatcher, 30 of which are federally listed under the Act.

111. The Western Riverside MSHCP's spatial extent includes approximately 1.26 million acres and encompasses 14 incorporated cities as well as the unincorporated portions of western Riverside County. The Orange and San Bernardino County boundary lines define the western boundary of the proposed Plan Area, while the San Bernardino and San Diego County boundary lines form the northern and southern boundaries respectively. The eastern portion boundary of the Western Riverside MSHCP is formed by Banning Pass and the crest of the San Jacinto Mountains.

112. Section 9 of Volume I and Volume II-B of the Western Riverside MSHCP describe in detail the conservation objectives and conservation measures specifically related to the flycatcher. The Western Riverside MSHCP plan area includes 10,580 acres of suitable habitat for the flycatcher. The management objectives and conservation measures focus

[57] Public comments of Michael Markus, General Manager, Orange County Water District on the critical habitat designation for the Santa Ana sucker, February 8, 2010.

[58] Riverside County. 2003. *Riverside County Integrated Project Multiple Species Habitat Conservation Plan (MSHCP), Volume 1 – The Plan, Section 7.3.7 "Flood Control Facilities."*

[59] Riverside County. 2003. *Riverside County Integrated Project Multiple Species Habitat Conservation Plan (MSHCP), Volume 4 – Final EIR/EIS, Section 2.3 "Proposed Action."*

on identifying flycatcher habitat and preserving undeveloped landscape adjacent to conserved habitat.[60]

113. Because these dams are covered under the existing Western Riverside MSHCP, and are already subject to section 7 consultation on their actions, impacts to these facilities are considered baseline. To estimate the costs of complying conservation measures outlined under the MSHCP, the analysis relies on the annual per-acre foot estimate outlined in Section 3.3. With a holding capacity of 145,600 acre-feet, total baseline impacts to Seven Oaks dam are estimated at $712,000 to $5.97 million in present value terms. Baseline impacts to the Prado dam are estimated at $1.44 million to $12.1 million in present value terms.

Supplemental Water Supply Project at Seven Oaks Dam

114. In addition to its existing use as a flood control facility, a supplemental water supply project has been approved for the dam. San Bernardino Valley Municipal Water District (Valley District) and Western Municipal Water District of Riverside County (Western), which provide water directly or indirectly to 853,000 municipal customers, receive a portion of their water supply from the Santa Ana River and its tributaries. In October 2009, Valley District and Western obtained appropriative water rights permits from the State of California, (as set forth in Decision 1649), to divert and store up to 198,317 acre-feet of water per year behind Seven Oaks Dam for beneficial consumptive purposes in the Districts' service areas.[61] The decision explicitly recognizes that the "flow in the Santa Ana River is highly variable" and that the "actual amount of water available" in any given year may be "much less" than 198,317 acre-feet.[62] This volume of 198,317 was calculated through modeling by the Districts of a "maximum diversion scenario" for the wettest year of a 39-year base period of study. The same model predicted an average capture of 27,000 acre-feet under that scenario.[63]

115. The Districts previously expressed concerns that proposed CHDs for other species, including the Santa Ana sucker, may affect their ability to exercise their newly acquired water rights. The Decision 1649 found that the Supplemental Water Supply project, while subject to the conditions specified in the order, "will not have a negative impact on public trust resources."[64] The decision calls for some mitigation and monitoring and reporting requirements applicable to the impacts of the project on biological and cultural resources, specifically requiring the development of a multi-species HCP for endangered species, and that "all mitigation requirements necessitated by water conservation operations will

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[60] Riverside County. 2003. *Riverside County Integrated Project Multiple Species Habitat Conservation Plan (MSHCP), Volume 2 – The MSHCP Reference Document, Part B. MSHCP Species Accounts."*

[61] State of California, State Water Resources Control Board, Decision 1649, Dated October 20, 2009; Public comments of San Bernardino Valley Municipal Water District, Western Municipal Water District of Riverside County, City of Riverside, on the Santa Ana sucker, February 5, 2010.

[62] State of California, State Water Resources Control Board, Decision 1649, Dated October 20, 2009.

[63] Ibid.

[64] Ibid.

be undertaken without interference with mitigation for flood control."[65] However, the State Water Control Board reserves jurisdiction to "require any reasonable amendments to these measures and requirements to ensure that they will accomplish the stated goal."[66]

116. Because the MSHCP covers new construction at flood control facilities, this analysis assumes that conservation efforts associated with this project would be included in total costs estimated for compliance with the MSHCP; therefore, no additional impacts beyond those estimated above are anticipated. That said, should the critical habitat result in restrictions on water usage, substantial impacts to water users would be expected.

3.3.3 SAN DIEGO

117. The 130 foot-high Hodges Dam was built in 1917 and has a maximum storage of 64,700 acre-feet of water. Hodges Reservoir stores water collected from local runoff, primarily from the San Dieguito River system. The City of San Diego purchased Hodges Reservoir in 1925 and continues to own the dam and associated water rights. In 2005, the City began a project to connect Hodges Reservoir with Olivenhain Reservoir via pipeline. This pipeline provides various benefits, including the ability to store 20,000 acre-feet at Hodges Reservoir for use during a water emergency, the ability to keep the reservoir at a more consistent level, and the ability to capture some water before it periodically spills over Hodges Reservoir Dam and into the ocean during the rainy seasons. Specifically, the pipeline allows water to be pumped from Hodges Reservoir to Olivenhain Reservoir and controls the flow of water from Olivenhain Reservoir to Hodges Reservoir. That is, in rainy winter years, water can be captured and moved to Olivenhain Reservoir. During the summer, it can then be moved back to Hodges Reservoir in order to benefit recreation activities. The pipeline also contains pump turbines, allowing the generation of up to 40 megawatts of energy as water flows from Olivenhain to Hodges Reservoir. The pipeline was completed in spring 2007, and the entire project is anticipated to be operational in 2012.[67]

118. Hodges Dam resides within the boundaries of the San Diego Multiple Species Conservation Program (MSCP), an effort that encompasses more than 528,000 acres and involves the participation of the County of San Diego and 11 cities, including the City of San Diego. The MSCP provides for the establishment of approximately 171,000 acres of preserve areas to provide conservation benefits for 85 federally listed and sensitive species, including the flycatcher, over the 50-year life of the permit. However, the area of the existing Hodges Reservoir and dam are excluded from the MSCP.[68]

119. In addition, the Corps consulted with the Service in 1997 regarding the San Diego County Water Authority Emergency Storage Project, which included Hodges Reservoir. The consultation resulted in an ITP for up to nine pairs of flycatchers. As part of the

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[65] Ibid.

[66] Ibid.

[67] Personal communication with Larry Purcell, San Diego County Water Authority, on September 2, 2005.

[68] City of San Diego, *City of San Diego MSCP Subarea Plan*, accessed at http://www.sandiego.gov/planning/mscp/pdf/subarea.pdf.

consultation, the San Diego County Water Authority was required to implement a number of conservation measures to protect endangered species and habitat, including the flycatcher. Of the wetland habitat, approximately 30 acres of wetlands habitat was affected, requiring the mitigation of approximately 50 acres.[69]

120. Water stored at Hodges Reservoir is currently delivered and sold to the San Dieguito Water District and the Santa Fe Irrigation District. The San Dieguito Water District serves approximately 38,000 customers in the communities of Leucadia, Old Encinitas, and portions of New Encinitas.[70] The Santa Fe Irrigation District serves approximately 20,900 in the communities of Rancho Santa Fe and Solana Beach.[71]

121. Because flycatcher territories have been detected along this river segment and because Hodges Reservoir is excluded from the MSCP, we assume that the City would seek an ITP to cover its actions under an HCP. Total baseline impacts to develop and implement this ITP given a storage capacity of 64,700 are estimated at $316,000 to $2.65 million in present value terms.

122. Constructed in 1949, Vail Dam is owned and operated by the Rancho California Water District. Vail Lake is the only surface water capture-release facility in the hydrogeologic area of the district. It was initially constructed to impound water for irrigation from winter flows from an upstream area of 319 square miles, including the Wilson, Kolb, and Temecula Creeks. Through the Vail Lake Agreement between Kaiser Development Company and the District in 1978, the district acquired Vail Lake and Dam, as well as the right to operate the facilities for the benefit of the District's water users.

123. Vail Lake has a maximum storage capacity of 62,000 acre-feet. Average annual surface flows into the reservoir are approximately 11,000 acre-feet. Under an Appropriations Permit obtained from the State of California in 1947, the Rancho California Water District may store up to 40,000 acre-feet in Vail Lake each year between November 1 and April 30. This water is used for irrigation and domestic uses incidental to farming operations in Riverside County. In addition to providing irrigation water, captured surface water-runoff has been periodically released to artificially recharge groundwater aquifers serving the Rancho California Water District.

124. Similar to Hodges Reservoir, we assume the Rancho California Water District will seek an ITP for its operations at Vail Lake. Because flycatcher territories have been detected in this area, impacts are expected to be baseline. Given its maximum storage capacity of 62,000, total baseline impacts to obtain and implement an ITP are estimated at $303,000 to $2.54 million in present value terms. Together with forecast impacts at Hodges Reservoir, total ITP costs for the management unit are estimated at $619,000 to $5.20 million.

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[69] City of Encinitas, San Dieguito Water District, accessed at http://www.ci.encinitas.ca.us/index.aspx?page=52 on December 12, 2011.

[70] City of Encinitas, San Dieguito Water District, accessed at http://www.ci.encinitas.ca.us/index.aspx?page=52 on December 12, 2011.

[71] Santa Fe Irrigation District, *SFID at a Glance*, accessed at http://www.sfidwater.org/ataglance.htm on December 12, 2011.

3.3.4 OWENS

125. The Pleasant Valley Dam is owned and operated by the City of Los Angeles Department of Water and Power (LADWP). With a maximum storage capacity of 2,989 acre-feet, the dam and its reservoir is one of eight reservoirs that make up the Owens Valley water system, which supplies water to the City of Los Angeles. In total, the Owens Valley system is anticipated to provide 91,000 acre-feet of groundwater to LADWP over the 2011-2012 Runoff Year.[72]

126. We assume that the City of Los Angles pursues an ITP as part of an HCP. With a maximum storage capacity of 2,989 acre-feet, total baseline impacts of implementing the ITP are estimated to be $14,600 to $123,000 in present value terms.

3.3.5 KERN

127. In 1953, the Corps built earthen dams across the two forks of the Kern River to create the Isabella Reservoir. The reservoir is Kern County's largest body of water with a surface area of approximately 11,200 acres and a maximum storage capacity of 568,000 acre-feet. The construction of Isabella Dam was authorized by the Flood Control Act of 1944 to protect the city of Bakersfield, a city built on the floodplain of the Kern River.

128. Rights to water stored at Lake Isabella are stipulated under the 1964 Contract, and are shared among the North Kern Water Storage District, and the City of Bakersfield. In wet years, secondary water rights holders, including the Kern Delta Water District and the Hacienda Water District, also may store water in Lake Isabella. Water stored at Lake Isabella is primarily used for agriculture and irrigation uses. The total area dependent on the water stored at Lake Isabella is approximately 333,333 acres within the southern San Joaquin Valley.

129. The creation of Lake Isabella resulted in the loss of approximately 3,211 acres of riparian forest on the South Fork Kern River. An additional 309 acres of riparian habitat, at the confluence of Lake Isabella and the South Fork Kern River, lies within gross pool elevation and is periodically inundated by the reservoir during years of high runoff. Included in this riparian corridor are the South Fork Wildlife Area and the Kern River Preserve. The South Fork Wildlife Area was transferred to the U.S. Forest Service in the early 1990s. The Kern River Preserve has been managed by the Nature Conservancy since 1981.

130. Without intervention, rising water levels at Lake Isabella would inundate flycatcher nests in the South Fork Wildlife Area in wet years. The Corps' projections of peak inflows and reservoir levels coincide with the flycatcher breeding season from April through July. Formal consultation on the operations and maintenance of the Lake Isabella Reservoir began on January 8, 1995. Applicants to the consultation include the Corps, U.S. Forest Service (USFS), and the Kern River Water master. In January 1995, the Service and the Corps agreed to complete the consultation in two phases. Operations and management of the Lake Isabella Dam and Reservoir for water year 1996 was addressed in the first

[72] Santa Fe Irrigation District, *SFID at a Glance*, accessed at http://www.sfidwater.org/ataglance.htm on December 12, 2011.

consultation, while a subsequent consultation addressed the future, long-term operations of the dam and reservoir.

131. On April 18, 1997, the Service issued a biological opinion addressing the impacts of the long-term operations and maintenance of Lake Isabella Dam and Reservoir. As part of the Interagency Agreement for long-term operations, the Corps and the Service agreed to protect 360 acres of flycatcher habitat upstream of Lake Isabella.

132. In addition, the Service appointed a subcommittee of the flycatcher recovery team to frame critical questions relating to flycatchers and their habitat in the project vicinity. After review of the best available information, the Service determined it was necessary to protect a total of 1,100 acres of habitat to minimize the effects of future reservoir operations. The Corps, in cooperation with the National Fish & Wildlife Foundation and the National Audubon Society, allocated $3.8 million for the acquisition and/or easement of 1,100 acres.

133. On October 24, 1997, the Southwest Center for Biodiversity filed a lawsuit alleging the Corps and the Service violated the Act with respect to the biological opinion on the long-term operations of Isabella Reservoir. On April 1, 1999, an injunction was granted against the Corps filling the reservoir above 2,584 feet, or 347,580 acre-feet of storage.

134. Meanwhile, due to the time required to complete the appraisals, evaluations, and escrow, negotiations to acquire the 1,100 acres were delayed. As a result, the Corps was required to implement a set of interim measures for a period of 12 months if the purchase of the 1,100 acres was not completed by March 1, 2000. These measures state that the Corps should not allow the reservoir to rise above 2,584 feet in elevation for the period of March 1 through September 30 until the land is purchases or a permanent conservation easement is in place.

135. The Corps reinitiated consultation on its long-term operations of Isabella Dam and Reservoir in February 2005. Specifically, the Corps requested concurrence that its conservation plan proposal to manage 1,150 acres of habitat upstream of the Isabella Dam and Reservoir was in accordance with the Service's previous biological opinions. The Service concurred that the Corps' purchase of Sprague Ranch fulfills the commitment to protect 1,100 acres of flycatcher habitat, and the Service concluded that the Corps could proceed immediately with unrestricted operation of Isabella Dam and Reservoir to a maximum storage capacity of 568,100 acre-feet.[73]

136. Ongoing flycatcher conservation activities including restoration work, surveys, cowbird control, invasive species management, and cattle exclusion fencing are estimated to cost approximately $401,000 per year.[74] Over thirty years, total future baseline impacts thus are estimated to be $5.33 million in present value terms.

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[73] U.S. Fish and Wildlife Service. 2005. *Re-initiation of Formal Consultation on the Conservation Plan for the Long-Term Operation of Isabella Dam and Reservoir, Kern County, California,* 1-1-05-F-0067, March 3, 2005.

[74] Inflated to 2010$ using the GDP deflator. An annual cost of $350,000 in 2004$ was developed based on the interest generated from the endowment fund, capitalized at $7.5 million. Email communication from Mitch Stewart, Army Corps of Engineers, Sacramento District, on August 26, 2004.

3.3.6 AMARGOSA

137. The Service's Ash Meadows National Wildlife Refuge is located within the proposed Amargosa management unit. The refuge was established in June 1984 to protect federally listed endangered plant and animal species, including four endangered fish species and one endangered plant. Flycatcher pairs use the refuge for breeding between June and August.[75]

138. The refuge's objectives include:

    a. Restore and eventually delist endangered plant and animal populations on the refuge;

    b. Restore wetland and desert upland habitat; and

    c. Provide habitat for other migrating and resident wildlife.

139. To realize these objectives, the refuge has undertaken wetland and desert upland habitat restoration, as well as water level and water quality programs. In particular, the Service has purchased 54 permitted or certificated water rights, totaling approximately 12,573 acre-feet. These water rights make the Service the single largest water right holder in the Amargosa Desert hydrographic basin.[76]

140. The refuge contains several smaller lakes and reservoirs, the largest of which are Crystal Reservoir with a storage capacity of 2,300 acre-feet, Lake No. 3 with a storage capacity of 1,200 acre-feet, and Lake No. 5 with a storage capacity of 3,000 acre-feet. While the refuge is managed to provide habitat for migrating species like the flycatcher, this analysis contemplates the potential need for an ITP as part of intra-Service consultation in the future (e.g., if efforts to maintain habitat for endangered fish species result in inundation of flycatcher habitat.). For the three largest lakes, total costs to obtain an ITP are estimated at $31,800 to $267,000 in present value terms.

3.3.7 LITTLE COLORADO

141. A public comment submitted on the 2004 CHD on behalf of the Lyman Water Company, J. Albert Brown Ranches, and others states that "the potential loss of the ability to divert surface water and possibly groundwater is perhaps the most important economic, social, and environmental consideration in the Little Colorado Management Unit."[77] Surfacewater diversions are subject to the Norviel Decree, which enforces water rights dating back to the 18702. Under this Decree, the court found that this river is fully appropriated.

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[75] Ash Meadows National Wildlife Refuge, Quick Facts, accessed at http://www.fws.gov/desertcomplex/ashmeadows/quickfacts.htm on December 16, 2011.

[76] Nye County Department of Natural Resources and Federal Facilities. 2004. *Nye County Water Resources Plan*, prepared by Thomas S. Buqo, August 2004.

[77] Comments of David A. Brown and Michael J. Brown, Brown & Brown Law Offices, on behalf of the Lyman Water Company, the Round Valley Water Users Association, various cities and towns, J. Albert Ranches, and numerous other irrigation users within the Little Colorado River watershed, "Proposed Designation of Southwestern willow flycatcher critical habitat," July 12, 2005.

142. Small-scale water management infrastructure controls these diversions throughout the management unit. In particular, the Round Valley Water Users, Inc. owns River Reservoir #3, an irrigation facility with maximum storage capacity of 3,195 acre-feet. In addition, the Black Rock dam in McKinley County, NM with a storage capacity of 2,610 acre-feet, is managed by the Bureau of Indian Affairs. With a total storage capacity of 5,800 acre-feet and applying an annual per-acre foot cost of $0.37 to $3.09, we estimate total baseline impacts associated with these facilities of $28,400 to $238,000 in present value terms.

3.3.8 LOWER COLORADO RIVER SYSTEM

143. The Lower Colorado River System includes portions of the Middle Colorado, Hoover to Parker, and Parker to Southerly International Border management units. The following water management facilities are located within these management units:

a. **Lake Mead/Hoover Dam.** Located within the Middle Colorado management, Lake Mead is controlled by Hoover Dam, which is owned and operated by USBR. Lake Mead is the primary flood control and water storage facility on the Lower Colorado with a maximum storage capacity of 28,357,000 acre-feet.

b. **Lake Havasu/Parker Dam.** Within the Hoover to Parker management unit, Parker Dam and powerplant are owned and operated by USBR. The primary purpose of Parker Dam is to provide reservoir storage for water deliveries to the Metropolitan Water District (California Aqueduct) and the Central Arizona Project (CAP). Lake Havasu is also heavily used for recreation. Smaller than Lake Mead, Lake Havasu has a maximum storage capacity of 651,000 acre-feet.

c. **Moovalya Lake/Headgate Rock Dam.** Headgate Rock Dam is a water diversion structure and low-head hydroelectric plant located in the Parker to Southerly-International Border management unit. The facility is managed by the Bureau of Indian Affairs (BIA) and operated primarily for the use of the Colorado Indian Tribes. Lake Moovalva has a maximum storage capacity of 200,000 acre-feet.

d. **Laguna Dam.** Also located in the Parker to Southerly-International Border management unit, Laguna Dam is one of the oldest facilities in the Lower Colorado system, and has a storage capacity of 1,600 acre-feet. The dam is now used as a regulating structure to help manage water deliveries and for sediment control.

e. **Imperial Dam.** With a storage capacity of 160,000 acre-feet, Imperial Dam is a major diversion dam that delivers water to the All-American Canal and the Gila Gravity Main Canal, which serve the Imperial Irrigation District and Coachella Valley Water District, among others.

d. **Senator Wash Dam.** Owned by USBR and operated by the Imperial Irrigation District, Senator Wash Dam is a small pump and store reservoir. With a storage capacity of 10,721 acre-feet, it provides off-stream regulatory storage to help manage water deliveries at the lower end of the Colorado River.

144. This section first provides a summary of previous biological opinions for flycatcher in this river system. It then describes the Lower Colorado Multi-Species Conservation Program and associated costs. It concludes by allocating the implementation costs for the program across the relevant facilities.

History of Consultation for the Lower Colorado River

145. In April 1997, the Service issued a biological opinion for the operations and maintenance of the Lower Colorado River for the flycatcher and other endangered species. The action area for this biologically opinion generally included the mainstem Lower Colorado River from the upper end of Lake Mead to the Southerly International Boundary, or approximately 700 river miles. This opinion found that the proposed action was likely to jeopardize the existence of the flycatcher. As a result of this consultation, USBR was required to:[78]

a. Protect approximately 1,400 acres of currently unprotected riparian habitat;

b. Review and evaluate fish and wildlife mitigation and enhancement programs in the action area to determine how they may be modified to enhance flycatcher habitat;

c. Survey and monitor habitat and breeding groups;

d. Fund a five-year survey, monitoring and research program for the flycatcher along the Lower Colorado River and confluent drainages;

e. Develop a long-term plan for on and offsite compensation for lost flycatcher habitat;

f. Participate in the MSCP and develop agreements with MSCP parties;

g. Conduct ecological restoration;

h. Evaluate progress annually in a written report.

146. In January 2001, the Service issued a separate biological opinion to USBR on the potential impacts of Interim Surplus Criteria, Secretarial Implementation Agreements, and Conservation measures on flycatcher and other endangered species. Although the Service did not find jeopardy for any species, it did request that USBR conduct flycatcher surveys for up to five years between Parker and Imperial dams. In April 2002, the Service issued another biological opinion resulting from reinitiation of the 1997 consultation on USBR's Lower Colorado operations. This opinion required USBR to study the effectiveness of brown-headed cowbird trapping on conservation of the flycatcher.

147. As a result of these past consultations, USBR and cooperating agencies have conducted surveys, monitoring, and life history studies in approximately 140 sites and four life

[78] U.S. Fish and Wildlife Service. 1997. "Biological and Conference Opinion on Lower Colorado River Operations and Maintenance: Lake Mead to Southerly International Boundary." Southwestern Regional Office, April 30, 1997; U.S. Fish and Wildlife Service. 2004. "Economic Analysis: Southwestern Willow Flycatcher: 1996-2004," Lower Colorado Regional Office, USBR, written memorandum to Industrial Economics, July 2004.

history sites along the Virgin River, Grand Canyon, Pahrangat National Wildlife Refuge, Bill Williams, and the Lower Colorado River.

Lower Colorado Multi-Species Conservation Program

148. The Draft Lower Colorado MSCP was released on June 18, 2004, and was signed on April 4, 2005. The MSCP planning area includes the historical floodplain in the Lower Basin, from Lee Ferry to the Southerly International Boundary with Mexico, including the full-pool elevations of Lakes Mead, Mohave, and Havasu. The program began following the designation of portions of the Lower Colorado River as critical habitat for four endangered fish species in 1994. Federally threatened and endangered species now included in the MCSCP include the flycatcher, the Yuma clapper rail, Desert tortoise, bonytail chub, humpback chub, and razorback sucker.

149. The goals of the MSCP are: [79]

   a. To conserve habitat and work toward the recovery of threatened and endangered species, as well as reduce the likelihood of additional species being listed;

   b. To accommodate present water diversions and power production and optimize opportunities for future water and power development, to the extent consistent with the law, and;

   c. To provide the basis for incidental take authorizations.

150. In keeping with these goals, the MSCP does not recommend that agencies modify water operations, citing legal and contractual constraints. In addition to the extremely complex Law of the River, another legal constraint is that a Federal action agency is not required to modify its activities to protect endangered species if it has no discretion to change its operations. In 1997, USBR advised the Service that it lacked discretion to reduce the level of Lake Mead except for purposes of river regulation, flood control, irrigation, domestic uses, and power generation. The Ninth Circuit Court of Appeals upheld USBR's position that protection of flycatcher habitat outside of the Lake Mead delta was acceptable (and thus changing water operations was not necessary).[80]

151. In general, the MSCP "provides long-term mitigation to offset incidental take of listed threatened and endangered species resulting from actions, projects, or activities" for many Federal and non-Federal actions related to water diversions and returns and hydropower operations. Among other initiatives, the MSCP calls for the creation or restoration of 8,132 acres of habitat along the Colorado River. Of these acres, 5,940 acres are for cottonwood-willow habitat, and 4,050 are specifically maintained for flycatcher habitat.

152. In total, the costs of developing and implementing the MSCP over its 50-year estimated time horizon are approximately $718 million (undiscounted). Of these, total costs that can be reasonably attributed to flycatcher are estimated at $582 million (undiscounted). As

[79] Draft Lower Colorado River Multi-Species Conservation Program Habitat Conservation Plan, June 18, 2004.

[80] Southwest Center for Biological Diversity v. U.S. Bureau of Reclamation. 143 F.3d 519 (9th Cir. 1998).

shown in Exhibit 3-5, this estimate includes costs associated with all species and habitat types in the MSCP except where noted. This is due to the difficulty in separating out implementation efforts put forth solely for flycatchers.

EXHIBIT 3-5. ESTIMATED LOWER COLORADO MSCP COSTS (2010$, UNDISCOUNTED)

CATEGORY	EXPENDITURES FOR ALL SPECIES	EXPENDITURES FOR FLYCATCHER	PERCENT OF TOTAL FUNDS
Program administration	$58,388,000	$58,388,000	10.0%
Land acquisition	$68,813,000	$68,813,000	11.8%
Planning, design, and engineering	$12,685,000	$12,685,000	2.2%
Habitat creation	$164,153,000	$103,220,000	17.7%
Environmental compliance	$3,509,000	$3,509,000	0.6%
Fish augmentation	$38,994,000	$0	0.0%
Conservation area management and maintenance	$60,406,000	$60,406,000	10.4%
Law enforcement staff	$9,175,000	$9,175,000	1.6%
Firefighting staff	$13,040,000	$13,040,000	2.2%
Existing habitat maintenance	$28,672,000	$28,672,000	4.9%
Topock marsh pumping	$3,097,000	$3,097,000	0.5%
Monitoring, research, and adaptive management	$184,660,000	$148,476,000	25.5%
Remedial measures	$15,219,000	$15,219,000	2.6%
Water acquisition	$57,344,000	$57,344,000	9.9%
Total	**$718,156,000**	**$582,044,000**	**100%**

Sources: Appendix N, Detailed Implementation Cost Estimate Assumptions, Lower Colorado MSCP, June 18, 2004.
Note: Totals may not sum due to rounding.

153. Of the flycatcher-related expenditures, we estimate that USBR has already incurred approximately $91.5 million for land acquisition and on-going survey, monitoring, and administrative costs.[81] To forecast future costs, the analysis apportions the implementation costs across the water management facilities in the Lower Colorado system based on their storage capacity (see Exhibit 3-6). Due to the size of Lake Mead relative to other dams within the Lower Colorado system, more than 90 percent of total estimated costs are attributed to Hoover Dam.

154. Notably, USBR states that: "With the implementation of the Multi-Species Conservation Program, and due to the legal requirements for delivery of water, there will be no changes in the operations of the Lower Colorado River. Minimum flows and water diversions are non-discretionary actions associated with the delivery of water based on laws and treaties. Currently all conservation programs are completed through a willing sellers program, and it is not foreseen that any forbearance agreements are to be enacted specifically for the

[81] U.S. Bureau of Reclamation. 2004. "Economic Analysis: Southwestern Willow Flycatcher: 2006-2004", Lower Colorado Regional Office, written memorandum, July 2004.

Southwestern Willow Flycatcher along the Lower Colorado River."[82] Therefore, the analysis does not forecast any impacts to water management activities at Lake Mead beyond those under the MSCP.

EXHIBIT 3-6. ESTIMATED FUTURE LOWER COLORADO MSCP COSTS BY FACILITY (2010$, DISCOUNTED AT SEVEN PERCENT)

FACILITY	STORAGE CAPACITY (AF)	TOTAL IMPACTS DISCOUNTED AT 7%	ANNUALIZED IMPACTS[1]
Lake Mead/Hoover Dam	28,357,000	$152,000,000	$10,500,000
Lake Havasu/Parker Dam	651,000	$3,480,000	$241,000
Moovalya Lake/Headgate Rock Dam	200,000	$1,070,000	$74,000
Laguna Dam	1,600	$8,550	$592
Imperial Dam	160,000	$855,000	$59,200
Senator Wash Dam	10,721	$57,300	$3,970
Total	**29,380,321[2]**	**$157,000,000**	**$10,900,000**

Notes: Totals may not sum due to rounding
1. Total impacts represent the costs of implementing the MSCP over the remaining 43 years of the project's 50 year time horizon (i.e., through 2054). Impacts are annualized over the same time period.
2. Total storage capacity for the entire Lower Colorado system is 31,003,000, including Lake Mohave, which is not analyzed here.

3.3.9 PAHRANAGAT

155. The Service's Pahranagat National Wildlife Refuge is located in the Pahranagat management unit, approximately 90 miles northwest of Las Vegas. The refuge was established in August 1963 to provide habitat for migratory birds, especially waterfowl. The refuge's objectives include:

    a. Provide high quality migration and wintering habitat for migrating birds, with emphasis on waterfowl;

    b. Restore wetland and desert upland habitats; and

    c. Provide opportunities for wildlife dependent recreation and enjoyment of refuge fish, wildlife and habitats.

156. To realize these objectives, the refuge has undertaken wetland and desert upland habitat restoration, as well as water level and water quality programs.[83]

157. The refuge has four main water impoundments: North March, Upper and Lower Lakes, and Middle Marsh. Of these four impoundments, Upper Lake, with a storage capacity of 3,457 acre-feet, falls within the proposed CHD. While the refuge is managed to provide

[82] U.S. Bureau of Reclamation. 2004. "Economic Analysis: Southwestern Willow Flycatcher: 2006-2004", Lower Colorado Regional Office, written memorandum, July 2004.

[83] Pahranagat National Wildlife Refuge, *Quick Facts*, accessed at http://www.fws.gov/desertcomplex/pahranagat/quickfacts.htm on December 16, 2011.

habitat for migratory birds like the flycatcher, this analysis contemplates the potential need for an intra-Service section 7 consultation in the future. For the Upper Pahranagat Dam, total costs to obtain an ITP are estimated at $16,900 to $142,000 in present value terms.

3.3.10 BILL WILLIAMS

158. Alamo Dam is a Corps project used for flood control, water supply and conservation, as well as recreational uses. In 1996, Congress amended the purpose of Alamo Dam to include management of fish and wildlife resources both upstream and downstream.[84] Water releases from Alamo Dam large enough to reach the mainstem Colorado River drain into Lake Havasu behind Parker Dam (see following section). Alamo Dam operations are closely coordinated with the operations of the USBR dams on the Lower Colorado.

159. Approximately 18,000 acres of the 23,000 acres in the Alamo Lake Recreation Area are managed as the Alamo Wildlife Area by Arizona Game and Fish (AZGFD). The area has an adaptive management plan for riparian management. In addition, AZGFD, the Service, Arizona State Parks, the Corps, and the US Geological Survey sit on the on the Bill Williams River Technical Committee whose aim is to improve bird and other species habitats in the river.

160. Flycatcher conservation activities at this facility have consisted primarily of monitoring because the Corps does not typically hold water in the reservoir during the times of the year when flycatcher are present. [85] Annual costs for these monitoring efforts are approximately $313,000 per year based on past monitoring efforts and planned expenses.[86] In addition to monitoring costs, the members of Bill Williams River Technical Committee also incur costs for participation. AZGFD estimates that it spends approximately $8,500 annually to participate in the committee.[87] Assuming other participating agencies expend a similar amount, total Committee-related costs are approximately $49,300 annually. This analysis assumes that monitoring and committee activities continue over the next thirty years, totaling $4.82 million in present value terms.

3.3.11 VERDE

161. The Salt River Project (SRP) operates six reservoirs and dams on the Salt and Verde Rivers. Together, these reservoirs provide 40 percent of the water supply to the Phoenix Active Management Area, an area of approximately 5,600 square miles.[88] SRP diverts about 900,000 acre-feet of surface water annually for use by the City of Phoenix, Salt

[84] Written communication from the Service, Arizona Field Office, on June 13, 2010.

[85] Personal communication with Carvel Bass, US Army Corps of Engineers, Los Angeles District, on October 1, 2004.

[86] Inflated to 2010$ using the GDP deflator. Personal communication with Carvel Bass, US Army Corps of Engineers, Los Angeles District, on October 1, 2004.

[87] Inflated to 2010$ using the GDP deflator. Email communication with Charles Paradzick, Aquatic Habitat Specialist, Arizona Fish and Game Department, on April 12, 2004.

[88] U.S. Fish and Wildlife Service. 2002. Final Environmental Impact Statement for the Roosevelt Habitat Conservation Plan, Gila And Maricopa Counties, Arizona Volume 1 of the FEIS. p 15

River Pima-Maricopa Indian Community, Fort McDowell Yavapai Nation, Phelps Dodge Corporation (PDC), irrigation users, and other communities in the Phoenix area, including Chandler, Glendale, Mesa, Scottsdale, and Tempe. The system serves 240,000 acres over an area of 375 square miles.

162. Of these diversions, about 40 percent are supplied from Horseshoe and Bartlett Reservoirs. Horseshoe Reservoir has a storage capacity of approximately 131,500 acre-feet. Combined with the Bartlett Reservoir, Horseshoe Reservoir can only handle approximately two-thirds of the average runoff from the Verde. Therefore, they are managed differently than Roosevelt Dam, which is also part of the Salt River system as discussed below. Water stored in Horseshoe is the first to be released out of all the SRP reservoirs in order to provide space for additional runoff on the Verde.

163. SRP obtained an ITP for Horseshoe and Bartlett reservoirs on April 1, 2008. As part of this ITP, SRP agreed to purchase a total of 200 acres of mitigation lands as part of off-site mitigation for the flycatcher and the Western yellow-billed cuckoo. In addition, SRP agreed to modify reservoir operations to make riparian habitat available earlier in the nesting season, including earlier and more rapid drawdown of Horseshoe Reservoir "whenever feasible".[89] Assuming an annual cost of approximately $373,000, total costs for implementation of this permit are estimated at $5.44 million over the remaining 46 years of the permit.[90]

3.3.12 ROOSEVELT

164. Roosevelt Dam and Lake is the dominant water management facility in the Roosevelt management unit. While USBR owns Roosevelt Dam, the SRP operates and manages it. The SRP operates six reservoirs and dams on the Salt and Verde Rivers. Together, these reservoirs provide 40 percent of the water supply to the Phoenix Active Management Area, an area of approximately 5,600 square miles. SRP divers about 900,000 acre-feet of surface water annually for use by the City of Phoenix, Salt River Pima-Maricopa Indian Community, Fort McDowell Yavapai Nation, Freeport McMoran, irrigation users, and other communities in the Phoenix area, including Chandler, Glendale, Mesa, Scottsdale, and Tempe. The system serves 240,000 acres over an area of 375 square miles. Roosevelt is the largest of the four reservoirs on the Salt River with a storage capacity of 1,331,000 acre-feet, representing 71 percent of the total surface water storage capacity in the SRP system.[91]

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[89] U.S. Fish and Wildlife Service. 2008. "Intra-Service Biological and Conference Opinion – Issuance of a Section 10(a)(1)(B) Permit to Salt River Project for Incidental Take of Threatened and Endangered Species Associated with Operation of Horseshoe and Bartlett Reservoirs," April 1, 2008.

[90] Written comments of Craig Sommers, ERO Resources, on behalf of the Salt River Project, to Industrial Economics, Inc., August 26, 2004.

[91] The Salt River Project consists of the Salt River Valley Water Users' Association and the Salt River Project Agricultural Improvement and Power District. The District provides electricity to nearly 934,000 retail customers in the Phoenix area, while the Association delivers nearly 1 million acre-feet of water annually to a service area in central Arizona. Salt River Project, *Facts about SRP,* accessed at http://www.srpnet.com/about/Facts.aspx on December 15, 2011.

165. In 1996, the Service issued a biological opinion to USBR on a Federal action to raise the Roosevelt dam elevation from 2,136 to 2,151 feet. This action would create New Conservation Space (NCS) behind the dam. USBR initiated the consultation because the new water conservation space added by raising the dam contained flycatcher habitat. The biological opinion was done solely for the flycatcher, and concluded that the action was likely to jeopardize the continued existence of the flycatcher.[92] As part of the reasonable and prudent alternative, USBR was asked to undertake the following actions:

    a. USBR should not permit long-term storage in the NCS until after September 1, 1996;
    b. Purchase "replacement" habitat and provide funds for management;
    c. Provide a management fund for on-the-ground improvements;
    d. Hire a conservation coordinator for ten years;
    e. Conduct research and monitoring for ten years;
    f. Implement a cowbird management program;
    g. Conduct population monitoring at Roosevelt Lake and Lower San Pedro River;
    h. Collect demographic data for flycatcher;
    i. Conduct dispersal/emigration surveys within a 25-mile radius of Roosevelt Lake and lower San Pedro River sites, Gila River, and Verde River;
    j. Conduct a genetic study; and
    k. Conduct habitat monitoring.

166. Under a 1917 agreement, the SRP operates and maintains Roosevelt Dam and Lake, although USBR owns the dam. The cities of Chandler, Gilbert, Glendale, Mesa, Peoria, Phoenix, Scottsdale, and Tempe have rights to the original conservation space behind Roosevelt Dam, along with several irrigation districts and three Tribes. The cities of Chandler, Glendale Mesa, Phoenix, Scottsdale, and Tempe have rights to water stored in the NCS that was created when the dam was raised.

167. When flycatcher territories were found below the 2,136 feet elevation (an area not covered by the USBR consultation), SRP began pursuing an HCP for authorization of "take" under section 10 of the Act. It was later agreed that the HCP should be expanded to include all impacts associated with SRP water storage, both in the new and existing conservation space. As a result, the HCP was approved in February 2003. As part of the HCP, SRP agreed to:

    a. Acquire and manage riparian habitat;
    b. Protect and manage habitat at Roosevelt Lake;
    c. Acquire water rights for maintenance of riparian habitat; and

[92] U.S. Fish and Wildlife Service, Arizona State Office. 1996. "Biological Opinion for the Modified Roosevelt Dam and its Effects on the Endangered Southwestern willow flycatcher," July 16, 1996.

d. Acquire buffer lands to benefit riparian habitat.

168. Between 1996 and 2003, SRP incurred approximately $5.37 million in costs (see Exhibit 3-7). Future costs under the HCP are anticipated to include land acquisition, habitat management and maintenance, and survey monitoring and research. In total, future HCP implementation costs are estimated at $11.9 million in present value terms over fifty years.[93]

169. Notably, both the HCP and the ITP for Roosevelt state that CHD should not result in additional requirements to SRP:

> "If critical habitat is designated for any Plan Species, as long as the RHCP is being properly implemented, FWS shall not require, through the formal consultation process of section 7 of the ESA or otherwise, the commitment by the Permittee of additional land, water, financial compensation or other measures beyond those already provided for in the RHCP."[94]

EXHIBIT 3-7. PAST COSTS OF FLYCATCHER CONSERVATION AT ROOSEVELT RESERVOIR, 1996 TO 2003 (2010$, UNDISCOUNTED)

ACTIVITY	COST
Studies, Administrative, Legal	$1,324,000
Habitat Restoration	$165,000
Land Acquisition	$3,624,000
Habitat Management and Monitoring	$259,000
Total	**$5,372,000**

Source: Written comments of Craig Sommers, ERO Resources, on behalf of the Salt River Project, to Industrial Economics, Inc., August 26, 2004.

[93] While the length of the ITP is until 2151, we forecast impacts only over 50 years.

[94] Salt River Project, Roosevelt Habitat Conservation Plan, Gila and Maricopa Counties, Arizona. Submitted to the U.S. Fish and Wildlife Service, December 2002.

3.3.13 UPPER GILA

170. Construction of Coolidge Dam was completed in 1928. The Coolidge Dam is operated by the San Carlos Irrigation Project (SCIP) for purposes of providing irrigation to the Gila River Indian Community (GRIC) and the San Carlos Irrigation and Drainage District (SCIDD). The maximum storage capacity of Coolidge Dam is 869,000 acre-feet.

171. The flows between Coolidge Dam and the Ashurst-Hayden Diversion Dam are appropriated to GRIC and SCIDD. All diversions of Gila River water are regulated under the 1953 Globe Equity 59 Decree. The Gila Water Commissioner is appointed by the U.S. District Court to administer the Decree, which controls use of the waters of the Gila River in the reach from above Virden, NM to its confluence with the Salt River west of Phoenix. Under the Decree, approximately 60 percent of the water goes to GRIC, while the remaining 40 percent goes to SCIDD. SCIDD provides water to a variety of private landowners and municipalities for irrigation purposes on approximately 50,000 acres, including the communities of the Casa Grande and Florence Valleys.

172. In 2004, USBR consulted with the Service on a proposal to sell up to 20,000 acre-feet for CAP water to the San Carlos Apache Tribe to be supplied downstream of Coolidge Dam. The purchase of CAP water was intended to allow the San Carlos Apache to maintain water in the San Carlos Reservoir for recreation and wildlife uses, while meetings its obligations to deliver water to downstream users. The March 2004 Biological Opinion addressed this proposed water exchange, but the project was not implemented because the Tribe was denied a permit for the transaction.[95]

173. The biological opinion on the transfer recommended that USBR undertake a variety of activities, including additional research and monitoring, cowbird trapping, installation of meters, and reporting.[96] In the event that successive annual water transfers result in loss of downstream flycatcher habitat, the Service has previously suggested that flycatcher habitat could be acquired on the San Pedro River as part of an HCP.[97] To approximate the cost of an HCP, the analysis applies that range of ITP costs, which also incorporate the acquisition of mitigation lands. Applying this estimate, total costs for Coolidge Dam are approximately $4.25 to $35.7 million.

3.3.14 SAN LUIS VALLEY

174. The San Luis Valley Project was authorized in 1940 to provide flood control protection and regulate water supply for San Luis Valley. To date, the only facility constructed is the Platoro Dam located 40 miles away from the proposed CHD. Another project to install a

[95] Written communication from Susan Sferra, Bruce Ellis, and Henry Mesing, U.S. Bureau of Reclamation, Phoenix Area Office, on September 24, 2004.

[96] U.S. Fish and Wildlife Service, Albuquerque Regional Office. 2004. "Biological opinion on the Bureau of Reclamation's Approval of Water Exchange by the San Carlos Apache Tribe for Retention in San Carlos Reservoir", March 8, 2004.

[97] Comments of the Southwest Regional Solicitor's Office, Service, December 15, 2004.

system of wells, pumping plants, laterals, and a canal to salvage ground water within the Closed Basin for delivery to the Rio Grande also falls outside of the proposed CHD.[98]

175. The Rio Grande Water Conservation District (RGWCD) is in the process of developing an HCP for the region. In its comments on the Proposed Rule, RGWCD states that it and other entities in the San Luis Valley "have implemented significant ongoing conservation activities, and are proposing additional conservation activities, that already protect or will protect the Southwestern Willow Flycatcher and its habitat."[99] The plan "fosters participation by local entities and landowners in recovery of the Flycatcher, while allowing on-going approved water and land use activities."[100] That said, because the San Luis Valley portion of the proposed critical habitat does not contain reservoirs, this analysis does not forecast any baseline impacts to water management activities associated with the development and implementation of this HCP.

3.3.15 MIDDLE RIO GRANDE

176. In the Middle Rio Grande management unit, Elephant Butte Reservoir was constructed in 1916 as part of the Rio Grande Reclamation Project. Now called the Rio Grande Project, it includes Elephant Butte and Caballo Dams, six other diversion dams, 139 miles of canals, 465 miles of drains, and a hydroelectric powerplant. The project provides irrigation water for approximately 178,000 acres of land, as well as electric power for surrounding communities and industries. Approximately 60 percent of the lands receiving water are located in New Mexico, while approximately 40 percent are located in Texas. The project also diverts water to Mexico under the terms of the 1906 Convention with Mexico and the 1938 Rio Grande Compact. In addition, the reservoir provides water for municipal use, including as much as 50 percent of the City of El Paso's water supply.[101]

177. Operated by the USBR, Elephant Butte Dam has a maximum storage capacity of 2,065,010 acre-feet. While the population of flycatchers along the Rio Grande segment is the largest population of flycatchers in their range, critical habitat has not previously been designated at Elephant Butte Reservoir.[102] However, past consultations on USBR activities at Elephant Butte Reservoir and the Rio Grande Project indicate that USBR is aware of the presence of the flycatcher in these areas and of the need to undergo section 7 consultation for these activities.[103] Given that the critical habitat designation is unlikely to

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[98] U.S. Bureau of Reclamation, *San Luis Valley Project*, May 17, 2011. Accessed at http://www.usbr.gov/projects/Project.jsp?proj_Name=San+Luis+Valley+Project on January 18, 2011.

[99] Public comments of the Rio Grande Water Conservation District, received December 27, 2011.

[100] Ibid.

[101] Public comments of Patrick R. Gordon, Texas Commissioner, Rio Grande Compact Commission, on September 30, 2011. Bureau of Reclamation, *Rio Grande Project*, May 16, 2011. Accessed at http://www.usbr.gov/projects/Project.jsp?proj_Name=Rio+Grande+Project.

[102] 76 FR 50576.

[103] Table 6 of Appendix E summarizes flycatcher territories adjacent to or within the Elephant Butte Reservoir/Delta, listing 51 territories there in 2002. Service, *Biological and Conference Opinion on the Effects of Actions Associated with the Programmatic Biological Assessment of Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation, and Related Non-Federal Actions on the Middle Rio Grande, New Mexico*, #2-22-03-F-0129, March 17, 2003.

increase Agency awareness of the need to consult, potential impacts are attributed to the baseline.

178. Finally, we note that the Rio Grande Compact Commission has expressed concerns about the potential impact of CHD on water deliveries. In particular, "Changing the parameters (storage at Elephant Butte Reservoir) would result in changes to the equities of the 1906 Convention with Mexico and the Rio Grande Compact. It is hard to comprehend the impacts or the uncertainty of such changes on these long-term commitments."[104] As described in Section 3.3, USBR has successfully argued that it lacks the legal discretion to change dam or reservoir operations in the past. Because of the high level of uncertainty about whether dam operations would need to be modified to accommodate the flycatcher, the analysis assumes that USBR would seek an ITP in lieu of modifying its operations. Under this scenario, we estimate total baseline impacts of $10.1 to $84.7 million based on the reservoir's large storage capacity.

3.4 INCREMENTAL IMPACTS

179. To estimate the incremental impacts to water management facilities, this analysis first determined which water management facilities either were located in areas where flycatcher territories have not been previously detected or, in the case of the San Francisco management unit, where flycatcher presence is not well known, and therefore not currently addressed. We assume impacts at these facilities may be incremental (see Exhibits 2-2 and 2-3).[105] For these facilities, the analysis also assumes the need to consult with the Service under section 7 of the Act, or obtain an ITP where flycatcher territories are present, and applies the same assumptions outlined in Section 3.2. We estimate total incremental costs of $1.4 million to $9.6 million over the next thirty years, or $110,000 to $720,000 on an annualized basis. Impacts by management unit are presented in Exhibit 3-8. In addition to the conservation effort costs of $1.1 to $9.3 million, the analysis forecasts administrative costs associated with section 7 consultations of $340,000 in present value terms, or $26,000 on an annualized basis, assuming a discount rate of seven percent.

[104] Public comments of Patrick R. Gordon, Texas Commissioner, Rio Grande Compact Commission, on September 30, 2011.

[105] To develop a better understanding of the existing level of agency awareness, we undertook an additional review of the consultation history for water facilities in the Santa Clara and Middle Rio Grande management units where incremental impacts initially appeared disproportionately high relative to other management units. For Elephant Butte Reservoir, the consultation history indicated that USBR is aware of the presence of the flycatcher within the reservoir delta, and is already undertaking section 7 consultation for its activities at this facility. Therefore, conservation efforts at this facility were attributed to the baseline.

EXHIBIT 3-8. SUMMARY OF INCREMENTAL IMPACTS TO WATER MANAGEMENT ACTIVITIES BY MANAGEMENT UNIT, 2012 TO 2031 (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	PRESENT VALUE		ADMINISTRATIVE COSTS
	LOW	HIGH	
Santa Clara	$220,000	$1,800,000	$53,000
Santa Ana	$0	$0	$71,000
San Diego	$0	$0	$37,000
Owens	$0	$0	$5,000
Kern	$0	$0	$20,000
Mohave	$880,000	$7,400,000	$15,000
Amargosa	$0	$0	$5,000
Little Colorado	$0	$0	$10,000
Middle Colorado	$0	$0	$20,000
Pahranagat	$0	$0	$5,000
Bill Williams	$0	$0	$12,000
Hoover to Parker Dam	$0	$0	$10,000
Parker Dam to Southerly International Border	$0	$0	$10,000
Verde	$0	$0	$6,600
Roosevelt	$0	$0	$6,600
Middle Gila and San Pedro	$0	$0	$6,600
Upper Gila	$0	$0	$5,000
San Francisco	$8,800	$74,000	$20,000
Middle Rio Grande	$0	$0	$25,000
Total	**$1,100,000**	**$9,300,000**	**$340,000**

3.4.1 SANTA CLARA

180. Located on Tujunga Wash, Hansen Dam was constructed by the Army Corps in 1940 to control floodwaters and silt that flow down Big Tujunga and Little Tujunga stream channels during heavy rainfalls.[106] The Hansen dam and lake now form part of a complex that offers four recreational areas and one playground, attracting 1.52 million visits a year.[107] The lake has a storage capacity of 44,900 acre-feet.

181. Flycatcher territories have not been previously detected near Hansen Dam; therefore, all impacts are assumed to be incremental. The analysis assumes that water managers will seek to avoid adverse modification by implementing conservation measures similar to those usually recommended under an ITP. With a maximum storage capacity of 44,900

[106] Barker, Mayerene. 1990. "Troubled Waters in Lake Revival Work : Hansen Dam: Tons of silt have been removed, but completion of the Army Corps of Engineers project is still years away", *Los Angeles Times*, May 28, 1990. Accessed at http://articles.latimes.com/1990-05-28/local/me-217_1_hansen-dam-s-lake.

[107] US Army Corps of Engineers, *Lake Level Report: HANSEN DAM*, accessed at http://www.corpsresults.us/recreation/reports/lake.asp?ID=174 on December 16, 2011.

acre-feet, we estimate total incremental impacts of $219,000 to $1.85 million in present value terms.

3.4.2 MOHAVE

182. The Mojave Dam is an un-gated flood control structure located on the northern side of the San Bernardino Mountains. The drainage area above the dam consists of approximately 215 square miles of mountainous terrain. The area is drained by two main tributaries, Deep Creek and West Fork Mojave River, which converge just above the dam to form the Mojave River. In its entirety, the Mojave River basin comprises about 4,700 square miles, of which 95 percent is desert. Nearly all of the surface water that reaches the Mojave River is contributed by the relatively small area above the dam. [108]

183. The Mojave River Dam is the only flood control reservoir in the basin, but the area above the dam includes Lake Arrowhead and Lake Gregory, both man-made recreation lakes. Also located in the Mohave River basin is Cedar Springs Dam and its associated Silverwood Lake, which is part of the California Aqueduct operated by the State of California Department of Water Resources and is used for both water supply and recreation.[109]

184. Operations and maintenance of flood control infrastructure on the Mojave River is the responsibility of the San Bernardino Flood Control District, which conducts annual maintenance in four critical reaches of the Mojave River. Vegetation clearing in these areas and occasional maintenance of other areas in the river is conducted in accordance with an existing biological opinion that addresses flycatcher and other endangered species. Measures are incorporated into the Maintenance Plan to remove exotic vegetation, assist in preventing OHVs from entering Mojave Narrows Regional Park, operate cowbird traps, and fund restoration efforts by the BLM at Afton Canyon.[110]

185. Flycatcher territories have not been previously detected near Mojave Dam; therefore, all impacts are assumed to be incremental. The analysis assumes that water managers will seek to avoid adverse modification by implementing conservation measures similar to those usually recommended under an ITP. With a maximum storage capacity of 179,400 acre-feet and applying an annual per-acre foot cost of $0.37 to $3.09, we estimate total incremental impacts of $877,000 to $7.36 million in present value terms.

3.4.3 SAN FRANCISCO

186. In the San Francisco management unit, Luna Lake has a storage capacity of 1,800 acre-feet. While located in the Apache-Sitgreaves National Forest, the dam is owned by Luna Irrigation Company. Much of the area around the lake is managed to benefit wildlife. For example, the uppermost end of the lake is managed by the Arizona Department of Game and Fish as the Luna Lake Wildlife Area. In the Luna Lake Wildlife Area, the

[108] US Army Corps of Engineers, Mojave River Dam, accessed at http://www.spl.usace.army.mil/resreg/htdocs/mojv_2.html on December 12, 2011.

[109] Ibid.

[110] Ibid.

management emphasis is to provide quality habitat for waterfowl and other birds. The area is closed to public entry annually from April 1 through July 31.[111] In addition, the Draft Land Management Plan for Apache-Sitgreaves National Forest outlines a Luna Lake Wildlife Quiet area to provide "secure nesting and rearing habitat, free from human disturbance, for bald eagles and waterfowl."[112]

187. Although flycatcher territories have been detected in the area, Luna Lake does not have existing management plans for flycatcher, and species occupancy may not be well known. Therefore, we assume costs are incremental. Assuming that the facility has a federal nexus because of its location in Apache-Sitgreaves National Forest, we estimate the incremental costs to implement an ITP as part of this consultation to be $8,800 to $73,900 based on its storage capacity of 1,800 acre-feet.

3.4.4 ADMINISTRATIVE COSTS

188. The analysis also forecasts administrative costs associated with section 7 consultation for water management activities. For all facilities without a current ITP, the analysis forecasts one formal consultation per dam operator for each management unit. That is, the analysis assumes dams that are operated by one agency in concert with each other, such as Seven Oaks and Prado dams in the Santa Ana management unit, likely would undertake a single consultation for the system. In addition, the analysis forecasts consultations for smaller dams and diversions, emergency projects, or experimental water releases. Because of uncertainty about when and where these types of future projects may occur, the analysis estimates an annual average number of water-related consultations per management unit based on the consultation history, and distributes these consultations across a 30-year time horizon. In total, the analysis forecasts 119 formal consultations across all management units over the next 30 years. The analysis forecasts total incremental administrative costs associated with section 7 consultations of $340,000 in present value terms, or $26,000 on an annualized basis, assuming a discount rate of seven percent

189. As shown in Exhibit 2-2, even consultations for projects where conservation effort costs are expected to be baseline may incur some additional, incremental administrative costs associated with the consideration of adverse modification. That is, new consultations taking place after CHD may require additional effort to address critical habitat issues above and beyond the listing issues. In this case, only the additional administrative effort required to consider critical habitat is considered an incremental impact of the designation. As a result, some units without incremental project modification costs may have incremental administrative costs associated with considering adverse modification.

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[111] Arizona Game and Fish Department, *Luna Lake*, accessed at http://www.azgfd.gov/h_f/documents/LunaLakeGeneralDescriptionFoyer.pdf on December 16, 2011. Arizona Game and Fish Department, *Luna Lake Wildlife Area*, accessed at http://www.gf.state.az.us/outdoor_recreation/wildlife_area_luna_lake.shtml on December 16, 2011.

[112] Arizona Game and Fish Department, *Luna Lake*, accessed at http://www.azgfd.gov/h_f/documents/LunaLakeGeneralDescriptionFoyer.pdf on December 16, 2011. Arizona Game and Fish Department, *Luna Lake Wildlife Area*, accessed at http://www.gf.state.az.us/outdoor_recreation/wildlife_area_luna_lake.shtml on December 16, 2011.

For projects where conservation effort costs are expected to be incremental, we also assume the full cost of conducting the consultation is incremental.

3.5 CAVEATS TO ECONOMIC ANALYSIS OF IMPACTS TO WATER MANAGEMENT ACTIVITIES

190. Exhibit 3-9 summarizes the key assumptions of the analysis of economic impacts on water management activities, as well as the potential direction and relative scale of bias introduced by these assumptions.

EXHIBIT 3-9. CAVEATS TO THE ECONOMIC ANALYSIS OF WATER MANAGEMENT ACTIVITIES

KEY ASSUMPTION	EFFECT ON IMPACT ESTIMATE
Critical habitat will not result in changes to operations at water management facilities. In particular, it assumes that critical habitat will not require changes in water level operations or loss of storage capacity.	-
All facilities will seek to develop and implement an HCP, or implement similar conservation efforts as part of a biological opinion.	+
Facilities will implement conservation efforts that are similar to those efforts implemented at the four facilities described in Section 3.2.	+/-
The relationship between conservation effort costs and the storage capacity of the relevant reservoir is constant.	+/-
The analysis estimates impacts only to facilities located within, or directly affecting reservoirs located within, proposed critical habitat.	-
The rate of past formal section 7 consultations reflects the future rate of section 7 consultation in these units.	+/-
The analysis assumes an administrative level of effort to obtain an incidental take permit as part of an HCP or section 7 consultation is equal to a formal section 7 consultation.	+/-

Notes:

- : This assumption may result in an underestimate of real costs.

+ : This assumption may result in an overestimate of real costs.

+/- : This assumption has an unknown effect on the magnitude of cost estimates.

CHAPTER 4 | POTENTIAL ECONOMIC IMPACTS TO LIVESTOCK GRAZING ACTIVITIES

191. This chapter provides an analysis of potential economic impacts to livestock grazing activities associated with conservation efforts for the flycatcher. We first provide a summary of the results of this analysis, including a summary of forecast baseline and incremental impacts. The next section provides an overview of past conservation efforts undertaken for the flycatcher related to grazing activities. Specifically, it describes typical conservation efforts that have been recommended to provide protection from improperly managed grazing activities that may pose a threat to the species. The chapter then discusses the analytic method used to calculate potential impacts to grazing, and presents potential baseline impacts resulting from grazing restrictions, riparian fence maintenance, cowbird trapping, and section 7 consultations or technical assistance. We then consider the potential for critical habitat to result in incremental changes to grazing activity through additional reductions in grazing allowances, riparian fence construction and maintenance, and administrative costs associated with section 7 consultations or technical assistance. The chapter concludes with an analysis of regional economic impacts from livestock grazing, and provides a summary of how key assumptions may affect the results of our analysis.

4.1 SUMMARY OF IMPACTS TO GRAZING ACTIVITIES

192. Exhibit 4-1 summarizes the anticipated incremental impacts of critical habitat on grazing activities by management unit. The present value of incremental impacts to grazing activities is estimated at $2.2 million to $3.5 million, assuming a seven percent real discount rate over 20 years, from 2012 through 2031. This corresponds to an annualized impact of approximately $190,000 to $310,000. These impacts include the costs associated with reductions in grazing allowances and riparian fencing, as well as administrative efforts to consider potential adverse modification of habitat as part of future formal and informal section 7 consultations, and technical assistance, related to grazing allotments in critical habitat areas. Because grazing activities occur in 27 of the 29 critical habitat units, future administrative costs are anticipated in most units. Of the total proposed designation, nearly 40,000 acres, or 7.5 percent, overlap Federal grazing allotments.[113]

[113] Because of a revision to the proposed critical habitat acreage in the current Notice of Availability, this analysis does not include cost estimates for one allotment that may overlap the Santa Cruz management unit. However, these costs are likely to be minimal. According to the Arizona BLM, this allotment is already fenced and is unlikely to face AUM reductions. The area is considered unoccupied, so no impacts associated with cowbird trapping are forecast. Therefore, the only costs omitted from this analysis for this allotment are baseline fencing maintenance costs. The final analysis will be updated to include these costs.

EXHIBIT 4-1. SUMMARY OF INCREMENTAL IMPACTS TO GRAZING ACTIVITIES BY MANAGEMENT UNIT, 2012 TO 2031 (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	PRESENT VALUE		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH
Santa Ynez	$8	$8	$1	$1
Santa Clara	$1,100	$1,100	$96	$96
Santa Ana	$2,300	$2,300	$200	$200
San Diego	$0	$0	$0	$0
Owens	$510	$510	$45	$45
Kern	$2,500	$2,500	$220	$220
Mohave	$380,000	$770,000	$33,000	$68,000
Salton	$0	$0	$0	$0
Amargosa	$72,000	$72,000	$6,300	$6,300
Little Colorado	$3,400	$3,400	$300	$300
Virgin	$84,000	$84,000	$7,400	$7,400
Middle Colorado	$810	$810	$71	$71
Pahranagat	$32,000	$32,000	$2,800	$2,800
Bill Williams	$110,000	$110,000	$9,700	$9,700
Hoover to Parker Dam	$770	$770	$68	$68
Parker Dam to Southerly International Border	$5,400	$5,400	$480	$480
San Juan	$17,000	$17,000	$1,500	$1,500
Powell	$210,000	$400,000	$19,000	$35,000
Verde	$32,000	$32,000	$2,800	$2,800
Roosevelt	$54,000	$54,000	$4,700	$4,700
Middle Gila and San Pedro	$65,000	$65,000	$5,800	$5,800
Upper Gila	$54,000	$54,000	$4,700	$4,700
Santa Cruz	$21,000	$21,000	$1,800	$1,800
San Francisco	$850,000	$1,600,000	$75,000	$140,000
Hassayampa and Agua Fria	$3,900	$3,900	$340	$340
San Luis Valley	$4,700	$4,700	$410	$410
Upper Rio Grande	$1,200	$1,200	$110	$110
Middle Rio Grande	$150,000	$150,000	$13,000	$13,000
Lower Rio Grande	$11,000	$11,000	$930	$930
Total	**$2,200,000**	**$3,500,000**	**$190,000**	**$310,000**

Note: Totals may not sum due to rounding.

193. As outlined in Exhibit 2-2, these incremental impacts are associated with: (1) areas where flycatcher territories have not been detected; (2) areas where critical habitat may result in increased agency awareness of the need to consult (in the San Francisco management unit

only); and (3) the administrative costs of considering adverse modification in section 7 consultation in all other areas.

194. This analysis assumes that the potential for grazing restrictions, in the form of reductions to grazing allowances (AUMs, described in section 4.2.1), exists in all grazing allotments overlapping proposed critical habitat, except those identified by wildlife biologists and range managers as unlikely to be affected by the designation. Reasons cited for assuming no future reductions in grazing allowances include sufficient existing riparian exclusions, such as fences or roadways, allotment vacancy, seasonal use, and lack of appropriate flycatcher habitat. In allotments where the potential for grazing restrictions exists, this value is calculated in perpetuity according to grazing permit values on Federal lands. Because, in some cases, range managers may be able to shift management practices to avoid reductions in grazing allowances, we assume a low-end estimate of no reductions in allotments where proposed critical habitat accounts for five percent or less of the grazing allotment. In unoccupied reaches or reaches where species occupancy may not be well known, these costs are assumed to be an incremental result of the designation. In occupied reaches, reaches that were previously proposed or designated as critical habitat, or reaches where species occupancy is well known, these costs occur under the baseline.[114]

195. To estimate the cost of riparian exclusions, this analysis assumes that fencing will be required around the perimeter of all potentially grazed areas in proposed critical habitat, and will need to be maintained for 20 years. Where some reaches may need fencing around only a portion of the perimeter, this assumption may overestimate incremental costs. For all stream reaches where riparian fencing or other exclusion is known to exist currently, efforts to maintain existing fencing are assumed to occur under the baseline scenario. In unoccupied reaches or reaches where species occupancy may not be well known, new construction costs are assumed to be an incremental result of the designation. In reaches that were previously proposed or designated as critical habitat, or reaches where species occupancy is well known, these costs occur under the baseline.

196. The Service notes that in some cases, alternative management scenarios, such as seasonal rest combined with grazing rotation, can reduce the need for additional riparian fencing.[115] To be conservative, this analysis assumes that landowners will implement the more costly measures of installing and maintaining riparian fencing. This assumption may result in an overestimate of future costs for some reaches.

197. Exhibit 4-2 summarizes the anticipated baseline impacts of flycatcher conservation on grazing activities by management unit. We estimate the present value of baseline impacts to grazing activities to be $9.3 million to $20 million, assuming a seven percent real discount rate over 20 years. This figure represents an annualized impact of approximately $820,000 to $1.8 million. These impacts include the lost value associated with reductions

[114] For a detailed discussion of the basis for attributing costs to the baseline or incremental scenarios, see Chapter 2 of this report.

[115] Written communication with U.S. Fish and Wildlife Service, Arizona Ecological Services Office, on July 1, 2005.

in grazing allowances, costs of maintaining existing riparian fencing in 81 grazing allotments where adequate riparian exclusion already exists, costs of constructing new fencing in allotments not currently excluded, costs of cowbird trapping to avoid jeopardy to the flycatcher, and the costs of administrative effort to consider jeopardy in future section 7 consultations and technical assistance.

EXHIBIT 4-2. SUMMARY OF BASELINE IMPACTS TO GRAZING ACTIVITIES BY MANAGEMENT UNIT, 2012 TO 2031 (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	PRESENT VALUE		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH
Santa Ynez	$7,300	$25,000	$650	$2,200
Santa Clara	$26,000	$72,000	$2,300	$6,400
Santa Ana	$220,000	$460,000	$19,000	$41,000
San Diego	$0	$0	$0	$0
Owens	$2,600	$16,000	$230	$1,400
Kern	$57,000	$140,000	$5,000	$12,000
Mohave	$7,000	$7,000	$610	$610
Salton	$0	$0	$0	$0
Amargosa	$760,000	$1,100,000	$67,000	$100,000
Little Colorado	$27,000	$93,000	$2,400	$8,200
Virgin	$1,100,000	$2,500,000	$99,000	$220,000
Middle Colorado	$250,000	$540,000	$22,000	$48,000
Pahranagat	$490,000	$890,000	$43,000	$78,000
Bill Williams	$1,100,000	$2,100,000	$100,000	$190,000
Hoover to Parker Dam	$19,000	$47,000	$1,700	$4,200
Parker Dam to Southerly International Border	$36,000	$81,000	$3,200	$7,100
San Juan	$520,000	$1,000,000	$46,000	$91,000
Powell	$4,500	$18,000	$400	$1,600
Verde	$1,200,000	$2,700,000	$110,000	$240,000
Roosevelt	$1,600,000	$3,700,000	$140,000	$330,000
Middle Gila and San Pedro	$360,000	$1,000,000	$32,000	$88,000
Upper Gila	$500,000	$1,200,000	$44,000	$100,000
Santa Cruz	$39,000	$150,000	$3,500	$13,000
San Francisco	$110,000	$670,000	$9,800	$59,000
Hassayampa and Agua Fria	$17,000	$42,000	$1,500	$3,700
San Luis Valley	$58,000	$260,000	$5,200	$23,000
Upper Rio Grande	$76,000	$240,000	$6,700	$21,000
Middle Rio Grande	$500,000	$630,000	$44,000	$56,000
Lower Rio Grande	$100,000	$230,000	$9,100	$20,000
Total	**$9,300,000**	**$20,000,000**	**$820,000**	**$1,800,000**

Note: Totals may not sum due to rounding.
Some units, such as the Powell management unit, are unoccupied and otherwise considered to have incremental impacts. However, baseline costs included here reflect future maintenance costs of existing riparian fencing.

4.2 OVERVIEW OF ACTIVITY AND PAST CONSERVATION EFFORTS

198. Livestock grazing may impact the flycatcher either directly or indirectly. The Recovery Plan states that grazing may affect the flycatcher by:

- Impairing the ability of riparian communities to develop into flycatcher habitat;
- Destroying nests with eggs or young; and
- Facilitating brood parasitism by brown-headed cowbirds.[116]

199. The Recovery Plan also notes that "...the effects of livestock grazing vary over the range of the flycatcher, due to variations in grazing practices, climate, hydrology, ecological setting, habitat quality, and other factors. … Addressing the issue of livestock management in the context of recovery of the southwestern willow flycatcher is therefore complicated."[117] On Federal lands, specific management of grazing allotments is left to the discretion of the Federal agencies responsible for permitting grazing on those lands.

200. This section discusses the typical project modifications that have been implemented to provide protection for the flycatcher from livestock grazing activities on Federal lands. Exhibit 4-3 presents a list of example project modifications from past consultations on USFS and BLM grazing allotments. Examples of conservation activities implemented on grazing allotments for flycatcher protection include:

- Conducting surveys at occupied and/or potential flycatcher locations;
- Exclusion or removal of livestock grazing from riparian areas year-round, or during the flycatcher breeding season;
- Monitoring the river corridor to ensure that permitted and trespass cattle remain outside flycatcher nesting areas and riparian corridors; and
- Initiation of cowbird trapping programs during the flycatcher breeding season to reduce the incidence of cowbird parasitism.

These actions can be grouped into three categories: grazing restrictions, other project modifications, and administrative costs. Note that no single consultation included all of these example conservation efforts.

201. The remainder of this section will provide a more detailed discussion of two of the key conservation activities quantified in this analysis: specifically, the loss of permit value associated with reductions in grazing allowances, and the need for riparian exclusions.

[116] U.S. Fish and Wildlife Service. 2002. Recovery Plan for the Southwestern willow flycatcher (Empidonax traillii extimus), August 2002 (Appendix G).

[117] U.S. Fish and Wildlife Service. 2002. Recovery Plan for the Southwestern willow flycatcher (Empidonax traillii extimus), August 2002 (Appendix G).

EXHIBIT 4-3. PROJECT MODIFICATIONS FROM PAST CONSULTATIONS ON FLYCATCHER

EXAMPLE CONSERVATION EFFORTS
Grazing Restrictions
• If standardized monitoring indicates that use of apical stems of woody riparian vegetation exceeds 40% (frequency of occurrence), then the Service must remove livestock from riparian area in the affected pasture immediately and shall defer use of the riparian area in the affected pasture in the following year. (a) • Livestock grazing in riparian pastures shall be restricted to winter to avoid flycatcher breeding season. (e, g) • Monitoring of the utilization levels shall be done to ensure <30 percent utilization limits are not exceeded. Once the 30 percent utilization level is met, all livestock will be removed from the pasture. (e)
Monitoring and Reducing Cattle Trespassing
• Any trespass livestock found shall be removed from riparian areas immediately and a reasonable effort shall be made to determine and eliminate the source or point of trespass. (a) • Immediately remove cattle entering breeding area through breaks in fencing on neighboring allotments. (c) • Work with private landowners to exclude livestock from Bureau-administered lands. (e) • Take immediate action to remove trespass cattle from or within 5 miles of occupied flycatcher habitats, and measures, including fences, shall be developed and implemented. (e, f) • Grazing in riparian pastures with occupied habitat will not be authorized until riparian fencing is complete. (e) • Monitor entire river corridor through the allotment for livestock. (a) • Monitor to ensure that cattle remain outside of the WIFL breeding area and riparian area after March 15 of each year. (c)
Cowbird Trapping
• Implement cowbird trapping in the action area if cowbird parasitism results in excess of 5 percent nest failure per year. (e) • New livestock management facilities that are likely to attract and support cowbirds must be located beyond five miles of occupied, suitable, or potential flycatcher habitat. (f) • If breeding status of any observed flycatcher is confirmed or suspected, begin a brown-headed cowbird trapping program in the following year by April 1, and maintain program data. (d)
Maintenance and Management Activities
• Construction, maintenance, and management activities in occupied or suitable flycatcher habitat shall occur outside the SWWF breeding season (April 15 – August 31). (e, f, g) • Construction, maintenance, and management activities in occupied SWWF habitat shall be planned to avoid removing willows and cottonwoods. (f) • Restriction of range improvement activities in the riparian corridor, except for fences, cattle guards, and gates to exclude and better manage cattle. (e, f)
Conduct Surveys and Monitoring
• Map the distribution, size, and areal extent of riparian habitats along the river corridor through the allotment. (a) • Monitor bud utilization on cottonwood and willow seedlings and saplings, and adjust management to maintain a range of 30 percent to 50 percent use with a three-year average of 40 percent. (g) • Determine breeding status of any flycatcher observed. If breeding status is confirmed or suspected, continue monitoring efforts by visiting breeding locations at least once during each of the three 10-day periods of June and July. (d) • Monitor incidental take resulting from the proposed action and report the findings of that monitoring. (e, f)
Sources: (a) 2-21-94-I-559, Tonto National Forest, Yavapai County, AZ, June 25, 1997. (b) 2-21-92-F-693, Eastern Roosevelt Lake Watershed, Gila County, AZ, December 1, 1995. (c) 2-21-92-I-360, Tonto Basin, AZ, November 30, 1995. (d) 2-21-92-F-500, Coconino National Forest, Yavapai and Coconino Counties, AZ, February 3, 1995. (e) 2-21-00-F-0029, Middle Gila River Ecosystem, Gila and Pinal Counties, AZ, October 23, 2003. (f) 2-21-96-F-160, Safford and Tucson Field Office's Livestock Grazing Program, Southeastern, AZ, September 26, 1997. (g) 22410-2010-F-0442, Greenwood Community Allotment, Mohave County, AZ, December 15, 2010.

4.2.1 AUMS AND PERMIT VALUE ON FEDERAL LANDS

202. On Federal lands, reductions in available grazing area can be realized by reducing the number of authorized or permitted AUMs (which are a measure of the amount of forage consumed by one cow and calf during one month). In some areas, restrictions have already been placed on the use of (or level of activity in) riparian areas for livestock grazing. Of the 171 potential grazing areas overlapping proposed critical habitat, 81 have already been excluded from grazing either year-round or seasonally, for various reasons, along streams now proposed as critical habitat. In areas not currently excluded, future AUM reductions as a result of flycatcher conservation are possible. This section will describe the concept of grazing permit value, which we use to estimate economic losses from future AUM reductions, as well as challenges associated with attributing AUM reductions to the flycatcher and potential means of avoiding reductions.

The Concept of Permit Value

203. The system of Federal grazing permits in the American West was established on USFS lands in the early 1990s and on BLM lands by the Taylor Grazing Act of 1934.[118] In most areas, qualifying ranches were assigned a number of AUMs based on the carrying capacity of the grazing allotment.[119] These allotments were connected to private holdings through the establishment of renewable leases that were both inheritable and transferable with the sale of the land or, in the case of USFS permits, the transfer of the livestock. As a result of this attachment of the grazing permit to the base properties, real estate markets adjusted the value of those properties to reflect the Federal AUMs associated with the grazing permits.[120]

204. This concept of permit value, however, has been an issue of debate. A 1970 court decision, Pankey Land and Cattle Co. v. Hardin, 427 F.2d 43 (10th Cir. 1970), formed the basis for the government's position that ranchers "are not given title to the grazing resource and as such do not own a property right or have a corresponding economic right to permit value."[121] Nonetheless, numerous published studies have found that a rancher obtains a value for holding a Federal grazing permit whether or not he has title to the permit, and whether or not he sells his property.[122] Furthermore, if the grazing fee is

[118] Grazing fees on USFS lands was first introduced in 1906. (Cody, B.A. 1996. Grazing Fees: An Overview. Congressional Research Service. Washington, D.C.)

[119] Kerr, Andy. 1998. "The Voluntary Retirement Option for Federal Public Land Grazing Permittees. Rangelands." Vol. 20, No. 5. October. 26-30.

[120] Stern, B.S. 1998. "Permit Value: A Hidden Key to the Public Land Grazing Dispute." M.S. Thesis. University of Montana. March 1998.

[121] Torell et al. 1994. "The Market Value of Public Land Forage Implied from Grazing permits." Current issues in Rangeland Economics: 1994. Western Research Coordinating Committee 55: Range Economics, 1994.

[122] "The general observation is that public land grazing permits do have market value," Torell et al. 2001. "The Lack of Profit motive for ranching: Implications for policy analysis." Current issues in Rangeland Economics, Western Coordinating Committee 55 (WCC-55); Torell, L. Allen and S.A. Bailey. 1991. "Public land policy and the value of grazing permits." Western Journal of Agricultural Economics, Volume 16 (174-184). Also see: Rowan, R. C., and J.P. Workman. 1992. "Factors affecting Utah ranch prices." Journal of Range Management. Volume 45 (263-266); Sunderman, M. A. and R. Spahr. 1992. "Valuation of government grazing leases." Journal of Real Estate Research, Volume 9 (179-196); Spahr, R. and M.A. Sunderman. 1995. "Additional evidence on the homogeneity of the value of government grazing leases and changing

below the value of grazing, and if the permit is renewable from year to year in a dependable fashion, then the economic rents (the difference between the fee and the value of grazing) will be incorporated and reflected into the value of the grazing permit.[123]

205. Thus, permit value can be used as a measure of rancher wealth tied up in grazing permits, and forced reductions in permitted AUMs can be represented by a loss in permit value or rancher wealth.

206. Economic literature supports this concept. For example, Torell et al. states that "permit value represents the only available direct valuation of public land forage, except for a few scattered instances where public land is competitively leased. Using an appropriate capitalization rate, annualized estimates of forage value can be determined from the observed permit value."[124] In a summary of recommended forage valuation methods, the author states that "permit values provide a direct and site-specific estimate of forage value. Theoretically, this estimate should provide a site-specific estimate of value while considering the inherent production characteristics, regulations, and economic potential of specific allotments."[125] As defined in a public comment on the 2005 critical habitat rule from the New Mexico Department of Agriculture, "permit value is essentially a measure of rancher wealth based on the number of federally permitted AUMs he is allowed to graze, the value of the Federal grazing fee, and the private property rights owned by the permittee."[126] Exhibit 4-4 presents the results of nine studies that attempt to measure the permit value, in perpetuity, of Federal grazing (per AUM), by permitting agency (USFS and BLM).

207. The range of values found in these studies likely results from variations in factors such as study method, region, quality of forage, substitute availability, and capitalization rates. This analysis adopts an estimated permit value, in perpetuity, per AUM as the average of the permit value studies below, or $101 per BLM AUM and $92 per USFS AUM.

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attributes for ranch value." Journal of Real Estate Research, Volume 10 (601-616); Torell, L. Allen and M.E. Kincaid. 1996. "Public land policy and the market value of New Mexico ranches, 1979-1994." Journal of Range Management, Volume 49 (270-276).

[123] Technical advisor review comments of B. Delworth Gardner, Brigham Young University, December 18, 2005.

[124] Torell et al. 2001. "The Lack of Profit motive for ranching: Implications for policy analysis." Current issues in Rangeland Economics, Western Coordinating Committee 55 (WCC-55).

[125] Torell, L. Allen et al. 1994. "Theoretical Justification and Limitations of Alternative Methods used to value public land forage." 1994. Western Research Coordinating Committee 55: Range Economics.

[126] Private property referred to here reflects private land values. Public comment on Draft Economic Analysis of Critical Habitat for the MSO from Julie Maitland, Division Director, New Mexico Department of Agriculture, April 26, 2004.

EXHIBIT 4-4. SUMMARY OF PERMIT VALUE ESTIMATES FOR BLM AND USFS PERMITS

STUDY	METHOD	YEARS	LOCATION	$/BLM AUM (2010$)*	$/USFS AUM (2010$)*
Rowen & Workman	Regression	1975-1987	Utah	$37	$37
Torell & Doll	Regression	1979-1988	New Mexico	$111	$111
Rowen & Workman	Regression	1980-1988	Utah	$69	$69
Torell & Kincaid	Various	1988	New Mexico	$123	$115
Torell et al.	Regression	1992	New Mexico	$126	$102
Kincaid	Regression	1987-1994	New Mexico	$116	$112
Torell & Kincaid	Various	1994	New Mexico	$118	$81
Torell et al.	Case Studies	2002	Idaho, Nevada, Oregon	$109	$109
			Average	**$101**	**$92**

Sources: Stern, Bill S. 1998. "Permit Value: A Hidden Key to the Public Lands Grazing Dispute," University of Montana, Master of Science thesis; Torell et al. 2002. "Ranch level impacts of changing grazing policies on BLM land to protect the Greater Sage-Grouse: Evidence from Idaho, Nevada, and Oregon." Policy Analysis Center for Western Public Lands, Policy Paper SGB01B02.

Notes:

* Numbers represent the permit value per AUM in perpetuity. Values adjusted from 2004 economic analysis to 2010$ using the National Income and Product Accounts Table, Table 1.1.4 Price Indexes for Gross Domestic Product, annual values, U.S. Department of Commerce, Bureau of Economic Analysis.

208. Two complications arise, however, when estimating the number of AUM reductions associated with restrictions on riparian grazing. First, numerous factors affect the number of permitted and authorized AUMs approved by USFS and BLM for any given grazing allotment, and AUM reductions due to the flycatcher often cannot be separated from other causes. Second, in some cases, restrictions on grazing allotments have been limited to the exclusion of only the riparian corridor during the flycatcher breeding season from May 1 through September 1. According to conversations with USFS and BLM staff, AUM reductions have been avoided in the past for this type of restriction through offsetting increases in the number of head during non-flycatcher breeding months, or by changing grazing management practices to avoid excluded riparian corridors.[127] These two complications are explored further in the following sections.

Attributing AUM Reductions to the Flycatcher

209. On a particular allotment containing flycatcher habitat, reductions to authorized or permitted AUMs made by USFS or BLM may be: (1) directly related to flycatcher conservation; (2) not related to flycatcher conservation at all; or (3) a combination of factors.

[127] Industrial Economics, Inc. 2005. "Final economic analysis of critical habitat designation for the southwestern willow flycatcher." September 28, 2005. Prepared for the U.S. Fish and Wildlife Service.

- *Causes directly related to flycatcher.* Although livestock grazing does not directly harm flycatchers, agencies have had to consider potential impacts of livestock grazing on the flycatcher since its listing. In a 2001 hearing with the New Mexico Public Land Grazing Task Force (New Mexico Task Force), Federal agencies in New Mexico cited compliance with Federal laws as a key factor that affects their management of livestock grazing.[128] As part of a survey, the New Mexico Task Force asked USFS and BLM permittees whether decreases in the permitted number of livestock on their allotments were due to the presence of federally listed endangered or threatened species (Exhibit 4-5). Their answers indicate that endangered species considerations have influenced the number of permitted AUMs, particularly on National Forest lands.[129] Although not definitive, this survey supports the assertion that flycatcher considerations may affect the number of permitted AUMs on allotments.

EXHIBIT 4-5. RESPONDENTS CLAIMING REDUCTIONS IN AUMS DUE TO PRESENCE OF THREATENED AND ENDANGERED SPECIES

GRAZING AREA	PERCENT
Carson National Forest	23
Cibola National Forest	2
Gila National Forest	42
Lincoln National Forest	7
Santa Fe National Forest	2
New Mexico BLM	5

Source: Douds, George A. New Mexico Department of Agriculture. 2002. "Report to the Governor of New Mexico from the Public Land Grazing Task Force," Appendices D, E and F.

Notes:

1. The survey question was not specific to flycatcher, thus drawing conclusions from this study about reductions in AUMs that may have resulted from flycatcher conservation activities is not possible.
2. BLM percentage presented is an average of the four offices. The Task Force sent surveys to 1,128 USFS permittees and 2,045 BLM permittees. They received responses from 322 USFS and 482 BLM permittees, or 29 and 24 percent, respectively.

- *Causes unrelated to flycatcher.* When Federal agencies assess an allotment for permit renewal, they must also consider weather conditions (such as drought), forage availability, presence of other ungulates, such as elk, as well as presence of other sensitive, threatened and endangered species. For example, past reductions in

[128] George A. Douds, New Mexico Department of Agriculture. 2002. "Report to the Governor of New Mexico from the Public Land Grazing Task Force."

[129] While this survey does not present a definitive answer to the question posed, it suggests that AUM reductions may be, in part, associated with endangered species considerations. However, the survey question was not specific to flycatcher, thus drawing conclusions from this study about reductions in AUMs that may have resulted from flycatcher conservation activities is not possible.

AUMs were prompted in the Tonto National Forest because of drought and on Arizona BLM allotments along the Virgin River due to the presence of the endangered desert tortoise.

- *Combination of Causes.* In most cases, however, decisions by Federal agencies to change the permitted or authorized AUMs in flycatcher habitat areas is a combination of considerations that include the flycatcher, other endangered species, other regulatory considerations (such as Grazing Guidance Criteria, Forest Plans, and Resource Management Plans), current forage availability, general health of the riparian corridor, and weather conditions. In addition, subjective factors such as political pressures from interest groups or other land user groups may also influence agency decisions. These subjective impacts are the most difficult to predict, but may play an important role in the decisionmaking process.

210. For allotments that have gone through formal section 7 consultations, or the NEPA permit issuance processes, specific changes directly caused by the flycatcher can be described and documented. However, not all changes to the permitted AUMs may be directly attributable to flycatcher conservation activities, and as described above, the spatial and temporal overlap with flycatcher consultation activities makes separating these impacts difficult.

Avoiding AUM Reductions

211. According to USFS and BLM staff, range managers can sometimes avoid AUM reductions when grazing restrictions are put in place for the flycatcher through changes in grazing management practices. For example, in the Apache-Sitgreaves forest, three flycatcher nesting sites were identified on allotments along the Little Colorado River. Grazing was restricted within a two mile radius around these sites during the flycatcher breeding season. Due to the small number of acres excluded relative to the entire allotment, USFS range managers were able to alter grazing patterns to avoid these areas during the summer without reducing AUMs. Another example of this type occurred with the exclusion of grazing during the flycatcher breeding season on the Bruton River allotment, administered by New Mexico BLM. Initially this allotment was authorized for 1,800 AUMs for 150 head year-round. To avoid reducing AUMs, after the exclusion of grazing during the flycatcher breeding season, BLM increased the number of head authorized during rest of the year from 150 to 198 cows, thereby maintaining an authorization of 1,800 AUMs. However, these approaches to management may result in other costs, such as losses in flexibility and increases in the time the permittee must commit to livestock management to ensure that cows do not wander into flycatcher-protected areas.[130]

[130] Personal communication with Vicente Ordonez, Apache-Sitgreaves National Forest, on August 13, 2004; Personal communication with Ralph Pope, Gila National Forest, on August 27, 2004.

4.2.2. RIPARIAN EXCLUSIONS

212. In the past, riparian fencing activities and associated reductions in AUMs have been undertaken for the protection of several endangered species and native fish, including the flycatcher. Specifically, in 1998, USFS Region 3 (New Mexico and Arizona) conducted a region-wide consultation on all of their grazing actions, resulting in the allotment-by-allotment review of 963 allotments. This review was the result of two lawsuits filed against the USFS by environmental groups in 1997, the Forest Guardians and the Center for Biological Diversity. The Forest Guardians' initial lawsuit focused upon four endangered species and threatened species: the southwestern willow flycatcher, the loach minnow, the spikedace, and the Mexican spotted owl. Their lawsuit challenged the issuance of grazing permits on allotments located in the Apache-Sitgreaves, Carson, Cibola, Gila, Prescott, and Santa Fe National Forests. The Center for Biological Diversity's initial lawsuit did not focus on any specific endangered or threatened species, but challenged the issuance of grazing permits on allotments in six national forests: Apache-Sitgreaves, Coconino, Coronado, Gila, Prescott, and Tonto. Because the complaints shared common issues and challenged many of the same allotments, the cases were consolidated.

213. In response to the lawsuit, USFS initiated informal consultation with the Service in February 1998 on the 158 allotments named in the complaints as well as hundreds of other allotments (962 in total) in the National Forests of Arizona and New Mexico (USFS Region 3). The purpose of the consultation was to determine the potential effects of livestock grazing on endangered and threatened species on the allotments and therefore whether formal consultation between USFS and the Service was necessary. As part of the informal consultation process, the USFS also developed "Grazing Guidance Criteria for Preliminary Effects Determinations for Species Listed as Threatened, Endangered or Proposed for Listing," ("Guidance Criteria") dated February 13, 1998.

214. Of the 962 allotments under consultation, 619 "No Effect," 321 "NLAA" (not likely to adversely affect) findings, and 22 "LAA" (likely to adversely affect) determinations were made. "No Effect" findings concluded the USFS's obligations under the Act and do not require Service concurrence. The USFS received concurrence from the Service for the 321 "NLAA" determinations, and thus no further action was necessary on those allotments.

215. This left 22 allotments where the USFS made LAA determinations with regards to listed species, including the flycatcher. In February 1999, the Service released a biological opinion in which it concluded that the impacts of grazing on 21 of the 22 allotments would not jeopardize the continued existence of the flycatcher.

216. The 962-allotment review prompted both Plaintiffs to amend their complaints in September 1999. The Forest Guardians narrowed their complaint to the loach minnow, the spikedace, and the spotted owl on allotments in the Apache-Sitgreaves, Gila and Cibola National Forests while the Center for Biological Diversity re-focused their

complaint to the loach minnow and spikedace on allotments in the Apache-Sitgreaves and Gila National Forests.[131]

217. The result of this process was the exclusion of the majority of the riparian corridor on grazing allotments in USFS Region 3.[132] In these cases, it is clear that the riparian exclusions were a result of a combination of causes, to which the flycatcher may have contributed but was not the primary driving factor. However, because of the temporal and spatial overlap, it is difficult to separate flycatcher-related impacts from other causes.

218. In addition to fencing, grazing exclusions in riparian areas may also occur as a result of natural features (such as gorges), roads, or seasonal use of the allotment to avoid flycatcher breeding season.[133] As described above, the causes of these exclusions may be unrelated or only partially related to flycatcher conservation.

4.3 ANALYTIC APPROACH

219. As stated above, previous lawsuits have resulted in the exclusion of cattle grazing from much of the riparian corridor in proposed critical habitat areas. Past riparian fencing activities and associated AUM reductions are considered baseline and retrospective impacts because the reductions were implemented previously, and thus are not quantified here.

220. Potential impacts to grazing quantified in this chapter may consist of:

1. **AUM Reductions.** As a low-end estimate, AUM reductions are assumed to occur only in allotments where proposed critical habitat accounts for greater than five percent of total allotment area; this analysis assumes that changes in grazing practices are available to avoid AUM reductions. A high-end estimate assumes that changes in grazing practices are not available, and AUM reductions will occur in all allotments overlapping critical habitat, unless identified as unlikely to be affected by USFS or BLM staff. For reaches that are considered occupied or where species occupancy is well known, any future AUM reductions are considered baseline. For unoccupied reaches or reaches where occupancy may not be well known, all future AUM reductions are considered incremental. (See Chapter 2 for a discussion of the identification of baseline and incremental impacts and classification of reaches by baseline or incremental status.)
2. **Fencing Construction.** For areas where fencing or other riparian exclusions are known not to exist, or where it could not be determined if adequate exclusions exist, fencing is assumed to be needed around the perimeter of all potentially

[131] United States District Court of Arizona. Southwest Center for Biological Diversity, et al., Plaintiff v. United States Forest Service et al., Defendants, and Arizona Cattle Growers' Association, Applicant-in-Intervention. Forest Guardians, Plaintiff v. United States Forest Service, et al., Defendants. No. CV 97-666 TUC JMR consolidated with No. CIV 97-2562 PHX-SMM.

[132] Personal communication with Wally Murphy, USFS Region 3, on September 3, 2004.

[133] Personal communication with BLM and USFS range management specialists and wildlife biologists, in November and December, 2011.

grazed areas overlapping proposed critical habitat. For reaches that are considered occupied or where species occupancy is well known, any future fencing construction is considered baseline. For unoccupied reaches or reaches where occupancy may not be well known, all future fencing construction is considered incremental.

3. **Fencing Maintenance.** All fencing is assumed to be maintained for 20 years. This may result in an overestimate of future costs for some reaches. For areas previously fenced, continued maintenance is assumed to be baseline regardless of the status of species occupancy in the fenced area. For fencing assumed to be constructed as a result of critical habitat, maintenance is assumed to occur under the baseline in reaches that are considered occupied or where occupancy is well known. In unoccupied reaches or reaches where occupancy may not be well known, maintenance of fencing constructed as a result of critical habitat is considered incremental.

4. **Cowbird Trapping.** Cowbird trapping programs may be required to avoid jeopardy to the flycatcher. For a high-end estimate, this analysis adopts a conservative assumption that cowbird trapping may occur in all potentially grazed areas within stream reaches known to be occupied. Because cowbird trapping has rarely been implemented for flycatcher conservation in recent years, this analysis assumes a low-end estimate of zero. All cowbird trapping costs are considered baseline.

5. **Administrative Costs.** These impacts consist of the administrative effort associated with formal and informal section 7 consultations, as well as technical assistance, on grazing activities. Costs associated with jeopardy analyses in occupied reaches where flycatcher occupancy is well known are considered baseline; additional costs associated with adverse modification analyses in these areas, as well as all consultation costs in unoccupied reaches or reaches where species occupancy may not be well known, are considered incremental.

221. The remainder of this section discusses the approach to quantifying these categories of impacts.

4.3.1 AUM REDUCTIONS

222. Due to the complications involved in assigning AUM reductions to the flycatcher exclusively, this analysis includes low and high estimates of AUMs reduced.

223. The low estimate uses the following criteria:

- For allotments identified by wildlife biologists, range managers, and permittees as unlikely to be impacted by the designation of flycatcher critical habitat, this analysis assumed no AUM reductions.
- For allotments where proposed critical habitat is less than or equal to five percent of total allotment area, this analysis assumes that changes in grazing management practices are available to avoid AUM reductions.

- For allotments where proposed critical habitat is equal to more than five percent of total allotment area, this analysis assumes the reduction in AUMs due to flycatcher is proportional to the percentage of allotment area designated as proposed flycatcher critical habitat.
- For the remaining allotments where the number of AUMs authorized is not known, this analysis assumes that reductions in AUMs will be equal to an average value of 0.23 AUMs reduced per acre. The derivation of this value is shown in Exhibit 4-6 below.

224. The high estimate uses the same criteria, without allowing for changes in management practices to avoid AUM reductions.

EXHIBIT 4-6. AVERAGE AUMS REDUCED DUE TO FLYCATCHER PER ACRE OF PROPOSED FLYCATCHER CRITICAL HABITAT

MANAGEMENT UNIT	AVERAGE AUMS REDUCED PER ACRE OF PROPOSED CRITICAL HABITAT
San Diego	0.73
Kern	1.04
Little Colorado	0.34
Virgin	0.03
Bill Williams	0.03
Parker Dam to Southerly International Border	0.02
Verde	0.15
Roosevelt	0.13
Middle Gila and San Pedro	0.13
Upper Gila	1.05
Upper Rio Grande	1.42
Middle Rio Grande	0.31
Average	**0.23**

Source: 2005 IEc analysis. Note that some of the impacts described here may be caused jointly by several causes, including other endangered species and other riparian habitat protection initiatives.

4.3.2 FENCING CONSTRUCTION AND MAINTENANCE

225. Costs of fencing exclosures for flycatcher are anticipated to range from $8,940 to $14,500 per river mile ($1.69 to $2.75 per foot) of fence construction, with an additional $179 to $725 annually in maintenance (see Exhibit 4-7). Land managers point out that maintenance of riparian fencing ultimately outweighs the costs of installing it, as animals,

weather, water, and human abuse all contribute to fence wear and tear over time.[134] Conversations with USFS staff suggest that when fencing is required as a conservation measure on grazing allotments, USFS bears both construction and maintenance costs.[135] Additionally, when fencing construction and maintenance is required on BLM allotments, either BLM or the permittee may be responsible for covering these costs, as decided on a case-by-case basis. However, BLM staff suggest that BLM often provides funding or materials to ranchers in cases where the permittee is responsible.[136] For purposes of this analysis, we assume that all fencing costs will be borne by the Federal agencies.

EXHIBIT 4-7. COST ESTIMATES: INSTALLING AND MAINTAINING CATTLE EXCLUSION FENCING AND ALTERNATIVE WATER SOURCES (2010$, UNDISCOUNTED)

ACTION	COST	
	LOW	HIGH
Livestock Fencing (Per Mile)		
Fence Construction[1]	$8,940	$14,498
Fence Maintenance and inspection (annual)[2]	$179	$725

Source: Personal and written communication with Seth Piedler, NRCS, Albuquerque, New Mexico Office, on December 14, 2011, based on expected fence construction rates for NRCS' Southern Mountain Region (Nevada, Utah, Arizona, New Mexico, and Colorado) for the year 2012. Low-end estimates represent costs of construction of smooth or barbed wire fencing and annual maintenance costs of two percent of the cost of construction. High-end estimates represent the costs of construction of smooth or barbed wire fence in difficult terrain and annual maintenance costs of five percent of the cost of construction.

Notes:

1. Assumed to be a one-time cost over 20 years.
2. Fence maintenance costs are estimated to range from two percent of installation costs annually to five percent of installation costs annually.

226. To estimate potential future fence construction and maintenance costs in critical habitat areas, we first contacted USFS and BLM land managers to identify the extent to which allotments intersecting the proposed designation already contain riparian exclusions. The analysis relies on GIS data to calculate the boundary of each allotment overlapping proposed critical habitat. For all reaches where exclusions are not known to exist, fencing is assumed to be constructed around the perimeter of the area overlapping proposed critical habitat and maintained for 20 years. In reaches where fencing or other riparian exclusions have been identified, only fencing maintenance is assumed for the next 20 years.

[134] Personal communication with Ted Cordery, BLM, Arizona State Office, on July 18, 2005.

[135] Personal communication with Beth Humphrey, Apache-Sitgreaves National Forest, on February 22, 2012.

[136] Personal communication with Tim Hughes, Endangered Species Coordinator, BLM Arizona State Office, on February 27, 2012; personal communication with Jeffrey Starosta, BLM Bishop Field Office, on February 27, 2012; and personal communication with Andrew Archuleta, Field Manager, BLM San Luis Valley Field Office, on February 22, 2012.

4.3.3 COWBIRD TRAPPING

227. Because brown-headed cowbirds are considered brood parasites to the flycatcher, past section 7 consultations have required ranchers to implement trapping programs as conservation measures. Cowbird trapping is undertaken to avoid jeopardizing the flycatcher, and as a result, is assumed to occur only in the baseline. The cost of such programs is an estimated $857 per allotment per year, as shown in Exhibit 4-8. To quantify baseline impacts due to the initiation of cowbird trapping programs, this analysis assumes that, as a high estimate, trapping will be required in all occupied reaches, and applies the cost of $857 to each allotment overlapping occupied proposed critical habitat. According to the Service, however, "the philosophy on cowbird trapping has changed over the years," and trapping is now significantly less common.[137] Conversations with wildlife biologists and range management specialists confirm that few allotments have established trapping programs, so this analysis assumes a low estimate of zero. Additionally, because cowbird trapping has not been commonly used for flycatcher conservation in recent years, this analysis relies on cost information from the previous 2005 analysis of CHD for flycatcher.

EXHIBIT 4-8. ESTIMATION OF COWBIRD TRAPPING COSTS (2004$ AND 2010$)

TOTAL PAST COSTS* (2004$)	NUMBER OF YEARS	NUMBER OF ADMINISTRATIVE UNITS	PAST COST PER ADMINISTRATIVE UNIT	AVERAGE NUMBER OF ALLOTMENTS PER ADMINISTRATIVE UNIT*	COST PER ALLOTMENT PER YEAR
$342,157	13	6	$4,400	5.9	$747.17
				Inflated to 2010$	$856.92

Notes: * Past costs are based on conversations with wildlife biologists, range management specialists, and permittees. The average number of allotments per administrative unit is based on 2005 IEc analysis. Values adjusted to 2010$ using the National Income and Product Accounts Table, Table 1.1.4 Price Indexes for Gross Domestic Product, annual values, U.S. Department of Commerce, Bureau of Economic Analysis. Calculations reflect rounding.

4.3.4 ADMINISTRATIVE COSTS

228. The analysis also forecasts administrative costs associated with formal section 7 consultations for grazing activities. A review of the past consultation history for the flycatcher identifies 27 formal consultations on grazing activities since the listing of the species in 1995. Because of uncertainty about future grazing rotations and the timing of transfers of grazing permits, it is difficult to forecast the number of grazing projects that may be subject to section 7 consultation. Therefore, we estimate an average number of consultations based on the past consultation history. To account for a potential increase in the number of section 7 consultations as more habitat becomes recognized as important for flycatcher conservation, we adjust the average number of formal consultations per year by the ratio of stream miles currently proposed as critical habitat to stream miles

[137] Personal communication with Greg Beatty, Arizona Ecological Services Office, U.S. Fish and Wildlife Service, on November 28, 2011.

proposed in the previous Proposed Rule in 2004. This results in an estimated 2.13 formal consultations on grazing activities per year. We distribute these 2.13 consultations per year across the management units with grazing allotments proportional to the number of grazing acres. That is, this analysis assumes that the larger the overlap with critical habitat, the greater the costs associated with consultation.

229. In addition to formal consultations, the Service frequently responds to requests for technical assistance and informal consultation. Because a detailed history of informal consultations and technical assistance regarding the flycatcher is not available, this analysis uses data provided by the Ventura office in California and Region 2 of the Service to estimate ratios of informal consultations and technical assistance requests to formal consultations.

230. The ratio of technical assistance requests to formal consultations for the flycatcher ranges from 0.3 (Region 2) to three (Ventura office). Although this ratio is not specific to grazing consultations, this analysis adopts a ratio of three technical assistance requests to one formal consultation for management units in California, and 0.3 technical assistance requests to one formal consultation for management units in all other states.

231. The ratio of informal to formal consultations for the flycatcher, which is again not specific to grazing consultations, ranges from nine (Ventura office) to eleven (Region 2). This analysis adopts a ratio of nine informal consultations to one formal consultation for management units in California, and 11 informal consultations to one formal consultation for management units in all other states.

232. For the three management units (Amargosa, Hoover to Parker Dam, and Parker Dam to Southerly International Border) located in both California and another state, this analysis assigned the California ratio. As a result, the analysis may overestimate technical assistance costs and underestimate informal consultation costs.

233. In unoccupied reaches and reaches where flycatcher occupancy may not be well known, these consultations are assumed to result from the CHD, and thus all associated administrative costs are considered incremental. In occupied reaches where occupancy is considered well known, administrative effort is needed to address both jeopardy and adverse modification issues. The portion of administrative effort to address adverse modification is considered to be an incremental cost, while the portion to address jeopardy is considered baseline.

4.4 BASELINE IMPACTS

234. To estimate baseline impacts on grazing activities, this analysis assumes that AUM reductions will be required on allotments overlapping proposed critical habitat, along reaches that are considered occupied and where flycatcher occupancy is well known. As a low-end estimate, this analysis assumes AUM reductions only occur where proposed critical habitat accounts for more than five percent of total allotment area; otherwise, changes in grazing management practices are available to avoid AUM reductions. The high-end estimate assumes AUM reductions cannot be avoided. For allotments that

wildlife biologists and range managers identified as unlikely to face additional reductions in AUMs, no reductions are estimated. Where currently authorized AUMs are known, this analysis assumes reductions proportional to the percentage of allotment area within proposed critical habitat. Where the number of authorized AUMs is unavailable, this analysis applies an average reduction of 0.23 AUMs per acre to the number of acres of grazing land in critical habitat (see Exhibit 4-6).

235. Through GIS analysis and communication with BLM and USFS range management specialists and wildlife biologists, we identified a total of 171 grazing allotments intersecting proposed critical habitat.[138] Of these, land managers identified 81 allotments as already containing riparian exclusions. This analysis assumes that the 81 allotments which already contain adequate riparian exclusions will require only maintenance of existing fencing over the next twenty years. We further assume that allotments without existing exclusions that overlap occupied reaches where flycatcher occupancy is considered well known will require construction of riparian fences. This fencing will be maintained for the next twenty years.

236. In addition to AUM reductions and fencing costs, this analysis estimates the impact of cowbird trapping programs under the baseline. As a conservative, high-end estimate, this analysis assumes that cowbird trapping will be required in every allotment overlapping occupied proposed critical habitat. However, because cowbird trapping has only rarely been used as a conservation measure in recent years, the analysis assumes a low-end estimate of zero.

237. Total baseline impacts are estimated at $9.3 million to $20 million in present value terms, or $820,000 to $1.8 million on an annualized basis. As shown in Exhibit 4-9, the majority of these impacts are associated with fencing construction and maintenance, at approximately $6.9 million to $16 million.

[138] BLM and USFS range management specialists and wildlife biologists identified a small number of allotments that appeared to overlap proposed critical habitat but are not grazed. These allotments were omitted from the analysis.

EXHIBIT 4-9. SUMMARY OF BASELINE COSTS BY MANAGEMENT UNIT (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	VALUE OF AUM REDUCTIONS		FENCING CONSTRUCTION AND MAINTENANCE IMPACTS		COWBIRD TRAPPING IMPACTS		ADMINISTRATIVE IMPACTS
	LOW	HIGH	LOW	HIGH	LOW	HIGH	
Santa Ynez	$0	$22	$7,300	$15,000	$0	$9,700	$21
Santa Clara	$0	$700	$25,000	$50,000	$0	$19,000	$1,700
Santa Ana	$0	$6,300	$210,000	$430,000	$0	$19,000	$6,900
San Diego	$0	$0	$0	$0	$0	$0	$0
Owens	$0	$0	$1,000	$4,200	$0	$9,700	$1,500
Kern	$6,100	$6,200	$44,000	$97,000	$0	$29,000	$7,400
Mohave	$0	$0	$0	$0	$0	$0	$7,000
Salton	$0	$0	$0	$0	$0	$0	$0
Amargosa	$200,000	$200,000	$360,000	$730,000	$0	$9,700	$200,000
Little Colorado	$0	$0	$19,000	$75,000	$0	$9,700	$8,300
Virgin	$6,400	$68,000	$870,000	$2,000,000	$0	$190,000	$250,000
Middle Colorado	$0	$0	$250,000	$520,000	$0	$19,000	$2,400
Pahranagat	$62,000	$63,000	$330,000	$680,000	$0	$49,000	$95,000
Bill Williams	$0	$4,100	$810,000	$1,600,000	$0	$120,000	$330,000
Hoover to Parker Dam	$0	$470	$17,000	$35,000	$0	$9,700	$2,300
Parker Dam to Southerly International Border	$0	$0	$20,000	$45,000	$0	$19,000	$16,000
San Juan	$0	$0	$460,000	$950,000	$0	$29,000	$52,000
Powell	$0	$0	$4,500	$18,000	$0	$0	$0
Verde	$0	$72,000	$1,100,000	$2,400,000	$0	$140,000	$96,000
Roosevelt	$0	$51,000	$1,500,000	$3,300,000	$0	$180,000	$160,000
Middle Gila and San Pedro	$0	$0	$160,000	$660,000	$0	$150,000	$200,000
Upper Gila	$0	$310	$340,000	$880,000	$0	$150,000	$160,000
Santa Cruz	$0	$0	$34,000	$140,000	$0	$9,700	$5,000
San Francisco	$0	$0	$110,000	$450,000	$0	$220,000	$0
Hassayampa and Agua Fria	$0	$7	$5,000	$11,000	$0	$19,000	$12,000
San Luis Valley	$0	$8,600	$44,000	$180,000	$0	$58,000	$14,000
Upper Rio Grande	$0	$470	$73,000	$180,000	$0	$49,000	$3,600
Middle Rio Grande	$0	$29	$58,000	$120,000	$0	$68,000	$440,000
Lower Rio Grande	$0	$230	$71,000	$150,000	$0	$49,000	$32,000
Total	**$270,000**	**$480,000**	**$6,900,000**	**$16,000,000**	**$0**	**$1,600,000**	**$2,100,000**
Grand Total Low	**$9,300,000**						
Grand Total High	**$20,000,000**						

Note: Totals may not sum due to rounding.

4.5 INCREMENTAL IMPACTS

238. To estimate the incremental impacts on grazing activities, this analysis assumes that AUM reductions will be required on allotments overlapping proposed critical habitat along reaches that are considered unoccupied or where flycatcher occupancy may not be well known. As a low-end estimate, this analysis assumes AUM reductions only occur where proposed critical habitat accounts for more than five percent of total allotment area; otherwise, changes in grazing management practices are available to avoid AUM reductions. The high-end estimate assumes AUM reductions cannot be avoided. For allotments that wildlife biologists and range managers identified as unlikely to face additional reductions in AUMs, no reductions are estimated. Where currently authorized AUMs are known, this analysis assumes reductions proportional to the percentage of allotment area within proposed critical habitat. Where the number of authorized AUMs is unavailable, this analysis applies an average reduction of 0.23 AUMs per acre to the number of acres of grazing land in critical habitat.

239. This analysis also assumes that the allotments that do not currently have riparian exclusions will construct and maintain riparian fencing as a result of critical habitat. We further assume that this fencing will be maintained for the next twenty years. These fencing construction and maintenance costs are considered to be incremental in reaches that are considered unoccupied by the flycatcher or where the species presence may not be well known.

240. The incremental analysis estimates the value of future AUM reductions at $9,900 to $36,000 in present value terms, or $880 to $3,200 on an annualized basis, and fencing construction and maintenance costs at $1.3 million to $2.6 million in present value terms over the next twenty years, or $110,000 to $230,000 on an annualized basis. In addition, the analysis forecasts administrative costs associated with section 7 consultation and technical assistance at $860,000 in present value terms, or $76,000 on an annualized basis, assuming a discount rate of seven percent. Total incremental impacts range from $2.2 million to $3.5 million present value. Impacts by management unit are presented in Exhibit 4-10.

EXHIBIT 4-10. SUMMARY OF INCREMENTAL COSTS BY MANAGEMENT UNIT (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	VALUE OF AUM REDUCTIONS		FENCING CONSTRUCTION AND MAINTENANCE IMPACTS		ADMINISTRATIVE IMPACTS
	LOW	HIGH	LOW	HIGH	
Santa Ynez	$0	$0	$0	$0	$8
Santa Clara	$0	$0	$0	$0	$1,100
Santa Ana	$0	$0	$0	$0	$2,300
San Diego	$0	$0	$0	$0	$0
Owens	$0	$0	$0	$0	$510
Kern	$0	$0	$0	$0	$2,500
Mohave	$0	$5,400	$370,000	$750,000	$6,200
Salton	$0	$0	$0	$0	$0
Amargosa	$0	$0	$0	$0	$72,000
Little Colorado	$0	$0	$0	$0	$3,400
Virgin	$0	$0	$0	$0	$84,000
Middle Colorado	$0	$0	$0	$0	$810
Pahranagat	$0	$0	$0	$0	$32,000
Bill Williams	$0	$0	$0	$0	$110,000
Hoover to Parker Dam	$0	$0	$0	$0	$770
Parker Dam to Southerly International Border	$0	$0	$0	$0	$5,400
San Juan	$0	$0	$0	$0	$17,000
Powell	$2,300	$2,300	$180,000	$370,000	$27,000
Verde	$0	$0	$0	$0	$32,000
Roosevelt	$0	$0	$0	$0	$54,000
Middle Gila and San Pedro	$0	$0	$0	$0	$65,000
Upper Gila	$0	$0	$0	$0	$54,000
Santa Cruz	$0	$0	$0	$0	$21,000
San Francisco	$7,700	$29,000	$740,000	$1,500,000	$100,000
Hassayampa and Agua Fria	$0	$0	$0	$0	$3,900
San Luis Valley	$0	$0	$0	$0	$4,700
Upper Rio Grande	$0	$0	$0	$0	$1,200
Middle Rio Grande	$0	$0	$0	$0	$150,000
Lower Rio Grande	$0	$0	$0	$0	$11,000
Total	**$9,900**	**$36,000**	**$1,300,000**	**$2,600,000**	**$860,000**
Grand Total Low	**$2,200,000**				
Grand Total High	**$3,500,000**				
Note: Totals may not sum due to rounding.					

4.6 REGIONAL ECONOMIC IMPACTS

241. This section presents the regional economic impacts expected to result from reductions in grazed AUMs generated by flycatcher conservation activities. The above analysis estimates:

- Approximately 2,700 to 4,900 AUMs reduced on Federal grazing lands over the next 20 years due to flycatcher conservation activities occurring under the baseline.
- Approximately 110 to 390 AUMs reduced on Federal grazing lands over the next 20 years due to flycatcher conservation activities as an incremental impact of CHD.

242. Decreases in livestock production due to reductions in AUMs in proposed flycatcher critical habitat areas will occur only if no substitute forage is available. In general, it has been documented that ranchers work to maintain the size of existing herds following changes in public land forage availability. For example, Rimbey et al. states that when faced with changes to public forage availability, ranchers "would do everything they could do to maintain their existing herd. Depending upon when the reductions occurred during the year, the ranchers identified alternatives for maintaining herd size and remaining in business: purchase (or not sell) additional hay (to replace forage in winter, early spring, or late fall), and look for private pasture and rangeland leases (summer forage). The last alternative mentioned by ranchers was the reduction in the number of cattle they would run on their ranches."[139] Torell et al. states that "given the stated and observed desire to remain in ranching, perhaps, the most reasonable assumption for policy analysis is that western ranchers will continue in business until forced to leave."[140] In another example, Rowe et al. states that "in general, ranchers favor finding alternatives to Federal forage rather than selling their ranch if faced with reductions in Federal forage."[141] Given observed rancher behavior, it is unclear that a reduction in permitted or authorized AUMs in proposed flycatcher critical habitat areas would necessarily lead to a reduction in herd size, as long as replacement forage is available.

243. However, given the localized nature of ranching and the increasing number of restrictions on ranching behavior overall, it is possible that reductions in forage availability on public land associated with flycatcher conservation could occur in areas where substitute forage is not available, or where supplemental forage is prohibitively expensive. This analysis assumes that AUMs will be reduced as a result of flycatcher conservation (i.e., effectively assuming that no replacement forage is available). This analysis captures the value of these losses to rancher wealth by assuming that ranchers lose the value of these AUMs.

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[139] Rimbey, N., T. Darden, A. Torell, J. Tanaka, L. Van Tassel, and J.D. Wulfhorst. 2003. "Ranch Level Economic Impacts of Public Land Grazing Policy Alternatives in the Bureau Resource Area of Owyhee County, Idaho." Agricultural Economics Extension Series No. 03-05, University of Idaho, College of Agricultural and Life Sciences, June.

[140] Torell, L. Allen et al. 2001. "The Lack of Profit Motive for Ranching: Implications for Policy Analysis," Current Issues in Rangeland Economics, Proceedings of a Symposium Sponsored by Western Coordinating Committee 55 (WCC-55), February 2001.

[141] Rowe, Helen I., M. Shinderman, and E.T. Bartlett. 2001. "Change on the range." Rangelands 23 (2).

244. To estimate the regional economic impact of grazing restrictions, this analysis first estimates the number of AUMs likely to be lost as a result of flycatcher conservation activities. Direct effects are calculated by converting this AUM reduction to an estimated loss in livestock production. Next, the analysis utilizes IMPLAN to estimate indirect and induced impacts on the region in terms of output and jobs.

4.6.1 RUNNING THE IMPLAN MODEL

245. For purposes of this regional economic impact analysis, the study area includes 49 counties in Arizona, New Mexico, Colorado, Utah, Nevada, and California. The study area includes only the counties in which flycatcher critical habitat is proposed. This scale at which regional economic impacts are modeled was determined by considering that the overall impact of this activity relative to the size of the sector is small. While it would be possible to run the IMPLAN model at the individual county level, at that fine scale, some regional impacts may "leak out" of the analysis and cause the impacts to appear smaller yet.

246. Restrictions in grazing activity will primarily affect the livestock-related sectors of the economy. Decreased operations in these industries would also result in secondary effects on related sectors in the study area. Some of these related sectors may be closely associated with the livestock industry, such as feed grains and hay and pasture; while others may be less closely associated, such as the insurance sector.

247. This analysis relies on regional economic modeling to estimate the economic impacts of these initial and secondary effects. In particular, it utilizes a software package called IMPLAN to estimate the total economic effects of the reduction in economic activity in the livestock-related industries in the study area. IMPLAN is commonly used by State and Federal agencies for policy planning and evaluation purposes. The model draws upon data from several Federal and State agencies, including the Bureau of Economic Analysis and the Bureau of Labor Statistics.

248. IMPLAN translates initial changes in expenditures into changes from demand for inputs to affected industries. These effects can be described as direct, indirect, or induced, depending on the nature of the change:

- **Direct effects** represent changes in output attributable to a change in demand or a supply shock. These are specified initially by the modeler (e.g., the change in recreation expenditures on goods and services, by sector);
- **Indirect effects** are changes in output in industries that supply goods and services to those that are directly affected by the initial change in expenditures; and
- **Induced effects** reflect changes in household consumption, arising from changes in employment (which in turn are the result of direct and indirect effects). For example, changes in employment in a region may affect the consumption of certain goods and services.

These categories are calculated for all industries to determine the regional economic impact of grazing restrictions resulting from flycatcher conservation activities.

4.6.2 CAVEATS TO THE IMPLAN MODEL

249. There are two important caveats relevant to the interpretation of IMPLAN model estimates, generally, and within the context of this analysis. The first is that the model is static in nature and measures only those effects resulting from a specific policy change (or the functional equivalent specified by the modeler) at a single point in time. Thus, IMPLAN does not account for posterior adjustments that may occur, such as the subsequent reemployment of workers displaced by the original policy change. In the present analysis, this caveat suggests that the long-run net output and employment effects resulting from grazing restrictions are likely to be smaller than those estimated in the model, which implies an upward bias in the estimates. A second caveat to the IMPLAN analysis is related to the model data. The IMPLAN analysis relies upon input/output relationships derived from 1998 data. Thus, this analysis assumes that this historical characterization of the affected counties' economies is a reasonable approximation of current conditions. If significant changes have occurred since 1998 in the structure of the economies of the counties in the study area, the results may be sensitive to this assumption. The magnitude and direction of any such bias are unknown.

4.6.3 REGIONAL ECONOMIC IMPACT ESTIMATES

250. Future regional economic impacts are estimated for both baseline and incremental impacts using the high estimates of lost AUMs (Exhibits 4-11 and 4-12, respectively). At the high end, this analysis estimates future baseline reductions of 4,900 AUMs, and future incremental reductions of 390 AUMs, due to flycatcher conservation activities. The calculation of the direct effect of future reductions in AUMs on annual livestock production relies on the following assumptions:

- The five-year average of livestock production per head in New Mexico and Arizona ($1,040);[142] and
- Value per head is converted to annual forage value (per AUM) by dividing by 18 ($58).[143]

Exhibits 4-13 and 4-14 present the results of the IMPLAN analysis for the baseline and incremental scenarios, respectively. Future baseline reduction in livestock production as a result of AUM reductions is shown to result in an annual economic loss of approximately $500,000 (2010$) in regional output and approximately 3.4 jobs across all sectors of the economy. This impact represents less than 0.1 percent of total output and employment from the livestock industry in this region. Future incremental reduction in livestock production as a result of AUM reductions results in an annual economic loss of approximately $41,000 (2010$) in regional output and less than one job across all sectors

[142] NASS Quick Stats. Value of cattle, including calves – inventory, measured in $/head, 2003-2007.

[143] Assuming one calf per cow and a monthly requirement of 0.5 AUMs per calf. Lewandrowski, Jan and K. Ingram. "Restricting Grazing on Federal Lands in the West to Protect Threatened and Endangered Species: Ranch and Livestock Sector Impacts." Review of Agricultural Economics, Volume 24, Number 1 (78-107).

of the economy. This impact represents less than 0.01 percent of total output and employment from the livestock industry in this region.[144]

EXHIBIT 4-11. CALCULATION OF FUTURE BASELINE DIRECT EFFECT OF GRAZING REDUCTIONS ON LIVESTOCK PRODUCTION, 2012-2031 (ANNUAL 2010$)

MANAGEMENT UNIT	AFFECTED PARTY	ESTIMATED AUM REDUCTION[1]	VALUE OF LIVESTOCK PRODUCTION (DOLLARS PER AUM)[2]	TOTAL LIVESTOCK PRODUCTION LOSS (ANNUAL DOLLARS)[3]
Santa Ynez	USFS	0.2	$58	$14
Santa Clara	USFS	8	$58	$440
Santa Ana	USFS	69	$58	$4,000
San Diego	n/a	0	$58	$0
Owens	n/a	0	$58	$0
Kern	BLM, USFS	67.00	$58	$3,900
Mohave	n/a	0	$58	$0
Salton	n/a	0	$58	$0
Amargosa	BLM	2,000	$58	$110,000
Little Colorado	n/a	0	$58	$0
Virgin	BLM	670	$58	$39,000
Middle Colorado	n/a	0	$58	$0
Pahranagat	BLM	620	$58	$36,000
Bill Williams	BLM	40	$58	$2,300
Hoover to Parker Dam	BLM	4.7	$58	$270
Parker Dam to Southerly International Border	n/a	0	$58	$0
San Juan	n/a	0	$58	$0
Powell	n/a	0	$58	$0
Verde	USFS	780	$58	$45,000
Roosevelt	USFS	550	$58	$32,000
Middle Gila and San Pedro	n/a	0	$58	$0
Upper Gila	BLM, USFS	3.0	$58	$180
Santa Cruz	n/a	0	$58	$0
San Francisco	n/a	0	$58	$0
Hassayampa and Agua Fria	BLM	0.1	$58	$4
San Luis Valley	BLM	85	$58	$4,900
Upper Rio Grande	BLM, USFS	4.7	$58	$270
Middle Rio Grande	BLM	0.3	$58	$16
Lower Rio Grande	BLM	2	$58	$130
	Total	**4,900**		**$290,000**

Notes:

1. Based on the high estimate of AUM reduction. Note that some of the potential impacts cited here may be caused jointly by several causes, including other endangered species and other riparian habitat protection initiatives.
2. Value of production represents the five year average for NM and AZ.
3. Totals may not sum due to rounding.

[144] These data are from IMPLAN for the Range-Fed, Ranch-Fed and Cattle Feedlots livestock sectors.

EXHIBIT 4-12. CALCULATION OF FUTURE INCREMENTAL DIRECT EFFECT OF GRAZING REDUCTIONS ON LIVESTOCK PRODUCTION, 2012-2031 (ANNUAL 2010$)

MANAGEMENT UNIT	AFFECTED PARTY	ESTIMATED AUM REDUCTION[1]	VALUE OF LIVESTOCK PRODUCTION (DOLLARS PER AUM)[2]	TOTAL LIVESTOCK PRODUCTION LOSS (ANNUAL DOLLARS)[3]
Santa Ynez	n/a	0	$58	$0
Santa Clara	n/a	0	$58	$0
Santa Ana	n/a	0	$58	$0
San Diego	n/a	0	$58	$0
Owens	n/a	0	$58	$0
Kern	n/a	0	$58	$0
Mohave	USFS	59	$58	$3,400
Salton	n/a	0	$58	$0
Amargosa	n/a	0	$58	$0
Little Colorado	n/a	0	$58	$0
Virgin	n/a	0	$58	$0
Middle Colorado	n/a	0	$58	$0
Pahranagat	n/a	0	$58	$0
Bill Williams	n/a	0	$58	$0
Hoover to Parker Dam	n/a	0	$58	$0
Parker Dam to Southerly International Border	n/a	0	$58	$0
San Juan	n/a	0	$58	$0
Powell	BLM	22	$58	$1,300
Verde	n/a	0	$58	$0
Roosevelt	n/a	0	$58	$0
Middle Gila and San Pedro	n/a	0	$58	$0
Upper Gila	n/a	0	$58	$0
Santa Cruz	n/a	0	$58	$0
San Francisco	USFS	310	$58	$18,000
Hassayampa and Agua Fria	n/a	0	$58	$0
San Luis Valley	n/a	0	$58	$0
Upper Rio Grande	n/a	0	$58	$0
Middle Rio Grande	n/a	0	$58	$0
Lower Rio Grande	n/a	0	$58	$0
	Total	**390**		**$23,000**

Notes:

1. Based on the high estimate of AUM reduction. Note that some of the potential impacts cited here may be caused jointly by several causes, including other endangered species and other riparian habitat protection initiatives.
2. Value of production represents the five year average for NM and AZ.
3. Totals may not sum due to rounding.

EXHIBIT 4-13. FUTURE BASELINE REGIONAL ECONOMIC IMPACT OF REDUCTIONS IN LIVESTOCK PRODUCTION, 2012-2031 (ANNUAL, 2010$)*

MANAGEMENT UNIT	AFFECTED PARTY	DIRECT EFFECT (OUTPUT)	INDIRECT EFFECT (OUTPUT)	INDUCED EFFECT (OUTPUT)	TOTAL IMPACT (OUTPUT)
Santa Ynez	USFS	$13	$9	$3	$25
Santa Clara	USFS	$420	$280	$77	$770
Santa Ana	USFS	$3,800	$2,600	$710	$7,100
San Diego	n/a	$0	$0	$0	$0
Owens	n/a	$0	$0	$0	$0
Kern	BLM, USFS	$3,700	$2,500	$690	$6,800
Mohave	n/a	$0	$0	$0	$0
Salton	n/a	$0	$0	$0	$0
Amargosa	BLM	$110,000	$73,000	$20,000	$200,000
Little Colorado	n/a	$0	$0	$0	$0
Virgin	BLM	$37,000	$25,000	$6,900	$68,000
Middle Colorado	n/a	$0	$0	$0	$0
Pahranagat	BLM	$34,000	$23,000	$6,400	$64,000
Bill Williams	BLM	$2,200	$1,500	$410	$4,100
Hoover to Parker Dam	BLM	$260	$170	$48	$480
Parker Dam to Southerly International Border	n/a	$0	$0	$0	$0
San Juan	n/a	$0	$0	$0	$0
Powell	n/a	$0	$0	$0	$0
Verde	USFS	$43,000	$29,000	$8,000	$80,000
Roosevelt	USFS	$30,000	$20,000	$5,600	$56,000
Middle Gila and San Pedro	n/a	$0	$0	$0	$0
Upper Gila	BLM, USFS	$170	$110	$31	$310
Santa Cruz	n/a	$0	$0	$0	$0
San Francisco	n/a	$0	$0	$0	$0
Hassayampa and Agua Fria	BLM	$4	$2	$1	$7
San Luis Valley	BLM	$4,700	$3,100	$870	$8,700
Upper Rio Grande	BLM, USFS	$260	$170	$48	$480
Middle Rio Grande	BLM	$16	$11	$3	$29
Lower Rio Grande	BLM	$130	$85	$24	$240
Total Output ($)		**$270,000**	**$180,000**	**$50,000**	**$500,000**
Total Employment (jobs)		**2.1**	**1.0**	**0.3**	**3.4**

Notes:

* Regional economic impact measures represent one-time changes in economic activity (i.e., not present values); thus, these estimates represent annual losses. Note that some of the potential impacts cited here may be caused jointly by several causes, including other endangered species and other riparian habitat protection initiatives.

Totals may not sum due to rounding.

EXHIBIT 4-14. FUTURE INCREMENTAL REGIONAL ECONOMIC IMPACT OF REDUCTIONS IN LIVESTOCK PRODUCTION, 2012-2031 (ANNUAL, 2010$)*

MANAGEMENT UNIT	AFFECTED PARTY	DIRECT EFFECT (OUTPUT)	INDIRECT EFFECT (OUTPUT)	INDUCED EFFECT (OUTPUT)	TOTAL IMPACT (OUTPUT)
Santa Ynez	n/a	$0	$0	$0	$0
Santa Clara	n/a	$0	$0	$0	$0
Santa Ana	n/a	$0	$0	$0	$0
San Diego	n/a	$0	$0	$0	$0
Owens	n/a	$0	$0	$0	$0
Kern	n/a	$0	$0	$0	$0
Mohave	USFS	$3,300	$2,200	$610	$6,100
Salton	n/a	$0	$0	$0	$0
Amargosa	n/a	$0	$0	$0	$0
Little Colorado	n/a	$0	$0	$0	$0
Virgin	n/a	$0	$0	$0	$0
Middle Colorado	n/a	$0	$0	$0	$0
Pahranagat	n/a	$0	$0	$0	$0
Bill Williams	n/a	$0	$0	$0	$0
Hoover to Parker Dam	n/a	$0	$0	$0	$0
Parker Dam to Southerly International Border	n/a	$0	$0	$0	$0
San Juan	n/a	$0	$0	$0	$0
Powell	BLM	$1,200	$840	$230	$2,300
Verde	n/a	$0	$0	$0	$0
Roosevelt	n/a	$0	$0	$0	$0
Middle Gila and San Pedro	n/a	$0	$0	$0	$0
Upper Gila	n/a	$0	$0	$0	$0
Santa Cruz	n/a	$0	$0	$0	$0
San Francisco	USFS	$17,000	$12,000	$3,200	$32,000
Hassayampa and Agua Fria	n/a	$0	$0	$0	$0
San Luis Valley	n/a	$0	$0	$0	$0
Upper Rio Grande	n/a	$0	$0	$0	$0
Middle Rio Grande	n/a	$0	$0	$0	$0
Lower Rio Grande	n/a	$0	$0	$0	$0
Total Output ($)		**$22,000**	**$15,000**	**$4,100**	**$41,000**
Total Employment (jobs)		**0.2**	**0.1**	**0.0**	**0.3**

Notes:

* Regional economic impact measures represent one-time changes in economic activity (i.e., not present values); thus, these estimates represent annual losses. Note that some of the potential impacts cited here may be caused jointly by several causes, including other endangered species and other riparian habitat protection initiatives.

Totals may not sum due to rounding.

4.7 CAVEATS TO ECONOMIC ANALYSIS OF IMPACTS ON THE LIVESTOCK GRAZING ACTIVITIES

251. Exhibit 4-15 summarizes the key assumptions of the analysis of economic impacts on grazing activities, as well as the potential direction and relative scale of bias introduced by these assumptions.

EXHIBIT 4-15. CAVEATS TO THE ECONOMIC ANALYSIS ON LIVESTOCK GRAZING ACTIVITIES

KEY ASSUMPTION	EFFECT ON IMPACT ESTIMATE
Although there are many factors that may result in AUM reductions, reductions to grazing (permitted AUMs) in flycatcher habitat are assumed to result from flycatcher conservation activities.[145]	+
For the high-end estimate, this analysis assumes that portions of allotments within critical habitat will be retired completely. In fact, the consultation history suggests that grazing may only be disallowed for part of a year.	+
The percent of AUMs reduced on allotments where direct AUM reductions were not known is assumed to be equal to the percentage of the allotment designated as proposed flycatcher critical habitat. This analysis could underestimate (e.g., range managers are able to avoid AUM reductions through changes in grazing management and patterns) or overestimate (e.g., fencing off the riparian corridor results in a greater number of AUMs reduced) the economic impacts.	+/-
The livestock grazing permit value is $92/AUM on USFS lands, and $101/AUM on BLM lands.	+/-
For Federal allotments where the actual number of AUMs grazed is unknown, this analysis estimates the AUMs reduced due to flycatcher using the average AUM reduction on Federal grazing lands with known AUMs.	+/-
The length of fencing required to exclude portions of allotments overlapping critical habitat is assumed to be the perimeter of the overlapping area. In some cases, where roads or natural barriers exist, this may overestimate the new fencing requirement.	+
For all allotments where the existence of riparian exclusions was unknown, this analysis assumes no existing fencing and that fence construction will be required for flycatcher conservation.	+
The cost of livestock fencing per mile ranges from $8,940 to $14,498 for construction, and $179 to $725 for maintenance.	+/-
The cost of cowbird trapping per allotment per year is $857.	+/-
This analysis assumes that the rate of formal and informal section 7 consultations, as well as technical assistance requests, will increase proportionally to the increase in river miles proposed as critical habitat. In fact, the true rate of consultations will depend on awareness of the existence of flycatcher habitat within specific project locations.	+/-
The IMPLAN model used to estimate regional economic impacts is a static model	+

[145] Forest Guardians agrees in its public comment that this assumption overstates impacts due to flycatcher. Public comments of Billy Stern, Grazing Program Coordinator, Forest Guardians, "Proposed Designation of Critical Habitat for the Southwestern willow flycatcher (Empidonax traillii extimus)", May 26, 2005.

KEY ASSUMPTION	EFFECT ON IMPACT ESTIMATE
and does not account for the fact that the economy will adjust. IMPLAN measures the effects of a specific policy change at one point in time. Over the long-run, the economic losses predicted by the model may be overstated as adjustments such as re-employment of displaced employees occurs.	
The IMPLAN model used to estimate regional economic impacts relies on 1998 data. If significant changes have occurred in the structure of the affected counties economies, the results may be sensitive to this assumption. The direction of any bias is unknown.	+/-
The annual production value of livestock is $58/AUM.	+/-
Notes: - : This assumption may result in an underestimate of real costs. + : This assumption may result in an overestimate of real costs. +/- : This assumption has an unknown effect on the magnitude of cost estimates.	

CHAPTER 5 | POTENTIAL ECONOMIC IMPACTS TO RESIDENTIAL AND RELATED DEVELOPMENT

252. The proposed rule identifies urbanization as a threat to flycatcher critical habitat.[146] Construction of residential and commercial properties within or adjacent to critical habitat may cause riparian habitat loss and degradation that could adversely affect flycatcher proposed critical habitat. Additionally, development in flycatcher habitat can increase the presence of predators such as cowbirds and house cats.[147] Real estate development also increases demand for domestic, commercial, and industrial water use; transportation infrastructure; and recreational opportunities; each of these activities is addressed elsewhere in this report.

253. This section focuses on identifying forecast real estate development activities on private lands in the vicinity of critical habitat to determine whether they may be affected by conservation efforts for flycatcher critical habitat. The chapter proceeds as follows: Section 5.1 summarizes estimated impacts. Section 5.2 describes the methodology and approach used for estimating future economic impacts associated with conservation efforts (land set-asides, project modifications, and associated time delay) and quantifies these costs. Section 5.3 estimates administrative costs, and Section 5.4 discusses key sources of uncertainty in the analysis.

5.1 SUMMARY OF IMPACTS TO DEVELOPMENT RELATED ACTIVITIES

254. The majority of impacts to development activities are baseline impacts, nearly all of which are due to lost land value resulting from set-asides of otherwise developable land in California and Arizona management units. As described in chapter 2, past consultations and existing management plans indicate that flycatcher presence is well known in areas potentially affected by development. The only incremental development impacts are attributed to a single development project forecast on an unoccupied stream reach (Little Tujunga Canyon in Los Angeles County).

255. In total, we estimate incremental impacts of $810,000 over 20 years (see Exhibit 5-1). This total impact estimate includes the following project modification costs potentially incurred on the unoccupied Little Tujunga Canyon stream segment: $37,000 in lost land value due to set-asides of otherwise developable land; potential conservation efforts associated with the project at a cost of $140,000 over 20 years; and regulatory time delay

[146] U.S. Fish and Wildlife Service, Final Recovery Plan: Southwestern Willow Flycatcher, August 2002, p. 37.

[147] Final Recovery Plan: Southwestern Willow Flycatcher (*Empidionax traillii extimus*), prepared by Southwestern Willow Flycatcher Recovery Team Technical Subgroup for U.S. FWS Region 2, August 2002.

impacts associated with a two-year delay that may occur if the designation triggers review under CEQA, estimated at $4,100 in present value terms. Future administrative costs to address adverse modification of critical habitat associated with this project, and those associated with addressing adverse modification for an additional 37 projects in other stream reaches, are also included. Finally, additional incremental administrative costs stem from the effort associated with addressing adverse modification for an estimated 344 informal and 104 technical assistances. In total, we estimate incremental administrative costs of $630,000 in present value terms. On an annualized basis, total incremental impacts are estimated to be $71,000.

256. As described in chapter 2, we estimate baseline impacts occurring in occupied habitat, where flycatcher presence is already acknowledged by consulting agencies. In these areas, we estimate baseline impacts of $50 million in present value terms. This total cost estimate includes lost land value associated with set-asides of $35 million, other project modification costs associated with 37 projects of $9.9 million, and regulatory time delay impacts of $3.3 million. Additionally, administrative costs associated with conducting jeopardy analyses for these projects are considered baseline costs and are estimated to be $1.8 million over 20 years. On an annualized basis, total baseline impacts are estimated to be $4.4 million. Exhibit 5-2 summarizes anticipated baseline costs related to development projects in flycatcher critical habitat areas.

EXHIBIT 5-1. SUMMARY OF INCREMENTAL IMPACTS TO DEVELOPMENT ACTIVITIES (2012 – 2031, 2010$, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

MANAGEMENT UNIT	VALUE OF LAND SET-ASIDE	OTHER PROJECT MODIFICATIONS	TIME DELAY IMPACTS	ADMINISTRATIVE COSTS	TOTAL	
					PRESENT VALUE	ANNUALIZED
Santa Ynez	$0	$0	$0	$16,000	$16,000	$1,400
Santa Clara	$37,000	$140,000	$4,100	$150,000	$330,000	$30,000
Santa Ana	$0	$0	$0	$200,000	$200,000	$18,000
San Diego	$0	$0	$0	$110,000	$110,000	$9,700
Mohave	$0	$0	$0	$78,000	$78,000	$6,900
Hoover to Parker Dam	$0	$0	$0	$35,000	$35,000	$3,100
Verde	$0	$0	$0	$31,000	$31,000	$2,800
Total	**$37,000**	**$140,000**	**$4,100**	**$630,000**	**$810,000**	**$71,000**

Note: Totals may not sum due to rounding.

EXHIBIT 5-2. SUMMARY OF BASELINE IMPACTS TO DEVELOPMENT ACTIVITIES (2012 – 2031, 2010$, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

MANAGEMENT UNIT	VALUE OF LAND SET-ASIDE	OTHER PROJECT MODIFICATIONS	TIME DELAY IMPACTS	ADMINISTRATIVE COSTS	TOTAL	
					PRESENT VALUE	ANNUALIZED
Santa Ynez	$61,000	$280,000	$6,600	$47,000	$390,000	$34,000
Santa Clara	$14,000,000	$2,200,000	$1,600,000	$380,000	$18,000,000	$1,600,000
Santa Ana	$13,000,000	$3,600,000	$1,400,000	$610,000	$18,000,000	$1,600,000
San Diego	$690,000	$1,900,000	$75,000	$330,000	$3,000,000	$270,000
Mohave	$2,800,000	$1,400,000	$310,000	$230,000	$4,800,000	$420,000
Hoover to Parker Dam	$4,300,000	$550,000	$0	$110,000	$5,000,000	$440,000
Verde	$0	$0	$0	$94,000	$94,000	$8,300
Total	**$35,000,000**	**$9,900,000**	**$3,300,000**	**$1,800,000**	**$50,000,000**	**$4,400,000**

Note: Totals may not sum due to rounding.

5.2 METHODOLOGY AND PROJECT MODIFICATION IMPACT ESTIMATES

257. Potential impacts to development projects stemming from flycatcher conservation activities can affect landowners, consumers, and real estate markets in general. The total economic impact depends on the scope of flycatcher conservation activities, pre-existing land use and regulatory controls in the region, and the nature of regional land and real estate markets. In order to accurately account for all of these factors, and to estimate the corresponding economic impacts, this analysis employs the following methodology.

1. **Identify areas likely to be developed**. We first limit our analysis to areas where development can be feasibly expected. Flycatcher habitat is within the 100-year floodplain, an area in which development restrictions are stringent. We therefore limit our analysis based on existing regulations, and assume that development will only occur in areas with high population density and low developable acreage, resulting in a potential demand for future housing units that will encourage development in the floodplain.

2. **Determine overlap between proposed critical habitat and projected land development**. This analysis employs GIS analysis of regional development projections in order to determine the number of acres likely to be developed in the floodplain over the period of the analysis.

3. **Determine off-setting compensation for impacts to flycatcher**. We conservatively assume that any project occurring in designated critical habitat will either require section 7 consultation with the Service or, in occupied habitat, will result in the development of an HCP (where none already exists). The Service may request a range of off-setting compensation for impacts to flycatcher habitat, including replacing flycatcher habitat. This analysis employs a

compensation ratio of 3 to 1, based on past consultation history for flycatcher and other species in the region, and applies this ratio to the acres of expected development, identified in Step 2.

4. **Evaluate effects on regional real estate market and associated cost**. The cost incidence or economic burden of real estate development impacts stemming from flycatcher conservation will be determined by their impact on regional real estate markets. To determine the regional significance of flycatcher conservation activities, this analysis compares the reduction in acres slated for development to market-wide demand and supply conditions, estimated using the proxy of projected acres of growth through 2031 in the municipalities where floodplain development is probable, using available development projections.
5. **Estimate the economic impact of project modifications**. This step includes taking the data and conclusions from the previous steps and estimating the potential economic cost associated with flycatcher protection. The economic impacts are estimated based on the loss in land value with restrictions on development within critical habitat, and other flycatcher project modification costs, such as cowbird trapping, resident education, studies, management plans, monitoring, and maintenance and construction restrictions. Additional time delay impacts result from CEQA review. Costs are assigned to the baseline or incremental scenarios based on geographic location and the presence of an existing HCP, as discussed in Chapter 2.
6. **Estimate administrative consultation costs**. This analysis assumes that all future projects overlapping proposed revised critical habitat are likely to have a federal nexus, and thus will result in consultation with the Service under section 7 of the Act. The location of affected projects (necessary to identify baseline and incremental impacts) and estimates of typical project size are combined with the administrative costs presented in Chapter 2 to estimate consultation costs. In Arizona, specific projects that will undergo consultation are identified by project proponents. Additional administrative costs due to CEQA review occur in unoccupied units.

In the remainder of this section, we describe the methods, assumptions, and data sources employed in each step in greater detail.

5.2.1 IDENTIFY AREAS LIKELY TO BE DEVELOPED

258. In this section, we describe our approach to identifying census tracts within the proposed critical habitat likely to experience enough development pressure over the next 20 years to make development within the 100-year floodplain a viable option. We describe the influence of existing FEMA restrictions, local development restrictions, and existing HCPs on development patterns. We combine this information with population projections from the 2010 census.

5.2.2 EXISTING FEMA DEVELOPMENT RESTRICTIONS

259. The proposed critical habitat is located within the FEMA 100-year floodplain or similarly flood-prone areas.[148] Generally, Federal guidelines govern real estate development in floodplains. Many jurisdictions in flood-prone areas participate in the National Flood Insurance Program, managed by the Mitigation Division of FEMA. Communities voluntarily adopt FEMA's floodplain management ordinances in exchange for Federally-backed flood insurance.

260. The 100-year floodplain is defined as all land subject to inundation by the 100-year flood (i.e., the flood elevation with a one percent change of being equaled or exceeded each year). FEMA defines these lands as Special Flood Hazard Areas and places special requirements on development within them. The lowest floor of all new residential buildings in the floodplain must be at or above the level of the 100-year flood in order to qualify for FEMA-backed insurance. Non-residential buildings must be at or above the level of the 100-year flood, or be flood-proofed to that level. Using these guidelines, construction in a floodplain is possible in lower-risk locations such as areas where the floodplain is wide. While FEMA regulates development in these areas, individual jurisdictions may place additional restrictions on construction above and beyond FEMA regulations.

261. Within the floodplain, the "floodway" is defined as all land required to convey the 100-year flood without structural improvements and/or all land required to convey the 100-year flood without increasing water surface elevation by more than one foot at any single point. It is the part of a waterway where water is likely to be fastest and highest, and it is therefore important that the floodway be kept free of obstructions in order to avoid increasing water level. FEMA does not prohibit all construction in floodways, but does require developers to obtain a "No Rise Certificate" by demonstrating that there will be no increase in water level as a result of construction. This FEMA development regulation may require flood control facilities or other special engineering, often making development in floodways impractical and prohibitively expensive.[149] Furthermore, individual jurisdictions may establish additional, more stringent restrictions on construction in the floodway.

262. Due to existing development restrictions, lands that can be feasibly developed are limited to areas within critical habitat where real estate demand is high enough to justify the costs associated with developing the floodplain. To identify these areas, this analysis relies on population density and land scarcity measures (where available). First, we use GIS analysis to identify census tracts intersecting proposed flycatcher habitat. Next, population density is calculated from Census 2010 data for each census tract that intersects proposed habitat. Then, for census tracts intersecting proposed habitat in

[148] Designation of Revised Critical Habitat for Southwestern Willow Flycatcher. 76 FR 50542.

[149] Personal communication with Mekbib Degaga, Riverside County Flood Control and Water Conservation District, August 18, 2003; and Personal communication with Clark Pharr, Kern County Engineering and Survey Services Department, August 18, 2004; as cited in Industrial Economics, Incorporated, *Final Economic Analysis of Critical Habitat Designation for the Southwestern Willow Flycatcher*, prepared for the U.S. Fish and Wildlife Service, September 28, 2005, p. 6-3.

California, developable acreage is calculated and divided by land area to determine the proportion of each census tract that is developable.[150] This latter calculation is not performed elsewhere, as the data necessary to identify developable land within proposed habitat is not available for Arizona, Colorado, New Mexico, Nevada, or Utah.

263. FEMA regulations and local ordinances do not preclude development on private lands within the proposed critical habitat. In general, existing regulations do aim to minimize obstructions within the floodplain that might otherwise result from unregulated development. Thus, there is theoretical potential for development activities to occur in many areas of proposed critical habitat. However, due to their rural nature, many areas included in the designation are not likely to experience development in the foreseeable future. This analysis identifies areas that are most likely to be affected by future residential and commercial development using GIS data to identify the overlap of private lands with critical habitat, as well as the number of proposed acres on private lands.

264. Exhibit 5-3 presents the counties in which there are census tracts with relatively high population density, and relatively low developable acreage.

EXHIBIT 5-3. AREAS IDENTIFIED AS MOST LIKELY TO SUPPORT DEVELOPMENT WITHIN PROPOSED FLYCATCHER CRITICAL HABITAT

STATE	COUNTIES (NO. OF CENSUS TRACTS)	MANAGEMENT UNIT	TRACTS
Arizona	Mohave (1), Yavapai (2), Yuma (2)	Verde, Hoover-Parker, Parker-Southerly International Boundary	5
California	Los Angeles (4), Orange (1), Riverside (10), San Bernardino (11), San Diego (14), Santa Barbara (2), Ventura (9)	Santa Ynez, Santa Clara, Santa Ana, Mojave, San Diego	51
Colorado	None	None	0
Nevada	Clark (2)	Virgin, Pahranagat	2
New Mexico	Rio Arriba (1), Valencia (1)	Upper Rio Grande, Middle Rio Grande	2
Utah	Washington (3)	Virgin	3
TOTAL	**14 counties**	**12 management units**	**63 tracts**

Source: IEc GIS analysis of Census 2010 population data ("Profile of General Population and Housing Characteristics: 2010", U.S. Census Bureau, 2010 Census, accessed via American Factfinder at http://factfinder2.census.gov/main.html, November 2010); Land ownership data provided by the U.S. FWS (Personal communication with Mike Dick, USFWS, on December 1, 2011), and Farmland Mapping and Monitoring Program (FMMP) data (CA Department of Conservation, Division of Land Resource Protection, downloaded at http://redirect.conservation.ca.gov/DLRP/fmmp/product_page.asp on November 7, 2011).

Note: We identified one additional tract with high population density in Arizona, located in La Paz County; however, this tract is located within the Colorado River Indian Reservation, and therefore any expected impacts are addressed in Chapter 6 of this report.

[150] Developable acreage is calculated as total private acreage, less water acreage and urbanized acreage, based on GIS land ownership data provided by the Service, and on California's Farmland Mapping and Monitoring Program (FMMP) data regarding urbanization. FMMP data is not available for Inyo or Mono Counties; however, these areas are known to be very rural.

5.2.3 LOCAL DEVELOPMENT RESTRICTIONS

265. While the GIS analysis utilizes the best available data, some areas identified as most likely to support floodplain development may be constrained by existing flood control infrastructure, local floodplain and floodway ordinances, or other factors not reflected in the GIS data available for this analysis. To account for factors not captured in GIS analysis, we rely on City and County planning documents to identify such development restrictions.

Arizona

266. The five census tracts with high population density intersecting critical habitat in Arizona are located within the cities of Lake Havasu (Mohave County, one tract), Cottonwood (Yavapai County, two tracts) and Yuma (Yuma County, two tracts).

267. According to Lake Havasu Public Works, the critical habitat being proposed in the indicated census tract is already protected as BLM lambing grounds for desert bighorn sheep, and will not be developed. This area is permanently closed to motor vehicles, but is a popular hiking area. However, other areas around this census tract include privately held parcels that may be developed, though specific plans are uncertain due to the local housing market. These project areas include:

- The city's island, which has developable land, partially zoned for residential use, and partially zoned for a resort;
- A development of upscale homes, adjacent to the Lake Havasu National Wildlife Refuge, called the Refuge. The site is not fully developed and consists of a golf course that is to be modified into an RV development.[151]

268. In each of these areas, portions of critical habitat are privately owned. We therefore assume that a consultation will occur on each of these sites (16.3 acres, and 13.7 acres of critical habitat, respectively). Accordingly, we also estimate lost land value and additional project modifications associated with these projects below.

269. According to the Yavapai County Planning Department, development in the floodplain is generally unlikely.[152] Since the designation of critical habitat in the county in 2005, no consultations have occurred, and the two development projects proposed in habitat areas prior to the 2005 designation were not undertaken, for reasons other than the designation of flycatcher habitat.

270. Just over two miles of proposed habitat within the Clarkdale town limit in Yavapai County were not designated in 2005. Along this stretch, the Peck's Lake area is owned by the copper and gold mining corporation Freeport-McMoRan, Inc. (FMI). The principal legal document defining allowable use of the property is an agreement held by FMI allowing a mixed development called Verde Valley Ranch Development, containing up to 900 homes, commercial buildings, a golf course, and other public infrastructure. There

[151] Personal communication with Doyle Wilson, Ph. D., RG, Water Resources Coordinator, Public Works Department, Lake Havasu City, AZ, on December 1, 2011.

[152] Personal communication with Tammy DeWitt, Senior Planner, Yavapai County Planning Department, on January 4, 2012.

are no plans for development in the near term, and the Town has held discussion with FMI regarding the long term viability of the property.[153] Further, in 2002, a National Pollutant Discharge Elimination System (NPDES) permit was remanded from the former owner of the property, Phelps Dodge Corporation, who planned to develop the property with 1,200 homes, due to a complaint raised by the Yavapai-Apache Nation, a downstream neighbor.[154]

271. The areas being proposed in Cottonwood were all designated in 2005. A wastewater treatment plant will be constructed in the next year, which will intersect the 100-year floodplain.[155] This analysis assumes that this project will undergo consultation with the Service, although because of the placement and existing level of environmental scrutiny the project has undergone, the City of Cottonwood does not expect the project to be affected by project modifications.[156] Otherwise, no consultations have occurred in this area since the previous designation, and together with the unlikelihood of permits being pursued for other projects in the floodplain, this analysis assumes no other developments will be affected by flycatcher habitat in this area.

272. According to the City of Yuma, the developable areas in the census tracts indicated as having high population are entirely developed, and no new development is expected. In addition, the portions of the census tracts in the floodplain consist of agricultural or park land.[157]

California

273. In addition to the analysis of potential future development in areas of critical habitat in the following sections, information on three specific projects or other land management plans was received via public comment letters in response to the proposed designation.

274. Pardee Homes indicates that proposed sewer line improvements along the West Hills Parkway Bridge over the San Diego River are within the proposed designation. This stream reach, however, is proposed for exclusion, because likely activities are covered by the San Diego County MSHCP. If this area is designated, the proposed offsite

[153] Personal communication with Jodie Filardo and Enalo Lockard, Clarkdale Community Development Department, on January 4, 2012 and Clarkdale 2012 General Plan, accessed on January 4, 2012 at http://www.clarkdale.az.us/2011%20Meetings/2011%20Parks%20and%20Recreation%20Commission/08-10-2011_parks_rec_minutes.pdf.

[154] "In Re Phelps Dodge Corporation Verde Valley Ranch Development, NPDES Appeal No. 01-07, Order Denying Review and Remanding," Environmental Administrative Decisions, Vol. 10 p 460, 21 May 2002.

[155] Personal communication with Tammy DeWitt, Senior Planner, Yavapai County Planning Department, on January 4, 2012. Personal communication with Dan Lueder, City of Cottonwood, on January 9, 2012.

[156] Personal communication with Dan Luder, City of Cottonwood, on January 9, 2012.

[157] Personal communication with Jennifer Albers, City of Yuma Planning Department, on December 2, 2011. Personal communication with Fernando Villegas, Yuma County Development Services, December 6, 2011. Additionally, the City of Yuma submitted a public comment in response to the proposed designation, stating that although they are concerned about potential impacts to recent projects in the City's Riverfront Development, specifically Gateway Park, West Wetlands Park, and the East Wetlands restoration project, these projects are outside of the proposed designation. (Letter from Greg Wilkinson, City Administrator, "Re: Economic Impact Associated with Proposed Critical Habitat Designation for the Southwest Willow Catcher", September 1, 2011.)

improvements would temporarily affect approximately 0.41 acres of critical habitat.[158] As described below, as a result of this and other potential projects in the area, this analysis projects a total of 1.5 acres of development in this area of proposed critical habitat over the next 20 years.

275. The City of Lompoc submitted a public comment regarding activities expected within the city limits in the proposed portion of the Santa Ynez River Management Unit. According to the City, existing activities include a high level of recreational use, as well as industrial commercial use and single- and multi-family residences adjacent to the river.[159] As described below, this analysis projects a total of approximately one acre of development in the proposed area over the next 20 years.

276. Newhall Land and Farming Company (Newhall) submitted a public comment letter indicating that it owns 1,699 acres of the Santa Clara River segment being proposed as part of the Santa Clara Management Unit. According to Newhall, for approximately 95 percent of this area, conservation measures sufficient to protect flycatcher, agreed upon during consultation for riparian birds and other species critical habitat, already apply. The current management plans in this area have set aside, or have pending or future plans to set aside, 1,619 acres of this segment of critical habitat in conservation easements.[160, 161] Our review of these plans suggests that the areas already protected do not overlap with areas of projected development discussed later in this chapter. Thus, the development forecast data obtained from regional planners likely already incorporate these conservation easements.

Nevada

277. The two, high-population census tracts in Nevada are located within the City of Mesquite. According to the City of Mesquite Planning Department, one or two lots in critical habitat might be developable, private land; however, requests for permits to build in the floodplain are not typical, indicating that demand for land is likely not high enough to warrant development in the floodplain.[162] The majority of the area proposed for

[158] Letter from Hugh Hewitt, Hewitt Wolensky LLP, "Subject: Comments on the Proposed Designation of Revised Critical Habitat for Southwestern Willow Flycatcher," October 6, 2011.

[159] Letter from Laurel Barcelona, City Administrator, City of Lompoc, "RE: Designation of Revised Critical Habitat for Southwestern Willow Flycatcher – H Street Bridge (HWY 1) to ½ mile east of Robinson Bridge (HWY 246)", October 13, 2011.

[160] Letter from Matt Carpenter, The Newhall Land & Farming Company, "Comments on 2011 Proposed Southwestern Willow Flycatcher Critical Habitat," October 14, 2011.

[161] There is an outstanding formal consultation considering jeopardy for the southwestern willow flycatcher. The EIS for Newhall's Resource Management and Development Plan states that, if a new species or critical habitat is proposed or designated in the project area, Newhall will coordinate with the Corps and the Service as necessary to consult or conference as appropriate. (See page 4.5-38 and 4.5-39 of "Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan," June 2010, accessible at http://www.dfg.ca.gov/regions/5/newhall/final/). This analysis assumes that the number of informal and technical assistance consultations estimated in this unit below will account for efforts necessary for future consultation on this project).

[162] Personal communication with John Willis, City of Mesquite Development Department, on December 5, 2011.

designation is zoned as reserves/park land, agriculture and public facilities land.[163] In addition, any activities occurring in these areas would be covered under the Clark County MSHCP (see discussion in section 5.2.1.3). Considering that the majority of the area was designated in 2005, no consultations have occurred since that time, and the low likelihood of permits for projects in the floodplain, we assume that no development will occur in flycatcher habitat in these areas.

New Mexico

278. We identified two high population density census tracts in New Mexico located within the city of Espanola, in Rio Arriba County, and the city of Los Lunas in Valencia County. The majority of proposed land in Espanola is in the Santa Clara Indian Reservation; however, small portions on the west bank of the proposed river segment are privately owned. The majority of the proposed area in Valencia County was designated in 2005, with no consultations occurring since that time. In this area, development within the floodplain is not feasible due to an existing levee system.[164] This analysis assumes that floodplain development restrictions will prevent future development in these areas.[165]

Utah

279. We identified three census tracts with high population density in Utah, located within the City of St. George.[166] All of the land within these tracts is privately owned, though the areas along the Virgin River in the city appear to be zoned for conservation. The majority of the area was designated as critical habitat for the flycatcher in 2005, resulting in no formal consultations since that time.[167] The 2005 Economic Analysis concluded that no future real estate development was expected within flycatcher critical habitat. In the absence of more recent or more specific information from city and county planners, and considering the lack of previous consultations in the area, this analysis assumes that floodplain development restrictions will prevent development in these areas.[168]

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[163] City of Mesquite, Nevada Land Use and Zoning Maps, accessed at http://www.mesquitenv.gov/SiteObjects/published/3E5E0C29ED1D8A9691E63E547AB9637E/0DC92ACC79059CAA965AF5DE05576E02/file/LandUseandZoningMap_UpdatedMay2510.pdf on January 4, 2012.

[164] Personal communication with Richard Padilla, Planning and Zoning Department, Valencia County, on September 8, 2004 for the 2005 Economic Analysis for flycatcher.

[165] In a public comment, Catron County, NM, indicated that access to power company transmission lines may be impacted by the designation of habitat in this area. This analysis, however, does not separately address impacts borne by utility activities. (Public comment from Chairman Hugh B. McKeen and Member Glyn Griffin on half of Catron County, October 5, 2011, Comments on Proposed Rule to Revise Critical Habitat for Southwestern Willow Flycatcher.)

[166] One tract (271701) is approximately half in the city limits, and half in unincorporated lands.

[167] City of St. George zoning, accessed at http://enet.sgcity.org/departments/it/gis/upload/Zoning.pdf on December 6, 2011.

[168] According to the Service, the City of St. George has an Erosion Control Ordinance, which may make development difficult (particularly for residential development), though the ordinance itself does not itself preclude development. With proper studies and sufficient engineering, building in the floodplain is possible. However, for the purposes of this analysis, we assume that lack of past demand indicates that these additional costs are prohibitively high, and that building in the floodplain is unlikely to occur in this area.

5.2.4 EXISTING HCPS

280. In addition to the FEMA regulations and local flood control ordinances described in the previous sections, several communities have developed regional HCPs or other management plans aimed at protecting sensitive habitat while allowing for residential and other development. Five conservation and other habitat management plans in California and two HCPs in Nevada offer protection to the flycatcher and include development as a Covered Activity. Costs attributed to flycatcher conservation and resulting from the implementation of these plans are part of the baseline. In California, these plans include:

- City of Carlsbad Subarea Habitat Management Plan (under the umbrella of the North County Multiple Habitat Conservation Plan);
- Haffenfeld Ranch Conservation Easement;
- Orange County Southern Subregional HCP;
- San Diego County MSCP; and
- Western Riverside County MSHCP.

The Nevada plans include:

- Clark County MSHCP; and
- Southeastern Lincoln County HCP.

5.2.5 ESTIMATE THE NUMBER OF ACRES LIKELY TO BE DEVELOPED IN PROPOSED CRITICAL HABITAT

281. In addition to identifying areas most likely to support development, estimation of future flycatcher-related impacts on private development within critical habitat requires consideration of projected amount of development in those areas. To estimate the number of acres likely to be developed absent flycatcher conservation efforts, GIS maps of proposed critical habitat boundaries were correlated with census tract level data provided by the Southern California Association of Governments (SCAG) and the San Diego Association of Governments (SANDAG). SCAG and SANDAG are quasi-governmental agencies responsible for providing official demographic projections for the counties of Los Angeles, Ventura, Riverside, San Bernardino, Orange, and San Diego Counties.

282. The regional agency responsible for demographic projections in Santa Barbara County does not develop land use projections on a census tract basis. In one of the two census tracts in this county, population and the number of households fell from 2000 to 2010, so we assume no development in the floodplain will occur in this tract. In the second census tract, the number of housing units grew by about 16.4 per year. Assuming that this level of growth is sustained over the 20 year period of this analysis, an estimated 328 units will be built in this tract. Only a portion of the tract, however, is within critical habitat. Assuming development density similar to what currently exists in the area, and that

development is evenly distributed across the tract, we project that approximately one acre of critical habitat will be developed in this tract in Santa Barbara County.[169]

283. SANDAG provides the number of acres projected to be developed in five-year increments through 2050, and SCAG provides population and housing forecasts through 2035, which are converted to expected acres subject to development based on assumptions regarding household density.[170] To translate census tract-level development projections into projections within the proposed revised critical habitat units, the analysis uses GIS to identify the proportion of each census tract overlapping critical habitat. Under the assumption that projected development is evenly distributed throughout the land available for development within each census tract, we estimate the amount of growth projected within each critical habitat unit by applying the percentage of overlap between the unit and census tract to project development within those tracts.

284. Exhibit 5-4 presents the acres of expected development by management unit. In total, we estimate that 509 acres of land within proposed critical habitat would be developed over the next 20 years but for conservation efforts for the flycatcher. The largest numbers of potentially affected acres are in the Santa Clara and Santa Ana Management Units in Los Angeles and Riverside Counties, respectively.

EXHIBIT 5-4. PROJECTED ACRES OF DEVELOPMENT WITHIN PROPOSED REVISED CRITICAL HABITAT BY MANAGEMENT UNIT (2012 THROUGH 2031)

MANAGEMENT UNIT	COUNTY[1,2,3,4]	STREAM SEGMENT	PROJECTED DEVELOPMENT (ACRES)
Santa Ynez	Santa Barbara	Santa Ynez River	1.0
Santa Clara	Los Angeles	Castaic Creek	0.0
		Little Tujunga Canyon	0.6
		Santa Clara River	148.2
	Ventura	Santa Clara River	75.1
		Ventura River	0.0
Santa Ana	Riverside	Santa Ana River	172.4
	San Bernardino	Santa Ana River	26.5
		San Timoteo Creek	0.0
San Diego	Orange	Canada Gobernadora	0.0
	San Diego	Agua Hedionada	1.5
		San Diego River	1.5
		San Dieguito River	0.0
		San Luis Rey River	7.8

[169] Density estimate obtained from City of Lompoc Paper on Housing, accessed at http://www1.cityoflompoc.com/departments/comdev/Environmental/GeneralPlan/Housing-7-08.pdf on January 11, 2012.

[170] Development density within critical habitat is assumed to be similar to what was planned for the Northlake Development Project; "Biological Opinion for the Northlake Development project, City of Santa Clarita, Los Angeles County, California (File No. 98-00585-AOA) (CON-1-8-04-F-57), June 21, 2005.

MANAGEMENT UNIT	COUNTY[1,2,3,4]	STREAM SEGMENT	PROJECTED DEVELOPMENT (ACRES)
Mojave	San Bernardino	Mojave River	44.4
Hoover to Parker Dam	Mohave	Lake Havasu – Colorado River	30.0
		TOTAL	**509.0**

Sources:
1. For Santa Barbara County: Census 2000 and 2010 population data ("Profile of General Population and Housing Characteristics: 2010", U.S. Census Bureau, 2010 Census, accessed via AmericanFactfinder at http://factfinder2.census.gov/main.html, November 2010) and City of Lompoc ("Issue Paper on Housing: City of Lompoc General Plan Update", July 2008, available at http://www1.cityoflompoc.com/departments/comdev/Environmental/GeneralPlan/Housing-7-08.pdf, on January 30, 2012)
2. For Los Angeles, Ventura, Riverside, San Bernardino, and Orange Counties: Development projections from SCAG (Integrated Growth Forecast, "Tier1_PHOE08_localinput" data files, obtained via personal communication with Simon Choi and Ying Zhou, and Javier Minjares on December 8 and December 16, 2011, respectively. Similar data available at http://www.scag.ca.gov/forecast/index.htm).
3. For San Diego County: SANDAG (2010 Census Tract data for the 2050 Regional Growth Forecast, obtained via personal communication with Beth Jarosz, on December 7, 2011).
4. For Mohave County: Personal communication with Kevin Davidson, Mohave County Development Services Department, on December 1, 2011 and January 4, 2012; Personal communication with Doyle Wilson, Lake Havasu City Public Works Department, on December 1, 2011; GIS data from the Service, personal communication with Mike Dick, December 1, 2011.

285. This analysis further compares projected development to available land use data. SANDAG provides spatial data on areas of land that are considered to be developable, or reasonably like to be redeveloped or undergo densification.[171] The most current spatial land use data available from SCAG are from 2008, which identifies a category of land use for identifiable land parcels.[172] Land use data were used to identify areas that are already developed, and therefore unavailable for future development. Total land area available for development within critical habitat was compared to estimated future development in these areas. In instances where estimated future development was greater than the amount of land available for development, we revised our development estimate to reflect the available developable acres in critical habitat.[173]

5.2.6 OFF-SETTING COMPENSATION FOR IMPACTS TO FLYCATCHER

286. The Service may request a range of off-setting compensation for impacts to flycatcher habitat. For example, the Service may request that developers avoid permanent impacts to flycatcher habitat in the future. That is, due to the scarcity of flycatcher habitat, the

[171] SANDAG GIS files of redevelopment and infill areas and land available for potential development for the Series 12 Regional Growth Forecast, December, 2010. Accessed at http://www.sandag.org/index.asp?subclassid=100&fuseaction=home.subclasshome on December 7, 2010.

[172] Data files obtained from Javier Minjares, SCAG, on January 17, 2011.

[173] It is important to note that in the SCAG region (Riverside, Orange, San Bernardino, Ventura, and Los Angeles Counties) the majority of land in critical habitat was identified as "Vacant Undifferentiated". According to SCAG, "This category represents most occurrences of vacant land. This class does not include vacant lots in urbanized areas (see code 1900), although terraced erosion control embankments are included. Also included in this category are road cuts. Undeveloped areas of parks are also included. Most vacant land is in a natural state, containing tree, brush/shrub, and/or grassland vegetation. No or few significant structures or improvements are present. Rangeland may be open land or fenced over large areas. Rangeland vegetation may be no different than open vacant land, or may contain grassland for grazing livestock. Eucalyptus groves are also included." Based on this definition, some "vacant undifferentiated" land may not be suitable for development. However, lacking better data, we assume that all lands in this category have development potential.

Service may ask that developers not undertake projects in these areas. However, the Service is more likely to request that impacts to flycatcher habitat be off-set through the purchase of mitigation lands to replace affected habitat. For example, the Service requested an average off-setting compensation ratio of 1.25 to 1 for impacts to another riparian species in Southern California, the arroyo toad.

287. Past biological opinions addressing the effect of development projects on the flycatcher require off-setting compensation. Although the ratio of affected habitat set-aside is difficult to ascertain from biological opinions, it appears that the ratio is greater than 1.25 to 1. Thus, this analysis relies on an off-setting compensation ratio of 3 to 1 for permanent impacts to flycatcher habitat. This corresponds to the mitigation ratio described by the Service for California tiger salamander. That is, for every project acre developed, three on-site acres must be preserved. The acreage of off-setting compensation projected within flycatcher critical habitat is presented below in Exhibit 5-5.

EXHIBIT 5-5. PROJECTED ACRES OF OFF-SETTING COMPENSATION (2012 THROUGH 2031)

MANAGEMENT UNIT	COUNTY	STREAM SEGMENT	PROJECTED DEVELOPMENT (ACRES)	OFF-SETTING COMPENSATION	REMAINING FOR DEVELOPMENT
Santa Ynez	Santa	Santa Ynez	0.0	0.0	0.0
Santa Clara	Los Angeles	Castaic Creek	0.6	0.4	0.1
		Little Tujunga	148.2	111.2	37.1
		Santa Clara	75.1	56.3	18.8
	Ventura	Santa Clara	0.0	0.0	0.0
		Ventura River	172.4	129.3	43.1
Santa Ana	Riverside	Santa Ana River	26.5	19.9	6.6
	San Bernardino	Santa Ana River	0.0	0.0	0.0
		San Timoteo	0.0	0.0	0.0
San Diego	Orange	Canada	1.5	1.1	0.4
	San Diego	Agua	0.0	0.0	0.0
		San Diego River	7.8	5.8	1.9
		San Dieguito	44.4	33.3	11.1
		San Luis Rey	30.0	22.5	7.5
Mojave	San	Mojave River	1.5	1.1	0.4
Hoover to Parker Dam	Mohave	Lake Havasu – Colorado River	1.0	0.7	0.2
		TOTAL	**509.0**	**381.7**	**127.2**

MANAGEMENT UNIT	COUNTY	STREAM SEGMENT	PROJECTED DEVELOPMENT (ACRES)	OFF-SETTING COMPENSATION	REMAINING FOR DEVELOPMENT

Sources: See Exhibit 5-4; This analysis relies on an off-setting compensation ratio of 3 to 1 for permanent impacts to flycatcher habitat. This corresponds to the mitigation ratio described by the Service for California tiger salamander.

Notes:

1. Projected development taken from Exhibit 5-4.
2. The calculation of off-setting compensation and the number of acres remaining for development assumes that for every acre developed, three must be preserved onsite.
3. Totals may not sum due to rounding.

5.2.7 REGIONAL REAL ESTATE EFFECTS

288. The cost incidence or economic burden of real estate development project modifications stemming from flycatcher protection will be determined by their impact on the regional real estate market (i.e., on overall real estate production and prices). To determine the regional significance of flycatcher conservation activities, this analysis compares the reduction in acres slated for development to market-wide demand and supply conditions.

289. Ideally, land set-aside requirements should be compared with the total supply of developable acreage in the region. However, accurate estimates of total regional development potential are not readily available. Consequently, for the purposes of this analysis, projected acres of growth through 2031 in the eight counties where floodplain development is most probable are used as proxies for regional market supply.

290. A comparison of total acres of on-site habitat set-aside in proposed critical habitat resulting from flycatcher conservation activities and total projected acres of growth through 2031 for each county is provided in Exhibit 5-6. As shown, the estimated on-site habitat set-aside in proposed critical habitat represents less than 0.37 percent of future growth for each county.

EXHIBIT 5-6. REGIONAL SIGNIFICANCE OF PROJECTED LAND SET-ASIDE

COUNTY	TOTAL GROWTH THROUGH 2031 (ACRES)	REGIONAL SIGNIFICANCE OF CRITICAL HABITAT	
		ON-SITE ACRES SET ASIDE	PERCENT OF PROJECTED COUNTY GROWTH
Santa Barbara[1]	3,124	0.7	0.02%
Los Angeles[2]	109,904	111.6	0.10%
Ventura[2]	15,063	56.3	0.37%
Riverside[2]	127,381	129.3	0.10%
San Bernardino[2]	71,552	53.2	0.07%
Orange[2]	28,066	0.0	0.00%
San Diego[3]	334,167	8.1	0.00%
Mohave[4]	14,662	22.5	0.15%
TOTAL	**703,919**	**381.7**	**0.05%**

Sources:
1. Land development projections provided by SANDAG through 2030 for the Arroyo Toad Critical Habitat Draft Economic Analysis, 2010.
2. Land development estimated based on SCAG demographic projections.
3. Based on countywide projections of new residential and commercial units from 2010-2030 in SBCAG Regional Growth Forecast 2000-2030, report, as presented in the Arroyo Toad Critical Habitat Draft Economic Analysis, 2010.
4. Represents growth for the City of Lake Havasu only. Source: Lake Havasu General Plan 2002; sum of Growth Area (areas of intended growth for 20 year horizon) acreage available for residential development.

291. It is important to note that the estimates of regional significance of set-asides presented in Exhibit 5-6 are an overestimate of the impact of flycatcher conservation activities on regional development opportunities. The following factors suggest that the flycatcher-related on-site habitat set-aside will actually represent a much smaller proportion of the regional real estate market.

- Regional land supply is greater than projected demand through 2031. The above estimates rely on projected land consumption through 2031 as a proxy for long-term supply. In reality, the long-term land supply is greater than demand through 2031because many of the communities within the counties are not expected to reach build-out until a significantly later date.
- Developers will adjust to reduced land supply by increasing density. The above estimates assume that development in areas both inside and outside of critical habitat cannot occur at higher densities. In practice, increased densification as well as revitalization of under-utilized "in-fill" sites can continue to provide significant development opportunities in land constrained markets.

Given these factors, and the fact that 0.05 percent is a very small proportion of real estate supply, set-aside land associated with flycatcher protection is not expected to affect the

dynamics of the regional real estate market. Hence, housing prices in each county are not likely to be affected. However, regulated landowners will bear the cost associated with flycatcher protection, in the form of lower property values. As this analysis assumes that the total supply of housing will be met, some projects may be distributed to other locations while others may proceed with higher flycatcher protection costs and lower land values. No broader effects on regional real estate prices are anticipated.

5.2.8 ESTIMATED ECONOMIC IMPACT OF PROJECT MODIFICATIONS

292. In order to estimate economic costs of flycatcher conservation on private development activities, we apply information about the value of undeveloped acres in the relevant census tracts to the number of acres set aside, as calculated in the previous sections. In addition, we also estimate the cost of additional project modifications. These calculations are discussed below.

5.2.9 LOSS IN LAND VALUE

293. In order to estimate the loss in land value associated with development restrictions, this analysis relies on estimates of the market value of raw land within developable areas that intersect proposed revised flycatcher critical habitat. Based on sales transactions for raw land within the census tracts in which development in critical habitat is projected, the median raw land value across these census tracts in California is $162,000 per acre, and in Arizona, $364,000 per acre (in 2010$).[174]

294. The future land value losses for private development projects through 2031 are estimated by calculating the lost raw land value of on-site acres expected to be set aside due to flycatcher protection. Projected development is assumed to be evenly distributed on an annual basis through 2031. The economic impact associated with on-site set-aside is therefore calculated as the present value of future annual land value losses. Based on developer interviews conducted as part of the economic analysis of critical habitat designation for another federally-listed California species, the California red-legged frog, the appropriate nominal opportunity cost of capital for developers is 15 percent, and based on economic modeling conducted in the same economic analysis, the average annual nominal property value growth rates are forecast to be approximately 6.86 percent.[175] This means that in each year, the developer will lose 15 percent of the value of the land he cannot develop; however, simultaneously, the value of that land he owns grows by 6.86 percent in each year. Discounting the total value of the land set aside in each year (e.g., acres set aside multiplied by the per acre land value, described above) by the difference of these rates (8.14 percent) gives us the present value of the loss to the

[174] Based on median raw land sale data in each census tract over the past 10 years, provided by DataQuick, January 18, 2012. Some tracts did not have sales transactions over the past 10 years, resulting in no estimate of raw land value in these areas, while others had very few transactions, coupled with instances of large outliers (both higher and lower than a measure of central tendency). For these reasons, we took the median value of all transactions in the floodplain census tracts identified, by State assuming that floodplain properties are relatively homogenous over the study area in each State.

[175] Industrial Economics, Incorporated and Berkeley Economic Consulting, Economic Analysis of Critical Habitat Designation for the California Red-legged Frog: Final Report, prepared for the U.S. Fish and Wildlife Service, January 25, 2010, Appendix E.

developer in that year. When summed over the 20 year period of the analysis, we get the total future value not realized by the developer due to the inability to build. [176]

295. The results of these calculations are summarized by management unit in Exhibit 5-7, below. Assuming substitute land is available to developers, existing landowners bear the full burden of costs of flycatcher conservation in the form of lower land values. This reduction in land value occurs immediately at the time of finalization of an HCP or critical habitat designation; therefore, this analysis assumes the loss occurs in 2012. We estimate total land value losses in 2012 of approximately $35 million and $37,000 under the baseline and incremental scenarios, respectively. These estimates effectively represent the reduction in the value of the parcels assuming that three-quarters of each parcel must be set aside in order to conserve the flycatcher.

EXHIBIT 5-7. LOST LAND VALUE DUE TO OFF-SETTING COMPENSATION OF FLYCATCHER HABITAT (2010$)

MANAGEMENT UNIT	BASELINE		INCREMENTAL	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Santa Ynez	$61,000	$5,400	$0	$0
Santa Clara	$14,000,000	$1,300,000	$37,000	$3,300
Santa Ana	$13,000,000	$1,100,000	$0	$0
San Diego	$690,000	$61,000	$0	$0
Mohave	$2,800,000	$250,000	$0	$0
Hoover to Parker Dam	$4,300,000	$380,000	$0	$0
Total	**$35,000,000**	**$3,100,000**	**$37,000**	**$3,300**

296. As described above, the total amount of land projected to be set aside due to flycatcher conservation activities does not represent a significant portion of the total land supply. No regional price increases are therefore expected, and the cost burden of the proposed rulemaking is expected to fall entirely on landowners in the form of reduced raw land prices for parcels affected by the designation.

5.2.10 OTHER PROJECT MODIFICATIONS

297. Flycatcher conservation measures may also include biological monitoring, fencing, and additional project modifications. This section examines past project modification costs and presents the total costs attributed to these additional project modifications applied to future expected projects. This analysis assumes that each census tract that overlaps critical habitat represents one development project. In census tracts with potential for future development in critical habitat, the average overlap with critical habitat is

[176] Because both the 6.86 percent growth rate and the 15 percent discount rate are nominal, inflation is controlled for within the calculation and the outcome is in real dollars.

approximately 14 acres, similar to the average project size of real estate development projects for similar areas of critical habitat, such as arroyo toad.[177]

298. Prior to 2005, two real estate development project consultations addressing the flycatcher provided information on a range of project modifications associated with flycatcher conservation, Homestead at Camp Verde and the Verde Valley Ranch Development, both in Yavapai County, AZ. The consultation focusing on the issuance of a NPDES permit for the Homestead at Camp Verde master planned community in Arizona, a proposed community of 800 single-family residential units and 300 apartment units on 363 acres, recommended the following conservation measures:

    a. Fencing;
    b. Producing educational materials for homeowners;
    c. Conducting scientific studies over 20 years;
    d. Surveying and monitoring over 20 years;
    e. And off-setting mitigation (habitat set-asides).

The consultation for a NPDES permit for the Verde Valley Ranch Development, a proposed 1,200 unit on 977 acres, including an 18-hole golf course and small commercial area, included surveying and monitoring as conservation measures.[178]

299. Since 2005, five development-related formal consultations have been completed for flycatcher, four in California, and one in Nevada: three for Incidental Take Permits (the Coachella Valley MSHCP, and The Southern Orange Natural Community Conservation Plan/Master Streambed Alteration Agreement/Habitat Conservation Plan, Orange County, California; and Southeastern Lincoln County Habitat Conservation Plan, Nevada); one for a housing development project (Northlake Development Project); and one for development of a high school.[179]

300. A small amount of flycatcher critical habitat was affected for the Vista Unified District Duel Magnet High School project (City of Oceanside, San Diego, CA), and it was compensated for at an approximately one-to-one ratio of habitat creation. The Northlake Specific Plan is a development of 1,500-acre site in a tributary to Castaic Creek, including 3,943 residential dwelling units, 13 acres of commercial development, 50 acres

[177] Economic and Planning Systems, Final Economic Analysis of Revised Critical Habitat Designation for the Arroyo Toad, prepared under subcontract to Industrial Economic, Incorporated for the U.S. Fish and Wildlife Service, November 2010.

[178] "Biological Opinion Summary: Storm Water Permit for the Verde Valley Ranch," Yavapai County, Arizona, October 7, 1997.

[179] "Intra-Service Formal Section 7 Consultation for Issuance of a Section 10(a)(1)(B) (TE- 104064-0) Incidental Take Permit under the Endangered Species Act for the Coachella Valley Multiple Species Habitat Conservation Plan, Riverside County, California"; "Biological Opinion for the Proposed Vista Unified School District Dual Magnet High Schools, City of Oceanside, San Diego County, California (200600424-RRS)"; "Intra-Service Formal Section 7 Consultation for Issuance of a Section 10(a)(1)(B) Permit (TE- 144113-0, TE144110-0, and TE144105-0) for The Southern Orange Natural Community Conservation Plan/Master Streambed Alteration Agreement/Habitat Conservation Plan, Orange County, California"; "Biological Opinion for the Northlake Development project, City of Santa Clarita, Los Angeles County, California"; "Biological Opinion on the Issuance of Section(10)(a)(1)(B) Incidental Take Permits to Lincoln County, Nevada; City of Caliente, Nevada; and the Union Pacific Railroad for the Southeastern Lincoln County Habitat Conservation Plan".

of light industrial development, and 476 acres of open space including three schools and park sites. This biological opinion did not include consultation on impacts to flycatcher critical habitat. Project modifications included in this consultation included timing restrictions, construction restrictions, and conducting surveys and monitoring.

301. Though no flycatcher critical habitat was included in the Southeastern Lincoln County Habitat Conservation Plan, the Plan requires that $12,000 per acre of impacted suitable habitat be paid, enough to cover a 2 to 1 ratio of habitat loss. The plan covers a total of 84.3 acres of suitable habitat. Other conservation measures included in the HCP are surveying for flycatchers, worker training, minimization of impacts during project implementation, implementation of Best Management Practices (BMPs), and public education.

302. Per-project project modification cost estimates developed using the consultation history described above are detailed in Exhibit 5-8. To estimate costs associated with real estate development, we assign per project costs to each potential future development project (37 total).

303. Exhibit 5-9 presents the baseline and incremental costs associated with these additional project modifications. As shown below, the total baseline project modification costs in areas proposed for designation are estimated to be $9.9 million ($880,000 on an annualized basis), and the total incremental project modification costs are estimated to be approximately $140,000 ($12,000 on an annualized basis).

EXHIBIT 5-8. ESTIMATED PER PROJECT COSTS (EXCLUDING LAND SET-ASIDES) ASSOCIATED WITH DEVELOPMENT ACTIVITIES

COST TYPE	COST
Cowbird trapping program[1]	$29,000
Fencing[2]	$17,000
Biological surveys over 20 years[2]	$25,000
Biological monitoring over 20 years[2]	$160,000
Management of preservation land[2]	$230,000
Educational materials for homeowners[3]	$30,000
Total per project costs	**$490,000**

Sources:
1. Personal communication with D. Zuber, Harvard Investments, September 21, 2004, for 2005 Economic Analysis for Flycatcher.
2. Economic and Planning Systems, *Final Economic Analysis of Revised Critical Habitat Designation for the Arroyo Toad,* prepared under subcontract to Industrial Economic, Incorporated for the U.S. Fish and Wildlife Service, November 2010. Annual survey, monitoring, and management costs discounted over the 20 year period.
3. Derived from personal communication with Mike Wahleen, SunCal (Northlake Development), December 20, 2011.

Notes: Totals may not sum due to rounding. Costs assumed to be one-time costs, over 20 years.

EXHIBIT 5-9. ESTIMATED BASELINE AND INCREMENTAL ADDITIONAL PROJECT MODIFICATION COSTS RELATED TO DEVELOPMENT ACTIVITIES (2012 – 2031, 2010$, SEVEN PERCENT DISCOUNT RATE)

MANAGEMENT UNIT	BASELINE		INCREMENTAL	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Santa Ynez	$280,000	$24,000	$0	$0
Santa Clara	$2,200,000	$190,000	$140,000	$12,000
Santa Ana	$3,600,000	$320,000	$0	$0
San Diego	$1,900,000	$170,000	$0	$0
Mohave	$1,400,000	$120,000	$0	$0
Hoover to Parker Dam	$550,000	$49,000	$0	$0
Total	**$9,900,000**	**$880,000**	**$140,000**	**$12,000**

Note: Totals may not sum due to rounding.

5.2.11 OTHER FUTURE IMPACTS TO REAL ESTATE DEVELOPMENT

304. In addition to the direct costs of protecting the flycatcher and its habitat resulting from implementation of the Act, the informational nature of the designation may result in indirect impacts. Specifically, local planning authorities may treat the habitat differently as a result of the designation. Furthermore, time delays associated with the section 7 consultation process, development of an HCP, or additional scrutiny by local planners result in additional costs. Below, we estimate the value of these indirect costs.

CEQA

305. This section discusses whether the designation of critical habitat provides new information that triggers additional administrative costs under CEQA. This State law only affects projects in California; similar statutes do not apply in Arizona, Colorado, New Mexico, Nevada, or Utah.

306. CEQA requires proposed projects that have the potential to harm sensitive species or habitat (state- or federally-listed) to identify their environmental effects. CEQA requires State and local agencies ("the lead agency") to determine whether a proposed project would have a "significant" impact on the environment, and for any such impact identified, determine whether feasible mitigation measures or alternatives will reduce the impact to a "less-than significant" level. Under CEQA, the lead agency typically requires projects that may impact sensitive species or habitat to sponsor a biological assessment by a qualified biologist to determine the potential for impacts to all rare, threatened and endangered species. Section 15065 of Article 5 of CEQA states that a finding of significance is mandatory if the project will:

> "substantially reduce the habitat of a fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory."

307. If the lead agency finds that a project causes significant impacts, the project proponent must prepare an EIR. CEQA requirements already play a role in conservation for flycatcher by requiring an environmental review for projects that may impact the species.

308. In addition, although some projects would typically be categorically exempted from CEQA, based on Section 15300 of Article 9 of CEQA, these projects may not be exempted in the presence of critical habitat:

> "…a project that is ordinarily insignificant in its impact on the environment may in a particularly sensitive environment be significant. Therefore, these classes are considered to apply all instances, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies."

309. CEQA is implemented at a local level by county planning departments. Based on discussions with county planners, the most likely effect of proposed revised critical habitat designation is increased information about the geographic distribution of habitat.

Typically, planners rely on information resources such as the California Natural Diversity Database to identify the location of state- and federally-listed species. If a project is proposed in unoccupied critical habitat, the counties may initiate a biological assessment that would not have occurred otherwise. Initiating this process would also cause delays in development projects.

310. For development projects that occur in areas where flycatcher territories have not previously been detected, this analysis assumes that project proponents incur incremental administrative costs associated with CEQA, which vary depending on the type of project. Based on discussions with consultants who specialize in CEQA, this analysis uses an average cost for developing an environmental assessment and the relevant documents of $19,600 per project. Interviews with county staff indicated that either a negative or a mitigated negative declaration would most likely result from the biological assessment in unoccupied areas, and that as such, some mitigation requirements may be imposed that would be indirectly attributable to the proposed revised critical habitat designation. Although county officials were unable to provide estimates of the magnitude or nature of any mitigation that may be required prior to project implementation, we assume that mitigation requirements will be similar to the standard project modifications discussed above in Exhibit 5-8.[180]

311. Implementing CEQA may also cause project time delays. According to research conducted in a previous economic analysis of proposed revised critical habitat designation, the CEQA process can delay projects for up to two years, particularly when surveys must be conducted for species that are only detectable during certain months of the year.[181] These time delays result in an indirect economic impact of the revised critical habitat designation by increasing the carrying costs of undeveloped properties to developers. We discuss the process of estimating time delay impacts below.

Estimating Regulatory Delay Impacts

312. Flycatcher conservation efforts can cause time delays to some private land development projects due to requirements not to conduct certain construction activities during specific periods of the year (e.g., during the flycatcher breeding season). In addition, projects pursued by applicants unfamiliar with the requirements of the Act may be delayed until compliance requirements become well understood. In particular, a two-year time delay has been identified for projects that undergo CEQA review.

313. The land value loss associated with this delay can be estimated by applying the appropriate discount rate. The methodology is similar to that used to estimate land value losses, above. To estimate the economic effects of a two-year time delay caused by CEQA, because development is assumed to proceed evenly through time, we first inflate

[180] Based on research conducted for the economic analysis for Riverside fairy shrimp. Industrial Economics, Incorporated, "Draft Economic Analysis of Critical Habitat Designation for Riverside fairy shrimp," prepared for the U.S. Fish and Wildlife Service, November 2011.

[181] Economic and Planning Systems, *Final Economic Analysis of Revised Critical Habitat Designation for the Arroyo Toad*, prepared under subcontract to Industrial Economic, Incorporated for the U.S. Fish and Wildlife Service, November 2010, p. 103.

the property values by 6.86 percent per year for all years between 2012 and 2031. Next, we estimated the economic impact to developers in each of these years resulting from a two-year delay, which would cost approximately 28 percent of the real land value during each year.[182] Lastly, we discount these impacts back to 2010 dollars using the developer's discount rate of 15 percent.[183] Total time delay impacts are presented in Exhibit 5-10, below. As shown, we estimate a total time delay impact associated with projects occurring in baseline areas of $3.3 million, and the total time delay impact associated with incremental flycatcher areas of $4,100 over 20 years ($290,000 and $360 on an annualized basis, respectively).

EXHIBIT 5-10. ESTIMATED BASELINE AND INCREMENTAL TIME DELAY IMPACTS TO DEVELOPMENT ACTIVITIES (2010$)

MANAGEMENT UNIT	BASELINE		INCREMENTAL	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Santa Ynez	$6,600	$590	$0	$0
Santa Clara	$1,600,000	$140,000	$4,100	$360
Santa Ana	$1,400,000	$120,000	$0	$0
San Diego	$75,000	$6,600	$0	$0
Mohave	$310,000	$27,000	$0	$0
Total	**$3,300,000**	**$290,000**	**$4,100**	**$360**

Note: Totals may not sum due to rounding.

5.3 ADMINISTRATIVE IMPACTS TO DEVELOPMENT ACTIVITIES

314. In addition to conservation effort costs, the analysis forecasts administrative costs associated with section 7 consultations for development activities. A review of the past consultation history for these species suggests that section 7 consultations on development activities are rare. Because of the relatively sparse consultation history, it is difficult to forecast the number of consultations that may be subject to section 7 consultation for development activities in the future. This analysis assumes that the acres of projected development in each census tract overlapping critical habitat represent one development project, for an average of approximately 14 acres per project. Accordingly, this analysis assigns one formal consultation for each of these occurrences.

315. In addition to formal consultations, the Service frequently responds to requests for technical assistance and informal consultation. Because a detailed history of informal consultations and technical assistance regarding the flycatcher is not available, this analysis uses data provided by the Ventura office in California and Region 2 of the

[182] This calculation is 100*(1 – (1-0.15)^2), where (1-0.15) is the value remaining after one year, and (1-0.15)^2 is the value remaining after two years. (1-(1-0.15)^2) thus provides the impact on land values, and the multiplier of 100 converts to a percentage effect.

[183] Because both the 6.86 percent growth rate and the 15 percent discount rate are nominal, inflation is controlled for within the calculation and the outcome is in real dollars.

Service to estimate ratios of informal consultations and technical assistance requests to formal consultations.

316. The ratio of technical assistance requests to formal consultations for the flycatcher ranges from 0.3 (Region 2) to three (Ventura office). Although this ratio is not specific to development consultations, this analysis adopts a ratio of three technical assistance requests to one formal consultation for management units in California, and 0.3 technical assistance requests to one formal consultation for management units in all other States.

317. The ratio of informal to formal consultations for the flycatcher ranges from nine (Ventura office) to eleven (Region 2). This analysis adopts a ratio of nine informal consultations to one formal consultation for management units in California, and 11 informal consultations to one formal consultation for management units in all other States.

318. In unoccupied reaches, these consultations are assumed to result from the critical habitat designation, and thus all associated administrative costs are considered incremental. In occupied reaches, administrative effort is needed to address both jeopardy and adverse modification issues. The portion of administrative effort to address adverse modification is considered to be an incremental cost; the portion to address jeopardy is considered baseline.

319. In total, baseline administrative costs are estimated at approximately $1.8 million over 20 years ($160,000 on an annualized basis). Incremental administrative costs are estimated at approximately $630,000 over 20 years ($55,000 on an annualized basis). We present these costs by management unit in Exhibit 5-10 below.

EXHIBIT 5-10. SUMMARY OF ADMINISTRATIVE COSTS BY MANAGEMENT UNIT (2012 – 2031, 2010$, SEVEN PERCENT DISCOUNT RATE)

MANAGEMENT UNIT	BASELINE		INCREMENTAL	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Santa Ynez	$47,000	$4,100	$16,000	$1,400
Santa Clara	$380,000	$33,000	$150,000	$14,000
Santa Ana	$610,000	$54,000	$200,000	$18,000
San Diego	$330,000	$29,000	$110,000	$9,700
Mohave	$230,000	$21,000	$78,000	$6,900
Hoover to Parker Dam	$110,000	$9,400	$35,000	$3,100
Verde	$94,000	$8,300	$31,000	$2,800
Total	**$1,800,000**	**$160,000**	**$630,000**	**$55,000**
Note: Totals may not sum due to rounding.				

5.4 KEY ASSUMPTIONS AND SOURCES OF UNCERTAINTY

320. Exhibit 5-11 summarizes the key assumptions in our analysis of potential economic impacts related to development activities, as well as the potential direction and relative scale of bias introduced by these assumptions.

EXHIBIT 5-11. CAVEATS TO THE ECONOMIC ANALYSIS OF DEVELOPMENT ACTIVITIES

KEY ASSUMPTION	EFFECT ON IMPACT ESTIMATE
Individual single-family home development has rarely been subject to consultation or habitat conservation plan requirements. Only four projects have undergone a formal section 7 consultation related to development activities that included flycatcher in the past.	+
Because riparian buffers for development (and floodplains) have already been established in these areas, development is already prohibited from some proposed acres.	+
Recent economic conditions make it difficult to project near-term development pressure in California. For the counties in which critical habitat is being designated, housing supply may be high due to foreclosures, and therefore demand for future development is potentially too low to demand new units within the floodplain.[1] We rely on the best available data to project future development pressure – long-term growth projections provided by regional planning agencies. Furthermore, when projecting the value of the potentially developable lands in critical habitat, we rely on recent sales transactions (2001 – 2011) in those census tracts. We assume that land values will grow over the long-term, averaging 6.86 percent annual growth in value based on the average annual growth rate from 1993 through 2008. This longer period encompasses both gains and losses in home values, including the largest drop from 2005 through 2008. It is possible, however, that either flood plain lands are under-represented in our sales data, or the recovery of the housing market will be slower than the historical average would suggest.	+
Estimation of forecast development is based on SANDAG, SCAG, SBCAG, FMMP, and Census data. Development estimates are spread evenly across census tracts and over the 20-year period of the analysis.	+/-
Estimation of per acre land values is based on transactions for all raw land over the past 10 years in the census tracts that overlap areas of potential floodplain development. Due to a lack of transactions in some tracts, this analysis uses the median value of these transactions over all areas in California and all areas in Arizona; however, proposed habitat in some areas may be valued higher or lower than these median prices. In addition, a lack of transactions in recent history may indicate that there is less land available for development in these areas than this analysis identifies.	+/-
Estimation of per project off-sets is based on assumptions used in the economic analysis for the designation of critical habitat for California tiger salamander. It appears, however, that the actual off-set ratio for flycatcher may be lower. Due to a lack of development consultations, a more informed off-set ratio could not be developed from the consultation history.	+
Acres projected for development in each census tract represent a single project. Administrative costs may be over- or understated if the number of projects overlapping census tracts varies.	+/-
The cost of additional project modifications for each project is $490,000. This estimate is a compilation of estimates obtained from the 2005 Economic Analysis for Flycatcher, recent interviews with developers, and estimates used in the Economic Analysis for Arroyo Toad.	+/-
CEQA review would not have been required for projects in stream segments where flycatcher territories have not previously been identified absent the designation.	+
Time delay for CEQA is two years.	+/-
All future projects have a Federal nexus. If some projects do not have a nexus, a portion of the impacts attributed to the baseline may result indirectly from the designation through project review by local agencies.	-
Projects cannot be reconfigured to avoid critical habitat or incorporate critical habitat acres into other open space requirements.	+

KEY ASSUMPTION	EFFECT ON IMPACT ESTIMATE
Source: Carreras, Joseph, "The Housing Market Outlook for 2009 and 2010", January 16, 2009, as viewed at http://www.scag.ca.gov/Housing/pdfs/trends/Housing-Market-Outlook-2009-10.pdf on December 6, 2011. **Notes:** - : This assumption may result in an underestimate of real costs. + : This assumption may result in an overestimate of real costs. +/- : This assumption has an unknown effect on the magnitude of cost estimates.	

CHAPTER 6 | POTENTIAL ECONOMIC IMPACTS TO TRIBES

321. Lands belonging to 20 Native American Tribes are included within the boundaries of the proposed flycatcher critical habitat, but all are being considered for exclusion from the final designation. This chapter considers potential economic impacts to these Tribes that may result from flycatcher critical habitat designation.

322. Given the unique characteristics of Tribal economies, the approach used to analyze potentially affected activities on Tribal lands is different than that for other types of activities. This chapter provides a qualitative discussion of economic conditions on Tribal lands, ongoing Tribal conservation efforts that may protect the flycatcher, and concerns about flycatcher critical habitat designation expressed by Tribal governments. We then discuss and quantify where possible the potential baseline and incremental impacts of critical habitat designation.

6.1 SUMMARY OF IMPACTS TO TRIBAL LAND USE ACTIVITIES

323. In general, of most concern to the Tribes whose lands are proposed to be included as flycatcher critical habitat is the potential impact that the designation of critical habitat could have on Tribes' abilities to manage natural resources, including water rights, on their sovereign lands. It is important to note that because the potentially affected Tribes are sovereign nations, they have a unique relationship with the U.S. government. Secretarial Order 3206 recognizes that Tribes have governmental authority and the desire to protect and manage their resources in the manner that is most beneficial to them. The analysis attempts to capture the concerns that Tribes have about potential impacts of critical habitat on Tribal land management activities, including that, due to Federal oversight, Tribes may be compelled to modify current plans for resource use. In particular, this chapter discusses the potential for critical habitat to impact Tribes' ability to exercise their water rights, utilize natural resources for traditional uses, and develop lands for commercial purposes, tourism, or other activities (see Exhibit 6-1). Detailed information on the location and specific costs of future conservation projects on Tribal lands was not generally available for this analysis. As such, costs of conservation efforts are not quantified in this analysis, resulting in a probable underestimate of future costs to Tribal entities in this section.

324. Exhibit 6-1 also summarizes the quantified baseline and incremental economic impacts of critical habitat designation for the flycatcher on activities conducted on Tribal lands. The present value of quantified incremental impacts to Tribal activities is estimated at $660,000 over the next 20 years assuming a seven percent real discount rate, or an annualized impact of approximately $59,000. The present value of quantified baseline impacts is estimated at $2 million over the next 20 years, or approximately $180,000 on an annualized basis. All of these estimated costs are administrative in nature.

325. Because all Tribal lands overlapping proposed critical habitat are located within areas occupied by the flycatcher and where the species occupancy is well-known, the Service considers all costs associated with conservation measures to be baseline (see Chapter 2). As a result, we assume that future incremental impacts will be limited to the additional administrative effort of addressing critical habitat in section 7 consultation. As noted above, the quantified figures presented in this chapter are an incomplete valuation of likely potential impacts to Tribal entities. For example, according to the Pala Band of Mission Indians, "…the lack of ability to quantify the amount does not translate to a 'zero impact.'. The impacts to the tribes are real and significant, though uncertain at this time...."[329]

[329] The Pala Tribe notes that one method of assessing additional impacts of the designation would be to calculate the cost to replace the designated land through the fee-to-trust process. This method would apply a cost of $15,000 in transaction costs per-acre, plus the cost of riparian habitat in each county. In San Diego County, for instance, the cost of replacement land is $25,000 per acre, meaning that each acre of designated land in that county would represent a $40,000 cost to the respective Tribal owners. (Letter from Shasta Gaugen, Pala Environmental Protection Agency, "Re: Comments Regarding Partial Draft Economic Analysis for the Proposed Critical Habitat for Southwest Willow Flycatcher," March 21, 2012.)

EXHIBIT 6-1. SUMMARY OF BASELINE AND INCREMENTAL COSTS TO TRIBES BY MANAGEMENT UNIT (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	TRIBE	BASELINE ADMINISTRATIVE IMPACTS TO TRIBES		INCREMENTAL ADMINISTRATIVE IMPACTS TO TRIBES		UNQUANTIFIED IMPACTS
		PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED	
Santa Ynez		$0	$0	$0	$0	
Santa Clara		$0	$0	$0	$0	
Santa Ana	Ramona Band of Cahuilla Indians	$190,000	$17,000	$63,000	$5,500	Potential for time delay costs in pursuing economic development projects Loss of procedural control for planning and management purposes
San Diego	La Jolla Band of Mission Indians[3] Viejas Band of Kumeyaay Indians and Barona Band of Mission Indians Pala Band of Mission Indians Rincon Band of Luiseno Indians	$190,000	$17,000	$63,000	$5,500	Development potential of affected acres, including additional "use-versatility" value of Tribally owned land (Barona and Viejas) Value of access to exercise federally reserved water rights (Barona and Viejas) Various conservation efforts applied in the riparian corridor (Pala and Rincon) Development of an HCP (Rincon)
Owens		$0	$0	$0	$0	
Kern		$0	$0	$0	$0	
Mohave		$0	$0	$0	$0	
Salton	Iipay Nation of Santa Ysabel[3]	$47,000	$4,100	$16,000	$1,400	--
Amargosa		$0	$0	$0	$0	
Little Colorado	Zuni Pueblo[3]	$53,000	$4,700	$18,000	$1,600	--
Virgin		$0	$0	$0	$0	
Middle Colorado	Hualapai Tribe	$53,000	$4,700	$18,000	$1,600	Development potential along river corridor Potential impacts to tourism operations

MANAGEMENT UNIT	TRIBE	BASELINE ADMINISTRATIVE IMPACTS TO TRIBES		INCREMENTAL ADMINISTRATIVE IMPACTS TO TRIBES		UNQUANTIFIED IMPACTS
		PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED	
Pahranagat		$0	$0	$0	$0	
Bill Williams		$0	$0	$0	$0	
Hoover to Parker Dam	Chemihuevi Tribe Fort Mojave Indian Tribe	$94,000	$8,300	$31,000	$2,800	Potential impacts to water withdrawals for uses such as irrigated agriculture (Fort Mojave) Potential impacts to development along Lake Havasu (Chemehuevi)
Parker Dam to Southerly International Border	Colorado River Indian Tribes Quechan Tribe	$94,000	$8,300	$31,000	$2,800	Time delays and project modification expenses as a result of avoiding flycatcher breeding season (Quechan) Surveys and monitoring, as well as conservation activities on the Ahakhav Tribal Preserve (CRIT)
San Juan	Navajo Nation; Southern Ute Tribe	$210,000	$19,000	$71,000	$6,200	Potential impacts to water withdrawals for uses such as irrigated agriculture (Southern Ute and Navajo)
Powell		$0	$0	$0	$0	
Verde	Yavapai-Apache Nation	$210,000	$19,000	$71,000	$6,200	Potential restrictions on water rights, water use, and cost of obtaining replacement water sources
Roosevelt		$0	$0	$0	$0	
Middle Gila and San Pedro		$0	$0	$0	$0	
Upper Gila	San Carlos Apache Tribe	$530,000	$47,000	$180,000	$16,000	Water exchange projects Livestock grazing and agricultural impacts Recreational impacts Forest and fire management
Santa Cruz		$0	$0	$0	$0	
San Francisco		$0	$0	$0	$0	

MANAGEMENT UNIT	TRIBE	BASELINE ADMINISTRATIVE IMPACTS TO TRIBES		INCREMENTAL ADMINISTRATIVE IMPACTS TO TRIBES		UNQUANTIFIED IMPACTS
		PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED	
Hassayampa and Agua Fria		$0	$0	$0	$0	
San Luis Valley		$0	$0	$0	$0	
Upper Rio Grande	Pueblo de San Ildefonso; Ohkay Owingeh Tribe; Santa Clara Indian Pueblo	$320,000	$28,000	$110,000	$9,400	Costs of flycatcher surveys and restoration projects (Ohkay Owingeh, Santa Clara, San Ildefonso); Impacts to water rights (Santa Clara)
Middle Rio Grande		$0	$0	$0	$0	
Lower Rio Grande		$0	$0	$0	$0	
Total		**$2,000,000**	**$180,000**	**$660,000**	**$59,000**	

Note: Many Tribes also state that critical habitat designation may result in a negative impact on the Service's government-to-government relationship with them.

1. Totals may not sum due to rounding.
2. Tribal lands will be considered for exclusion from the final critical habitat designation, as stated in the Proposed Rule.
3. The La Jolla Band of Luiseno Indians, Iipay Nation of Santa Ysabel, and Zuni Pueblo either could not provide information on specific impacts or could not be reached for this analysis.

6.2 BACKGROUND AND APPROACH TO EVALUATING IMPACTS TO AFFECTED TRIBES

326. As presented in Exhibit 6-2, more than 72,000 acres of proposed critical habitat fall on lands belonging to 20 Tribes. Maps of proposed areas are presented in Exhibit 6-3. Each of the Tribes with lands in proposed critical habitat is a sovereign nation. As stated in Executive Order 13175:

> The United States has a unique legal relationship with Indian Tribal governments as set forth in the Constitution of the United States, treaties, statutes, Executive Orders, and court decisions. Since the formation of the Union, the United States has recognized Indian Tribes as domestic dependent nations under its protection. The Federal Government has enacted numerous statutes and promulgated numerous regulations that establish and define a trust relationship with Indian Tribes.[330]

A recent presidential memorandum further charged executive departments and agencies with "engaging in regular and meaningful consultation and collaboration with Tribal officials in the development of Federal policies that have Tribal implications."[331]

327. Department of Interior Secretarial Order 3206 recognizes that Tribes have governmental authority and the desire to protect and manage their resources in the manner that is most beneficial to them.[332] Many of the Tribes with lands overlapping this proposed designation have their own natural resource programs and staff (the Yavapai-Apache Nation, for example, does not, due to its small size). Many affected Tribes have also enacted or are in the process of developing resource management plans, either specifically for the southwestern willow flycatcher, or for other riparian species (e.g., the spikedace and loach minnow). In addition, as trustee for land held by the United States for Indian Tribes, the BIA provides technical assistance to the Tribes on forest management planning and oversees a variety of programs on Tribal lands. The Yavapai-Apache Nation states that "the Secretary of the Interior lacks legal authority to designate critical habitat on the Nation's lands."[333] The San Carlos Apache Tribe has made similar remarks in regard to other proposed critical habitat designations.[334]

328. Given the unique characteristics of Tribal economies, the approach used to analyze potentially affected activities on Tribal lands is different than that for other types of activities. This section provides a discussion of the current socioeconomic status of the Tribal community, underscoring the conditions on the affected reservations. Available

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[330] Executive Order 13175, Consultation and Coordination with Indian Tribal Governments.

[331] White House, Memorandum for the Heads of Executive Departments and Agencies: Subject: Tribal Consultation, November 5, 2009. Accessed at: http://www.whitehouse.gov/the-press-office/memorandum-Tribal-consultation-signed-president.

[332] Department of Interior, Secretarial Order # 3206: Subject: American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act, June 1997.

[333] Public comment of Susan B. Montgomery, Special Legal Counsel to the Yavapai-Apache Nation, in response to the Proposed Rule for designation of flycatcher critical habitat. October 14, 2011.

[334] Public comments of Susan B. Montgomery, Sparks, Tehan, and Ryley P.C., Special Counsel to the San Carlos Apache Tribe, "Comments to Proposed Rule to Draft Environmental Assessment and Final Draft Economic Analysis of Critical Habitat for the Gila chub." September 30, 2005.

data demonstrate the economic vulnerability of the Tribes; their economies are characterized by high unemployment, low income, low education levels, and high poverty rates (see Exhibit 6-4). In addition, unique circumstances of communities on Tribal lands affect re-employment opportunities. For example, Tribal members may be less mobile than non-Tribal members, and Tribal members who lose jobs may be hesitant to move off their Reservation to find work elsewhere. Thus, if flycatcher conservation impacts employment opportunities on the reservations, those impacts may be compounded by poor baseline economic conditions and a lack of local employment alternatives. The remainder of this section discusses each potentially affected Tribe individually. All population and economic statistics cited are from the 2010 Census American Community survey, unless otherwise noted.

EXHIBIT 6-2. TRIBAL LANDS IN PROPOSED CRITICAL HABITAT

RECOVERY UNIT	MANAGEMENT UNIT	TRIBE NAME	RESERVATION NAME	ACRES IN PROPOSED CRITICAL HABITAT
Coastal California	San Diego	La Jolla Band of Luiseno Indians	La Jolla Indian Reservation	211.6
		Viejas Band of Kumeyaay Indians and Barona Band of Mission Indians	Capitan Grande Band of Diegueno Mission Indians	203.7
		Pala Band of Mission Indians	Pala Indian Reservation	325.8
		Rincon Band of Luiseno Indians	Rincon Indian Reservation	84.6
	Santa Ana	Ramona Band of Cahuilla Indians	Ramona Indian Reservation	4.4
Basin & Mojave	Salton	Iipay Nation of Santa Ysabel	Santa Ysabel Reservation	21.8
Lower Colorado	Hoover-Parker	Chemehuevi Tribe	Chemehuevi Indian Reservation	5,313.4
		Fort Mojave Indian Tribe	Fort Mojave Indian Reservation	6,525.4
	Little Colorado	Zuni Pueblo	Zuni Indian Reservation	7,082.8[(1)]
	Middle Colorado	Hualapai Tribe	Hualapai Indian Reservation	1,752.2
	Parker-Southerly International Boundary	Colorado River Indian Tribes	Colorado River Indian Reservation	13,945.8
		Quechan Tribe	Quechan (Fort Yuma) Indian Reservation	1,481.8
Upper Colorado	San Juan	Navajo Nation	Navajo Indian Reservation	5,622.8
		Southern Ute Tribe	Southern Ute Indian Reservation	2,628.6[(2)]
Gila	Upper Gila	San Carlos Apache Tribe	San Carlos Indian Reservation	21,852.1
	Verde	Yavapai-Apache Nation	Camp Verde Indian Reservation	219.9
Rio Grande	Upper Rio Grande	Pueblo de San Ildefonso	San Ildefonso Indian Reservation	1,094.9
		Ohkay Owingeh Tribe	San Juan Indian Reservation	1,982.0
		Santa Clara Indian Pueblo	Santa Clara Indian Reservation	1,760.3
			Total	**72,113.8**

(1) Conversations with the Ramah Navajo Natural Resources and Realty Departments, the Navajo Nation Natural Heritage Program, and the Zuni Pueblo Realty Office indicate that the 543 acres originally identified by the Service as Ramah Navajo lands are in fact part of the Zuni Pueblo.

(2) Estimates of acreage from GIS maps provided by the Service do not precisely align with estimates of acreage provided by the Southern Ute Tribe. According to the Tribe, 2,685 acres of land managed by the Southern Ute (including Tribal trust, allotment, and Tribal fee lands) are proposed as critical habitat. For purposes of this analysis, we rely on acreage as provided by the Service.

Source: GIS analysis of Service and ESRI spatial data.

EXHIBIT 6-3-1. INTERSECTION OF RESERVATION LANDS WITH PROPOSED CRITICAL HABITAT

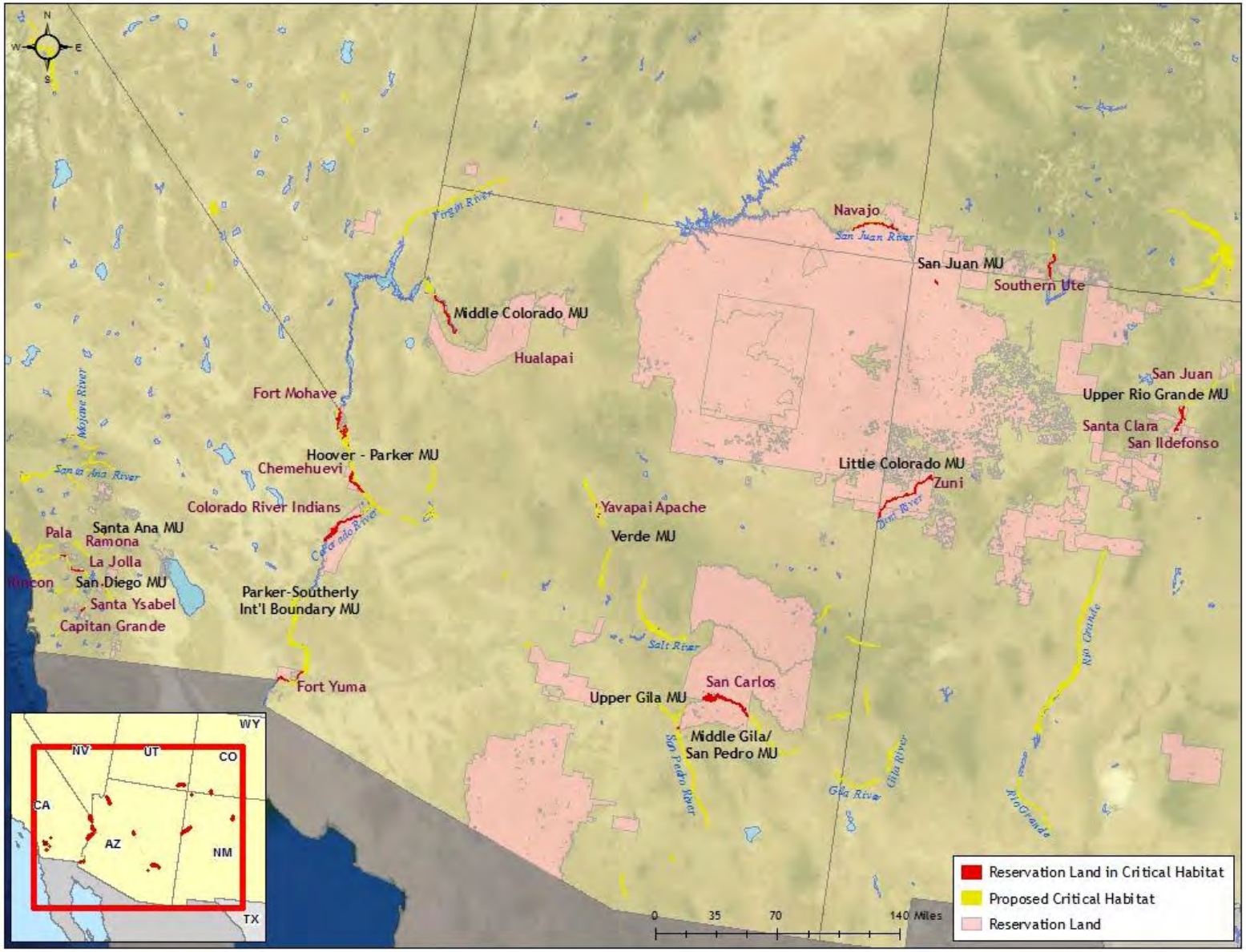

EXHIBIT 6-3-2. INTERSECTION OF RESERVATION LANDS WITH PROPOSED CRITICAL HABITAT IN SOUTHERN CALIFORNIA

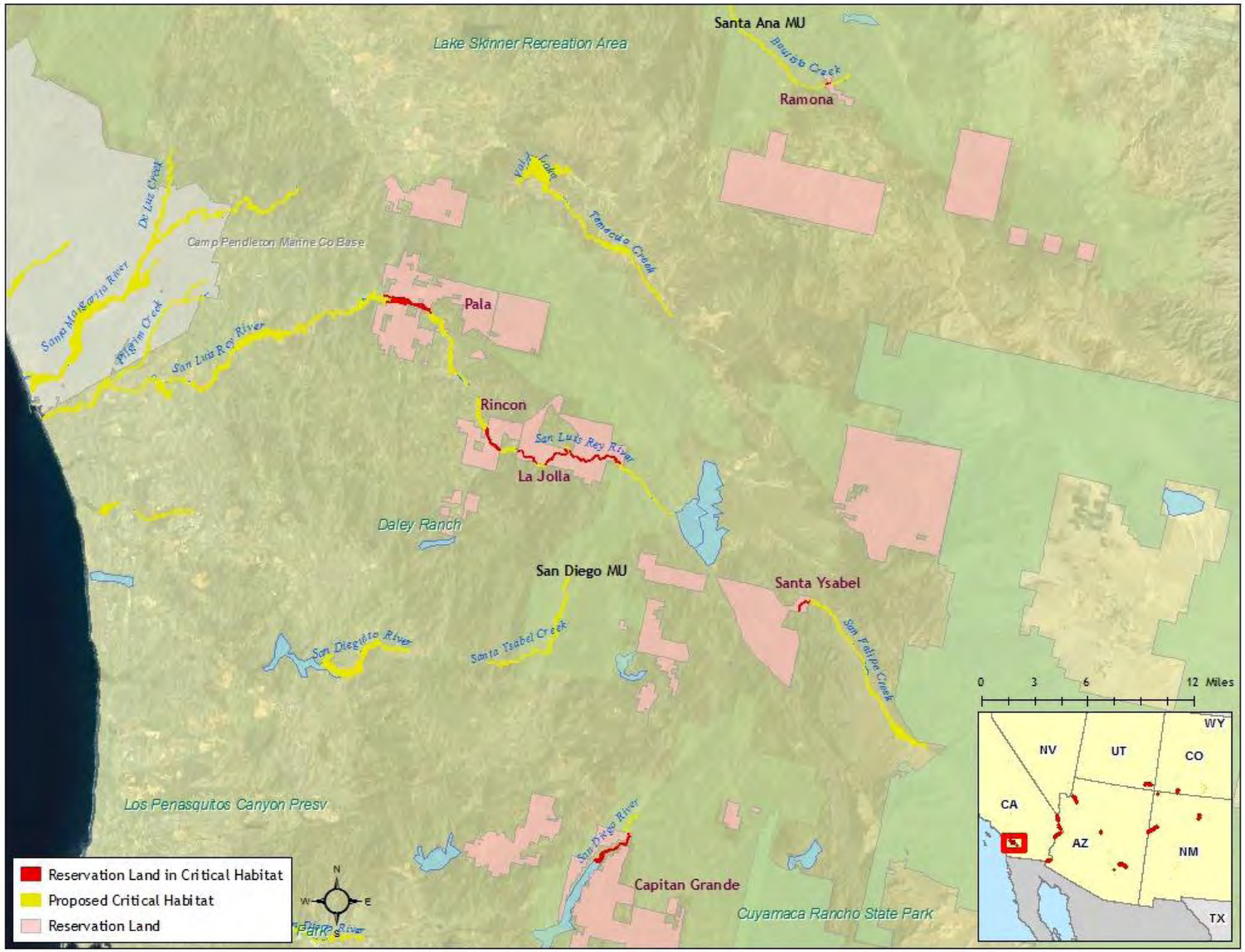

EXHIBIT 6-3-3. INTERSECTION OF RESERVATION LANDS WITH PROPOSED CRITICAL HABITAT IN THE PARKER-SOUTHERLY MU

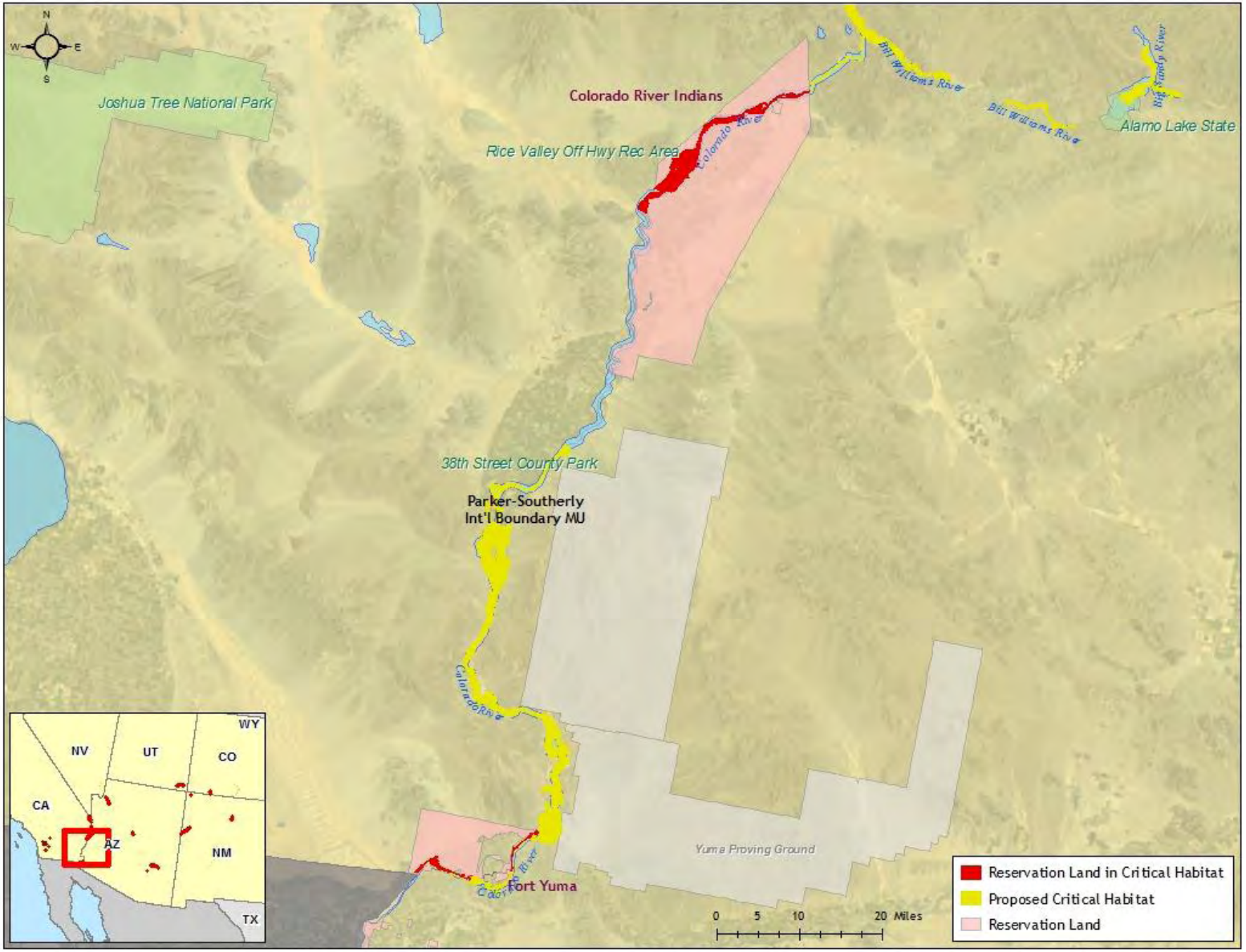

EXHIBIT 6-3-4. INTERSECTION OF RESERVATION LANDS WITH PROPOSED CRITICAL HABITAT IN HOOVER-PARKER AND MIDDLE COLORADO MANAGEMENT UNITS

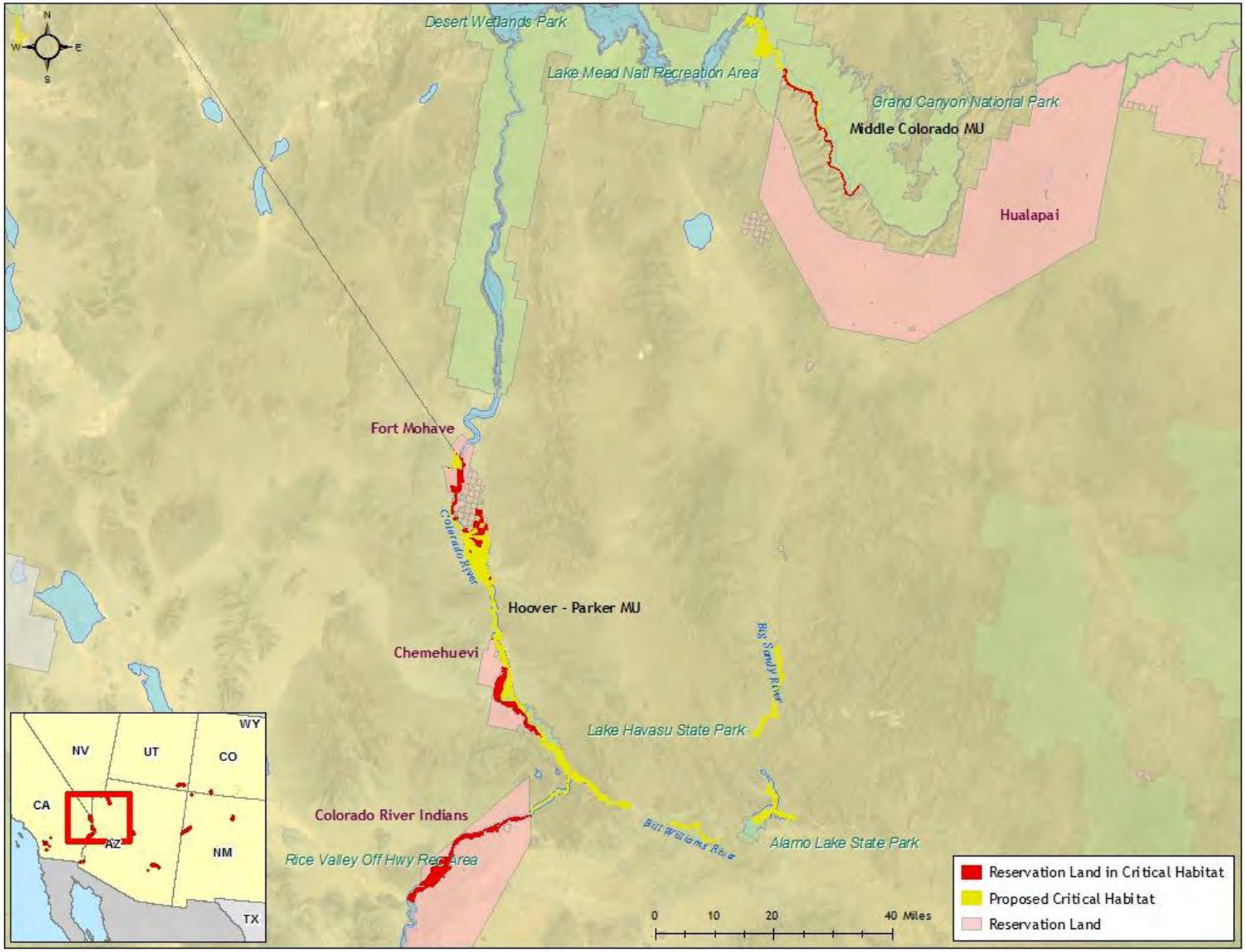

EXHIBIT 6-3-5. INTERSECTION OF RESERVATION LANDS WITH PROPOSED CRITICAL HABITAT IN CENTRAL ARIZONA

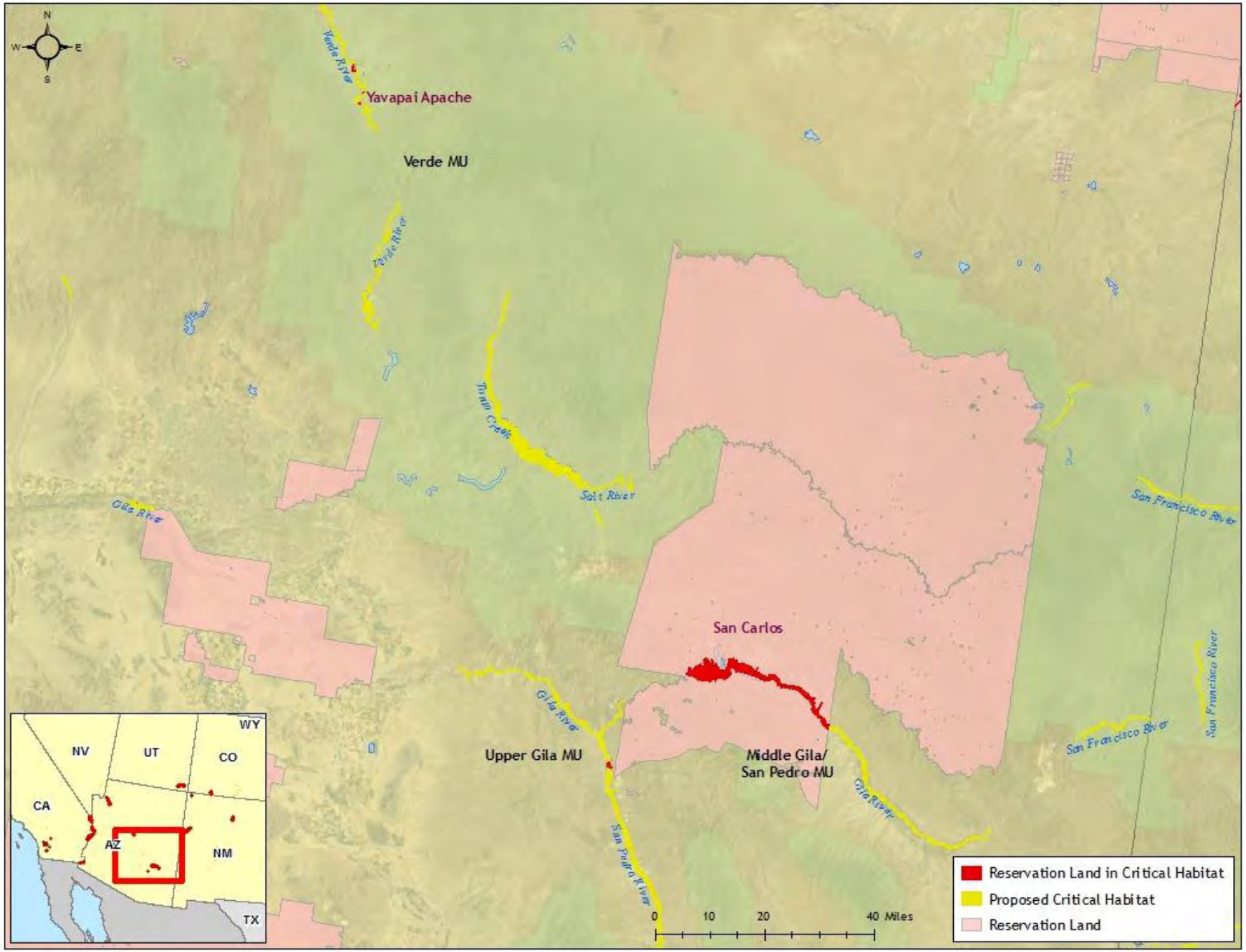

EXHIBIT 6-3-6. INTERSECTION OF RESERVATION LANDS WITH PROPOSED CRITICAL HABITAT IN UTAH, COLORADO, AND NEW MEXICO

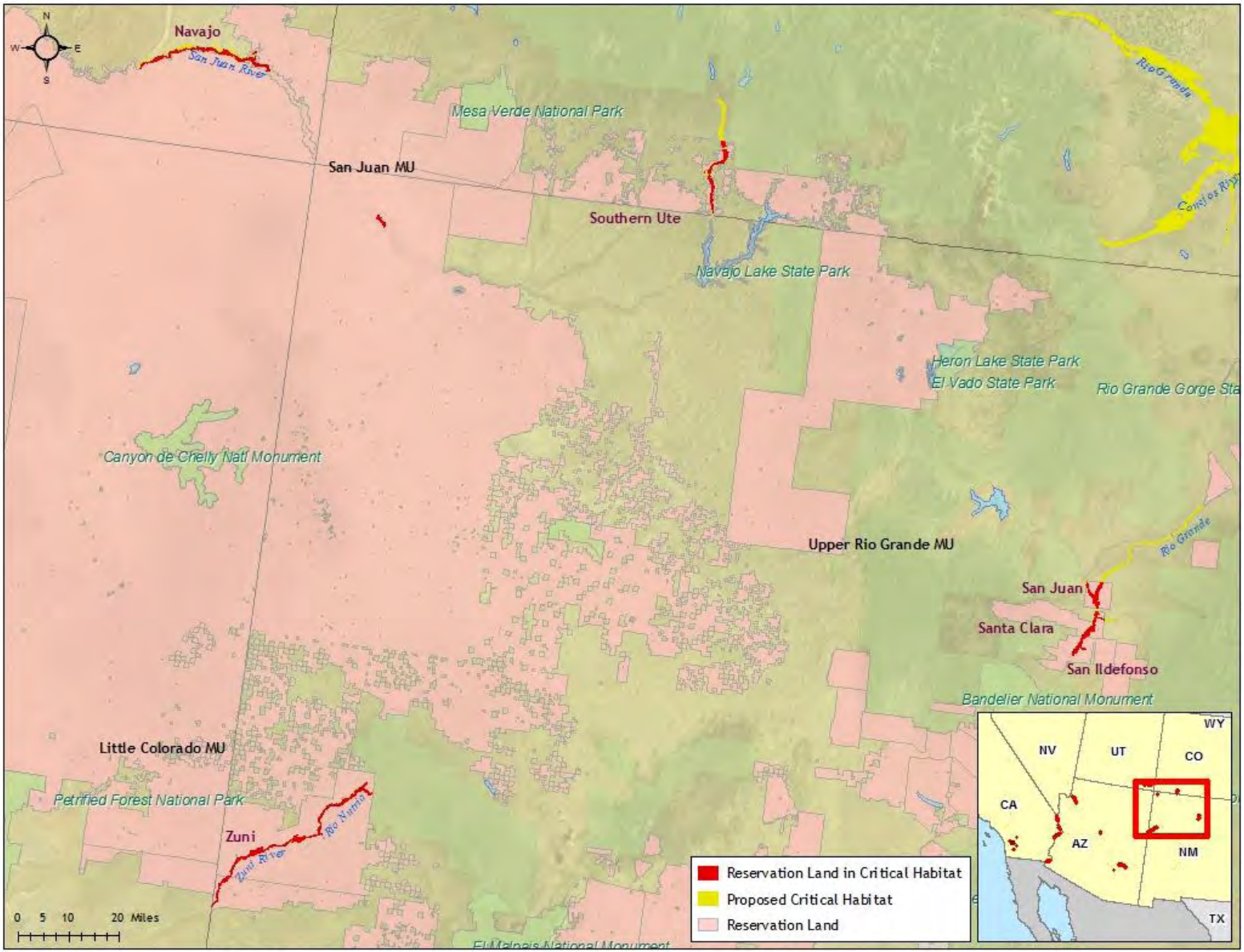

EXHIBIT 6-4. CENSUS SOCIOECONOMIC INFORMATION FOR AFFECTED TRIBES (2010)

AREA/TRIBAL LAND AREA	POPULATION	UNEMPLOYMENT RATE [1]	PER CAPITA INCOME	POVERTY RATE [2]
National Level Information				
USA	308,745,538	7.9%	$27,334	13.8%
State Level Information				
Arizona	6,392,017	7.7%	$25,680	15.3%
California	37,253,956	9.0%	$29,188	13.7%
Colorado	5,029,196	6.8%	$30,151	12.2%
Nevada	2,700,551	9.0%	$27,589	11.9%
New Mexico	2,059,179	7.2%	$22,966	18.4%
Utah	2,763,885	5.9%	$23,139	10.8%
Tribal Level Information				
Barona Reservation, CA	640	13.6%	$43,396	10.5%
Chemehuevi Reservation, CA	308	13.0%	$17,001	50.2%
Colorado River Indian Reservation, AZ, CA	8,764	5.1%	$17,432	26.3%
Fort Mojave Reservation and Off-Reservation Trust Land, AZ, CA, NV	1,477	11.3%	$21,661	28.6%
Fort Yuma Indian Reservation, CA, AZ	2,197	18.9%	$9,512	36.6%
Hualapai Indian Reservation and Off-Reservation Trust Land, AZ	1,335	15.1%	$12,209	41.2%
La Jolla Reservation, CA	476	13.2%	$24,167	9.4%
Navajo Nation Reservation and Off-Reservation Trust Land, AZ, NM, UT	173,667	15.6%	$10,547	37.7%
Ohkay Owingeh, NM	6,309	13.6%	$18,034	24.3%
Pala Reservation, CA	1,315	6.6%	$19,549	32.4%
Ramona Village, CA [3]	13	NA	NA	NA
Rincon Reservation, CA	1,215	9.7%	$24,840	20.9%
San Carlos Reservation, AZ	10,068	19.8% [5]	$10,222	46.0%[5]
San Ildefonso Pueblo and Off-Reservation Trust Land, NM	1,752	12.9%	$26,131	9.0%
Santa Clara Pueblo, NM	11,021	7.4%	$22,182	22.8%
Santa Ysabel Reservation, CA	330	30.9%	$14,684	15.0%
Southern Ute Reservation, CO	12,153	5.4%	$27,714	8.4%
Viejas Reservation, CA	520	8.5%	$27,158	22.1%
Yavapai-Apache Nation Reservation, AZ	2,290 [4]	12.3%	$10,275	42.4%
Zuni Reservation, NM, AZ	7,891	8.8%	$10,081	37.0%

AREA/TRIBAL LAND AREA	POPULATION	UNEMPLOYMENT RATE (1)	PER CAPITA INCOME	POVERTY RATE (2)

Notes:

(1) Unemployment rate provided by the Census is the number of unemployed persons, age 16 and over, as a percent of the total civilian labor force.

(2) Poverty rate represents the percent of individuals whose income in a 12 month period was below the poverty level. Poverty thresholds are the same for all parts of the country, but vary depending on the applicable family size, age of householder, and number of related children under 18. Poverty thresholds are shown at http://www.census.gov/hhes/www/poverty/data/threshld/.

(3) 2010 Census data are not available for the Ramona Reservation, beyond a population estimate of 13.

(4) Public comment of Susan B. Montgomery, Special Legal Counsel to the Yavapai-Apache Nation, in response to the Proposed Rule for designation of flycatcher critical habitat. October 14, 2011.

(5) The U.S. Census reports 2010 unemployment as 19.8 percent and the poverty rate as 46.0 percent for the San Carlos Apache. The San Carlos Apache Tribe has stated that they believe that these estimates are low. The April 2011 Official Labor Force Report of the San Carlos Apache Tribe lists an unemployment rate of 67 percent and poverty rate of 50 percent. Official Labor Force Report. San Carlos Apache Tribe Planning & Economic Development. April 2011.

Sources: U.S. Census Bureau, 2010 American Community Surveys.

6.2.1 BARONA BAND OF MISSION INDIANS AND VIEJAS BAND OF KUMEYAAY INDIANS

329. The Capitan Grande Indian Reservation is an uninhabited Reservation that is jointly administered by the Barona and Viejas Bands of Mission Indians. Though currently uninhabited, the Capitan Grande Band of Mission Indians lived on the Reservation until 1932, when the City of San Diego obtained consent from Congress to condemn the Capitan Grande Reservation in order to build a dam and flood the area. The same Act authorized the federal government to use proceeds from the condemnation to purchase one or more substitute reservations to which the Capitan Grande people would relocate. The Secretary of the Interior purchased what are now the Barona Indian Reservation to the west of the Capitan Grande Indian Reservation, and the Viejas Indian Reservation to the south and east. The Capitan Grande people who settled on the two new substitute reservations became known as the Barona and Viejas Bands of Mission Indians, each of which is currently treated as a successor to the Capitan Grande Band, and recognized as an autonomous Tribe.

330. The Capitan Grande Indian Reservation is approximately 16,000 acres, located within Cleveland National Forest in San Diego County, California. Approximately 2.9 river miles (203.7 acres) of critical habitat have been proposed on the Capitan Grande Reservation.

331. The U.S. Census estimates that Barona Reservation had a population of 640 enrolled members in 2010. The unemployment rate was reported as 13.6 percent for 2010, 4.6 percentage points higher than the state of California. A substantially higher unemployment rate of 80 percent was reported by the BIA in 2001.[335] Per capita income was $43,396 in 2010, higher than the average for the state of California, and the percent

[335] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (367)

of the Reservation's population that lives below poverty line is 10.5 percent, which is lower than the average for the state of California.

332. The Barona's economy relies heavily on the gaming industry, though opportunities in tourism, recreation, and retail provide additional employment opportunities and revenue.[336]

333. The U.S. Census estimates that Viejas Reservation had a population of 520 enrolled members in 2010. The unemployment rate was reported as 8.5 percent in 2010, though a substantially higher rate of 68 percent was reported by the BIA in 2001.[337] Per capita income was $27,158 in 2010, similar to the average for the state of California. In addition, approximately 22.1 percent of the Tribe's population lives below the poverty line, over one and one-half times the average for the state of California.

334. The Viejas has developed an increasingly stable economy, which struggled with the loss of their original land base, based primarily in gaming operations. The Tribe, however, has been actively trying to develop more diversified economic sectors.[338]

6.2.2 CHEMEHUEVI TRIBE

335. The Chemehuevi Indian Tribe is located on the Chemehuevi Reservation, a Reservation of 30,653 acres along the Colorado River and Lake Havasu in San Bernardino County, California. Approximately 5,000 acres of critical habitat have been proposed on the Reservation.

336. The U.S. Census estimated the population of the Chemehuevi Reservation at 308 in 2010. The unemployment rate was reported as 13.0 percent, and per capita income was $17,001 in 2010, less than two-thirds the average for the state of California. In addition, approximately 50 percent of the Tribe's population lives below the poverty line, nearly four times the California average.[339]

337. The Chemehuevi Tribe's economy includes agricultural production, recreation, and tourism. The Tribe's casino and resort provide the majority of local employment and revenue.[340] To the north of the casino, economic activity is limited due to the presence of a wildlife refuge, but to the south, boating, OHV use, and beach tourism provide significant recreation revenue.[341]

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[336] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (367)

[337] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (502)

[338] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (502)

[339] U.S. Census Bureau, 2010 American Community Surveys.

[340] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (392)

[341] Personal communication with Fred Rivera, Conservation Officer for the Chemehuevi, on December 6, 2011.

6.2.3 COLORADO RIVER INDIAN TRIBES

338. The Colorado River Indian Tribes (CRIT) Reservation encompasses approximately 270,000 acres in Arizona and California. Approximately 14,000 acres on the CRIT Reservation along the Colorado River are included in the proposed flycatcher critical habitat designation, as shown in Exhibit 6-3-4.

339. The population on the CRIT Reservation was 8,764 in 2010. Unemployment was estimated at 5.1 percent, and per capita income was $17,432, or approximately two-thirds the averages for Arizona and California. In addition, 26.3 percent of the Tribal population lives below the poverty line.[342]

340. A variety of activities occur on CRIT lands either on or adjacent to the proposed critical habitat. This includes agriculture, casino and resort operations (including a marina), and other tourism related enterprises.[343]

6.2.4 FORT MOJAVE INDIAN TRIBE

341. The Fort Mojave Reservation encompasses 41,914 acres in Arizona, California, and Nevada. Approximately 6,500 acres on the Fort Mojave Reservation along the Colorado River are included in the proposed flycatcher critical habitat designation. The Tribe states in its Southwestern Willow Flycatcher Management Plan that it is not aware of any nest sites; however, potentially suitable habitat may exist. Additionally, the Tribe has had reports of willow flycatchers in some areas, but the subspecies is unknown.[344]

342. The population on the Fort Mojave Reservation in 2010 was 1,477, with an unemployment rate of 11.3 percent. Per capita income was $21,661, which was slightly lower than the averages for the surrounding States. In addition, 28.6 percent of the Tribe's population lives below the poverty line, while in Arizona, California and Nevada, average poverty rates range from 11.9 to 15.3 percent.[345]

343. The Fort Mojave economy includes 15,000 acres of agricultural production and the Avi Resort and Casino in Nevada, in addition to the Spirit Mountain Casino in Arizona. Other tourism and recreation enterprises contribute to the Tribe's economy as well.[346] According to a public comment submitted on the proposed designation of critical habitat, much of the Reservation land proposed as critical habitat is undeveloped, with the exception of isolated areas of intense development north of Plantation Drive. Activities that occur along the undeveloped portions include farming and a wastewater treatment

[342] U.S. Census Bureau, 2010 American Community Surveys.

[343] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (295)

[344] Fort Mojave Indian Tribe Southwestern Willow Flycatcher Management Plan. Provided through personal communication with Luke Johnson, Director of Environmental Protection for Fort Mojave, on December 12, 2011.

[345] U.S. Census Bureau, 2010 American Community Surveys.

[346] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (413)

plant.[347] The Tribe describes the areas newly proposed in 2011 as heavily developed; economic activity along this stretch of the river includes a resort, housing development, and irrigated agriculture.[348]

6.2.5 HUALAPAI TRIBE

344. The Hualapai Reservation encompasses nearly one million acres in northern Arizona; flycatcher habitat on this reservation is located on the southern shore of the Colorado River, across from Grand Canyon National Park. Approximately 1,750 acres on the Hualapai Reservation are included in the proposed flycatcher critical habitat designation.

345. The 2010 population on the Hualapai Reservation was 1,335. The unemployment rate reached 15.1 percent in 2010, approximately equal to the average for Arizona.[349] The 2010 Census identifies per capita income of $12,209, less than half the average for Arizona. In addition, approximately 41.2 percent of the Tribe's population lives below the poverty line.[350]

346. The economy on the Hualapai Reservation is primarily based on tourism and recreation, although agriculture also plays a significant role.[351] Helicopter, Hummer, and ATV tours, as well as pontoon boat tours and river rafting, operate at Grand Canyon West, and serve an estimated 100,000 visitors each year. The Hualapai Tribe also owns the Grand Canyon Resort Corporation, which operates the Hualapai Lodge in addition to other facilities. [352]

6.2.6 IIPAY NATION OF SANTA YSABEL

347. The Iipay Nation of Santa Ysabel is located on the Santa Ysabel Reservation, which encompasses 15,257 acres in Southern California. Approximately 21.8 acres on the Santa Ysabel Reservation along the San Felipe Creek are included in the proposed flycatcher critical habitat designation.

348. The U.S. Census estimated the population of the Santa Ysabel Reservation in 2010 to be 330. The unemployment rate was 30.9 percent in 2010, approximately three times the average for California.[353] Per capita income was $14,684 in 2010, approximately half the average for California. In addition, approximately 15.0 percent of the population of the Santa Ysabel Reservation lives below the poverty line.

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[347] Public comment by John Algots, Director of the Physical Resources Department for the Fort Mojave Indian Tribe, submitted in response to the Proposed Rule for designation of flycatcher critical habitat. Oct 4, 2011.

[348] Fort Mojave Indian Tribe Southwestern Willow Flycatcher Management Plan. Provided through personal communication with Luke Johnson, Director of Environmental Protection for Fort Mojave, on December 12, 2011.

[349] U.S. Census Bureau, 2010 American Community Surveys.

[350] U.S. Census Bureau, 2010 American Community Surveys.

[351] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (323)

[352] Personal communication with Kerry Christensen, Senior Scientist for Hualapai Tribe, on December 5, 2011.

[353] A substantially higher unemployment rate of 84 percent was reported by the BIA labor report in 2001. (Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005, p. 477.

349. The Santa Ysabel's economy is based primarily on the gaming industry.[354]

6.2.7 LA JOLLA BAND OF LUISEÑO INDIANS

350. The La Jolla Band of Luiseño Indians is located on the La Jolla Reservation, which encompasses 8,541 acres in Southern California. Approximately 211.6 acres on the La Jolla Reservation along the San Luis Rey River are included in the proposed flycatcher critical habitat designation.

351. The U.S. Census estimated the population of the La Jolla Reservation to be 476 in 2010. The unemployment rate was 13.2 percent in 2010, though a substantially higher rate of 56 percent was reported by the BIA in 2001.[355] Per capita income was $24,167 in 2010, similar to the average for California. In addition, approximately 9.4 percent of the Tribe's population lives below the poverty line.

352. The Tribe's economy is primarily seasonal, as the Tribe's three main enterprises (selling camping supplies, a paintball-water park, and a speed track) operate only during the summer.[356]

6.2.8 NAVAJO NATION

353. The Navajo Nation, which comprises more than 17 million acres, is the largest Indian reservation in the United States and falls within northeast Arizona, northwest New Mexico, and southeast Utah. Approximately 5,600 acres of land along the San Juan River in New Mexico and Utah have been proposed as critical habitat. The portion of these lands in Utah falls at the northern boundary of the Reservation.

354. The population on the Navajo Reservation in 2010 was 173,667. The unemployment rate was 15.6 percent, and per capita income was $10,547. Approximately 38 percent of the population was living below the poverty line.[357]

355. Given the Nation's large size, the Navajo economy is diverse and difficult to characterize. In the areas surrounding proposed critical habitat on the San Juan River, permits for hiking, camping, and other recreation generate Tribal revenue.[358] In the southern portion of the San Juan River in New Mexico, near the town of Shiprock, development and small-scale agriculture also contribute to the economy.[359]

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[354] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (477)

[355] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (572)

[356] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (430-431)

[357] U.S. Census Bureau, 2010 American Community Surveys.

[358] Navajo Nation Parks and Recreation website, accessed at http://www.navajonationparks.org/htm/sanjuan.htm.

[359] Personal communication with Chad Smith, Zoologist for the Navajo Natural Heritage Program, and Viola Willeto, Wildlife Manager, on December 21, 2011.

6.2.9 OHKAY OWINGEH

356. The Ohkay Owingeh, also known as the San Juan Pueblo, are located on the San Juan Indian Reservation in Rio Arriba County, New Mexico. The Reservation encompasses 26,198 acres along the Rio Grande north of Santa Fe. Nearly 2,000 acres on the San Juan Pueblo are included in the proposed flycatcher critical habitat designation.

357. According to 2010 Census data, the population on the San Juan Pueblo was 6,309. The unemployment rate was 13.6 percent, which was nearly twice the average for New Mexico (7.2 percent). Per capita income was $18,034. In addition, approximately 24 percent of the Pueblo's population lives below the poverty line, which is significantly higher than the average for New Mexico of 18.4 percent.[360]

358. Economic activities undertaken by the Ohkay Owingeh include agricultural production and livestock grazing, casino and resort operations, and some recreation and tourism. The Reservation encompasses approximately 1,200 acres of irrigated agriculture land and 10,000 acres of rangeland. Additionally, construction of an airport began in 2004, and the Tribe has plans for a 500-acre industrial park as well.[361]

6.2.10 PALA BAND OF LUISEÑO MISSION INDIANS

359. The Pala Band of Luiseño Mission Indians is located on the Pala Reservation, which encompasses 11,893 acres in Southern California. Approximately 325.8 acres on the Pala Reservation along the San Luis Rey River are proposed for exclusion. In addition to this area indicated as Pala Reservation land in the Proposed Rule, the Tribe has also indicated that it owns, and/or has outstanding applications for, fee lands adjacent to and near the Reservation which are included in the proposed designation.[362] These areas include a parcel just west of the areas currently proposed for exclusion, and an area of land approximately five miles to the southwest of the Reservation, near the crossroads of I-15 and S.R. 76, also on the San Luis Rey River.

360. The 2010 population on the Pala Reservation was 1,315. The unemployment rate was 6.6 percent in 2010, though a substantially higher rate of unemployment of 62 percent was reported by the BIA in 2001.[363] Per capita income was $19,549 in 2010, approximately two-thirds the average of the state of California. In addition, approximately 32.4 percent of the Tribe's population lives below the poverty line, more than double the state average.

361. Agricultural enterprises (specifically growing alfalfa and avocados) are the Tribe's primary source of revenue and employment. The Tribe also maintains a gaming facility,

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[360] U.S. Census Bureau, 2010 American Community Surveys.

[361] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (572)

[362] Letter from Robert H. Smith, Chairman, Pala Band of Mission Indians, "Re: Comments on the Proposed revised Designation of Critical Habitat for Southwestern Willow Flycatcher", dated October 13, 2011.

[363] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (447)

the Pala Casino Resort and Spa, while Sand and gravel mining also contributes substantially to the Tribe's economy.[364]

6.2.11 PUEBLO DE SAN ILDEFONSO

362. The San Ildefonso Pueblo encompasses 39,449 acres in New Mexico north of Santa Fe. Approximately 1,100 acres of San Ildefonso Pueblo lands along the Rio Grande are included in the proposed flycatcher critical habitat designation.

363. The 2010 population on the San Ildefonso Pueblo and off-reservation population was 1,752. The unemployment rate was 12.9 percent, higher than the average for New Mexico, and per capita income was $26,131. In addition, approximately nine percent of the Pueblo's population lives below the poverty line, compared to 18.4 percent for the State of New Mexico.[365]

364. The Pueblo's economy consists primarily of tourism, as well as approximately 500 acres of irrigated agriculture, 25,000 acres of livestock rangeland, and sand, gravel, and pumice mining.[366]

6.2.12 QUECHAN INDIAN TRIBE

365. The Quechan Tribe, previously called the Yumas, resides on the Fort Yuma-Quechan Tribe Reservation, which encompasses 43,942 acres in southern Arizona and California. Approximately 1,480 acres along the Colorado River on the Reservation are included in the proposed flycatcher critical habitat designation.

366. The 2010 population on the Reservation was 2,197. The unemployment rate was 18.9 percent in 2010, significantly higher than the 15.3 percent and 13.7 percent averages for Arizona and California, respectively. Per capita income was $9,512 in 2010, or nearly one third the averages for Arizona and California. In addition, approximately 36.6 percent of the Tribe's population lives below the poverty line.[367]

367. The Reservation's economy includes agriculture, tourism, and recreation. The Paradise Casino opened in 1996, and the Tribe also operates four trailer and RV parks and a parking lot outside the port of entry into Algodones, Baja California, Mexico. In addition, 700 acres of Tribal land are irrigated for agriculture.[368]

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[364] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (447)

[365] U.S. Census Bureau, 2010 American Community Surveys.

[366] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (750)

[367] U.S. Census Bureau, 2010 American Community Surveys.

[368] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (305)

6.2.13 RAMONA BAND OF CAHUILLA

368. The Ramona Band of Cahuilla is located on the Ramona Indian Reservation, which encompasses approximately 560 acres in Southern California. Approximately 4.4 acres on the Ramona Reservation along the Bautista Creek are proposed for exclusion.

369. The population on the Ramona Reservation was estimated to be 13 in 2010. Though statistics are not available in the 2010 Census for the Ramona Reservation, the Ramona are part of the Cahuilla Tribe, whose reported population was 68 in 2010, and reported unemployment rate was 43.8 percent. The BIA labor report, however, reported an unemployment rate of 11 percent in 2001.[369] The Cahuilla per capita income in 2010 was $11,704, with 41.9 percent of the population living below poverty.

370. The Ramona Band is working to develop their economy by building an eco-resort, which will be fully powered using renewable energy, with a U.S. Department of Energy grant.[370]

6.2.14 RINCON BAND OF LUISEÑO INDIANS

371. The Rincon Band of Luiseño Indians is located on the Rincon Reservation, which encompasses 4,276 acres in Southern California. Approximately 84.6 acres on the Rincon Reservation along the San Luis Rey River are proposed for exclusion. In addition to this area indicated as Rincon Reservation land in the Proposed Rule, the Rincon Band has also indicated that it owns fee lands for which a fee to trust application has been filed.[371]

372. The U.S. Census Bureau reports the population on the Rincon Reservation to be 1,215 in 2010. The unemployment rate was 9.7 percent in 2010, though a substantially higher unemployment rate of 51 percent was reported by BIA in 2001.[372] Per capita income was $24,840 in 2010. In addition, approximately 20.9 percent of the Rincon Band's population was below poverty level in 2010.

373. The Rincon's economy is primary reliant on gaming facilities, but the Tribe also leases avocado and citrus groves to private operators.[373]

6.2.15 SAN CARLOS APACHE TRIBE

374. The San Carlos Apache Reservation encompasses over 1.8 million acres in southeast Arizona. Approximately 22,000 acres along the Gila River are included in the proposed flycatcher critical habitat designation.

375. Based on U.S. Census data, the population on the San Carlos Apache Reservation was 10,068 in 2010, and the unemployment rate was 19.8 percent.[374] However, in a letter from

[369] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (386)

[370] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (457)

[371] Letter from Bo Mazzetti, Chairman, Re: Proposed Revised Critical Habitat Designation for the Southwestern Willow Flycatcher, dated October 10, 2011.

[372] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (462)

[373] *Ibid.*

the Tribe dated March 27, 2012, which includes the April 2011 San Carlos Apache Tribe Official Labor Force Report, the Tribe estimates the current unemployment rate at 67 percent and the poverty rate at 50 percent.[375] According to Census data, San Carlos Apache per capita income was $10,222 in 2010, or less than half of the Arizona average. In addition, the Census estimates the poverty rate at 46 percent.[376]

376. A large portion of the Tribe's economy is based on tourism and recreation, through the Apache Gold Casino and resort, as well as San Carlos Lake. Livestock ranching also contributes significantly, generating over $1 million annually.[377] The Tribe has stated that the primary uses of the Gila River at this time are agricultural and recreational.[378]

6.2.16 SANTA CLARA INDIAN PUEBLO

377. The Santa Clara Pueblo encompasses 45,824 acres in New Mexico, approximately 25 miles northwest of Santa Fe. Approximately 1,800 acres on Santa Clara Pueblo lands along the Rio Grande are included in the proposed flycatcher critical habitat designation.

378. The 2010 population on the Santa Clara Pueblo was reported as 11,021. The unemployment rate was 7.4 percent; per capita income was $22,182, and nearly 23 percent of the Pueblo's population lived below the poverty line. These statistics are similar to the averages for the State of New Mexico; however, economic conditions in the region significantly lag below national statistics.[379]

379. Economic activities occurring on the Pueblo include operation of a casino, a golf club, and the Santa Clara Canyon Recreational Area. The Pueblo also relies on irrigated agriculture in the floodplain of the Rio Grande, as well as livestock grazing.[380]

6.2.17 SOUTHERN UTE TRIBE

380. The Southern Ute Indian Reservation encompasses approximately 315,000 acres in southwestern Colorado. More than 2,600 acres of Reservation land along the Los Pinos River have been proposed as critical habitat. However, the Tribe has raised the concern that there is "sonogram evidence from the United States Geological Survey indicating

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[374] U.S. Census Bureau, 2010 American Community Surveys.

[375] Letter from Alexander B. Ritchie, Office of the Attorney General, San Carlos Apache Tribe, "Re: Comments for the Draft Economic Analysis Regarding Designation of Critical Habitat for the Southwestern Willow Flycatcher," dated March 27, 2012; and Official Labor Force Report. San Carlos Apache Tribe Planning & Economic Development. April 2011.

[376] U.S. Census Bureau, 2010 American Community Surveys.

[377] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (348)

[378] Letter from Alexander B. Ritchie, Office of the Attorney General, San Carlos Apache Tribe, "Re: Comments for the Draft Economic Analysis Regarding Designation of Critical Habitat for the Southwestern Willow Flycatcher," dated March 27, 2012.

[379] U.S. Census Bureau, 2010 American Community Surveys.

[380] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (760)

that a different, common sub-species, not the endangered southwestern sub-species, occurs on the Reservation."[381]

381. The population of the Southern Ute Reservation was 12,153 in 2010. Unemployment was estimated at 5.4 percent, compared to the Colorado State average of 6.8 percent. Per capita income was $27,714, and 8.4 percent of the population lived below the poverty line. This was lower than the statewide average for Colorado, at 12.2 percent.[382]

382. The Tribal economy includes significant forestry, agriculture, and livestock operations, as well as the Sky Ute Casino. More than 90 percent of the Tribe's income is associated with natural gas production on the Reservation. The Tribe also brings in approximately $30,000 per year in fishing permit revenues, a portion of which is associated with the Los Pinos River, proposed as critical habitat.[383] Over the next five years, the Tribe expects that construction of new gas wells and pipelines will lead to a 10 to 15 percent increase in Tribal revenue.[384]

6.2.18 YAVAPAI-APACHE NATION

383. The Yavapai-Apache Nation is located on a collection of land parcels known as Camp Verde Reservation. The approximately 1,800 acres of the Reservation are distributed in parcels located near Clarkdale, Middle Verde, Camp Verde, Rimrock, and at the I-17 interchange for the Montezuma Castle National Monument in Arizona.[385] Approximately 220 acres, or 12 percent of the Reservation, are included in the proposed flycatcher critical habitat.

384. The Camp Verde Reservation is home to more than 2000 Tribal members.[386] As reported by the U.S. Census, the unemployment rate was 12.3 percent in 2010, nearly double the average for Arizona. Per capita income was $10,275 in 2010, less than half the average for Arizona. In addition, approximately 42.4 percent of the Tribe's population lives below the poverty line.[387]

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[381] "Potential socio-economic impacts of critical habitat designation for southwestern willow flycatcher on Southern Ute Indian Reservation." Provided through written communication with Steve Whiteman, Head of the Southern Ute Division of Wildlife, on December 8, 2011.

[382] U.S. Census Bureau, 2010 American Community Surveys.

[383] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (510)

[384] "Potential socio-economic impacts of critical habitat designation for southwestern willow flycatcher on Southern Ute Indian Reservation." Provided through written communication with Steve Whiteman, Head of the Southern Ute Division of Wildlife, on December 8, 2011.

[385] Public comment of Susan B. Montgomery, Special Legal Counsel to the Yavapai-Apache Nation, submitted in response to the Proposed Rule for designation of flycatcher critical habitat. October 14, 2011.

[386] Ibid.

[387] U.S. Census Bureau, 2010 American Community Surveys.

385. The Tribal economy includes agriculture, the Cliff Castle Casino (including a bowling center and live entertainment venues), and other recreation and tourism enterprises.[388]

6.2.19 ZUNI PUEBLO

386. The Zuni Pueblo encompasses approximately 460,000 acres in New Mexico, as well as smaller, non-contiguous parcels in Arizona. The Reservation is adjacent to the Ramah Navajo Reservation and the Cibola National Forest. Approximately 6,540 acres of Reservation land along the Zuni River and Rio Nutria in New Mexico are included in the proposed designation of critical habitat. Additionally, approximately 540 acres along the Zuni River that were initially identified by the Service as Ramah Navajo Reservation lands have been identified by the Ramah Navajo and Zuni Pueblo Realty Offices as occurring within the Zuni Pueblo.[389] Thus, a total of 7,082 acres of Zuni Pueblo land is proposed as critical habitat.

387. According to Census data, the population of the Zuni Pueblo in 2010 was 7,891. The unemployment rate was 8.8 percent, slightly higher than average for the State of New Mexico. Per capita income was estimated at $10,081, with approximately 37 percent of the population living below the poverty line. In comparison, the poverty rate for New Mexico was 18.4 percent.[390]

388. Economic activities on the Zuni Pueblo include livestock production, forestry operations, and retail and manufacturing services such as the Pueblo of Zuni Arts and Crafts Enterprise.[391]

6.3 BASELINE PROTECTIONS

389. Nearly all of the potentially affected Tribes currently undertake conservation efforts for the protection of the flycatcher or other riparian species. Tribal activities that may affect the flycatcher are covered under management plans, established BMPs, and Tribal ordinances. The following sections discuss these baseline protections in greater detail by Tribe.

6.3.1 BARONA BAND OF MISSION INDIANS AND VIEJAS BAND OF KUMEYAAY INDIANS

390. The Barona and Viejas Bands intend to develop a comprehensive management plan for the Capitan Grande Reservation which will include flycatcher. Though the Viejas do not currently have flycatcher-specific conservation efforts in place, the Tribes have undertaken resource management activities in the Capitan Grande Reservation that may

[388] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (290)

[389] Personal communication with Mike Henio, Natural Resources Director for the Ramah Navajo Chapter, on December 9 and December 13, 2011; personal communication with Kee Lee, Ramah Navajo Realty Office, on March 16, 2012; and personal communication with Shirley Bellson, Zuni Pueblo Realty Office, on March 16, 2012.

[390] U.S. Census Bureau, 2010 American Community Surveys.

[391] Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (771)

benefit flycatcher and its habitat, including fuel management activities and a deer hunting moratorium. In general, activities on the Reservation have been conservation oriented, and existing Tribal restrictions on allowable uses for the land have been effective in preserving pristine suitable habitat for flycatcher.[392]

6.3.2 CHEMEHUEVI TRIBE BASELINE PROTECTIONS

391. The Chemehuevi Tribe has developed a Southwestern Willow Flycatcher Management Plan that calls for wildfire control, native vegetation improvement projects, minimization of impacts due to recreational and other uses of riparian areas, and collaboration with the Service to prevent burro damage to suitable habitat, within funding limits. This Plan identifies management of saltcedar and native willow, cottonwood, and mesquite to promote native vegetation. Additionally, developments along the Colorado River – recreational or otherwise – will consider flycatcher habitat needs. Chemehuevi management of the flycatcher may also work in conjunction with the Lower Colorado River Multi-Species Conservation Plan (LCR MSCP).[393] Conversations with the Tribal Conservation Officer confirmed that the Chemehuevi are actively involved in saltcedar removal and revegetation with native plant species.[394]

6.3.3 COLORADO RIVER INDIAN TRIBES BASELINE PROTECTIONS

392. The CRIT have finalized a management plan for the flycatcher. This Plan identifies a schedule for surveying breeding habitat and monitoring nesting activity. Protection of breeding habitat is accomplished primarily through the Ahakhav Tribal Preserve and in areas established for the flycatcher by the LCR MSCP. Measures to protect habitat from fire, overgrazing, recreation, and development are established in the Plan, as well as measures to identify and protect migration habitat.[395]

6.3.4 FORT MOJAVE INDIAN TRIBE BASELINE PROTECTIONS

393. The Fort Mojave Tribe finalized a Southwestern Willow Flycatcher Management Plan prior to the previous designation of critical habitat in 2005, and revised the plan in September 2011 to include protections specific to areas proposed as critical habitat in 2011. According to the Tribe, the Plan has been successful since its implementation, resulting in no loss of flycatcher habitat.[396]

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[392] Letter from Art Bunce, Tribal Attorney, "Comments of the Barona Band of Mission Indians on Proposed Revised Designation of Critical Habitat for Southwestern Willow Flycatcher", dated October 13, 2011; and Letter from Anthony R. Pico, Chairman, Viejas Band of Kumeyaay Indians, "Re: Comments on the Proposed Rule for Revised Critical Habitat on the Southwestern Willow Flycatcher," dated October 14, 2011.

[393] U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Designation of Revised Critical Habitat for Southwestern Willow Flycatcher; Proposed Rule. Published in the Federal Register on August 15, 2011, 76 FR 50542.

[394] Personal communication with Fred Rivera, Chemehuevi Conservation Officer, on December 6, 2011.

[395] U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Designation of Revised Critical Habitat for Southwestern Willow Flycatcher; Proposed Rule. Published in the Federal Register on August 15, 2011, 76 FR 50542.

[396] Public comment by John Algots, Director of the Physical Resources Department for the Fort Mojave Indian Tribe, submitted in response to the Proposed Rule for designation of flycatcher critical habitat. October 4, 2011.

394. As stated in the revised Plan, the intent is to encourage growth of native willow and cottonwood trees in riparian areas. The Plan commits to "protect [potentially suitable habitat] from further development, enhance [these areas] where possible and, to the best of [the Tribe's] ability, protect them from wildland fire." However, the Plan notes that many of the areas now proposed in 2011 are heavily developed; economic activity along the river includes a resort, housing development, and irrigated agriculture. The river is in places confined to a rocky channel, backed by an armored levee and unarmored dikes. The Tribe states: "While the Colorado River in this reach is mostly barren and the historic floodplain all but completely developed, there are remaining pockets that contain the essential elements of habitat." Of the lands also proposed as critical habitat in 2005, most are "dominated by saltcedar [with] sparse stands of native cottonwood, willow and/or native mesquite. Management strategies include fencing to protect willow and cottonwood habitat; irrigated re-vegetation; and protection from beaver disturbance.[397]

6.3.5 HUALAPAI TRIBE BASELINE PROTECTIONS

395. The Hualapai Tribe finalized a Southwestern Willow Flycatcher Management Plan prior to the previous designation of critical habitat in 2005. According to the Tribe, the Plan has been successfully implemented with "no known negative impacts on flycatcher habitat on the Hualapai Reservation" since that time.[398] The Tribe updated this Plan in response to the 2011 revised proposed critical habitat. Conservation measures established in the Plan include prohibiting helicopter flights within 100 yards of occupied habitat; surveying of suitable habitat during flycatcher breeding season, pending funding (the Bureau of Reclamation last funded these surveys in 2008); placing signage at tourist beaches to increase awareness of flycatcher presence and conservation efforts; and avoiding removal of riparian vegetation.[399] In addition, in conjunction with the Steering Committee for the LCR MSCP, the Tribe has conducted bank stabilization and tamarisk removal projects.[400]

6.3.6 IIPAY NATION OF SANTA YSABEL BASELINE PROTECTIONS

396. Though the Santa Ysabel did not provide information regarding existing protections for flycatcher, according to the 2005 Economic Analysis, the Tribe had plans to designate riparian areas as protected areas for cultural reasons and for habitat management purposes. The San Felipe Creek is used only for cultural activities, and development restrictions were expected.

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[397] Fort Mojave Indian Tribe Southwestern Willow Flycatcher Management Plan. Provided through personal communication with Luke Johnson, Director of Environmental Protection for Fort Mojave, on December 12, 2011.

[398] Public comment from Louise Benson, Chairwoman of the Hualapai Tribe, submitted in response to the Proposed Rule for designation of flycatcher critical habitat. September 20, 2011.

[399] Draft Hualapai Nation Southwestern Willow Flycatcher Management Plan. September 2011. Submitted with public comment from Louise Benson on September 20, 2011.

[400] Personal communication with Dr. Kerry Christensen, Senior Scientist for the Hualapai Tribe, on December 5, 2011.

6.3.7 LA JOLLA BAND OF LUISENO INDIANS BASELINE PROTECTIONS

397. In 2005, the Service accepted a management plan submitted by the Tribe to assist with the protection of the flycatcher and other species. The management plan is still valid, and can continue to be used for the management and protection of the flycatcher.[401]

6.3.8 NAVAJO NATION BASELINE PROTECTIONS

398. The Navajo Nation Department of Fish and Wildlife has an established Navajo Endangered Species List, on which the flycatcher is listed as Endangered. The Navajo assign this status to any "species or subspecies whose prospects of survival or recruitment are in jeopardy."[402] The Species Account for the flycatcher suggests that conservation actions include surveying during breeding season, year-round avoidance of alteration of suitable habitat surrounding known breeding sites, and avoidance of activity within a quarter-mile radius of potential habitat during the breeding season.[403] In addition to offering protection to the flycatcher through its Endangered Species List, the Navajo Nation also undertakes riparian restoration and invasive species control projects when funding is available through the BIA.[404]

6.3.9 OHKAY OWINGEH BASELINE PROTECTIONS

399. The Ohkay Owingeh Tribe has conducted numerous voluntary measures to conserve the flycatcher and its habitat on Tribal lands. These measures generally focus on re-establishing riparian habitat, and consist of removing nonnative vegetation and restoring wetlands. The Tribe estimates that 1,400 acres have been restored, 700 of which are considered flycatcher habitat.[405] The Tribe is also involved in flycatcher monitoring, education of the Tribe and surrounding community, and wildfire prevention through the restoration of native vegetation.[406]

6.3.10 PALA BAND OF MISSION INDIANS BASELINE PROTECTIONS

400. The Pala has developed a management plan to address resource management and conservation of the sensitive species on its lands, which the Tribe cites will provide direct and indirect benefits to flycatcher and its habitat on the Reservation.[407] The Tribe also has

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[401] Letter from LaVonne Peck, Tribal Chair, "Re: Response for the Designation of Revised Critical Habitat for the Southwestern Willow Flycatcher; Attn: FWS-R2-2011-0053", dated September 27, 2011.

[402] Navajo Endangered Species List 2008. Navajo Nation Department of Fish and Wildlife. Accessed at http://nnhp.nndfw.org/endangered.htm.

[403] Southwestern Willow Flycatcher Species Account. Navajo Nation Natural Heritage Program. Accessed at http://nnhp.nndfw.org/a_comname.htm.

[404] Personal communication with Chad Smith, Zoologist for the Navajo Natural Heritage Program, and Viola Willeto, Wildlife Manager, on December 21, 2011.

[405] Personal communication with Charlie Lujan, Director of Environmental Affairs for the Ohkay Owingeh, on December 6, 2011.

[406] U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Designation of Revised Critical Habitat for Southwestern Willow Flycatcher; Proposed Rule. Published in the Federal Register on August 15, 2011, 76 FR 50542.

[407] Letter from Robert H. Smith, Chairman, Pala Band of Mission Indians, "Re: Comments on the Proposed revised Designation of Critical Habitat for Southwestern Willow Flycatcher", dated October 13, 2011.

a required screening and review process by Pala EPA for activities undertaken on the Reservation. This review process includes habitat analysis, impact avoidance and mitigation measures, and design guidance. For projects that may impact threatened or endangered species, Pala EPA works with the project proponent and the Service to ensure appropriate conservation measures are undertaken. Additionally, Pala EPA has an education program for Tribal Members to ensure awareness of habitat and resource constraints on Reservation lands.

401. Other actions taken by the Tribe that may help preserve flycatcher habitat include the creation of a riparian preserve area along the San Luis Rey, an Arroyo Toad Preservation Fund to which $25,000 is funded annually for additional riparian habitat acquisition, preservation, and management, exotic plant removal efforts in the floodway, and actively discouraged use of OHVs in the floodway on the Reservation.[408]

6.3.11 PUEBLO DE SAN ILDEFONSO BASELINE PROTECTIONS

402. In 2003, the San Ildefonso Pueblo completed a flycatcher survey along the Rio Grande as part of the Environmental Assessment (EA) for their Bosque Restoration project. While the surveys and restoration work were funded through BIA and USFS grants, the Tribe expended efforts in the form of staff time to participate in this project and develop an EA. In 2005, the Pueblo conducted another Bosque restoration project that covered approximately 350 acres and would be a collaborative effort with funding from the Corps.[409] The San Ildefonso Pueblo adopted an Integrated Resource Management Plan in 2005 that offers protection to the flycatcher and its habitat.

403. According to a public comment submitted on behalf of the Pueblo, San Ildefonso developed a supplement to this Plan with an addendum focusing on conservation measures as listed in the Service's Southwestern Willow Flycatcher Recovery Plan.[410] In this addendum, specific management strategies for the flycatcher include improving livestock fences; managing recreational areas to protect against off-road vehicles and other threats; controlling exotic plant species; and restoring habitat with native plants.[411] In addition, the Pueblo has collaborated for several years with the Corps and neighboring Pueblos to manage riparian habitat on the Rio Grande.[412]

6.3.12 QUECHAN TRIBE BASELINE PROTECTIONS

404. The Quechan Tribe has completed a flycatcher management plan, which calls for managing riparian saltceder mixed with willow, cottonwood, mesquite, and arrowweed to maximize suitability for nesting. The Plan also states that any permanent land use

[408] Letter from Robert H. Smith, Chairman, Pala Band of Mission Indians, "Re: Comments on the Proposed revised Designation of Critical Habitat for Southwestern Willow Flycatcher", dated October 13, 2011.

[409] Personal communication with James Pena, Natural Resources Department, San Ildefonso Pueblo, September 3, 2004.

[410] Public comment of Peter C. Chestnut, Attorney, on behalf of the San Ildefonso Pueblo. Submitted on October 11, 2011.

[411] "Pueblo de San Ildefonso Integrated Resource Management Plan: Management Goals and Objectives, 2011 Addendum." Submitted with public comment of Perry Martinez, Governor of the San Ildefonso Pueblo. Submitted on October 14, 2011.

[412] Public comment of Perry Martinez, Governor of the San Ildefonso Pueblo. Submitted on October 14, 2011.

changes will consider flycatcher needs in addition to the cultural and economic needs of the Tribe. Monitoring flycatcher presence and habitat condition, pursuant to funding availability, is also called for by the Plan. The Quechan Tribe's management plan may also work in conjunction with flycatcher management by the LCR MSCP.[413]

6.3.13 RAMONA BAND OF CAHUILLA INDIANS BASELINE PROTECTIONS

405. The Ramona Band did not identify any activities that will provide baseline protection for flycatcher on the Reservation.

6.3.14 RINCON BAND OF LUISENO INDIANS BASELINE PROTECTIONS

406. The Rincon Band is developing an HCP in conjunction with the San Diego County North County MSCP. Flycatcher is intended to be a focal species for plan development.[414]

407. In addition to HCP development, the Tribe has implemented a Tribal Resource Conservation Management Plan (TRCMP) for the flycatcher. The TRCMP is intended to serve as an interim measure until the Reservation-wide HCP is complete. The Rincon believe that the early implementation of the TRCMP is providing additional early benefit to flycatcher habitat. Specifically, community education and outreach components of the TRCMP and HCP work to inform Tribal Members of the importance of the area to flycatcher.[415]

6.3.15 SAN CARLOS APACHE TRIBE BASELINE PROTECTIONS

408. The Tribe developed and adopted a Southwestern Willow Flycatcher Management Plan in May of 2005. In June of 2005, the San Carlos Apache Tribal Council adopted the Amended Plan. According to the Tribe, the overall goal of this Plan is "to protect and secure those areas of suitable and potentially suitable habitat for the Southwestern Willow Flycatcher on the San Carlos Apache Reservation while meeting Tribal goals and priorities." Specifically, the Plan calls for continued monitoring, surveying, and cowbird trapping; conducting all restoration activities, such as salt cedar removal, outside of flycatcher breeding season; and assessing all development projects to ensure no net habitat loss or permanent modification. [416] In addition, the Plan requires "consultation with the Tribal biologist before any development or construction activity of any type" occurs within flycatcher habitat.[417] The Tribe notes that its Management Plan has been successfully implemented in cooperation with the Service since its adoption.[418]

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[413] U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Designation of Revised Critical Habitat for Southwestern Willow Flycatcher; Proposed Rule. Published in the Federal Register on August 15, 2011, 76 FR 50542.

[414] Written communication with Tiffany Wolfe, Rincon EPA Director, on December 7, 2011.

[415] Letter from Bo Mazzetti, Chairman, Re: Proposed Revised Critical Habitat Designation for the Southwestern Willow Flycatcher, dated October 10, 2011.

[416] Public comment of Terry Rambler, Chairman of the San Carlos Apache, submitted on October 14, 2011.

[417] Letter from Alexander B. Ritchie, Office of the Attorney General, San Carlos Apache Tribe, "Re: Comments for the Draft Economic Analysis Regarding Designation of Critical Habitat for the Southwestern Willow Flycatcher," dated March 27, 2012.

[418] Public comment of Terry Rambler, Chairman of the San Carlos Apache, submitted on October 14, 2011.

409. In addition, as described in a letter dated March 27, 2012, "the Tribe utilizes an interdisciplinary team in addressing all significant and important decisions pertaining to land management and natural resources matters. The Tribe's interdisciplinary team works together to provide an ecosystem management approach […] to land and species management and preservation."

6.3.16 SANTA CLARA INDIAN PUEBLO BASELINE PROTECTIONS

410. The Santa Clara Pueblo offers protections to the flycatcher through existing conservation measures on Pueblo lands. As the Pueblo describes in their public comment letter to the Service, "Unlike the more transient non-Indian community, we at Santa Clara Pueblo have the most vested interest in promoting a healthy ecosystem and the life it supports simply because we, the Santa Clara Pueblo people, are never leaving our homeland."[419] Although the Pueblo does not have a flycatcher-specific management plan, the Pueblo engages in habitat restoration along the Rio Grande to benefit multiple species; this work includes exotic species removal and native species planting, and wetland creation. Such activities are timed to minimize impacts to nesting and migratory birds and include habitat monitoring. The Pueblo states that their "Rio Grande management activities have increased significantly since [the previous designation of critical habitat in] 2005." In addition, the Pueblo was awarded a "Habitat Enhancement Award" by the New Mexico Riparian Council in 2008 for their riparian restoration work.

411. The Santa Clara Pueblo has also collaborated with the San Ildefonso Pueblo, the Ohkay Owingeh Tribe, and the Corps on the Española Valley Watershed Feasibility Study. This study, running from 2005 through 2012, addresses "the feasibility of constructing projects that holistically address long-term river restoration and flood reduction."[420]

6.3.17 SOUTHERN UTE TRIBE BASELINE PROTECTIONS

412. The Southern Ute Tribe is actively developing a willow flycatcher Management Plan in response to the proposed designation of critical habitat. Specific protections provided by this Plan are not known at this time, but the Tribe states that the Plan "will be sufficiently protective of willow flycatchers and willow flycatcher habitat on the Reservation."[421] The Tribe is also careful to note in its public comment on the proposed designation that "neither this letter nor the management plan that is being prepared by the Tribe should be construed to constitute a concession that the endangered subspecies of willow flycatchers –the southwestern willow flycatcher (*Empidonax traillii extimus*) –has been present on

[419] Public comment of Walter Dasheno, Sr., Governor of the Santa Clara Pueblo. Submitted to the Service on October 13, 2011.

[420] Public comment of Walter Dasheno, Sr., Governor of the Santa Clara Pueblo. Submitted to the Service on October 13, 2011.

[421] "Potential socio-economic impacts of critical habitat designation for southwestern willow flycatcher on Southern Ute Indian Reservation." Provided through written communication with Steve Whiteman, Head of the Southern Ute Division of Wildlife, on December 8, 2011.

the Reservation. The presence of the *extimus* subspecies on the Reservation remains an open question pending further study."[422]

6.3.18 YAVAPAI-APACHE NATION BASELINE PROTECTIONS

413. While the Nation wants to maintain the options to use their lands as they see fit, the Nation also states that it has historically worked to protect wildlife and the unique riparian habitat of the Verde River, and already protects the riparian areas under its jurisdiction. In May 2005, the Nation adopted its Southwestern Willow Flycatcher Management Plan, and Tribal Resolution No. 46-2006, passed in June 2006, also establishes certain land use restrictions and management goals for the Verde River under Tribal law.

414. Specifically, Tribal Resolution No. 46-2006 formally designates a Riparian Conservation Corridor extending from the center of the river to 300 lateral feet on either side of the bankfull stage of the Verde River. Under the Plan and the Resolution, the Nation does not graze cattle near the River, and protects the Corridor from development and permanent modification. The Nation states that these conservation efforts have resulted in no net habitat loss for the flycatcher since the implementation of the Plan. [423]

415. Since the enactment of the Tribal Resolution, the Nation also has taken additional steps to protect the Verde River. For example, the Tribal housing department and planning committee do not allow development within the Riparian Conservation Corridor when evaluating requests for Tribal home sites or when considering other construction activities as part of the Nation's land use planning efforts. The Nation also educates its members on riparian conservation needs, and has undertaken invasive species removal from the Corridor. The Nation also conducts ongoing monitoring and studying of the Verde River riparian habitat.[424]

6.3.19 ZUNI PUEBLO BASELINE PROTECTIONS

416. The Zuni Fish and Wildlife Department states that the Tribe has "become [a] national leader on issues such as Tribal management of endangered species and migratory birds, riparian restoration, [and] wetlands protection." Over the past five years, the Department has completed numerous projects that may offer protection to the flycatcher, including establishment of a riparian/wetlands restoration program and membership on the federal southwestern willow flycatcher recovery team.[425]

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[422] Public comment from Pearl E. Casias, Chairman of the Southern Ute, submitted in response to the Proposed Rule for designation of flycatcher critical habitat. October 12, 2011.

[423] Public comment of Susan B. Montgomery, Special Legal Counsel to the Yavapai-Apache Nation, in response to the Proposed Rule for designation of flycatcher critical habitat. October 14, 2011.

[424] Ibid.

[425] Pueblo of Zuni Fish and Wildlife website, accessed at http://www.ashiwi.org/fishandwildlife/FishandWildlife.aspx.

6.4 POTENTIALLY AFFECTED ACTIVITIES

417. This section highlights Tribal activities occurring within proposed critical habitat areas. As discussed in greater detail below, the likelihood that these activities may be affected by critical habitat designation is uncertain, and Tribes cannot predict the extent to which critical habitat will result in project modifications. Therefore, this section does not quantify impacts associated with any of these activities, but rather qualitatively discusses the types of activities that the Tribes believe may be affected.[426] In some cases, information exists to forecast formal section 7 consultations for specific projects, and the sections below describe these predictions. The estimation of administrative costs and the approach to forecasting informal and technical assistance efforts is described in section 6.5.

6.4.1 BARONA BAND OF MISSION INDIANS AND VIEJAS BAND OF KUMEYAAY INDIANS

418. According to the Tribes, the remaining portions of the Capitan Grande Indian Reservation (i.e., those areas not condemned) have remained uninhabited since 1932. The Tribes confirm that, with the exception of occasional hunting and cultural uses by Tribal members, there has been no activity, construction, or development of any kind since the Tribes last lived there. In addition, the Tribes have no plans to pursue other activities on the land. Despite the lack of past activity, the Barona have stated that their ability to maintain the option of development in these areas "is an important aspect of Tribal sovereignty, particularly the ability to control the timing, content, and nature of the use or development of Reservation land."[427] Further, they state that the unique nature, scarcity, and irreplaceability of Reservation land make it an invaluable resource.[428] The Viejas maintain similar concerns, stating that "the proposed designation would cause Viejas significant hardship, interfering with Viejas's planned management of the Reservation lands and undermining Tribal sovereign government authority."[429]

419. It is important to note that, officially, the Barona Band decline to support an Economic Analysis for the designation of critical habitat on their lands, stating that that such an analysis "ignores federal law by treating the Barona Band as no more than an ordinary private developer. The subject 92 acres[430] of the Capitan Grande Indian Reservation are

[426] We note that all of the tribal lands proposed for designation fall in areas occupied by the flycatcher.

[427] Letter from Art Bunce, Tribal Attorney, "Comments of the Barona Band of Mission Indians on Proposed Revised Designation of Critical Habitat for Southwestern Willow Flycatcher", dated October 13, 2011.

[428] Letter from Art Bunce, "Re: Capitan Grande Indian Reservation Request to Barona Band of Mission Indians for call for comment on the proposed designation of critical habitat for southwestern willow flycatcher," on December 7, 2011.

[429] Letter from Anthony R. Pico, Chairman, Viejas Band of Kumeyaay Indians, "Re: Comments on the Proposed Rule for Revised Critical Habitat on the Southwestern Willow Flycatcher," dated October 14, 2011.

[430] The Barona Band notes that the area shown in the maps in the proposed rule appear almost identical to the 92 acres proposed for and excluded from designation for the arroyo toad. The Tribe points out that they believe only 92 acres of the cited 203.7 to be within the Capitan Grande Reservation, and the remaining 111.7 acres to be located north of the Reservation, outside of Tribally owned areas. (See Letter from Art Bunce, Tribal Attorney, "Comments of the Barona Band of Mission Indians on Proposed Revised Designation of Critical Habitat for Southwestern Willow Flycatcher", dated October 13, 2011.)

of far more economic and other value to the Barona Band than real estate development...", that being said, the Barona Band outlines the following proposed valuation for Tribal lands:

1) "…valuation of the development potential of the acres in question should be conducted as with any ordinary privately-owned land. While it is unlikely that the Barona and Viejas Bands will wish to develop these lands commercially, they insist on retaining the right to do so as would any private developer."

2) "…the use-versatility of trust land is a separate element of value. Instead of having to obey the general plan, zoning, property tax, and other development code of the County of San Diego, as well as restrictions from the State of California (e.g., Subdivision Map Act), any Tribal development on these 92 acres will have to obey only whatever restrictions the Barona and Viejas Bands choose to impose. Such wholesale use-versatility and exemption from property taxation are distinct elements of value…"[431]

420. Additionally, the Barona hold that the areas proposed for designation are also valuable to the Barona and Viejas because they provide physical access to the San Diego River, allowing them to exercise the rights to the water inherent in their ownership of the Reservation lands.[432] According to the Barona,

> This parcel is the ONLY point at which the Tribes may divert the river to use their federally-reserved water rights. In the arid southwest, and especially in San Diego County, the prior and paramount right to the flow of the largest river in the county is of immense value, including economic value…the proposed designation on the subject 92 acres would diminish that value by restricting it, delaying it, limiting it, or increasing the cost of using it to accommodate the designation.[433]

6.4.2 CHEMEHUEVI TRIBE

421. In the past, the Chemehuevi have not been greatly impacted by flycatcher conservation activities. While the Tribe has timed exotic plant removal activities to avoid migratory bird breeding season, they have not consulted on any projects specifically for the flycatcher. As of the previous critical habitat proposal in 2004, the Chemehuevi Tribe was planning to develop additional tourist facilities along Lake Havasu. The large, upscale planned development included a marina, several hotels, housing and condos, and

[431] Letter from Art Bunce, "Re: Capitan Grande Indian Reservation Request to Barona Band of Mission Indians for call for comment on the proposed designation of critical habitat for southwestern willow flycatcher," on December 7, 2011.

[432] Letter from Art Bunce, "Re: Capitan Grande Indian Reservation Request to Barona Band of Mission Indians for call for comment on the proposed designation of critical habitat for southwestern willow flycatcher," on December 7, 2011.

[433] Letter from Art Bunce, "Re: Capitan Grande Indian Reservation Request to Barona Band of Mission Indians for call for comment on the proposed designation of critical habitat for southwestern willow flycatcher," on December 7, 2011.

a new casino. The Chemehuevi economy is largely based on tourism, and this project would have brought significant job opportunities and revenue.[434] However, this planned development never happened.[435] If the Tribe chooses to resume development, they will consult with the Service on this project for a variety of endangered species, including the flycatcher. Any limitations on the project scope or size as a result of consultation could reduce the number of jobs and amount of revenue available to the Tribe. This analysis estimates one consultation over the next 20 years as a result of this planned development.

6.4.3 COLORADO RIVER INDIAN TRIBES

422. In the past, CRIT has undertaken various conservation activities for the flycatcher, including surveys, monitoring and restoration of a large riparian area. These efforts have resulted in the following costs to the Tribe:[436]

- Flycatcher surveys have been performed periodically by the CRIT Department of Fish and Game. In particular, surveys were performed on CRIT lands during 1998, 1999, 2000, and 2002. Each year, surveys cost an estimated $4,000. These costs include field surveys, data entry, and report preparation, and represent CRIT's in-kind contribution to these projects. The projected cost of future annual flycatcher monitoring under the CRIT Southwestern Willow Flycatcher Management Plan is expected to average about $6,000 annually.
- Riparian habitat conservation/restoration activities are primarily undertaken on the Colorado River Indian Reservation by the Ahakhav Tribal Preserve. These activities are directed toward benefiting all riparian wildlife species, including the southwestern willow flycatcher. The Preserve's annual operating budget directed toward these activities has averaged approximately $150,000 per year since 1995.

423. For purposes of this analysis, and because we were not able to obtain more recent cost data from the Tribe, we assume that these costs continue under the baseline.

424. Activities occurring on CRIT lands either within or adjacent to proposed critical habitat include agriculture, casino and resort operations (including a marina), and other tourism related enterprises. Based on available information, these ongoing operations are unlikely to be affected by flycatcher conservation activities. However, any future expansion of these enterprises would likely require consultation for the flycatcher under the proposed critical habitat designation. Economic impacts associated with the potential expansion of these activities could result in incremental administrative efforts for consultation, and potential mitigation measures. At this time, because expansion plans are uncertain, only one formal consultation over the next 20 years has been estimated related to these Tribal enterprises.

[434] Personal communication with David Todd, Environmental Director for the Chemehuevi, on August 24, 2004.

[435] Personal communication with Fred Rivera, Conservation Officer for the Chemehuevi, on December 6, 2011.

[436] Email communication from Charley Land, CRIT Wildlife Manager, September 13, 2004 and September 20, 2004.

6.4.4 FORT MOJAVE INDIAN TRIBE

425. Past consultations for the flycatcher included one formal consultation for a development project (Gold Properties) on the Fort Mojave Reservation. BIA indicated that this project was never undertaken.[437] However, the consultation resulted in the following potential project modifications:[438]

- Surveys to determine the presence/absence of flycatchers on or adjacent to the project site;
- Limitations on surface disturbing activity within 250 feet of occupied habitat, until after flycatchers have migrated out of the area;
- Conservation of replacement habitat if flycatchers are nesting on or adjacent to the project site; and
- Development and implementation of a wetland enhancement plan.

Because the Tribe adopted a Southwestern Willow Flycatcher Tribal Management Plan in 2005 and has implemented it since that time, future consultations are not expected to result in significant project modifications.

426. Currently, activities occurring along the proposed stretch of the Colorado River include a sewage treatment plant, flood control facilities (dikes and levees), irrigated agriculture, and development. The Tribe states that "while the Colorado River in this [newly proposed stretch north of Plantation Drive] is mostly barren and the historic floodplain all but completely developed, there are remaining pockets that contain the essential elements of habitat."[439] In these pockets, the designation of flycatcher critical habitat could have economic impacts associated with project modifications. While future development along the Colorado River is likely, particularly in the intensely developed areas north of Plantation Drive, the Tribe's development plans are uncertain. This analysis estimates one consultation over the next 20 years as a result of this development potential.

427. Additionally, the Tribe draws water from the Colorado River for use by its resort, a housing development, and agriculture.[440] To the extent that critical habitat designation limits water withdrawals, the Tribe could face decreased tourism revenues and increased costs associated with finding replacement water supplies.

[437] Personal communication with Goldie Stroup, Bureau of Indian Affairs, on September 23, 2004.

[438] U.S. Fish and Wildlife Service. Biological Opinion on the Potential Effects of the Proposed Gold Properties Limited, Inc., Development on the Endangered Southwestern Willow Flycatcher. June 5, 1995. File #1-5-95-F-197.

[439] Fort Mojave Indian Tribe Southwestern Willow Flycatcher Management Plan. Provided through personal communication with Luke Johnson, Director of Environmental Protection for Fort Mojave, on December 12, 2011.

[440] Fort Mojave Indian Tribe Southwestern Willow Flycatcher Management Plan. Provided through personal communication with Luke Johnson, Director of Environmental Protection for Fort Mojave, on December 12, 2011.

6.4.5 HUALAPAI TRIBE

428. Based on discussion with the Hualapai Tribe, activities on Hualapai Reservation lands have not been greatly impacted by flycatcher conservation activities to date, and expected future incremental impacts are minimal due to the presence of the Tribal Southwestern Willow Flycatcher Management Plan. However, any additional conservation measures required as a result of critical habitat designation could have significant economic impacts, particularly to the Tribe's tourism and recreation industry. The Hualapai operate helicopter tours and boating enterprises along the Colorado River. Neither of these activities is expected to be impacted by designation of critical habitat or flycatcher conservation activities. The Tribe has not conducted flycatcher surveys since 2008, when the Bureau of Reclamation ceased funding, but estimates that these surveys cost $65,000 per year.[441] To the extent that critical habitat designation requires resuming survey efforts, the Hualapai could face increased costs.

429. Additional consultation efforts are not expected as a result of critical habitat; however, consultations for flycatcher will continue to occur for projects with a Federal nexus. The types of projects affected in the past have included: prescribed burns (timing restrictions), construction of restroom facilities, and habitat conservation projects. The impacts related to these projects have been primarily limited to the administrative costs resulting from consultation efforts.[442]

6.4.6 IIPAY NATION OF SANTA YSABEL

430. The Santa Ysabel did not identify any specific economic activities they expect to be impacted by this proposed designation, however, the 2005 Economic Analysis considered impacts resulting from potential maintenance to an existing road in the area. The Tribe expected potential section 7 consultation costs and surveying costs related to road maintenance.

6.4.7 LA JOLLA BAND OF LUISENO INDIANS

431. Though no specific projects were identified, the La Jolla Band expects economic impacts to Tribal activities if habitat is designated on the Reservation.[443] According to the Tribe, "The designation of critical biological habitat on La Jolla Reservation lands will negatively impact Tribal use of trust resources and the exercise of La Jolla's Tribal rights as a sovereign nation whose lands were provided for the sole use and benefit of Tribal members."[444]

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[441] Personal communication with Dr. Kerry Christensen, Senior Scientist for the Hualapai Tribe, on December 5, 2011.

[442] Personal communication with Don Bay, Hualapai Department of Natural Resources, September 2, 2004.

[443] Personal communication with Rob Roy, EPA Director for the La Jolla Tribe, on December 13, 2011.

[444] Letter from LaVonne Peck, Tribal Chair, "Re: Response for the Designation of Revised Critical Habitat for the Southwestern Willow Flycatcher; Attn: FWS-R2-2011-0053", dated September 27, 2011.

6.4.8 NAVAJO NATION

432. Economic activities on the Navajo Reservation have not previously been affected by flycatcher conservation, and the Nation currently manages the proposed sections of the San Juan River for endangered fish species, as well as offering protection to the flycatcher through the Nation's Endangered Species List. However, flycatcher critical habitat designation could result in increased administrative costs for section 7 consultation, as well as project modifications, for activities including utilities, transportation, and sewer management. Near the town of Shiprock, the Nation is also concerned about potential impacts to residential development, and this analysis estimates one consultation over the next 20 years as a result. Additionally, the Navajo Parks and Recreation Department operates campsites in conjunction with BLM rafting operations along the San Juan River, which could potentially be affected by impacts to tourism as a result of critical habitat designation. Small-scale agriculture also occurs along the river, which could be affected by impacts to irrigation and water management.

6.4.9 OHKAY OWINGEH

433. Activities on the San Juan Indian Reservation likely to be impacted by flycatcher conservation activities are limited to administrative and surveying efforts conducted as part of riparian and wetlands restoration projects. The Tribe generally refrains from developing the riparian areas along the Rio Grande and has not been involved in any previous section 7 consultations for the flycatcher.[445] Restoration projects undertaken by the Tribe began as early as 1994 and have been funded by various agencies under various collaborative programs, such as the Middle Rio Grande Endangered Species Collaborative Program. The Tribe's Environmental Affairs Department employs Tribal members to work on habitat restoration in a holistic manner. Habitat restoration activities include removal of non-native species, flycatcher surveys, and restoration of wetlands.[446]

6.4.10 PALA BAND OF MISSION INDIANS

434. The Tribe expects significant economic impact to result from designation of habitat on Reservation land. The Tribe describes the potential impacts of designating habitat in the Public Comment letter submitted in response to the proposed revised designation:

> Much of the land within the riparian corridor occurs within allotted lands on the Reservation. Allotments were created decades ago with a focus on land division rather than equitable division of developable lands. Allotments are often owned by groups of Tribal individuals and may be the primary asset to those families. Allotments are not readily purchased or sold as they are generally unalienable properties. As a result, the impact of constraining these properties with a Critical Habitat designation can have a crippling effect on a family's assets. These are significantly disproportionate impacts to the allotment owners…Tribal

[445] Personal communication with Charlie Lujan, Director of Environmental Affairs for the Ohkay Owingeh, on December 6, 2011.

[446] Email communication from Charlie Lujan, Director of Environmental Affairs for the Ohkay Owingeh, on September 7, 2004.

> Governments have the capability to provide allottees holding constrained lands alternative land use options through their programs. As a matter of Tribal Law, Tribes may grant their members rights of use and occupancy of Tribal land for home and business purposes. These programs provide Tribes the ability to provide relief to Tribal members with environmentally constrained lands (e.g. in floodway); however, these programs are often integrated with the Tribe's overall resource management plans. This ability to provide alternatives to its Tribal members is among the several reasons that it is more effective and appropriate to have the Pala Tribe govern conservation of natural resources on the Reservation rather than seeking control through federal designation.[447]

435. The Tribe also holds that there are "unique economic and cultural impacts" that result from a designation of habitat on the Reservation:

> Unlike other areas in the region, a Reservation is set in a specific location that has resources exclusively for Tribal use that cannot be moved to other locations if constraint arises. Opportunities for relocation of projects on a Reservation are very limited. As a result, imposition of a constraint on Tribal property is not alleviated by simply locating a project in another region, as can occur in the surrounding county.[448]

436. The Tribe suggests that a method of assessing the economic impact of designating land as critical habitat would be to apply the cost of replacing that land being conserved by obtaining new land under a Fee-to-Trust Transfer. The Tribe provided an estimate of approximately $15,000 per acre in transaction costs associated with the Fee-to-Trust process. Included in this cost are: legal fees, effort associated with obtaining BIA approval, documentation for plans for the property being pursued, negotiations with local governments, and conducting an Environmental Assessment.[449] In addition to this transaction cost, the Tribe provides an estimated range of $10,000 to $25,000 per acre to purchase replacement riparian habitat in San Diego County. If the Tribe were to pursue replacement land for all acres being proposed for designation, an estimate of the total value of the impact would be approximately $8 million to 13 million.[450]

437. Further, the Tribe describes that since many actions on Tribal lands are federally funded, all activities must undergo a section 7 consultation, which can result in increasing delays

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[447] Letter from Robert H. Smith, Chairman, Pala Band of Mission Indians, "Re: Comments on the Proposed revised Designation of Critical Habitat for Southwestern Willow Flycatcher", dated October 13, 2011.

[448] Letter from Robert H. Smith, Chairman, Pala Band of Mission Indians, "Re: Comments on the Proposed revised Designation of Critical Habitat for Southwestern Willow Flycatcher", dated October 13, 2011.

[449] Personal communication with Shasta Gaugen (Pala Tribe EPA Director), and Ted Griswold (Attorney representing the Pala Tribe), on December 7, 2011.

[450] Letter from Shasta Gaugen, Pala EPA Director, "Re: Comments Regarding Partial Draft Economic Analysis for the Proposed Critical Habitat for Southwest Willow Flycatcher," March 21, 2012.

and costs for projects and tasks for Tribal members. In conclusion, the Tribe believes that economic impacts of designating Reservation land as critical habitat extends beyond any specific project-level impacts.

6.4.11 PUEBLO DE SAN ILDEFONSO

438. As stated in its public comments, the Integrated Resource Management Plan that describes the Pueblo's preferred management strategy for the Pueblo's natural resources, "focuses on environmental remediation and enhancement as a priority and not on economic development options." The Pueblo requests exclusion from critical habitat, because 1) it is already working with the Corps and upstream pueblos to restore critical habitat areas; 2) the Pueblo's motivation to repair and protect its lands, including the flycatcher's critical habitat is strong; and 3) exclusion of the Pueblo's land supports the policy of the Federal government that Indian Tribal governments should make their own laws and be governed by them." Thus, although the Pueblo may not have immediate plans for economic development of the riparian area along the Rio Grande within its boundaries, the Pueblo is concerned about the potential impacts of critical habitat designation on their relationship with the Service. For purposes of quantifying impacts related to San Ildefonso Pueblo, only administrative costs related to consultation are quantified. This analysis assumes that four formal consultations with this Pueblo will occur over the time period for this analysis.

6.4.12 QUECHAN TRIBE

439. The Quechan Tribe has previously used BIA funding to conduct surveys for the flycatcher and to remove riparian saltcedar. To the extent that these activities continue into the future, baseline costs associated with flycatcher conservation include the economic impacts of prohibiting vegetation removal during the flycatcher breeding season.[451] Avoiding flycatcher breeding season results in having to remove vegetation from marshy areas during the wet season, rather than during the summer when the water table drops and precipitation is infrequent; as a result, projects are more difficult and costly. Additionally, Tribal employment may drop as a result of postponing work during the breeding season.[452]

440. The Tribe may also face administrative costs associated with section 7 consultation for any future development along the Colorado River. Although updated information regarding potential economic activities or planned developments within proposed critical habitat was not available for this analysis, previous information indicates that the Tribe has considered construction of recreational facilities, such as RV parks, a marina, restaurants, and stores.[453]

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[451] Personal communication with Arlene Kingery, Environmental Department, Quechan Tribe, August 18, 2004.

[452] Personal communication with Arlene Kingery, Environmental Department, Quechan Tribe, November 3, 2004.

[453] Personal communication with Brian Golding, Economic Development Dept., Quechan Tribe, on September 27, 2004, and Arlene Kingery, Environmental Department, Quechan Tribe, on August 18, 2004.

6.4.13 RAMONA BAND OF CAHUILLA INDIANS

441. According to the Ramona Band, the area proposed for designation undergoes a high level of economic activity. Within the area being proposed, there is a road, an ecotourism project that has been under development for the past 12 years, and there is frequent cultural use of the area as a gathering site. In total, the Ramona Band estimates that there may be approximately four major projects in the area that would require some level of section 7 consultation with the Service in the next 20 years.

442. The Ramona Band also maintains that they have experienced project delays due to impacts from other species, such as the Quino checkerspot butterfly, and fear that designation of habitat for flycatcher will result in the same. Aside from these specific concerns, the Tribe maintains that it is important to be able to maintain procedural control for Reservation lands for planning and management purposes. [454]

6.4.14 RINCON BAND OF LUISENO INDIANS

443. No specific projects that may be impacted by flycatcher conservation have been identified by the Rincon. However, as described above, the Rincon Band is developing an HCP in conjunction with the San Diego County North County MSCP. The Tribe maintains, however, that the designation of critical habitat poses substantial risks to the HCP in the form of added regulatory uncertainty, increased cost of plan development and implementation, and weakened stakeholder support.[455] The incremental impact of the designation on the HCP has not been identified. This analysis assumes that a section 7 consultation on this HCP will occur related to flycatcher critical habitat designation.

6.4.15 SAN CARLOS APACHE TRIBE

444. As stated in the San Carlos Apache Tribe's public comments on another species, the Gila chub, "due to the unique Trust relationship between the United States and the Tribe, a significant number of Tribal programs, activities, and development projects require Federal government involvement, funding, or oversight. Thus…there will frequently be a Federal nexus requiring costly section 7 consultation with the [Service] for any Tribal project, activity, or development endeavor."[456] Past economic impacts related to flycatcher conservation include costs of administrative efforts, surveying and monitoring, and cowbird trapping.

445. Based on conversations with Tribal staff, potential future impacts to San Carlos Apache activities related to flycatcher conservation efforts could include the following:

- Administrative and conservation-related costs;
- Impacts on water use by the Tribe, as well as potential water exchanges;

[454] Personal communication with Reggie Agunwah, Environmental Director for Ramona Tribe, on December 7, 2011.

[455] Letter from Bo Mazzetti, Chairman, Re: Proposed Revised Critical Habitat Designation for the Southwestern Willow Flycatcher, dated October 10, 2011.

[456] Public comments of Susan B. Montgomery, Sparks, Tehan, and Ryley P.C., Special Counsel to the San Carlos Apache Tribe, "Comments to Proposed Rule to Draft Environmental Assessment and Final Draft Economic Analysis of Critical Habitat for the Gila chub." September 30, 2005.

- Limitations on livestock use and agricultural production of proposed critical habitat;
- Impacts to recreational and tourism activities;
- Impacts to forest resource management, including fire management; and
- Impacts to cultural and traditional activities.

Each of these impacts is discussed in more detail below.

Administrative and Conservation-Related Costs

446. Consulting with the Service, surveying for flycatchers, and implementing the Tribe's flycatcher management plan require use of the Tribe's limited resources. The San Carlos Apache have consulted on at least twenty projects in the past for which the Service considered effects to the flycatcher.[457] Recent consultation history indicates that the Tribe has participated in two formal section 7 consultations in 2009 and two informal consultations in 2010. The Tribe estimates approximate costs, including "in addition to the time and expenses incurred by the interdisciplinary team [for Tribal ecosystem management], the costs of outside expert consultants and attorneys," of $1,300 to $6,500 per consultation.[458] The high estimate is greater than the third party administrative costs listed in Exhibit 2-3. The Tribe suggests that administrative costs may be greater for the San Carlos Apache because of the rural and dispersed nature of the Reservation.[459]

447. The Tribe has also conducted flycatcher surveys since 1998, which cost approximately $15,000 annually. In addition, the San Carlos Apache spent approximately $1,000 for cowbird trapping in 2004, the first year in which the Tribe set cowbird traps. These flycatcher surveying and cowbird trapping costs are expected to continue under the baseline scenario. [460] Additionally, the Tribe recently incurred approximately $1,100 of expenses for flycatcher surveying equipment.[461]

Water Exchange Project

448. In addition to administrative and surveying costs, this analysis considers potential future impacts related to two proposed projects that would provide additional water to the San Carlos Apache. The first project involves a water exchange. Under a proposed project, the USBR oversees the sale of up to 20,000 acre-feet of Central Arizona Project (CAP) water to the San Carlos Apache to be supplied downstream of San Carlos Reservoir and Coolidge Dam. The purchase of CAP water would allow the Tribe to maintain a

[457] Faxed information from Mary Jo Stegman dated August 5, 2004. "U.S. Fish and Wildlife Service Section 7 Consultations with the San Carlos Apache Tribe (1995 – 2004) that Involve the Southwestern Willow Flycatcher."

[458] Letter from Alexander B. Ritchie, Office of the Attorney General, San Carlos Apache Tribe, "Re: Comments for the Draft Economic Analysis Regarding Designation of Critical Habitat for the Southwestern Willow Flycatcher," dated March 27, 2012.

[459] *Ibid.*

[460] Personal communication with Stefanie White, San Carlos Apache Recreation and Wildlife Department, August 24, August 26 and September 8, 2004.

[461] Letter from Alexander B. Ritchie, Office of the Attorney General, San Carlos Apache Tribe, "Re: Comments for the Draft Economic Analysis Regarding Designation of Critical Habitat for the Southwestern Willow Flycatcher," dated March 27, 2012.

minimum pool in the San Carlos Reservoir in lieu of releasing water out of the San Carlos Reservoir; the Tribe will likely seek to implement this water exchange water annually in perpetuity. A March 2004 Biological Opinion addressed this proposed water exchange, although the exchange did not take place that year. This Opinion recommended that USBR undertake a variety of activities, including additional research and monitoring, cowbird trapping, installation of meters, and reporting.[462] While these or similar measures would be expected if a similar project is proposed in the future, this project would likely be reevaluated before the exchange could occur; thus, future impacts are uncertain.

449. The March 2004 Biological Opinion requires the USBR to investigate flow regimes appropriate to support flycatcher habitat from Coolidge Dam to Kelvin. The Service did not, however, establish any minimum flow requirements. Rather, the Opinion states, "at this time, we cannot articulate a minimum flow […] that is needed to maintain flycatcher sites and to provide for adequate forage base for reproduction."[463] Because the science needed to determine minimum flow is not currently available, it is unlikely that the Service would require minimum flows to protect the flycatcher over the 20-year period of this analysis.[464]

450. Because the reasonable and prudent measures that the Service will require if this project proceeds are not currently known, this section provides information on Tribal activities that could be affected by restrictions to reservoir levels. In particular, restrictions to reservoir levels could affect income from recreational activities, including fishing license fees, camping fees, and revenues from the marina and store. Recreational activity also supports employment on the Reservation.[465] If flycatcher conservation efforts impact reservoir levels at the San Carlos Reservoir, these revenues and jobs could be at risk.

451. Another potential impact to the water exchange project stems from the fact that the San Carlos Apache may have to pay for the delivery of CAP water before the section 7 consultation is complete. If flycatcher conservation were to affect the Tribe's ability to complete an exchange after the Tribe had already paid, the Tribe could face economic losses. The Tribe's cost of CAP water is estimated at $79 per acre-foot; this equates to $1.6 million for 20,000 acre-feet.[466] While it is not certain that this payment will be lost, the Tribe anticipates that this is a potential high-end cost of flycatcher conservation.

452. In addition, Tribal representatives have stated that conditions set forth in future section 7 consultations could have an adverse economic impact on the Tribe "through curtailing of development, unexpected administrative or compliance costs, or by requiring costly

[462] U.S. Fish and Wildlife Albuquerque Regional Office. 2004. Biological opinion on the Bureau of Reclamation's Approval of Water Exchange by the San Carlos Apache Tribe for Retention in San Carlos Reservoir, March 8.

[463] Ibid.

[464] Personal communication with Service personnel, Region 2, August 9, 2004.

[465] Letter from Joe Sparks, Sparks, Tehan & Ryley, P.C. re: Request for Information Regarding Possible Designation of Critical Habitat for the Southwestern Willow Flycatcher, dated September 7, 2004.

[466] Ibid.

mitigation measures."[467] Based on the reasonable and prudent measures in the March 2004 Opinion, these types of impacts are not quantified in the analysis, though the analysis recognizes that such impacts are possible.

Water Delivery System Project

453. The second water project for which the Tribe has raised concerns involves construction of a system to deliver CAP water to the San Carlos Apache. This water would primarily be used for agricultural irrigation, although other uses may include municipal, commercial, and industrial purposes, and to provide recreational, cultural, and biological amenities. As of 2005, the scope of the project and delivery method had not been decided. Given the uncertainty associated with this project, it is not possible to anticipate future impacts related to flycatcher conservation measures.[468] As with the water exchange project, USBR would likely bear the costs associated with flycatcher conservation for this project.[469]

454. The Tribe remains concerned about retaining its water rights and the potential impacts if critical habitat results in limits to water withdrawals or exchanges. In a letter received March 28, 2012, the San Carlos Apache Tribe writes that "the Gila River was the primary factor in establishing the San Carlos Apache Reservation in its current location [… and] the potential economic impact of depriving or limiting the Tribe's use of this life blood asset is potentially devastating."

Impacts to Livestock Grazing and Agriculture

455. Livestock grazing is an important source of income for the San Carlos Apache Tribe, as large portions of San Carlos Apache lands, including San Carlos Lake, are grazed by five livestock associations and two Tribal ranches. In the past, livestock association personnel have expressed concerns that grazing practices could be impacted by proposed critical habitat designations on the Tribe's lands.[470] At this time, it is unknown what modifications or mitigation measures may be recommended to grazing activities as a result of flycatcher concerns.

456. If the amount of water available to the San Carlos Apache Tribe for irrigation were to be limited to protect the flycatcher or its habitat, the Tribe's agriculture activities would be affected. The San Carlos Apache Tribe has been farming for hundreds of years in the Gila Valley, with over 9,000 acres of land under cultivation in the late 1800s. According to the Tribe, "the Tribe now struggles to farm a fraction of these lands due to the lack of a

[467] Letter from Susan B. Montgomery, Sparks, Tehan & Ryley, P.C. re: Comments to Draft Economic Analysis Regarding Possible Designation of Critical Habitat for the Southwestern Willow Flycatcher on the San Carlos Apache Reservation, dated October 6, 2004.

[468] Personal communication with John McGlothlen, USBR, August 24, 2004. Also, Letter from Joe Sparks, Sparks, Tehan & Ryley, P.C. re: Request for Information Regarding Possible Designation of Critical Habitat for the Southwestern Willow Flycatcher, dated September 7, 2004.

[469] Personal communication with Service personnel, August 9, 2004.

[470] Personal communication with San Carlos Apache Tribe and livestock association personnel, May 25, 2005; personal communication with San Carlos Apache personnel, June 16, 2005.

reliable water supply."[471] The Tribe currently farms approximately 1,700 acres of land, with an additional 5,000 acres expected to be cultivated in the next several years. If the designation of critical habitat limits water withdrawals, nearly all of this agriculture could be affected. The Tribe estimates economic losses per acre of approximately $100 to $300, depending on the crop grown and current prices. Additionally, as a high-end impact, the Tribe estimates that lost wages from one "growing year" could range from $210,000 to $805,000, depending on the number of acres in production and employees (an estimated six to 23).[472]

Recreational Impacts

457. In the Tribe's public comment submitted to the Service on October 14, 2011, the Tribe raised concerns about impacts to recreational activities, specifically "recreational income derived by the Tribe from recreational, hunting and fishing permit sales."[473] The Tribal Recreation and Wildlife Department generates over $1 million annually from various recreational activities. From October 2010 through September 2011, a period of extremely low lake levels which may have resulted in a decrease in typical recreational usage, this value included more than $15,000 in Tribal permit sales alone. According to the Tribe, "San Carlos Lake is well known throughout the State of Arizona as one of the premier fishing spots," both the economy and the reputation of the Reservation would suffer if the designation of critical habitat restricts recreational activities.[474]

Impacts to Forest Resource Management

458. The San Carlos Apache Tribe expressed concern over potential administrative costs associated with consultation with the Service for forest management activities. According to the Tribe, riparian areas along the Gila River are populated by invasive salt cedar, and the Tribe is working to remove this species and revegetate with native willow and cottonwood. These activities could require consultation with the Service after the designation of critical habitat, as well as with a Tribal biologist as called for in the existing Tribal flycatcher management plan. The Tribe also raised similar concerns for fire management activities, such as controlled burns.[475]

Impacts to Tribal Culture and Traditions

459. The San Carlos Apache Tribe uses and values the riparian areas proposed as critical habitat for cultural, traditional, and religious purposes, including gathering willows and

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[471] Letter from Susan B. Montgomery, Sparks, Tehan & Ryley, P.C. re: Comments to Draft Economic Analysis Regarding Possible Designation of Critical Habitat for the Southwestern Willow Flycatcher on the San Carlos Apache Reservation, dated October 6, 2004.

[472] Letter from Alexander B. Ritchie, Office of the Attorney General, San Carlos Apache Tribe, "Re: Comments for the Draft Economic Analysis Regarding Designation of Critical Habitat for the Southwestern Willow Flycatcher," dated March 27, 2012.

[473] Public comment of Terry Rambler, Chairman of the San Carlos Apache, submitted on October 14, 2011.

[474] Letter from Alexander B. Ritchie, Office of the Attorney General, San Carlos Apache Tribe, "Re: Comments for the Draft Economic Analysis Regarding Designation of Critical Habitat for the Southwestern Willow Flycatcher," dated March 27, 2012.

[475] Letter from Alexander B. Ritchie, Office of the Attorney General, San Carlos Apache Tribe, "Re: Comments for the Draft Economic Analysis Regarding Designation of Critical Habitat for the Southwestern Willow Flycatcher," dated March 27, 2012.

other plants. According to the Tribe, "putting a monetary value on sunrise dances and medicinal plant harvesting is not possible. […] [T]he impact of [critical habitat designation] on Apache culture and traditions would be devastating to the Tribe."[476]

460. For purposes of this analysis, we assume that the San Carlos Apache Tribe will participate in ten formal consultations with the Service over the next 20 years.

6.4.16 SANTA CLARA INDIAN PUEBLO

461. Santa Clara Pueblo raised three primary concerns regarding potential impacts of critical habitat designation for flycatcher on Pueblo lands: [477]

- **Time delay and increased administrative costs associated with section 7 consultations for habitat restoration projects**. The Tribe is concerned that critical habitat could result in a need to re-consult on ongoing habitat restoration projects.
- **Potential limitations to developing water rights**. The Pueblo is concerned that the designation of critical habitat could limit water diversions and groundwater pumping, and that these limitations would have a disproportionate impact on the Pueblo, compared to non-Indian landowners who may not face a Federal nexus for similar activities.
- **Interference with the Service's government-to-government relationship with the Pueblo**. The Pueblo believes that the productive and cooperative relationship with the Service could be jeopardized. The Pueblo states that it would view critical habitat designation as "an intrusion on our sovereignty and as a sign of the Service's disregard for our government-to-government relationship."

In summary, Santa Clara Pueblo states that it is conducting many ongoing bosque and riparian area protection efforts in proposed areas, and "to face these potential burdens when Santa Clara Pueblo is already doing so much to protect all who rely upon our Bosque for their survival is upsetting and deeply offensive to us."[478] For purposes of this analysis, we assume that Santa Clara Pueblo will participate in four formal consultations with the Service over the next 20 years. However, additional potential economic impacts on the Pueblo are not quantified.

6.4.17 SOUTHERN UTE TRIBE

462. Despite the lack of evidence indicating the presence of the endangered southwestern willow flycatcher on Southern Ute lands, the Tribe already incurs administrative costs associated with reviewing biological assessments and with section 7 consultation for projects with a Federal nexus. According to the Tribe, "a critical habitat designation

[476] Letter from Alexander B. Ritchie, Office of the Attorney General, San Carlos Apache Tribe, "Re: Comments for the Draft Economic Analysis Regarding Designation of Critical Habitat for the Southwestern Willow Flycatcher," dated March 27, 2012.

[477] Public comment of Walter Dasheno, Sr., Governor of the Santa Clara Pueblo. Submitted to the Service on October 13, 2011.

[478] Public comment of Walter Dasheno, Sr., Governor of the Santa Clara Pueblo. Submitted to the Service on October 13, 2011.

would result in a significant and unnecessary extra regulatory burden and delay in processing economic development activities by creating increased requirements for consultation with the Service."[479] Activities potentially requiring consultation include construction of new gas wells and pipelines within the next five years, and utility transmission improvements and distribution extensions. The Tribe states that "the majority of Tribal members reside in the Pine River corridor, which is the area proposed by the Service for designation. The designation could delay, or otherwise effect [sic], potential new homesite development for Tribal members, as well as efforts to upgrade utility services to Tribal members."[480] As a result of the planned well and pipeline construction, as well as likely impacts to development and utilities, this analysis estimates three consultations over the next 20 years. Restrictions on energy development could also affect the economically significant Sky Ute Resort and Casino, as well as culturally and socially significant facilities, such as the Southern Ute Cultural Center and Museum and the Southern Ute Multi-Purpose Facility and Chapel. The Tribe has also raised concerns about potential impacts – both economic and cultural – to the delivery and use of irrigation water for agriculture. Additionally, the Tribe states that "because the Tribe's land is held in trust by the United States of America, most actions undertaken on Tribal lands within the Reservation have some federal nexus. The Tribe's development efforts are already hampered by a regulatory scheme (including NEPA and ESA compliance, for example) more burdensome than non-Tribal landowners experience for the same development activities."[481] The Southern Ute are particularly concerned about the potential for disproportionate impacts given the uncertainty over the subspecies of willow flycatcher present on Tribal lands.

6.4.18 YAVAPAI-APACHE NATION

463. The Yavapai-Apache Nation states that "given the small size of the Reservation, the proposed designation will have a disproportionate impact on the Nation relative to other potentially affected parties, particularly with regard to the Nation's sovereign and Constitutional right to exercise its own control over the Nation's lands and water resources on the Reservation."[482] Due to the small size of the Reservation, the areas proposed as critical habitat represent nearly 12 percent of the land holdings of the Nation.

464. With such a small Reservation, the Nation needs to be able to manage its lands in such a way as to achieve economic self-sufficiency in the long term, and it is concerned that proposed critical habitat could hinder its management ability. As such, the Nation may wish to use lands within and adjacent to proposed critical habitat areas for uses such as farming, light industrial, or other economic development purposes. Specifically, the

[479] "Potential socio-economic impacts of critical habitat designation for southwestern willow flycatcher on Southern Ute Indian Reservation." Provided through written communication with Steve Whiteman, Head of the Southern Ute Division of Wildlife, on December 8, 2011.

[480] *Ibid.*

[481] *Ibid.*

[482] Public comment of Susan B. Montgomery, Montgomery & Interpreter, plc, on behalf of the Yavapai-Apache Nation, October 14, 2011.

Nation notes the potential for the following activities to be impacted by the critical habitat designation:

- **Housing Development.** Using funds from the US Department of Housing and Urban Development, the Nation is presently constructing 45 homes near the Middle Verde, but outside the Riparian Conservation Corridor. These houses are scheduled to be completed within a year, but the Nation hopes to continue residential development on the Reservation over the next twenty years. [483]
- **CAP Project and Other Water Rights.** For the past 30 years, the Nation has been allocated 1,200 acre feet of water from the CAP project. The Nation recently completed an appraisal level study to conduct a water exchange in order to use these rights, and additional studies are anticipated in the near future. The Nation is particularly concerned that the designation of critical habitat may require it to complete an Environmental Impact Statement (EIS) instead of a less costly Environmental Assessment. The Nation also is in the process of negotiating a settlement of its water rights, and is concerned that the designation of critical habitat could affect or delay this settlement.[484] The Nation cites as precedent for such impacts the 1990 Biological Opinion concerning a Verde River CAP water exchange to benefit the City of Prescott and the Yavapai-Prescott Tribe, which, to prevent jeopardy to the threatened spikedace, recommended that the CAP exchange not occur.[485] Although this Biological Opinion involved a fish species rather than the flycatcher, and was not considering impacts to critical habitat, it did establish that a CAP water exchange could be prevented through the section 7 consultation process.
- In the event that the Yavapai-Apache are not permitted to use CAP water due to the designation of flycatcher critical habitat, the Nation will face the costs of **acquiring replacement water**, either through groundwater pumping or other means. Additionally, the Nation is concerned with the possibility of impacts from groundwater pumping, if such activity is found to adversely modify flycatcher critical habitat.[486]
- **Other Economic Development.** The Nation also operates some wastewater treatment facilities on the Reservation, and has plans to construct a shopping center along the I-17 corridor. While these activities are planned outside of the Riparian Conservation Corridor, the Nation remains concerned that the designation of

[483] Written communication from Susan B. Montgomery, Montgomery & Interpreter, plc, on behalf of the Yavapai-Apache Nation, March 9, 2011.

[484] Personal communication with Susan B. Montgomery and Robyn Interpreter, Montgomery & Interpreter, plc, on behalf of the Yavapai-Apache Nation, March 8, 2011.

[485] Biological Opinion 2-21-86-F-087. May 30, 1990.

[486] Personal communication with Susan B. Montgomery and Robyn Interpreter, Montgomery & Interpreter, plc, on behalf of the Yavapai-Apache Nation, December 1, 2011.

critical habitat may trigger section 7 consultation for these projects, and otherwise result in delays and additional administrative burden on the Nation.[487]

- **Traditional, Religious, and Cultural Purposes.** The Nation uses and values the Verde River area for traditional, religious, and cultural purposes, including willow harvesting, religious ceremonies, and religious, medicinal, and subsistence plant gathering. The Nation also claims aboriginal and Federal Reserve water rights to the River.

465. Additionally, the Nation is concerned about disproportionate economic and administrative impacts from section 7 consultations. Unlike on private land, nearly all activities occurring on Yavapai-Apache land have a Federal nexus through Federal funding.[488] For the Yavapai-Apache Nation, we estimate four formal section 7 consultations in the next 20 years associated with the Nation's CAP program, wastewater treatment facilities, construction of a shopping center, and construction of Tribal housing.[489]

466. Although the future impacts of designating flycatcher critical habitat on the Yavapai-Apache Nation are not certain, the Tribe believes that plans for economic development could be affected by this proposed critical habitat, particularly given the small size of the Reservation.[490]

6.4.19 ZUNI PUEBLO

467. Information on potentially affected activities within proposed critical habitat on the Zuni Pueblo was not available for this analysis. Because of the ongoing riparian restoration and wetlands protection by the Zuni Fish and Wildlife Department, incremental impacts of critical habitat designation are expected to be primarily limited to administrative costs of section 7 consultation. However, costs could be significantly higher, depending on current and planned activities occurring within proposed critical habitat.

6.5 ADMINISTRATIVE COSTS

468. Due to the trust relationship between the United States and the Tribes, a significant number of Tribal programs, activities, and development projects involve Federal funding or oversight. Therefore, where critical habitat is designated on an Indian Reservation, nearly all projects will have a federal nexus for section 7 consultation.[491] To estimate

[487] Personal communication with Susan B. Montgomery and Robyn Interpreter, Montgomery & Interpreter, plc, on behalf of the Yavapai-Apache Nation, March 8, 2011.

[488] Personal communication with Susan B. Montgomery and Robyn Interpreter, Montgomery & Interpreter, plc, on behalf of the Yavapai-Apache Nation, December 1, 2011.

[489] Personal communication with Susan Montgomery and Robyn Interpreter, Montgomery & Interpreter, plc on behalf of the Yavapai-Apache Nation, on March 8, 2011.

[490] Public comment of Susan B. Montgomery, Montgomery & Interpreter, plc, on behalf of the Yavapai-Apache Nation, October 14, 2011.

[491] See, for example, Public comments of Susan B. Montgomery, Montgomery & Interpreter, plc, on behalf of the Yavapai-Apache Nation, December 27, 2010.

potential administrative impacts associated with these section 7 consultations, this analysis forecasts formal section 7 consultations based on discussions with the Tribes about future projects.

469. Because all Tribal lands overlapping proposed critical habitat are occupied by the flycatcher and the species occupancy is considered well-known, we assume that future incremental impacts will be limited to the additional administrative effort of addressing critical habitat in section 7 consultation. Where we have specific information from the Tribes on ongoing or planned projects, we estimate the number of formal section 7 consultations over the next 20 years based on these projects. For all other Tribes, we estimate one formal consultation over the 20-year analysis period.

470. In addition to formal consultations, the Service frequently responds to requests for technical assistance and informal consultation. Because a detailed history of informal consultations and technical assistance regarding the flycatcher is not available, this analysis uses data provided by the Ventura office in California and Region 2 of the Service to estimate ratios of informal consultations and technical assistance requests to formal consultations.

471. The ratio of technical assistance requests to formal consultations for the flycatcher ranges from 0.3 (Region 2) to three (Ventura office). Although this ratio is not specific to Tribal consultations, this analysis adopts a ratio of three technical assistance requests to one formal consultation for Tribes in California, and 0.3 technical assistance requests to one formal consultation for Tribes in all other states.

472. The ratio of informal to formal consultations for the flycatcher, which is again not specific to Tribal consultations, ranges from nine (Ventura office) to eleven (Region 2). This analysis adopts a ratio of nine informal consultations to one formal consultation for Tribes in California, and 11 informal consultations to one formal consultation for Tribes in all other states. Per-consultation costs are taken from Exhibit 2-3. Total baseline administrative impacts as a result of Tribal activities are presented in Exhibit 6-5, and incremental administrative impacts are presented in Exhibit 6-6.

EXHIBIT 6-5. SUMMARY OF BASELINE COSTS TO TRIBES BY MANAGEMENT UNIT (2010$, TOTAL PRESENT VALUE IMPACTS DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	BASELINE ADMINISTRATIVE IMPACTS TO TRIBES	
	PRESENT VALUE	ANNUALIZED
Santa Ynez	$0	$0
Santa Clara	$0	$0
Santa Ana	$190,000	$17,000
San Diego	$190,000	$17,000
Owens	$0	$0
Kern	$0	$0
Mohave	$0	$0
Salton	$47,000	$4,100
Amargosa	$0	$0
Little Colorado	$53,000	$4,700
Virgin	$0	$0
Middle Colorado	$53,000	$4,700
Pahranagat	$0	$0
Bill Williams	$0	$0
Hoover to Parker Dam	$94,000	$8,300
Parker Dam to Southerly International Border	$94,000	$8,300
San Juan	$210,000	$19,000
Powell	$0	$0
Verde	$210,000	$19,000
Roosevelt	$0	$0
Middle Gila and San Pedro	$0	$0
Upper Gila	$530,000	$47,000
Santa Cruz	$0	$0
San Francisco	$0	$0
Hassayampa and Agua Fria	$0	$0
San Luis Valley	$0	$0
Upper Rio Grande	$320,000	$28,000
Middle Rio Grande	$0	$0
Lower Rio Grande	$0	$0
Total	**$2,000,000**	**$180,000**
Note: Totals may not sum due to rounding.		

EXHIBIT 6-6. SUMMARY OF INCREMENTAL COSTS TO TRIBES BY MANAGEMENT UNIT (2010$, TOTAL PRESENT VALUE IMPACTS DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	INCREMENTAL ADMINISTRATIVE IMPACTS TO TRIBES	
	PRESENT VALUE	ANNUALIZED
Santa Ynez	$0	$0
Santa Clara	$0	$0
Santa Ana	$63,000	$5,500
San Diego	$63,000	$5,500
Owens	$0	$0
Kern	$0	$0
Mohave	$0	$0
Salton	$16,000	$1,400
Amargosa	$0	$0
Little Colorado	$18,000	$1,600
Virgin	$0	$0
Middle Colorado	$18,000	$1,600
Pahranagat	$0	$0
Bill Williams	$0	$0
Hoover to Parker Dam	$31,000	$2,800
Parker Dam to Southerly International Border	$31,000	$2,800
San Juan	$71,000	$6,200
Powell	$0	$0
Verde	$71,000	$6,200
Roosevelt	$0	$0
Middle Gila and San Pedro	$0	$0
Upper Gila	$180,000	$16,000
Santa Cruz	$0	$0
San Francisco	$0	$0
Hassayampa and Agua Fria	$0	$0
San Luis Valley	$0	$0
Upper Rio Grande	$110,000	$9,400
Middle Rio Grande	$0	$0
Lower Rio Grande	$0	$0
Total	**$660,000**	**$59,000**

Note: Totals may not sum due to rounding.

CHAPTER 7 | POTENTIAL ECONOMIC IMPACTS TO TRANSPORTATION ACTIVITIES

473. Road and bridge construction and maintenance can adversely affect flycatcher habitat. These activities have the potential to permanently destroy or alter flycatcher habitat through, for example, discharging fill material, draining, ditching, tiling, pond construction, and stream channelization.[492] These activities are expected to affect flycatcher only when they cross riparian zones.

474. This chapter considers the potential for road and bridge construction and maintenance activities to be affected by CHD for the flycatcher. First, we provide a summary of estimated impacts. We then briefly describe existing baseline protections, including, for example, BMPs employed by States' Departments of Transportation (DOTs). Next, we describe the types of conservation efforts likely to be requested during section 7 consultations. We then present our analytic approach and calculate anticipated baseline and incremental costs associated with transportation projects in critical habitat areas. The chapter concludes with a discussion of key sources of uncertainty affecting the analysis.

7.1 SUMMARY OF IMPACTS TO TRANSPORTATION ACTIVITIES

475. In total, we estimate incremental impacts to transportation projects of $5.8 million over 20 years (or $510,000 on an annualized basis, assuming a seven percent discount rate). This estimate includes the administrative and project modification costs associated with eight road and bridge construction and maintenance projects that are expected to occur in unoccupied areas, or areas where flycatcher presence is not well known and not currently addressed. It also includes the cost of administrative effort for 88 informal consultations and two technical assistances that may occur in these areas over the next 20 years. The total includes the additional, incremental cost of considering adverse modification in 71 formal consultations, 759 informal consultations, and 51 technical assistance calls in areas that are occupied, and where the species' presence is currently addressed

476. We estimate baseline impacts to transportation activities of $40 million over 20 years ($3.5 million on an annualized basis). This total includes the costs of addressing jeopardy concerns in the formal section 7 consultations associated with 71 projects occurring in occupied habitat, where flycatcher presence is well-known and implementing associated project modifications. It also includes the administrative costs of considering jeopardy in the 759 anticipated informal consultations and 51 technical assistance calls occurring in

[492] 2011 Proposed Rule, 76 FR 50542.

these areas. Exhibit 7-1 summarizes anticipated baseline and incremental costs related to transportation projects in flycatcher critical habitat areas.

EXHIBIT 7-1. SUMMARY OF INCREMENTAL AND BASELINE IMPACTS TO TRANSPORTATION ACTIVITIES BY MANAGEMENT UNIT (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	BASELINE		INCREMENTAL	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Santa Ynez	$0	$0	$0	$0
Santa Clara	$0	$0	$0	$0
Santa Ana	$5,300,000	$470,000	$150,000	$13,000
San Diego	$0	$0	$0	$0
Owens	$0	$0	$0	$0
Kern	$0	$0	$0	$0
Mohave	$850,000	$75,000	$24,000	$2,100
Salton	$0	$0	$0	$0
Amargosa	$0	$0	$0	$0
Little Colorado	$2,800,000	$250,000	$650,000	$57,000
Virgin	$5,400,000	$480,000	$170,000	$15,000
Middle Colorado	$0	$0	$0	$0
Pahranagat	$0	$0	$0	$0
Bill Williams	$1,100,000	$98,000	$35,000	$3,100
Hoover to Parker Dam	$0	$0	$0	$0
Parker Dam to Southerly International Border	$0	$0	$0	$0
San Juan	$2,800,000	$250,000	$89,000	$7,800
Powell	$0	$0	$560,000	$49,000
Verde	$2,200,000	$200,000	$71,000	$6,200
Roosevelt	$560,000	$49,000	$18,000	$1,600
Middle Gila and San Pedro	$1,700,000	$150,000	$53,000	$4,700
Upper Gila	$3,900,000	$340,000	$120,000	$11,000
Santa Cruz	$0	$0	$560,000	$49,000
San Francisco	$0	$0	$2,900,000	$250,000
Hassayampa and Agua Fria	$0	$0	$0	$0
San Luis Valley	$3,900,000	$340,000	$120,000	$11,000
Upper Rio Grande	$2,800,000	$250,000	$89,000	$7,800
Middle Rio Grande	$2,800,000	$250,000	$89,000	$7,800
Lower Rio Grande	$3,900,000	$340,000	$120,000	$11,000

MANAGEMENT UNIT	BASELINE		INCREMENTAL	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Total	**$40,000,000**	**$3,500,000**	**$5,800,000**	**$510,000**
Note: Totals may not sum due to rounding.				

7.2 EXISTING BASELINE PROTECTIONS

477. State transportation agencies often implement standard protections, or BMPs, especially in sensitive areas such as the riparian zone, to avoid adverse impacts to habitat areas and other resources. BMPs apply to each part of a project process, from design and implementation, to any re-vegetation or restoration that may occur when the construction or maintenance activity is complete. The implementation of BMPs often occurs even absent the designation of critical habitat. Additional protections may also derive from Federal or State permitting restrictions and requirements. National permitting requirements often apply in riparian areas, such as the need to obtain NPDES permits under the Clean Water Act for the discharge of materials to waters of the U.S. Additional permit requirements may apply in individual States. For example, as discussed in detail in Chapter 5, local permitting authorities may request additional biological information in compliance with CEQA in order to understand potential impacts to environmentally sensitive areas. These permitting activities can require surveys, monitoring, or other protections, absent critical habitat.

478. Examples of the types of BMPs or other requirements typically implemented for State transportation projects absent critical habitat include the following:

- Controlling erosion and excess sedimentation through the use of silt fencing, gravel bags, hay bales, fiber rolls, and protection/velocity dissipation at drainage outlet points. Post-construction measures include plantings, retaining walls and slope stabilization techniques.[493]
- Preserving existing vegetation and re-establishing appropriate native vegetation during restoration activities. [494]
- Implementation of a plan or program to prevent storm water pollution, such as a Storm Water Pollution Prevention Plan (SWPPP), a Storm Water Management Plan, or a Water Pollution Control Program.[495]

[493] U.S. Fish and Wildlife Service. 2008. Biological Opinion for State Route 76 Melrose Drive to South Mission Highway Improvement Project, San Diego County, California, October 1, 2008.

[494] ADOT Post-Construction Best Management Practices Manual for Highway Design and Construction, 2009. Accessed at http://www2.azdot.gov/ADOT_and/Storm_Water/PDF/adot_post_construction_bmp_manual.pdf on November 25, 2011; Biological Opinion for State Route 76 Melrose Drive to South Mission Highway Improvement Project, San Diego County, California, October 1, 2008; and Biological Opinion for 8th Ave Bridge Replacement, Graham County, Arizona.

[495] U.S. Fish and Wildlife Service. 2008. Biological Opinion for State Route 76 Melrose Drive to South Mission Highway Improvement Project, San Diego County, California, October 1, 2008; U.S. Fish and Wildlife Service. Biological Opinion for Kelvin Bridge Replacement Project, Pinal County, Arizona.

7.3 OVERVIEW OF CONSULTATION HISTORY AND PAST CONSERVATION EFFORTS FOR FLYCATCHER

479. In addition to the baseline protections outlined above, past section 7 consultations specify a number of conservation measures for transportation projects within flycatcher critical habitat. Included in the consultation history provided by the Service are 13 formal consultations on transportation-related projects related to flycatcher since the previous CHD in 2005 and 18 from the time of the species' listing in 1994 through 2005.[496] About two-thirds of these consultations were for bridge construction or maintenance, and one-third were for highway or road building and maintenance. In the consultation history provided, 17 consultations occurred in Arizona, nine in California, three in Colorado, two in Nevada, and none in Utah or New Mexico. [497]

480. In general, the Service has sought avoidance of flycatcher and its habitat during the construction process, or habitat restoration and/or compensation for lost habitat if avoidance was not possible. Exhibit 7-2 summarizes the project modifications included in these past consultations.

[496] Prior to 2005, eighteen biological opinions were conducted on transportation projects: eight in California, three in Colorado, six in Arizona, and one in Nevada.

[497] While Utah has not completed a formal consultation for transportation projects in flycatcher critical habitat, one was initiated for a bridge project in 2009 (Mall Drive). This project is discussed in more detail in subsequent sections of this chapter.

EXHIBIT 7-2. FLYCATCHER PROJECT MODIFICATIONS ASSOCIATED WITH TRANSPORTATION PROJECTS

Impacts to flycatcher and its habitat during construction activities are minimized and/or avoided by implementing the following Conservation Measures:

- Use of a Service-approved biologist for oversight of monitoring and compliance with protective measures
- Conducting pre-construction surveys prior to initiation of construction, in order to determine if timing restrictions or avoidance of specific areas is necessary
- Timing restrictions (avoidance of flycatcher breeding season)
- Placing storage and staging areas as far from sensitive habitat as possible, and within a footprint not adjacent to or within sensitive habitat
- Incorporation of Best Management Practices into project plans to address erosion and excess sedimentation, clean water standards, native landscape re-vegetation, structure demolition/removal over water, and temporary stream crossings
- Avoiding use of water from river for construction and fire management related activities
- Ensuring no releases of oil or fluids from construction vehicles
- Construction of fences and guard rails to prevent entry by vehicles
- Construction of culverts so not to impede flow
- Comply with Section 401 Water Quality Certification requirements, intended to minimize the potential for water quality degradation
- Avoid use of chemicals within 300 feet of habitat
- Avoid developing access roads that would result in fragmentation or reduction in habitat quality

Impacts to flycatcher and its habitat are mitigated by using the following Conservation Measures:

- Install educational signage
- Forbid stream crossing in habitat areas
- Monitoring of mitigation sites for five years following completion, and quarterly reporting to the appropriate agency, and annual reporting to the FWS
- Install elk exclusion fencing to preserve flycatcher habitat vegetation
- Temporary disturbance would be offset through in-kind restoration of the impacted area. Habitat containing PCE's may require additional restoration.
- Compensate direct impacts by offset disturbance to habitat through restoration and enhancement of offsite parcels, and creation of habitat. A 5-year maintenance and monitoring program would be implemented, with established performance criteria.

Sources: List of past conservation efforts derives from study of the consultation history of past transportation-related activities ("Formal Section 7 Consultation on the State Route 76 Melrose Drive to South Mission Highway Improvement Project, San Diego County, California", "Biological Opinion – Hereford Bridge Collapse Emergency Consultation", "Biological Opinion for Cotton Lane Bridge, Bank Stabilization, and Habitat Modification at the Gila River", Biological Opinion on Tonto and Oak Creek Bridge Development", "Biological Opinion for 8th Avenue Bridge Replacement, Graham County, Arizona", Biological Opinion for Florence-Kelvin Bridge over the Gila River in Pinal County, Arizona, "Arizona Eastern Railway Safford Branch and Gila River Bridge Project", "Biological Opinion for the Rainbow Canyon Highway Reconstruction Project in Lincoln County, Nevada", "Biological Opinion on the Proposed Middle Gila Canyons Transportation and Travel Management Plan", and "Sunrise Park-Big Lake Road – Forest Highway 43") A summary of past conservation efforts from consultations prior to 2005 was included in the 2005 Economic Analysis, and was compiled into this list.

481. In summary, in past consultations on transportation projects that have involved the flycatcher, project modifications have typically involved:

- Hiring an on-site biologist;
- Training workers;
- Constructing fencing;
- Conducting habitat restoration and creation;
- Timing restrictions; and
- Monitoring and evaluation.

Costs of implementing these types of project modifications in the future are expected to vary depending on the scale of future projects. In the 2005 Economic Analysis, the following per project costs were applied to these types of project modifications (inflated to 2010$):

EXHIBIT 7-3. COSTS OF COMMON PROJECT MODIFICATIONS FOR AVOIDANCE AND COMPENSATION OF IMPACTS TO FLYCATCHER AND ITS HABITAT (2010$)

CONSERVATION MEASURE	COST PER PROJECT
On-site biologist	$17,000
Worker training	$1,100
Fencing	$210,000
Habitat restoration	$120,000
Habitat creation	$240,000
Timing restrictions	$200,000
Monitoring and evaluation	$100,000
Total	**$890,000**

Sources:
Data derived from the 2005 Economic Analysis (see Exhibit 8-1).
2005 Economic Analysis; Originally developed from analysis of transportation-related Biological Opinions.

Notes:
- Total may not sum due to rounding.
- Cost per project converted from 2004$ to 2010$ using the GDP Price Index (Source: National Income and Product Accounts Table, Table 1.1.4 Price Indexes for Gross Domestic Product, annual values. U.S. Department of Commerce, Bureau of Economic Analysis.)
- More recent Biological Opinions suggest that some of the costs in this exhibit may be overstated. For example, the Biological Opinion for the Rainbow Canyon Highway Reconstruction Project in Lincoln County, Nevada specifies that NDOT paid $12,000 for each acre of disturbed flycatcher habitat, to be used in Service-determined projects in the Meadow Valley Wash. None of the habitat disturbed for this project, however, was designated critical habitat (Biological Opinion for Rainbow Canyon Highway Reconstruction Project in Lincoln County, Nevada, March 11, 2009). Nevada DOT indicates that the cost to replace or improve habitat ranges from $10,000 per acre for non-native or potential habitat, to $20,000 per acre for native habitat (Personal communication with Chris Young, NDOT, on December 13, 2011).

482. We assume that future projects will be similar in scope and size to the majority of the projects forming the basis for the unit cost estimates presented in Exhibit 7-3. For more detail, see Exhibit 8-1 of the 2005 Economic Analysis.

7.4 ANALYTIC APPROACH

483. In this section, we describe the general approach used to estimate the impacts reported later in this Chapter. First, we describe the method used to forecast the number and location of future, formal consultations. We assume that each of these projects will require the suite of project modifications described in Exhibit 7-3. In the following subsection, we describe our calculation of administrative, section 7 costs associated with these formal consultations, as well as additional informal consultation and requests for technical assistance.

7.4.1 PROJECTED PROJECT MODIFICATION COSTS IN CRITICAL HABITAT

484. We began by contacting State DOTs to obtain information about future projects expected to occur in areas being proposed as flycatcher critical habitat. However, due to the apparent difficulty of identifying specific projects that may occur within the proposed habitat over a time frame of 20 years, location-specific information was largely unavailable. Instead, this analysis identifies the number of instances existing roads intersect proposed critical habitat stream reaches as a proxy for the amount of potential formal consultation activity in critical habitat areas. Major roads crossing critical habitat reaches are expected to undergo some level of maintenance activity over the next 20 years. In addition to these crossings, specific projects that were identified by State agencies, or described in public comments, are also included in the analysis.[498]

485. For each formal consultation, we assume that the Service will request the suite of project modifications presented in Exhibit 7-3. The Service believes that recommendations to avoid adverse modification are largely duplicative of those necessary to prevent jeopardy. Specifically, the Service states that, "it is likely that conservation measures by the Federal agency that might be required to avoid jeopardy would be similar, if not identical, to those required to avoid adverse modification."[499] Thus, we assume project modifications associated with projects intersecting stream segments where flycatcher territories have not be detected, or in occupied areas where flycatcher presence is not well known and therefore not addressed, would not be undertaken but for the designation (e.g., these costs are incremental effects of the designation).[500] This analysis also assumes that consultations and anticipated conservation efforts that would be protective of flycatcher

[498] Where we have information regarding the likely timing of future projects, we assign the projects to the relevant year. Where no data on timing are available, we assume the project has an equally likely probability of occurring in any of the next 20 years.

[499] U.S. Fish and Wildlife Service. 2011. "Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Re-Designate Critical Habitat for the Southwestern Willow Flycatcher (*Empidonax traillii extimus)* (flycatcher)," October 21, 2011, p. 22.

[500] Ibid.

critical habitat in previously designated, occupied areas are likely to occur under the baseline scenario.

7.4.2 ADMINISTRATIVE CONSULTATION COSTS

486. The analysis also forecasts administrative costs associated with formal section 7 consultations. As discussed above, because of uncertainty about future transportation projects, it is difficult to forecast the number and location of projects that may be subject to section 7 consultation. This analysis assumes that one formal consultation will occur for every road crossing or specific project identified, amounting to 79 formal consultations over the next 20 years. Thus, based on the historical rate of formal consultation since the species' listing in 1993 (approximately 31), our approach likely overstates the amount of anticipated formal consultation activity.

487. In addition to formal consultations, the Service frequently responds to requests for technical assistance and informal consultation. Because a detailed history of informal consultations and technical assistance regarding the flycatcher is not available, this analysis uses data provided by the Ventura office in California and Region 2 of the Service to estimate ratios of informal consultations and technical assistance requests to formal consultations.[501]

488. The ratio of technical assistance requests to formal consultations for the flycatcher ranges from 0.3 (Region 2) to three (Ventura office). Although this ratio is not specific to transportation consultations, this analysis adopts a ratio of three technical assistance requests to one formal consultation for management units in California, and 0.3 technical assistance requests to one formal consultation for management units in all other States.

489. The ratio of informal to formal consultations for the flycatcher ranges from nine (Ventura office) to eleven (Region 2). This analysis adopts a ratio of nine informal consultations to one formal consultation for management units in California, and 11 informal consultations to one formal consultation for management units in all other States.

490. For the three management units (Amargosa, Hoover to Parker Dam, and Parker Dam to Southerly International Border) located in both California and another State, we assign the California ratio. As a result, our analysis may overestimate technical assistance costs and underestimate informal consultation costs in these units.

491. We assume that the informal consultations and technical assistance calls are likely to occur in the same stream reaches as the formal consultations because these are the places where roads intersect proposed critical habitat. For simplicity, and lacking better data, we assign these additional consultation efforts to the same years that the formal consultations occur. In most units outside of California, the consultations are assumed to be equally likely to occur in any year during the time period of this analysis. In California, this additional effort is concentrated in 2020 and 2025.

[501] Industrial Economics, Incorporated. 2005. *Final Economic Analysis of Critical Habitat Designation for the Southwestern Willow Flycatcher*, prepared for the U.S. Fish and Wildlife Service, September 28, 2005, Exhibit 3-2.

492. We apply the unit administrative costs of consultation presented in Chapter 2 (see Exhibit 2-4). In stream reaches where flycatcher territories have not previously been identified, or in occupied areas where flycatcher presence is not well known and therefore not addressed, these administrative costs are assumed to result from the CHD, and thus are considered incremental. In occupied reaches where flycatcher presence is currently well known, administrative effort is needed to address the potential for both jeopardy and adverse modification. The portion of administrative effort to address adverse modification is considered to be an incremental cost; the portion to address jeopardy is considered baseline. In all cases, we assume a third party (e.g., State or County governments) is likely to be involved in the consultation.

7.5 BASELINE IMPACTS TO TRANSPORTATION ACTIVITIES

493. We identified 71 potential transportation projects in occupied stream reaches, where action agencies are believed to be aware of flycatcher presence. We assume these projects will undergo formal consultation in the next 20 years. These projects are outlined in Exhibit 7-4 below.

EXHIBIT 7-4. PROJECTS EXPECTED IN OCCUPIED STREAM SEGMENTS, WHERE FLYCATCHER PRESENCE IS WELL KNOWN (BASELINE SCENARIO)

MANAGEMENT UNIT	STREAM REACH	ROAD	PROJECT OR CROSSING
California			
Santa Ana	Bear Creek	S.R. 18	In 2020, Add capacity SR-18: LA Co. Line to US-395[1]
	Santa Ana River	I-10	In 2025, Revise/Build Interchange I-10: Alabama St.
			In 2020, Revise/Build Interchange I-10: California St.
			In 2020, Revise/Build Interchange I-10: Mountain View Ave.
			In 2020, Revise/Build Interchange I-10: Wabash Ave.
			In 2020, Add HOV lanes, I-10: I-15 to SR-38
		I-215	In 2020, Revise/Build Interchange I-215: Palm Ave.
			In 2025, Revise/Build Interchange I-215: University Parkway
		I-15	In 2015, New facility, Smart Street (Route) Magnolia Ave/Main St.
			In 2020, Add capacity, I-15 SR-91 to SR-60

MANAGEMENT UNIT	STREAM REACH	ROAD	PROJECT OR CROSSING
Mohave	Mohave River	S.R. 18	In 2020, Add capacity SR-18: I-15 to Thunderbird
			In 2020, Add capacity SR-18: LA Co. Line to US-395[1]
Utah			
Virgin	Virgin River	S.R. 9, 300 E, I-15, Mall Dr., Man-O-War Rd., River Rd.	1 crossing each (6 total)
San Juan	San Juan River	Texaco Rd., U.S. 191	1 crossing each (2 total)
Nevada			
Virgin River	Virgin River	I-15 at Pioneer Blvd.	1 project (Interchange construction)
Arizona			
Little Colorado	Little Colorado River	S.R. 373, Main St.	1 crossing each (2 total)
Virgin	Virgin River	I-15	2 crossings
Bill Williams	Big Sandy River	U.S. 93	1 crossing
	Lake Havasu (Bill Williams River)	S.R. 95	1 crossing
Verde	Verde River	I-17, S.R. 260, S.R. 89, Montezuma Castle Hwy	1 crossing each (4 total)
Roosevelt	Salt River	Globe Young Hwy	1 crossing
Middle Gila/San Pedro	Gila River	S.R. 77	1 crossing
	San Pedro River	S.R. 77	1 crossing
		River Rd.	1 crossing
Upper Gila	Gila River	U.S. 70	1 crossing
		Main St.	1 crossing
New Mexico			
Little Colorado	Rio Nutria	S.R. 602	1 crossing
	Zuni River	S.R. 36, S.R. 53	1 crossing each (2 total)
Upper Gila	Gila River	S.R. 92	1 crossing
		U.S. 180	3 crossings
		S.R. 211	1 crossing
Upper Rio Grande	Coyote Creek	S.R. 434	1 crossing
	Rio Grande	S.R. 68	1 crossing

MANAGEMENT UNIT	STREAM REACH	ROAD	PROJECT OR CROSSING
		S.R. 567, S.R. 74, U.S. 285	1 crossing each (3 total)
Middle Rio Grande	Rio Grande	S.R. 109, S.R. 309, S.R. 6, U.S. 380, U.S. 60	1 crossing each (5 total)
Lower Rio Grande	Rio Grande	S.R. 26	1 crossing
		S.R. 185	3 crossings
		S.R. 187	2 crossings
		I-25	1 crossing
Colorado			
San Juan	Los Pinos River	S.R. 151A, U.S. 160E	1 crossing with 151A, 2 with 160E (3 total)
San Luis Valley	Conejos River	S.R. 17A	3 crossings
	Rio Grande	S.R. 112A, S.R. 142A, U.S. 160A	2 crossings with 112A, 1 with 142A, and 1 with 160A (4 total)
		TOTAL	**71 projects and/or crossings**

Note:

1. This project spans two river segments. We therefore assign half of a consultation to the Mohave River, and half of a consultation to the Santa Ana River.

Sources: IEc GIS analysis of spatial data from the California Transportation Planning Program's (CTPP) California Transportation Investment System (CTIS) (California), downloaded at http://www.dot.ca.gov/hq/tpp/offices/osp/ctis.html on November 1, 2011; CDOT (Colorado) "Highways", downloaded at http://apps.coloradodot.info/dataaccess/Highways/index.cfm?fuseaction=HighwaysMain on November 28, 2011; Utah Automated Geographic Reference Center, State Geographic Information Database (SGID), "Roads" downloaded at http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layers-by-category#TRANSPORTATION on November 28, 2011; New Mexico Resource Geographic Information System Program (RGIS), "tra3" downloaded at http://rgis.unm.edu/browsedata on November 29, 2011; Personal communication with Chris Young, NDOT (Nevada), on December 12, 2011; ESRI 2009 ArcGIS Data (for Arizona, in the absence of AZ DOT, or other state-specific data).

494. Below, we summarize the level of forecast transportation activity in flycatcher habitat in each State, and provide any detailed information obtained from State DOTs regarding specific projects.

California

495. CalTrans did not identify any specific projects likely to be affected by the proposed designation.[502] However, one project was identified in a public comment submitted in response to the Proposed Rule, and regional planning data are available for the years

[502] CalTrans contacted each potentially affected transportation district to request information on any expected impacts to projects due to the proposed flycatcher critical habitat designation; however, no projects were identified. (Personal communication with Amy Pettler, Senior Endangered Species Coordinator and Wildlife Biologist, CalTrans Division of Environmental Analysis, on November 29, 2011.)

2003 through 2023. Below, we identify potentially affected projects identified through these sources.

Transportation Corridor Agencies

496. The Foothill/Eastern Transportation Corridor Agency (TCA) and San Joaquin Hills TCA submitted a public comment on the proposed rule regarding potential impacts to the 241 Completion Project. The TCAs are a public joint power authority formed by Orange County and eighteen cities within the county to plan, finance and build new regional transportation facilities, including the San Joaquin hills Transportation Corridor (State Route 73) and the Foothill/Eastern Transportation Corridors (State Routes 241/261/133).

497. The Foothill/Eastern TCA is planning the State Route 241 Completion Project as the final leg of its 67-mile public toll highway system. As planned, the 241 Completion would extend the Foothill Transportation Corridor (State Route 241) from its current terminus at Oso Parkway to Interstate 5 in the San Clemente area.[503] The area of critical habitat the project may intersect is the Canada Gobernadora Creek, in the San Diego management unit. This Creek lies entirely in the Orange County Southern Subregion HCP.

498. The 241 Completion project as planned, however, does not meet the requirements of the Coastal Zone Management Act and the permit has been denied by the California Coastal Commission (CCC).[504] Furthermore, the Service believes that there are no viable alternatives to address the CCC's concerns. Thus, the Service has concluded that the project and any potential impacts associated with the presence of flycatcher or its critical habitat are too uncertain for inclusion in this analysis.[505]

California Transportation Planning Program Data

499. We rely on the California Transportation Planning Program's (CTPP) California Transportation Investment System (CTIS) to identify future road projects occurring in proposed critical habitat. CTIS data show locations where transportation investment is currently underway (programmed projects) and where investments are planned over a period of 20 years. This analysis employed GIS to determine the number of intersections that exist between stream segments proposed as critical habitat and planned and programmed transportation projects.

500. The CTIS data have not been updated since 2004, and it is possible that projects listed have either been completed, or are no longer planned.[506] We only consider those projects with a funding year after 2012 as potentially affected by flycatcher critical habitat. As shown in Exhibit 7-4, 11 future transportation projects are expected to intersect habitat that is occupied and where flycatcher presence is well known.

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[503] Public Comment from Nossaman LLP on behalf of the Foothill/Eastern and San Joaquin Hills Transportation Corridor Agencies, October 14, 2011, Comments on Proposed Rule to Revise Critical Habitat for Southwestern Willow Flycatcher.

[504] "Common Questions – General," TheTollRoads.com,. Accessed at https://www.thetollroads.com/commonquestions/general.php on November 29, 2011.

[505] Written communication with the U.S. Fish and Wildlife Service, on June 16, 2010.

[506] Personal communication with Laurie Waters, Office of State Planning, Division of Transportation Planning, CalTrans, on November 17, 2011.

Utah

501. Since the designation of critical habitat in 2005, the Service has not completed any formal consultations on transportation projects in Utah, and no future projects have been identified by Utah DOT. According to the Service, however, a formal consultation was initiated in 2009 for a bridge crossing at Mall Drive in the City of St. George. The project, however, has been delayed and the consultation not yet complete due to lack of funding and other issues. The City of St. George, however, intends to move forward with construction and has begun work on habitat mitigation plans.[507] We assume one formal consultation for this project. Additionally, this analysis identifies five other locations where critical habitat intersects existing roads along the Virgin River, including the following roads: S.R. 9; 300-E; I-15; Man-O-War Road; and River Road. Finally, the San Juan River intersects roads in two places, as indicated in Exhibit 7-4. We assume one formal consultation will be undertaken for projects at each location.

Nevada

502. The Service's records include one formal consultation since 2005 addressing impacts to flycatcher for a transportation project in Nevada (Rainbow Canyon Highway Reconstruction). However, the project did not intersect critical habitat.

503. According to Nevada DOT, one planned project may intersect the proposed habitat. The project is the construction of a new interchange at I-15 and Pioneer Boulevard extension in the City of Mesquite. The total budget for the project is about $25 million, and the project is currently undergoing NEPA review. According to Nevada DOT, maintenance activities are restricted to existing facilities, bladed shoulders, and do not directly impact habitat features.[508] We assume the project will require a formal consultation with the Service.

504. Nevada DOT is in the process of developing an HCP with the Service for the desert tortoise, flycatcher, and the yellow-billed cuckoo that should be complete by summer 2012. To date, NDOT has not seen any restrictions to project types or locations due to critical habitat. Mitigation measures acceptable to both the Service and FHWA are usually implemented.[509]

Arizona

505. The Service has participated in 11 formal consultations in Arizona since the 2005 designation, eight of which considered the potential for adverse modification of critical habitat. Two of these projects were re-initiations of former biological opinions (Sunrise Park/Big Lake Road Highway 43, and Beaver Dam Wash Bridge Construction on Highway 91), two projects occurred on the San Carlos Indian Reservation, and one was an Emergency Consultation for the Hereford Bridge collapse in 2005.

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[507] Written communication with the Service, comments from UT FWO in email from Region 9 on March 9, 2012.

[508] Personal communication with Chris Young, Nevada DOT, on December 9, 2011.

[509] Personal communication with Chris Young, Nevada DOT, on December 9, 2011.

506. The Arizona DOT did not identify any specific transportation projects expected to be affected by the proposed designation.[510] However, due to the discrepancy with the consultation history (17 consultations have occurred since 1994), we assume that consultations will result each time an existing road intersects a proposed river segment. Using this method, we identify 16 instances where existing roads intersect occupied stream segments where flycatcher presence is well known.

New Mexico

507. No formal consultations on transportation projects have occurred in New Mexico since the previous designation, and New Mexico DOT did not identify any specific projects expected to occur within relevant critical habitat areas. However, as shown in Exhibit 7-4, we identified 25 locations where existing roads intersect critical habitat.

Colorado

508. No formal consultations have occurred in Colorado since the designation of habitat in 2005, and Colorado DOT does not expect any impacts to transportation construction or maintenance projects due to CHD in the State.[511] However, our analysis identifies ten locations where roads intersect the Los Pinos, Conejos, and Rio Grande Rivers, where impacts are considered in the baseline scenario.

509. The project modifications outlined in Exhibit 7-3 and administrative consultation costs are assigned to each of the projects identified above. Exhibit 7-5 summarizes both project modification and administrative baseline costs. We note that consultation history since 2005 suggests that our estimates of future projects requiring formal consultation are likely overstated. For some of the roads that intersect proposed critical habitat, maintenance or construction activities may not occur in the next 20 years, the projects may not have a Federal nexus compelling section 7 consultation, or those consultations may not be formal. In addition, some of the conservation efforts assumed to be undertaken to avoid jeopardy and adverse modification may be duplicative of measures required under other laws or programs. Thus, the costs presented in Exhibit 7-5 are likely overstated.

[510] Personal communication with Ben Kartchner, Planner, AZ Department of Transportation, on November 28, 2011.

[511] Personal communication with Tody Cady, CO DOT, Region 5 (Durango Office) Environmental Specialist, on November 23, 2011.

EXHIBIT 7-5. SUMMARY OF BASELINE IMPACTS TO TRANSPORTATION ACTIVITIES BY MANAGEMENT UNIT (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	PROJECT MODIFICATION COSTS		ADMINISTRATIVE COSTS	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Santa Ynez	$0	$0	$0	$0
Santa Clara	$0	$0	$0	$0
Santa Ana	$4,800,000	$430,000	$450,000	$40,000
San Diego	$0	$0	$0	$0
Owens	$0	$0	$0	$0
Kern	$0	$0	$0	$0
Mohave	$780,000	$69,000	$72,000	$6,400
Salton	$0	$0	$0	$0
Amargosa	$0	$0	$0	$0
Little Colorado	$2,500,000	$220,000	$270,000	$23,000
Virgin	$4,900,000	$430,000	$520,000	$46,000
Middle Colorado	$0	$0	$0	$0
Pahranagat	$0	$0	$0	$0
Bill Williams	$1,000,000	$89,000	$110,000	$9,400
Hoover to Parker Dam	$0	$0	$0	$0
Parker Dam to Southerly International Border	$0	$0	$0	$0
San Juan	$2,500,000	$220,000	$270,000	$23,000
Powell	$0	$0	$0	$0
Verde	$2,000,000	$180,000	$210,000	$19,000
Roosevelt	$500,000	$44,000	$53,000	$4,700
Middle Gila and San Pedro	$1,500,000	$130,000	$160,000	$14,000
Upper Gila	$3,500,000	$310,000	$370,000	$33,000
Santa Cruz	$0	$0	$0	$0
San Francisco	$0	$0	$0	$0
Hassayampa and Agua Fria	$0	$0	$0	$0
San Luis Valley	$3,500,000	$310,000	$370,000	$33,000
Upper Rio Grande	$2,500,000	$220,000	$270,000	$23,000
Middle Rio Grande	$2,500,000	$220,000	$270,000	$23,000
Lower Rio Grande	$3,500,000	$310,000	$370,000	$33,000
TOTAL	**$36,000,000**	**$3,200,000**	**$3,800,000**	**$330,000**

Note: Totals may not sum due to rounding.

510. Note that while project modification and administrative costs of addressing jeopardy associated with future projects occurring in these reaches are considered baseline, section 7 consultations on these projects will result in some incremental administrative costs to consider adverse modification of critical habitat.

7.6 INCREMENTAL IMPACTS TO TRANSPORTATION ACTIVITIES

511. We identified eight potential transportation projects in unoccupied stream reaches, or reaches where occupancy is not well known (e.g., on the San Francisco River). These projects are outlined in Exhibit 7-6 below. In the subsequent sections, we provide additional detail about the projects that were identified through conversations with State DOTs. The remaining projects in Exhibit 7-6 were identified through our mapping exercise.

EXHIBIT 7-6. PROJECTS EXPECTED IN UNOCCUPIED AREAS, OR WHERE FLYCATCHER PRESENCE IS NOT WELL KNOWN (INCREMENTAL SCENARIO)

MANAGEMENT UNIT	STREAM REACH	ROAD	PROJECT OR CROSSING
Utah			
Powell	Paria River	Paria River Rd.	1 crossing
Arizona			
Little Colorado	Little Colorado River West Fork	S.R. 273	1 crossing
Santa Cruz	Santa Cruz River	Rio Rico Dr.	1 crossing
San Francisco	San Francisco River	S.R. 180, Coronado Trail	1 crossing each (2 total)
New Mexico			
San Francisco	San Francisco River	U.S. 180	3 crossings
		TOTAL	**8 crossings**

Sources: IEc GIS analysis of spatial data from the California Transportation Planning Program's (CTPP) California Transportation Investment System (CTIS) (California), downloaded at http://www.dot.ca.gov/hq/tpp/offices/osp/ctis.html on November 1, 2011; CDOT (Colorado) "Highways", downloaded at http://apps.coloradodot.info/dataaccess/Highways/index.cfm?fuseaction=HighwaysMain on November 28, 2011; Utah Automated Geographic Reference Center, State Geographic Information Database (SGID), "Roads" downloaded at http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layers-by-category#TRANSPORTATION on November 28, 2011; New Mexico Resource Geographic Information System Program (RGIS), "tra3" downloaded at http://rgis.unm.edu/browsedata on November 29, 2011; ESRI 2009 ArcGIS Data (for Arizona, in the absence of AZ DOT, or other state-specific data).

Utah

512. A public comment submitted by the Kane County Commission indicates that the designation will cause conflict with maintenance in two locations: one road crossing at Paria River Road, and a four-mile stretch of Cottonwood Road, which directly abuts the Paria River. The county indicates that regular maintenance and repair of these roads is necessary, particularly on Cottonwood Road, which is located adjacent to a steep canyon wall, requiring regular work to maintain a safe travel surface.[512] This analysis assumes that the crossing with Paria River Road will result in one formal consultation, and that maintenance activities on Cottonwood Road will be addressed in informal consultations, which, as discussed in Section 7.4.2, are estimated based on the number of formal consultations forecast.

New Mexico

513. A public comment from Catron County indicates that impacts to road maintenance at river crossings are expected due to the proposed designation of critical habitat on the San Francisco River.[513] The San Francisco River bisects S.R. 180 in two locations in Catron County.

514. Project modification costs outlined in Exhibit 7-3 and administrative consultation costs as described in Section 7.4.1 are assigned to each of the eight projects identified above. Exhibit 7-7 summarizes both incremental project modification and incremental administrative section 7 consultation costs.

EXHIBIT 7-7. SUMMARY OF INCREMENTAL IMPACTS TO TRANSPORTATION ACTIVITIES BY MANAGEMENT UNIT (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	PROJECT MODIFICATION COSTS		ADMINISTRATIVE COSTS	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Santa Ynez	$0	$0	$0	$0
Santa Clara	$0	$0	$0	$0
Santa Ana	$0	$0	$150,000	$13,000
San Diego	$0	$0	$0	$0
Owens	$0	$0	$0	$0
Kern	$0	$0	$0	$0
Mohave	$0	$0	$24,000	$2,100
Salton	$0	$0	$0	$0
Amargosa	$0	$0	$0	$0

[512] Public Comment submitted by Kate County Commission, Board of Commissioners, on October 3, 2011, Comments on Proposed Rule to Revised Critical Habitat for Southwestern Willow Flycatcher.

[513] Public comment from Chairman Hugh B. McKeen and Member Glyn Griffin on half of Catron County, October 5, 2011, Comments on Proposed Rule to Revise Critical Habitat for Southwestern Willow Flycatcher.

MANAGEMENT UNIT	PROJECT MODIFICATION COSTS		ADMINISTRATIVE COSTS	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Little Colorado	$500,000	$44,000	$140,000	$12,000
Virgin	$0	$0	$170,000	$15,000
Middle Colorado	$0	$0	$0	$0
Pahranagat	$0	$0	$0	$0
Bill Williams	$0	$0	$35,000	$3,100
Hoover to Parker Dam	$0	$0	$0	$0
Parker Dam to Southerly International Border	$0	$0	$0	$0
San Juan	$0	$0	$89,000	$7,800
Powell	$500,000	$44,000	$53,000	$4,700
Verde	$0	$0	$71,000	$6,200
Roosevelt	$0	$0	$18,000	$1,600
Middle Gila and San Pedro	$0	$0	$53,000	$4,700
Upper Gila	$0	$0	$120,000	$11,000
Santa Cruz	$500,000	$44,000	$53,000	$4,700
San Francisco	$2,500,000	$220,000	$350,000	$31,000
Hassayampa and Agua Fria	$0	$0	$0	$0
San Luis Valley	$0	$0	$120,000	$11,000
Upper Rio Grande	$0	$0	$89,000	$7,800
Middle Rio Grande	$0	$0	$89,000	$7,800
Lower Rio Grande	$0	$0	$120,000	$11,000
TOTAL	**$4,000,000**	**$360,000**	**$1,800,000**	**$160,000**

Note: Totals may not sum due to rounding.

515. Note that while project modification and administrative costs attributed to the projects outlined in Exhibit 7-7 are all incremental, this exhibit also includes the cost of addressing adverse modification during section 7 consultation for the 71 projects identified in other occupied stream reaches in Exhibit 7-4, and administrative costs associated with conducting a jeopardy determination for consultations forecast on the San Francisco River.

7.7 CAVEATS TO THE ECONOMIC ANALYSIS OF POTENTIAL IMPACTS TO TRANSPORTATION ACTIVITIES

516. Exhibit 7-8 summarizes the key assumptions in our analysis of potential economic impacts related to transportation activities, as well as the potential direction and relative scale of bias introduced by these assumptions.

EXHIBIT 7-8. CAVEATS TO THE ECONOMIC ANALYSIS OF TRANSPORTATION ACTIVITIES

KEY ASSUMPTION	EFFECT ON IMPACT ESTIMATE
Every road crossing in proposed critical habitat will undergo maintenance or reconstruction activities sometime during the next 20 years.	+
Every road maintenance or construction project will have a section 7 nexus involving either the need for a section 404 permit from the Corps or Federal funding.	+
Typical project modifications and their costs will be similar to those requested during historical consultations.	+/-
The rate of informal consultations and technical assistance activities relative to formal consultations obtained from the Ventura, California and Colorado field offices is indicative of the rates in other States and for transportation activities.	+/-
Notes: - : This assumption may result in an underestimate of real costs. + : This assumption may result in an overestimate of real costs. +/- : This assumption has an unknown effect on the magnitude of cost estimates.	

CHAPTER 8 | POTENTIAL ECONOMIC IMPACTS TO OIL AND GAS DEVELOPMENT

517. This section describes the potential for economic impacts to energy development activities in areas proposed as critical habitat for the flycatcher. According to the Proposed Rule, the designation of flycatcher critical habitat is not anticipated to significantly affect the energy industry.[514] However, several organizations have expressed concern that oil and gas development will be negatively affected by the designation of critical habitat and the resulting need for section 7 consultation.

518. In this section, we first provide a brief summary of expected impacts to the oil and gas industry. The chapter discusses: the existing state of oil and gas development in the area; past consultations on oil and gas related activities for flycatcher; and current protections afforded to the species and its habitat from existing management plans and avoidance measures. The chapter concludes by estimating potentially affected future oil and gas activity on these stream reaches.

8.1 SUMMARY OF POTENTIAL IMPACTS TO OIL AND GAS DEVELOPMENT

519. Oil and gas development is expected to occur in the San Juan management unit, where the San Juan and the Los Pinos Rivers flow over currently active oil and gas fields. Oil and gas activities occurring on federally-owned or tribally-owned surface lands, or areas where private surface rights overlap Federal mineral rights, are expected to require consultation with the Service. Additionally, where oil and gas pipelines intersect proposed streams reaches, a 404 permit may be required for filling of wetlands or releases of material into waterways during pipeline construction or maintenance.

520. Due to the level of existing protections in riparian areas required by or agreed to by oil and gas developers and land and resource managers, no project modification costs are expected as a result of the designation of flycatcher critical habitat. However, administrative costs for one formal and six informal consultations are expected due to limited related oil and gas activities, including seismic studies and pipeline construction and maintenance. Because flycatchers have been detected in these stream segments, and species conservation is currently addressed by action agencies, the cost of addressing jeopardy for each consultation is considered baseline and the cost associated with addressing adverse modification is incremental. Below, Exhibit 8-1 provides a summary of these administrative costs associated with future oil and gas development in flycatcher critical habitat.

[514] 2011 Proposed Rule, 76 FR 50595.

EXHIBIT 8-1. SUMMARY OF IMPACTS TO OIL AND GAS DEVELOPMENT, 2012 TO 2031 (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	BASELINE		INCREMENTAL	
	PRESENT VALUE	ANNUALIZED COSTS	PRESENT VALUE	ANNUALIZED COSTS
San Juan	$33,000	$2,900	$11,000	$960
TOTAL	**$33,000**	**$2,900**	**$11,000**	**$960**

8.2 OVERVIEW OF EXISTING OIL AND GAS INFRASTRUCTURE IN PROPOSED CRITICAL HABITAT

521. The oil and gas industry contributes significantly to the economies of San Juan County, Utah, and La Plata County, Colorado. Representatives from each county have expressed concern about the economic impacts of flycatcher critical habitat to local oil and gas development in public comments submitted to the Service during October, 2011.

Utah

522. The San Juan County Commission has expressed concern over "the effects critical habitat designation and accompanying management actions could have on existing and future uses on and along the San Juan River," including oil and gas development. The County is characterized by high unemployment and a limited tax base, resulting from its high percentage (92 percent) of non-private land, and is concerned that the designation of critical habitat in addition to existing restrictions will disproportionately limit future development opportunities.[515]

523. The proposed area of critical habitat in San Juan County consists of an approximately 8,200 acre unit on the San Juan River. Of this area, 62 percent is owned by the Navajo Nation, about 27 percent by the Federal government (managed by BLM), and another 10 percent by private landowners. Just less than one percent is state-owned. The San Juan River unit is located over the Paradox Basin, which a significant exploration area for oil, with some prior exploration for natural gas.[516] The primary operating oil field is the Aneth Field, the mineral rights to which are owned by the Navajo Nation. There are 11 existing wells in the areas of proposed critical habitat on the San Juan River. Of these wells, five are on the Navajo Reservation, drilling into the Aneth Field, and six are on Federal land managed by BLM, for the most part accessing the Turner Bluff Field. The dates the wells were drilled range from 1960 to 2002 (a test well that resulted in no production). Currently, five of these wells are abandoned, five are plugged and

[515] Public comment letter from Bruce B. Adams, Commission Chairman for San Juan County Commission. Submitted October 10, 2011.

[516] UT Geological Survey, "Characterization of Utah's Natural gas Reservoirs and Potential New Reserves," accessed at http://geology.utah.gov/emp/gas_research/pdf/resource_character.pdf, February 2012.

abandoned, and one is a water injection well. No oil has been recovered from these wells since 1999.[517]

524. Multiple petroleum, natural gas, and CO_2 pipelines run through the southwestern corner of San Juan County (see Exhibit 8-2 at the end of this chapter). Three of these converge near the easternmost portion of the proposed habitat unit. One petroleum pipeline, the Running Horse Pipeline, operated by Navajo Nation Oil and Gas (NNOGC), runs parallel to this portion of critical habitat for approximately four miles.[518]

Colorado

525. The proposed area of critical habitat in La Plata County consists of an approximately 4,080 acre unit on the Los Pinos River. The Los Pinos River is located on the San Juan Basin, the second largest natural gas reserve in the United States.[519] The primary operating natural gas field is the Ignacio-Blanco Field. Sixty-four percent of this area of critical habitat is owned by the Southern Ute, while the remaining 36 percent is privately owned (totaling about 4,080 acres).

526. According to the La Plata County Energy Council, the County holds more than 3,300 active natural gas wells, many of which are located along the Los Pinos River. More than 4,000 local mineral owners contribute to the local economy, both directly and indirectly, through subcontractors, suppliers, and local residents employed by the oil and gas industry.[520] The Council writes:

> "La Plata County produces the most natural gas in the State of Colorado with the least amount of wells. Seventy-seven percent of the State of Colorado's coalbed methane natural gas is produced within the boundary of La Plata County. … According to the La Plata County Abstract and audit, the top ten taxpayers are natural gas companies. In 2007, natural gas operators paid as high as 65.9% of all property taxes; in 2010 over 40% of the property taxes will be paid by natural gas operators."[521]

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[517] GIS analysis of UT State Geographic Information Database (SGID) data on oil wells, UT DNR, Oil and Gas Mining Division, downloaded February 2012 at http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layer-download-index?fc=DNROilGasWells; UT Automated Geographic Reference Center (AGRC) Oil and Gas v2.4 Map, accessed at http://mapserv.utah.gov/oilgasmining/.

[518] GIS analysis of UT State Geographic Information Database (SGID) data on oil and gas pipelines, from UGS products. Downloaded February 2012 from http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layer-download-index?fc=OilGasPipelines_UGS. Information also obtained from the National Pipeline Mapping System, a project of the DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA), accessed at https://www.npms.phmsa.dot.gov/PublicViewer/composite.jsf on March 8, 2012.

[519] La Plata Energy Council, "Gas Facts: San Juan Basin Map", accessed February 2012 at http://www.energycouncil.org/gasfacts/sjbmap.htm.

[520] Public comment letter from Christi Zeller, Executive Director for the La Plata County Energy Council. Submitted October 14, 2011.

[521] *Ibid.*

The Council also cites the regional importance of energy impact grants funded through severance taxes, which have contributed nearly $62 million to various municipalities and special districts.[522]

527. Currently, seven drilled wells fall within critical habitat on the Los Pinos River. Three of these wells are on the Southern Ute Reservation, and the remaining four are on privately owned land. Of these wells, one is dry and abandoned, three are shut-in, and three are producing.[523] In one location, a natural gas pipeline, owned by Xcel Energy, runs subsurface to privately-owned proposed critical habitat.[524]

CONSULTATION HISTORY

528. Since the listing of the species, the Service has conducted at least two formal consultations with the energy industry that involved the flycatcher, both on pipeline maintenance and construction actions. A 1998 consultation with BLM addressed the TransColorado Gas Transmission Line Project, spanning multiple counties in the San Juan management unit in Colorado.[525] The second consultation, occurring in 2000, evaluated Questar's Southern Trails pipeline in California, Arizona, and Utah.[526] The Service determined that neither project was likely to jeopardize the existence of the flycatcher. Several public comment letters have also cited the Service's concurrence with a finding of "may affect, not likely to adversely affect" for the flycatcher on oil and gas development projects, due to existing conservation measures in place on BLM and USFS lands.[527]

8.3 BASELINE PROTECTIONS FOR FLYCATCHER FROM OIL AND GAS OPERATIONS

529. Generally, a high level of baseline protection is afforded to the flycatcher and its habitat from oil and gas activities in the region. Oil and gas developers consult regularly with the Service throughout the permitting and design process for a new well to implement project modifications that will avoid impacts in these areas. As such, despite the high level of activity in the surrounding area, there are relatively few existing wells within critical habitat, and few are expected to be developed over the next 20 years. Below, we describe existing protections afforded to flycatcher by the primary land managers on the affected stream reaches.

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[522] *Ibid.*

[523] GIS analysis of Colorado Oil and Gas Conservation Commission (COGCC) "WELLS" and "permits" shapefiles, downloaded February 23, 2012 at http://cogcc.state.co.us/infosys/maps/gismain.cfm.

[524] Department of Transportation, National Pipeline Mapping System, Public Map Viewer, view of La Plata County, CO accessed on March 7, 2012 at https://www.npms.phmsa.dot.gov/PublicViewer/composite.jsf; Personal communication with Kenneth P. Buys, Xcel Energy, March 7, 2012.

[525] U.S. Fish and Wildlife Service. 1998. Biological Opinion GJ-6-CO-98-F-007.

[526] U.S. Fish and Wildlife Service. 2000. Biological Opinion 1-5-00-F-420.

[527] Northern San Juan Coal Bed Methane Development EIS appendix J, 2003. Cited in public comment letters of Kristine Dutton (BP), Claire M. Moseley (Public Lands Advocacy) and Richard Ranger (American Petroleum Institute), and Christi Zeller (La Plata County Energy Council).

Utah

BLM MONTICELLO FIELD OFFICE RESOURCE MANAGEMENT PLAN

530. The BLM's Monticello Field Office manages 1,800,000 acres of Federal surface estate and 2,500,000 acres of Federal mineral estate in San Juan and Grand Counties in Utah, including the Federal lands being proposed on the San Juan River (27 percent of the proposed stream reach).

531. The Field Office's Resource Management Plan (RMP) specifically addresses stipulations for activities occurring in flycatcher habitat, including the following:

   a. Surveys are required prior to operations unless species occupancy and distribution information is complete and available.

   b. Activities require monitoring throughout the duration of the project.

   c. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate drilling in suitable riparian habitat.

   d. Activities would maintain a 300 foot buffer from suitable riparian habitat year round.

   e. Activity within 0.25 miles of occupied breeding habitat would not occur during the breeding season (May 1 to August 15).

   f. Impacts to riparian habitat are avoided during activity, and disturbance that does occur will be adequately mitigated.

NAVAJO RESOURCE MANAGEMENT PLAN

532. The Navajo Nation Department of Fish and Wildlife has an established Navajo Endangered Species List, on which the flycatcher is listed as Endangered. The Navajo assign this status to any "species or subspecies whose prospects of survival or recruitment are in jeopardy."[528] The Species Account for the flycatcher suggests that conservation actions include surveying during breeding season, year-round avoidance or alteration of suitable habitat surrounding known breeding sites, and avoidance of activity within a quarter-mile radius of potential habitat during the breeding season.[529]

Colorado

SOUTHERN UTE EXISTING PROTECTIONS

533. The Tribe generally avoids drilling in riparian areas. In 2009, the BLM conducted a "Programmatic Environmental Assessment for 80-acre Infill Oil & Gas Development" (PEA) for the Tribe, for which they consulted with the Service, that contains conservation measures for flycatcher and its habitat. According to the PEA, the Tribe conducts annual surveys on the Reservation, and as of 2007, identified six breeding territories on the Los

[528] Navajo Endangered Species List 2008. Navajo Nation Department of Fish and Wildlife. Accessed at http://nnhp.nndfw.org/endangered.htm.

[529] Southwestern Willow Flycatcher Species Account. Navajo Nation Natural Heritage Program. Accessed at http://nnhp.nndfw.org/a_comname.htm.

Pinos River. These areas are subject to the following protections, as outlined in the PEA.[530]

a. Conducting flycatcher surveys within suitable habitat prior to any construction activities; if flycatchers are present, no surface disturbance activities will be conducted between May 1 and August 15.

b. Construction activities will be minimized in wooded riparian habitat, or any other potential flycatcher nesting habitat.

c. No disturbance will be allowed within 200 meters of known or discovered occupied flycatcher breeding habitat.

In addition to these species-specific measures, a number of BMPs and other protections for all riparian areas are outlined in the PEA.

8.4 POTENTIAL INCREMENTAL IMPACTS TO OIL AND GAS OPERATIONS

534. Although the Service has not consulted with the oil and gas industry frequently in the past, the public comments submitted in response to the Proposed Rule suggest that designation of flycatcher critical habitat in the San Juan Basin could result in administrative and time delay costs.

FUTURE OIL AND GAS DEVELOPMENT PRESSURE

535. The American Petroleum Institute and Public Lands Advocacy, a trade association representing the interests of the oil and gas industry relating to responsible and environmentally sound exploration and development of oil and gas resources on Federal lands, describe the potential magnitude of such impacts in a joint public comment submitted to the Service on October 14, 2011. Citing the importance of the San Juan Basin both economically and for domestic energy supply, the letter concludes that incremental costs of section 7 consultations could "result in tangible and important economic impacts to domestic oil and gas development."[531]

> "Based on current projections for the period 2009–2023, approximately 1,769 wells on 1,132 single- and dual-well pads could be drilled in the Gothic Shale Gas Play alone. These wells have the potential to produce approximately 2.7 trillion cubic feet of gas from the Gothic Shale interval. Gross surface disturbance is projected at 5,887 acres for well-related activities and 910 acres for infrastructure-related activities in the shale gas trend during the 15- year (2009–2023) projection period. Combined with earlier estimates, 2,954 wells on 2,317 pads with 10,919 acres of surface disturbance are projected for all conventional and unconventional plays in the San Juan public lands planning area by 2024. […] Designation of critical habitat increases the cost of developing this vital resource by requiring additional consultations and

[530] U.S. Department of the Interior, Bureau of Land Management. "Programmatic Environmental Assessment for 80 Acre Infill Oil and Gas Development on the Southern Ute Indian Reservation." August 2009.

[531] Public comment letter from Claire M. Moseley, Executive Director for Public Lands Advocacy, and Richard Ranger, Senior Policy Advisor for the American Petroleum Institute. Submitted October 14, 2011.

additional expense upwards of $20,000 per project for projects that fall within the proposed critical habitat. This cost would be an unfair burden especially on small producers and developers often precluding them from being able to complete projects or from competing due to the higher cost."[532]

536. Additionally, the Service received a public comment from BP, also expressing concern over impacts to oil and gas development as a result of the increased need for section 7 consultation. According to the letter, "BP operates in areas identified in the Proposed Rules within the range of Revised Critical Habitat for Southwestern Willow Flycatcher. BP's operations on Federal land located in these areas for new activities could be precluded or delayed should the Service revise the critical habitat for the Southwestern Willow Flycatcher."[533]

537. According to the Service, there is a general understanding in the region that oil and gas development impacts to riparian areas should be avoided due to the potential for sensitive species and habitat in these areas. Additionally, potential impacts are usually identified in all suitable flycatcher habitat, regardless of occupancy, and the conservation actions agreed upon between the Service and developers are sufficient to protect flycatcher critical habitat. Nearly all consultations results in "no affect" or "not likely to adversely affect" determination.[534] As is evident from the consultation history, few if any consultations on oil and gas activity result in formal consultation (the only two past consultations were on large-scale pipeline construction and maintenance). For these reasons, all consultations resulting from the activities considered below are informal consultations. Additionally, since the designation of habitat in these areas will not alter the consultation process, there are no expected incremental project modification costs projected to results from the designation. We discuss the level of potential administrative impacts, by State, below.

Utah

538. Due to the drilling history, lack of production from the existing wells in the past decade, and land management actions limiting activity in riparian areas, we do not expect future drilling activity to occur in this critical habitat unit. A further restraint on drilling potential exists due to the fact that only small portions of the proposed river segment overlaps producing oil fields (see Exhibit 8-2, below). In the past, the only drilling in critical habitat has occurred above or directly adjacent to these fields (mainly, the Aneth and Turner Bluff fields).

539. A Federal nexus will exist, and consultation may only be expected on federally-owned surface land, tribally-owed surface lands, or where private surface ownership overlaps Federal mineral rights to the underlying oil or gas resources. Currently on the San Juan River, about one-third of the total BLM-managed land in critical habitat is leased or has a

[532] *Ibid.*

[533] Public comment letter from Kristine Dutton, Regulatory Advocacy Lead for BP. Submitted October 12, 2011.

[534] Written communication from Western Colorado Ecological Services Field Office, U.S. FWS on February 10, 2012; Personal communication with Western Colorado Ecological Services Field Office, U.S. FWS, on February 17, 2012.

lease pending; however, no permits have been sought in these areas.[535] Though limited and small in scale, there are likely a few acres of critical habitat where private land ownership overlaps Federal mineral rights.[536] On these Federal lands, there is a "No Surface Occupancy" (NSO) stipulation on all oil and gas leases in riparian areas, and new surface disturbance will require a 100-meter setback from riparian areas. According to the RMP, "Areas identified as NSO are open to oil and gas leasing but surface-disturbing activities cannot be conducted on the surface of the land. Access to oil and gas deposits will require directional drilling from outside of the boundaries of the NSO area."[537]

540. Of the tribally-owned portions, only a small subset on the far eastern end of the proposed river segment overlap the Aneth Field, where drilling may occur (and the only area it has occurred in the past). Navajo Nation Oil and Gas Company (NNOGC) is a Tribal corporation that facilitates oil and gas development within Navajo Nation boundaries. According to NNOGC, it is common to alter drilling plans in order to work around restricted areas, particularly with the increased use of directional drilling. Specifically in the area of interest, most operations are short-term, and have low surface impacts to begin with.[538] Further, the Navajo Nation Division of Minerals indicates that there is little activity in the areas surrounding the San Juan River. For the most part, the area has been fully explored, as indicated by the number of abandoned and plugged wells, described above.[539] The Navajo Nation does believe that some seismic studies (to assess the presence of recoverable resources) are likely to take place, which may be conducted by the Tribe, though more likely by a future lessee, and would require temporary encroachment.[540] Assuming these studies occur on Tribal lands, this analysis assumes two informal consultations for related projects.

541. It appears, however, that future consultations may arise due to pipeline activity. The only past formal consultations have been on pipeline construction and maintenance activities. As shown in Exhibit 8-2, there is a relatively high level of pipeline activity in the direct area. Pipeline maintenance is not a predictable activity, and varies greatly depending on specific terrain and surrounding activities. There are limited reasons a pipeline would need to be exposed for maintenance.[541] For this analysis, we assume one informal consultation will occur for each of the three pipelines approaching critical habitat.

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[535] Personal communication with Donald Ogaard, UT BLM, on February 24, 2012; GIS analysis of UT BLM data on oil and gas leases, downloaded February 2012 from http://www.blm.gov/ut/st/en/prog/more/geographic_information/gis_data_and_maps.html.

[536] Personal communication with Donald Ogaard, UT BLM, on February 24, 2012.

[537] Bureau of Land Management, Monticello Field Office, "Record of Decision and Approved Resource Management Plan," November 2008. See page 72, Map 4 (ROWs), and Map 18 (NSO designations).

[538] Personal communication with Steven Hines, Navajo National Oil and Gas, on March 6, 2012.

[539] Personal communication with Steven Prince, Navajo Department of Natural Resources, Minerals Division, on March 6, 2012.

[540] Personal communication with Steven Prince, Navajo Department of Natural Resources, Minerals Division, on March 8, 2012.

[541] Personal communication with Jake Jacobs, former EHS Technician with Encana Oil & Gas, Inc., on March 15, 2012.

Colorado

542. The two major land owners on the Los Pinos River are the Southern Ute and unidentified private landowners. See Exhibit 8-3 for a map of these areas.

543. Currently on Southern Ute land, wells are expected to be developed at a rate of one well per 80 acres, though many future wells are expected to be co-located on existing well pads in an effort to mitigate impacts.[542] In general, local operators understand the ecological importance of riparian habitat, and will readily avoid these sensitive areas by rerouting or altering projects. The Southern Ute have largely avoided oil and gas activities in riparian habitat on the Reservation. There are three outstanding permits for new wells on Southern Ute land with permit dates expiring between 2012 and 2013.[543]

544. According to the PEA described above, the Southern Ute currently plan to allow a total of 770 80-acre infill wells to be drilled from existing and new well sites within the Reservation before 2029, five of which are likely to be drilled in the near future in riparian habitat. These wells will be co-located on existing well pads in order to reduce surface disturbance. The Tribe also expects that within the next 20 years, future pipeline construction may intersect critical habitat.[544] In Chapter 6 of this analysis, we forecast consultation costs associated with these actions as part of the activities considered on Tribal lands. As described there, we project a total of three formal consultations and 33 informal consultations for activities undertaken by the Southern Ute, including new gas wells, pipelines, transmission improvements, and distribution extensions (see Section 6.4.17 of this report).

545. On the private lands north of the Southern Ute Reservation lands, potential exists for future oil and gas development in the region. For example, there are a total of nine well pads in or within one-quarter mile of critical habitat areas which could undergo future drilling. Well spacing is currently one well per 160 acres, but, following regional trends, could be changed to one well per 80 acres. It is also expected, however, that development on these lands will follow the regional pattern of infilling new wells on current well pads in order to mitigate surface impacts. Despite the potential for future wells to be drilled, there are no Federal subsurface rights for oil or gas in critical habitat, meaning there will be no Federal nexus, and therefore no section 7 consultations with the Service for new well development.

546. There is potential, however, for the need to consult on pipeline construction or maintenance if those projects intersect critical habitat. Currently, there is at least one natural gas pipeline that runs underneath privately-owned proposed flycatcher critical habitat. For the purposes of this analysis, we forecast one formal consultation for pipeline

[542] U.S. Department of the Interior, Bureau of Land Management. "Programmatic Environmental Assessment for 80 Acre Infill Oil and Gas Development on the Southern Ute Indian Reservation." August 2009.

[543] GIS analysis of Colorado Oil and Gas Conservation Commission (COGCC) "WELLS" and "permits" shapefiles, downloaded February 23, 2012 at http://cogcc.state.co.us/infosys/maps/gismain.cfm.

[544] Written communication from Western Colorado Ecological Services Field Office, U.S. FWS on February 10, 2012; Personal communication with Terry Ireland, U.S. FWS, on February 17, 2012.

construction over the next 20 years, and one informal consultation for maintenance on the existing natural gas pipeline in the area.

EXHIBIT 8-2. OIL AND GAS DEVELOPMENT IN FLYCATCHER CRITICAL HABITAT ON THE SAN JUAN RIVER, SAN JUAN COUNTY, UT

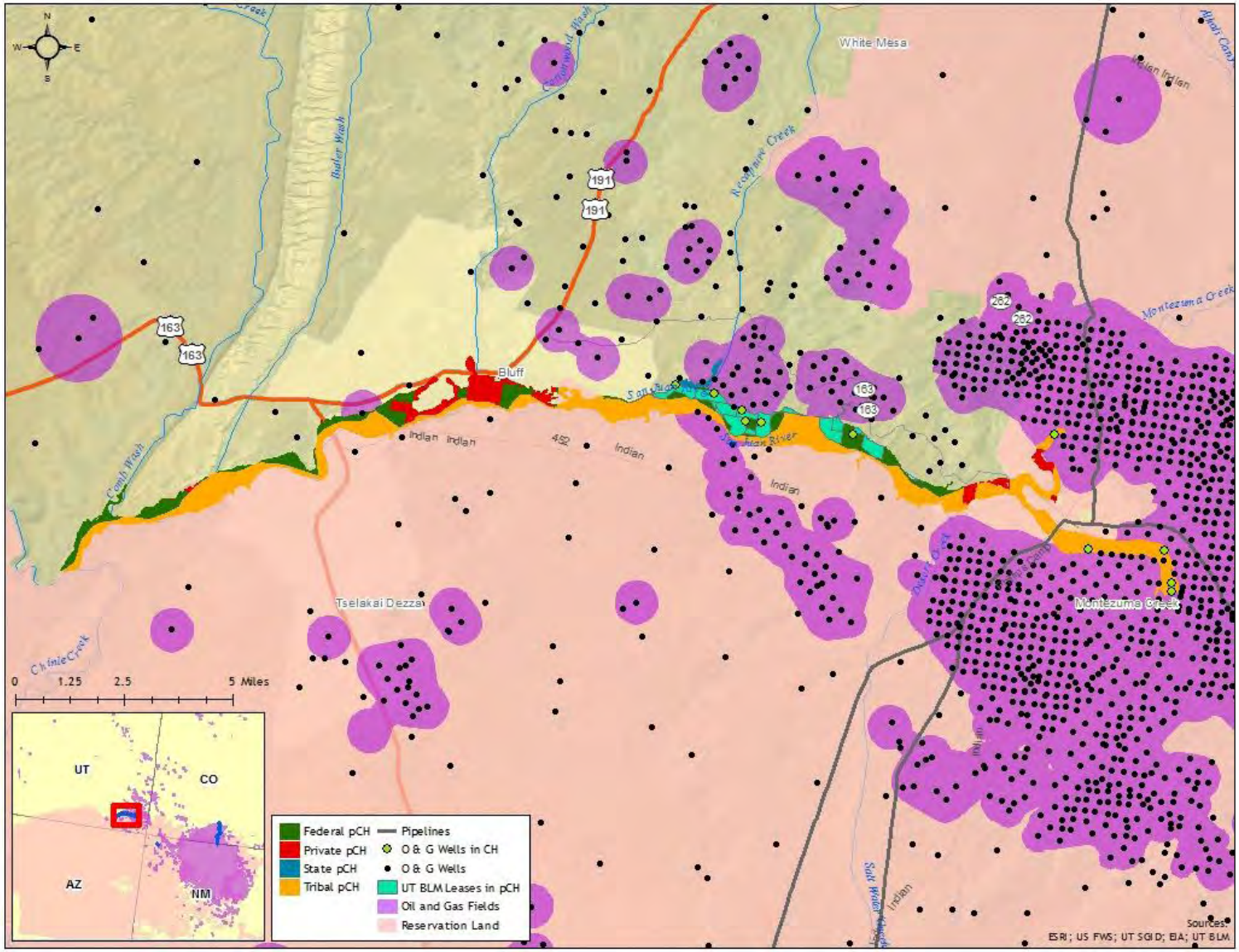
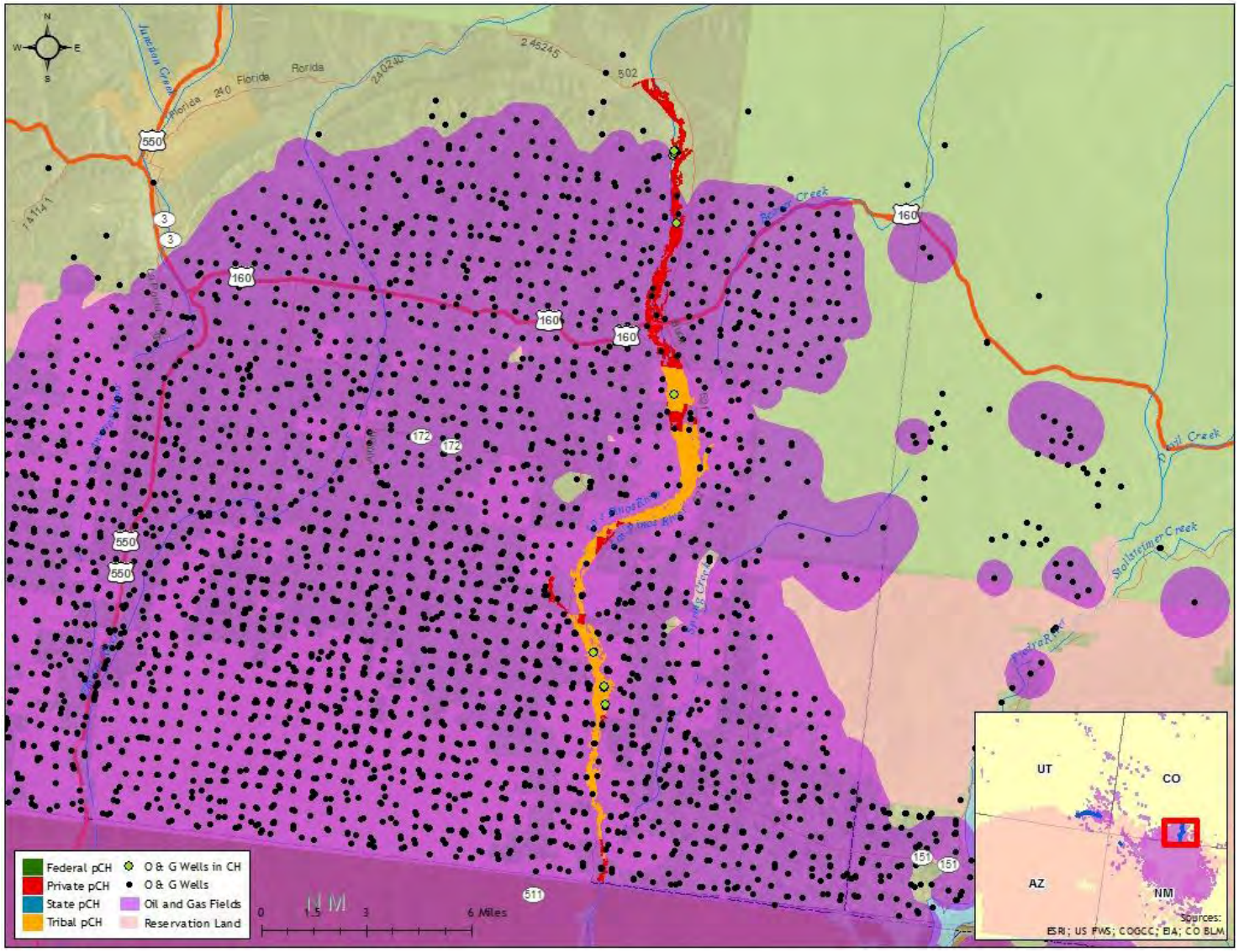


EXHIBIT 8-3. OIL AND GAS DEVELOPMENT IN FLYCATCHER CRITICAL HABITAT ON THE LOS PINOS RIVER, LA PLATA COUNTY, CO



CHAPTER 9 | POTENTIAL ECONOMIC IMPACTS TO MINING OPERATIONS

547. This section describes the potential for economic impacts to mining activities in areas proposed as critical habitat for the flycatcher. Unlike other chapters in this report, it does not quantify either baseline or incremental impacts to these activities, because of the high level of uncertainty about whether and the extent to which mining operations may undertake flycatcher conservation efforts.

548. Instead, the chapter provides a qualitative discussion of potential impacts to mining operations. We first provide an overview of the economic importance of the industry to the counties and States containing proposed critical habitat. Next, we provide a discussion of past economic impacts to mining operations related to flycatcher conservation activities. The final sections discuss qualitatively the operations that may be affected by proposed critical habitat, including Freeport-McMoRan Copper & Gold Inc. and its affiliates (hereafter, "Freeport").

9.1 SUMMARY OF POTENTIAL IMPACTS TO MINING ACTIVITIES

549. While few active mineral mining activities occur within the proposed critical habitat, the mining industry has previously expressed concern that water use by existing or potential mining operations could be affected by flycatcher conservation activities, particularly the designation of critical habitat. Critical to an understanding of the potential for impacts on water diversions or conveyance for mining purposes is an understanding of the probability and magnitude of any such changes. As detailed in this chapter, there are currently no data that indicate whether existing or future diversions of water for mining activities (including groundwater pumping) reduce stream flow or modify hydrologic conditions to a degree that adversely impacts the flycatcher and its riparian habitat. In addition, hydrologic models are unavailable to assess the role of any specific mining facility's groundwater pumping or surface water diversions in determining stream flow or other hydrologic conditions within critical habitat. As such, this analysis does not quantify the probability or extent to which water use for mining purposes would need to be curtailed or modified to remedy impacts flycatcher.

550. Given data and model limitations, this analysis does not answer the question of whether impacts to mining operations are likely (i.e., the probability of such impacts), or define the expected magnitude of these impacts. It does, however, provide information on the potential scale of the future baseline and incremental economic impact that could occur if requirements associated with flycatcher conservation result in changes to water diversions or conveyance. Specifically, to allow for an understanding of the economic activities that

could be at risk if modifications to water use or conveyance are required because of the designation of critical habitat, this analysis provides data on the location of mining activities potentially associated with critical habitat areas, as well as data on the regional economic importance of these operations.

9.2 OVERVIEW OF MINING ACTIVITIES IN STATES WITH PROPOSED CRITICAL HABITAT

551. Mining is a large industry in the counties containing flycatcher critical habitat, particularly in the state of Arizona. According to the Department of Mines and Mineral Resources, the estimated value of Arizona's non-fuel mineral production in 2007 – the most recent year for which data are available – was $7.26 billion, a 7.6 percent increase over the 2006 value. In 2007, the value of Arizona's non-fuel mineral production ranked first in the U.S.[767]

552. Copper production makes up the majority of non-fuel mineral production in Arizona. The Arizona Department of Mines and Minerals states that "Arizona continued to be the Nation's leading copper-producing State in 2007 and accounted for 63 percent of the total U.S. copper mine production."[768] A major producer of copper and mineral resources in the southwest, PDC merged with Freeport-McMoRan Copper & Gold Inc. in 2007, becoming the world's largest publicly traded copper producer. Before the merger in 2006, PDC accounted for nearly 75 percent of Arizona's total copper production.[769] By 2009, more than 9,000 Arizona residents were directly employed by the copper industry; including indirect employment in areas such as retail, manufacturing, and service industries, this number rises to an estimated 52,500.[770]

553. Consequently, the mining industry's contribution to Arizona's economy is important, particularly to some rural communities who rely on mining activities to provide employment and tax revenue. According to the U.S. Census, the combined direct and indirect impacts of the copper industry on Arizona's economy was approximately $9.3 billion in 2009,[771] or 3.7 percent of Arizona's total gross state product.[772] In addition to copper, the Arizona Mining Association (AMA) notes that Arizona is a leader in the production of gemstones, molybdenum, silver, perlite, sand, and gravel. Although more

[767] Arizona Department of Mines and Minerals/U.S. Geological Survey. 2007. "The Mineral Industry of Arizona," U.S. Geological Survey Minerals Yearbook, 2007, accessed at minerals.usgs.gov/minerals/pubs/state/az.html.

[768] Ibid.

[769] Arizona Department of Mines and Minerals/U.S. Geological Survey. 2006. "The Mineral Industry of Arizona," U.S. Geological Survey Minerals Yearbook, 2006, accessed at minerals.usgs.gov/minerals/pubs/state/az.html.

[770] George F. Leaming, Western Economic Analysis Center. 2010. "The Economic Impact of the Arizona Copper Industry 2009", March 2010.

[771] George F. Leaming, Western Economic Analysis Center. 2010. "The Economic Impact of the Arizona Copper Industry 2009", March 2010.

[772] U.S. Department of Commerce, Bureau of Economic Analysis. Gross Domestic Product by State accessed at http://www.bea.gov/regional/index.htm on November 15, 2011.

recent data is not available, numbers from 2003 suggest that 72 mining companies operated 126 mines in Arizona and directly employed more than 15,000 people.[773]

554. Mining is also a significant economic activity in the State of New Mexico, which is one of the nation's leading producers of coal, copper, molybdenum, and potash. From 2008 to 2009, due to worldwide dips in the price of copper and consequent closings of several major New Mexico mines, the State's copper production decreased 46.5 percent to 121.2 million pounds, and copper production value fell 58.6 percent to $289.6 million. Despite this decrease, New Mexico was the third largest State in terms of the amount of copper produced in 2009, as well as being the sixth largest producer of molybdenum, and the largest producer of potash, perlite, and zeolite. More than 5,000 New Mexico residents were employed by the mining sector in 2009. [774]

555. In Colorado, the mining industry directly employs approximately 5,000 residents, with another 5,000 employed in indirect sectors such as engineering, consulting, finance, transportation, and geotechnical and utility services. Colorado ranks sixth among States in coal production and receives $3 billion annually in sales from commodities, including coal, gold, molybdenum, silver, gypsum, and sand/gravel.[775]

556. Mining also represents a significant economic sector in the remaining states of Utah, Nevada, and California. Mineral production in Utah in 2009 totaled $4.38 billion, placing Utah third nationally in terms of the value of non-fuel mineral production. Utah also ranked second in the quantities of copper, potash, and magnesium produced. Of these, copper was the largest contributor to the value of non-fuel minerals, bringing an estimated $1.7 billion to the Utah economy.[776] In 2010 in Nevada, 97 percent of mining revenue came from precious metals such as gold, silver, and copper, and the industry contributed $12.3 billion to Gross State Product. Mining also generated more than 63,900 jobs in Nevada; of these, 12,200 represent direct employment in the mining industry.[777] Finally, in California, more than 700 mines produced $3.4 billion worth of non-fuel minerals in 2009, and led the nation in production of sand and gravel, diatomite, and natural sodium sulfate. California was the fourth largest State in terms of the value of non-fuel mineral production, following Arizona, Utah, and Nevada.[778]

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[773] Arizona Mining Association, Public Comment of Draft EA for Southwestern Willow Flycatcher, submitted on July 18, 2005.

[774] New Mexico Energy, Minerals, and Natural Resources Department. 2010. Annual Report 2010. Accessed at http://www.emnrd.state.nm.us/MAIN/documents/EMNRD-2010-Annual-Report.pdf on November 21, 2011.

[775] Colorado Mining Association. Facts and Resources. Accessed at http://www.coloradomining.org/mc_miningfacts.php on November 21, 2011.

[776] Bon, Roger L. and Krahulec, Ken. 2010. "2009 Summary of Mineral Activity in Utah." Utah Geological Survey 2010. Accessed at geology.utah.gov/online/c/c-111.pdf *on November 21, 2011.*

[777] Dobra, John L. Natural Resource Industry Institute, University of Nevada, Reno. 2011. "An Economic Overview of Nevada's Minerals Industry, 2010-11." Accessed at http://www.nevadamining.org/issues_policy/reports.php on November 21, 2011.

[778] Clinkenbeard, John, and Joshua Smith. 2009. "California Non-Fuel Minerals 2009." State of California Department of Conservation Mineral Production. Accessed at http://www.conservation.ca.gov/cgs/geologic_resources/mineral_production/Pages/Index.aspx on November 21, 2011.

9.3 EXAMPLE IMPACTS TO MINING OPERATIONS

557. Because certain types of mining activities use considerable volumes of water, flycatcher protection measures that require significant modifications in management regimes at dams or in surface or groundwater diversions could impact mining activities that utilize water on these stream reaches. The Proposed Rule and flycatcher Recovery Plan identify water diversion and groundwater pumping as actions that may threaten the availability and suitability of riparian habitat. Specifically, the Recovery Plan states:

> *Surface water diversions and groundwater pumping for agricultural, industrial, and municipal uses are major factors in the deterioration of southwestern willow flycatcher habitats.*[779]

558. Several mines, primarily located outside of proposed critical habitat, draw surface water or utilize groundwater wells located in the vicinity of critical habitat for industrial purposes. In some areas, mining infrastructure crosses Federal lands in the vicinity of proposed critical habitat, and thus has a potential Federal nexus for section 7 consultation. In addition, mining facilities can require a variety of Federal permits, potentially generating a Federal nexus for consultation. This combination of factors has led several mining companies to express concern about potential impacts of flycatcher conservation activities to their operations. These concerns include potential costs associated with section 7 consultations and mitigation, but focus on potential delays that could render operations uneconomical, and potential restrictions in mineral output that would lead to mine shut-down and subsequent closure.[780] Additional concerns focus on restrictions to water resources used by the mines as a result of flycatcher conservation.[781] Proposed stream reaches that are located adjacent to or which provide water to mining operations include the San Francisco, Gila, San Pedro, Big Sandy, and Verde Rivers, and Pinal Creek, all of which are considered to be occupied by the flycatcher. Of these segments, only the San Francisco River may experience incremental impacts as a result of increased awareness (see discussion in Chapter 2).

559. As previously mentioned in this report, incremental impacts are most likely to occur in unoccupied reaches of critical habitat. However, we recognize that interest concerning the potential impact that the designation may have on all operations remains. In particular, there is uncertainty about whether CHD may provide additional leverage for third party intervention in ongoing activities, but these are not quantifiable in the context of the current analysis. In response to previous public comments and inherent uncertainties, this analysis provides some additional information related to potential impacts to mining

[779] U.S. Fish and Wildlife Service. 2002. Final Recovery Plan Southwestern Willow Flycatcher (*Empidonax traillii extimus*), August 2002, p. II-38.

[780] Honey Creek Resources Inc. 2005. "Economic Impacts of Critical Habitat Designation to Copper Mining, Pinto Creek Basin, Arizona." Prepared for BHP Copper Inc., Honey Creek, Iowa. July 2005.

[781] Sunding, David L., Richard W. Dunford, and Jamie Glenn. 2005. "Proposed Critical Habitat Designation for the Southwestern willow flycatcher: Potential Economic Impacts on Phelps Dodge Corporation Operations." Prepared for Phelps Dodge Corporation, July 13, 2005.

activities on reaches that are considered occupied, even though incremental impacts are unlikely to occur.

560. Since the listing of the species, the Service has conducted four formal consultations with the mining industry that involved the flycatcher. A 2002 consultation with BLM focused on the proposed PDCDos Pobres/San Juan Project near Safford in Graham County, Arizona.[782] The consultation and environmental impact statement (EIS) examined two land development options. PDC could use 3,300 acres of BLM land to develop the Dos Pobres and San Juan copper ore bodies in the Gila Mountains. Alternatively, PDC could relinquish 3,858 acres of land to the BLM in various locations in Arizona in exchange for 17,000 acres of BLM land near the project site. The EIS identified the land exchange as the preferred alternative from the standpoint of species conservation. In addition to the flycatcher, the consultation considered potential impacts to the Gila topminnow, razorback sucker, spikedace, loach minnow, and their critical habitats. PDC agreed to protect sensitive habitat areas and monitor the populations occurring on their land. PDC surveyed the flycatcher populations on their land in 2002 and 2004, while three additional annual surveys were conducted by the Service. The Service ultimately concluded that disturbances resulting from the proposed Dos Pobres/San Juan Projects were unlikely to jeopardize the existence of the flycatcher.

561. Another biological opinion was issued in 1997 for five species including the flycatcher. The proposed action for the consultation was the issuance of a NPDES permit for the PDC Development, Verde Valley Ranch. [783] This consultation involved reclamation of tailings associated with historic United Verde mining operations. Reasonable and prudent measures for this consultation stated that implementation of the storm water management plan should not result in declining water quality to nearby receiving waters.

562. The third biological opinion, issued in 1997 to the Corps, addressed impacts to three species, including the flycatcher, from a sand mining and levee construction project in San Diego County, California. [784] Operations planned by H.G. Fenton Material Company ("Fenton") included mining 600,000 tons of sand annually from the floodplain of the San Luis Rey River. Through its application for a permit under section 404 of the Clean Water Act, Fenton was required by the Corps to protect native vegetation and control invasive plants, install and operate cowbird traps, and avoid any habitat removal activities during flycatcher breeding season. The Service concluded through consultation that jeopardy to the species and adverse modification of proposed flycatcher critical habitat were likely.

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[782] U.S. Fish and Wildlife Service, Phoenix, Arizona Ecological Services Office. 2002. Biological Opinion for the Dos Pobres/San Juan Project, June 11, 2002.

[783] U.S. Fish and Wildlife Service, Phoenix, Arizona Ecological Services Office. 1997. Biological Opinion for the National Pollution Discharge Elimination Program Storm Water permit to Phelps Dodge for the Proposed Verde Valley Ranch Development in Yavapai County, June 11, 1997.

[784] U.S. Fish and Wildlife Service, Carlsbad Field Office. 1997. Biological/Conference Opinion on the H.G. Fenton Material Sand Mine and Levee (U.S. Army Corps of Engineers File No. 94-20871-ES) near Pala on the San Luis Rey River, San Diego County, California, July 3, 1997.

563. Finally, in 1998, the Service issued a biological opinion to the Corps concerning the impacts of extracting sand and gravel from the Santa Maria and Sisquoc Rivers in Santa Barbara and San Luis Obispo Counties, California, to the flycatcher and three other species.[785] Coast Rock Product, Inc. and Kaiser Sand and Gravel proposed to carry out this extraction within the river channels and on upland agricultural fields. As described in the opinion, the companies were required to undertake several mitigation measures, including conservation of mitigation lands, through the Counties' Conditional Use Permits. The Service recommended additional monitoring, but determined that the proposed action was not likely to jeopardize the species. Flycatcher critical habitat was not designated in the project area.

9.4 POTENTIAL FUTURE IMPACTS OF CRITICAL HABITAT ON MINING ACTIVITIES

564. The locations of mine and mineral deposits relative to critical habitat were determined using geographic data from the USGS Mineral Resource Data System.[786] As shown in Exhibit 9-1, 51 sites fall within proposed critical habitat. Approximately 70 percent of those sites areas are located in Arizona (24) and New Mexico (11). The remaining sixteen are split between Colorado (6), California (7), and Utah (3).

565. More than half of the mines in critical habitat (27) are sand and gravel operations. Twelve of these are identified by the USGS Mineral Resources Data System as active producers, although more recent data from the Arizona Department of Mines and Mineral Resources (ADMMR) indicates that none of the three sites in Arizona were still in operation as of 2007. ADMMR also reports that these sand and gravel mines are typically small operations that extract streambed material in or near river channels with perennially low water levels. This type of mining activity does not utilize large volumes of surface water.[787] The Service maintains that although sand and gravel operations may disturb habitat over relatively small areas, they are unlikely to pose a major threat to the species.[788]

566. However, if sand and gravel pits occur within critical habitat and cause direct loss of habitat, operations may face constraints regardless of pit size. Potential conservation measures to mitigate these threats are uncertain. The consultation history involving the

[785] U.S. Fish and Wildlife Service, Ventura Field Office. 1998. Biological Opinion for Extraction of Sand and Gravel within the Santa Maria and Sisquoc Rivers, Santa Barbara and San Luis Obispo Counties, California (File Numbers 94-50249-TS [Coast Rock] and 94-50885-TS [Kaiser]) (1-8-96-F-61). August 17, 1998.

[786] U.S. Geological Survey. 2005. Mineral Resources Data System: U.S. Geological Survey, Reston, Virginia. The geographic data used for this analysis was extracted in November 2011. This database contains the records previously provided in the Mineral Resource Data System of USGS and the Mineral Availability System/Mineral Industry Locator System (MAS/MILS) originated in the U.S. Bureau of Mines, which is now part of USGS. USGS states that the positional information of the data is variable, and that data may not be updated to current conditions. Accessed at http://tin.er.usgs.gov/mrds/ on November 21, 2011.

[787] Personal communication with Nyal Niemuth, Mining Engineer, Arizona Department of Mines and Mineral Resources, on September 2, 2005 and September 9, 2005.

[788] Personal communication with Biologist, U.S. Fish and Wildlife Service, Arizona Ecological Services Office, on September 7, 2005.

mining industry is limited; of the four biological opinions that have been issued, two dealt with sand and gravel mining operations. In these two opinions, the Service recommended conservation measures such as the purchase of mitigation lands, timing restrictions to avoid flycatcher breeding season, and cowbird trapping to avoid jeopardy of the species and adverse modification of critical habitat. As a result, for active sand and gravel operations that occur within critical habitat and are subject to a Federal nexus, such as a section 404 permit under the Clean Water Act, we anticipate impacts to operations, but based on the limited consultation history, these impacts are uncertain.

567. An additional four of the mine sites occurring within critical habitat are geothermal operations, which extract energy from heat stored beneath the earth's surface. While no information is available on the specific operations at these sites, geothermal applications are generally considered non-consumptive water uses, and thus would be unlikely to be significantly affected by the CHD. However, according to communications with ADMMR, low temperature geothermal applications are occasionally used for shrimp farming and tomato cultivation, and such operations could be affected by restrictions on water withdrawals.

568. Eight of the 20 remaining sites within proposed critical habitat are mineral "occurrences" that are presently undeveloped. "Occurrence" status indicates the presence of an unexplored mineral deposit with no mining infrastructure. Such status does not imply that any individual or corporation owns rights to the deposit or that any individual or corporation intends to mine the deposit. Four additional sites were identified as "prospect" areas. "Prospect" status indicates that exploratory analysis of a mineral deposit has occurred, yet that no production is planned in the near term. The status of two sites is unknown.

569. The six remaining mines within proposed critical habitat are active producer sites. One of these is a copper site owned by Arizona Gold Mine in Pinal County. However, ADMMR reports that the Arizona Gold Mine has not been at full production since the 1960s, and is likely to be inactive, although very small-scale extractive operations may still be underway. ADMMR also reports that the Christmas Underground Mine and Tiger Tailings Dump have been closed.[789] Two additional sites - the F.L. Clark Trucking Company Plant and Silica Mill - are silica mines located in Pinal County, and the Colton Cement Plant in San Bernardino County, California, is a limestone mine. Both limestone and silica mines are quarry-style operations, which, according to ADMMR, are not water intensive. Expansion of production at any of these three sites could involve deepening or widening of the quarry, but not significant horizontal expansion across the landscape that could destroy flycatcher habitat. Consequently, it is highly unlikely that these six sites located within proposed critical habitat would pose a threat to the flycatcher or its habitat. Accordingly, none of the sites is likely to encounter constraints on operations due to the designation of critical habitat.

[789] Personal communication with Nyal Niemuth, Mining Engineer, Arizona Department of Mines and Mineral Resources, on September 2 and September 9, 2005, and November 18, 2011.

EXHIBIT 9-1. MINERAL RESOURCES LOCATED WITHIN FLYCATCHER MANAGEMENT UNITS

MANAGEMENT UNIT	STATE	COUNTY	SITE NAME	COMMODITY	STATUS
Amargosa	California	Inyo	Upper Canyon Nitrate Deposit	Nitrogen-Nitrates	Prospect
Bill Williams	Arizona	Mohave	Big Kimble	Gold, Copper	Unknown
			Krook	Silver, Gold	Occurrence
Hoover-Parker	Arizona	Mohave	State Pit No. 8374	Sand and Gravel	Unknown
Little Colorado	New Mexico	McKinley	State Hwy Pit No. 71-19-S	Sand and Gravel	Unknown
Lower Rio Grande	New Mexico	Sierra	Materials Pit #22	Stone	Unknown
		Dona Ana	Unnamed Sand and Gravel Pit	Sand and Gravel	Producer
			Unnamed Sand and Gravel Prospect	Sand and Gravel	Occurrence
Middle Gila/San Pedro	Arizona	Pinal	Silica Mill	Silica	Producer
			Tiger Tailings Dump	Copper	Producer
			Arizona Gold Mine	Copper	Producer
			Chalcocite Group	Copper	Prospect
			Winkelman	Gypsum-Anhydrite	Occurrence
			F.L. Clark Trucking Co. Plant	Silica	Producer
		Pinal, Gila	Mellor Prospect	Copper	Occurrence
		Gila	Christmas Underground Mine	Copper	Producer
		Cochise	Name Unknown	Geothermal	Producer
			Unknown	Geothermal	Producer
		Pima	Unknown	Geothermal	Occurrence
Middle Rio Grande	New Mexico	Valencia	Tome Pit	Sand and Gravel	Producer
		Socorro	Vignali Pit	Sand and Gravel	Producer
			Joyita Prospects	Unknown	Occurrence
Parker-Southerly International Boundary	Arizona	La Paz	Clip Wash	Kyanite	Occurrence
		Yuma	Unknown	Geothermal	Unknown
Powell	Utah	Kane	Utah Dept. Highways Pit #13020	Unknown	Occurrence
Roosevelt	Arizona	Gila	Clay Deposit	Clay	Prospect
San Luis Valley	Colorado	Conejos	Unknown	Sand and Gravel	Producer
		Alamosa	Unknown	Sand and Gravel	Occurrence
		Rio Grande	Unknown	Sand and Gravel	Occurrence
			Unknown	Sand and Gravel	Unknown

MANAGEMENT UNIT	STATE	COUNTY	SITE NAME	COMMODITY	STATUS
Santa Ana	California	San Bernardino	Colton Cement Plant	Limestone, General	Producer
Santa Clara	California	Ventura	Santa Barbara Portable Plant	Sand and Gravel	Producer
			Santa Clara River Pit	Sand and Gravel	Producer
			Santa Paula Pit	Sand and Gravel	Producer
			Saticoy Pit	Sand and Gravel	Producer
Upper Gila	Arizona	Pinal	Myres Property	Copper, Gold	Occurrence
Upper Rio Grande	New Mexico	Santa Fe	Materials Pits	Sand and Gravel	Unknown
			Materials Pit	Sand and Gravel	Unknown
		Rio Arriba	Materials Pit No. 64-17-S	Sand and Gravel	Prospect
Verde	Arizona	Yavapai	Bedrock Aggregate	Sand and Gravel	Producer
			Crushing & Screening Plant	Sand and Gravel	Producer
			El Jay Sand & Gravel	Sand and Gravel	Producer
			Saline Water Well Near Camp Verde	Halite, Bromine	Occurrence
			Sand and Gravel Pit	Sand and Gravel	Unknown
			Verde River Deposit	Diatomite	Prospect
Virgin	Utah	Washington	L Sullivan Pit	Sand and Gravel	Prospect
			L. Sullivan Pit	Sand and Gravel	Occurrence

Source: U.S. Geological Survey. 2005. Mineral Resources Data System: U.S. Geological Survey, Reston, Virginia. Accessed at http://tin.er.usgs.gov/mrds/ on November 21, 2011.
Notes: The geographic data used for this analysis was extracted in November 2011. This database contains the records previously provided in the Mineral Resource Data System of USGS and the Mineral Availability System/Mineral Industry Locator System (MAS/MILS) originated in the U.S. Bureau of Mines, which is now part of USGS. This exhibit does not include past producers.

[1]"Occurrence" status indicates that a mineral deposit exists, yet that no developed mining infrastructure exists on the site. Such status does not imply that any individual or corporation owns rights to the deposit or that any individual or corporation intends to mine the deposit. "Prospect" status indicates that although exploration at a mineral deposit is underway, no production is planned in the near term. "Producer" status indicates that the resource is in active use.

570. Aside from the sites located within critical habitat, mining companies are concerned that mines outside of critical habitat may encounter limitations on their surface and groundwater withdrawals, which are critical to production. Mines outside of critical habitat could negatively affect stream flow or other hydrologic features within critical habitat through surface and/or groundwater withdrawals. If impacts on flycatcher habitat were found to exist, these mines could potentially face constraints on their water use. Because the affected region is arid, and the volumes of water used by these facilities are large, substitute water sources are generally not readily available. Thus, these mining companies worry that reductions in water availability could delay or curtail production at

mine facilities. While less water intensive mining processes are being developed, such technology is not available in the short-term.[790] Because of the volatile nature of copper pricing, timing of mining production is critical to maximizing the value of the extracted resource. In response to the previous proposed designation of critical habitat, one commenter noted that for copper mines, "mine owners primarily bear the burden of the damages to the extent that mitigation reduce[s] profitability. However, if the mitigation ultimately results in a reduction in mine investment, including production being reduced or stopped, then the local communities share the burden through lost employment opportunities and reduced local government revenues."[791]

571. Constraints on water use to accommodate flycatcher concerns cannot be accurately quantified because hydrological models that explain the relationship between groundwater pumping and surface water diversions and flycatcher habitat health are not available. Such models would need to be highly site-specific in order to be accurate, and thus would require information that includes:

- Precise locations of water withdrawals;
- Streamflow in affected river reaches;
- Volume of surface and/or groundwater withdrawals by mines and nearby water users;
- Streamflow reduction resulting from a given volume of surface and groundwater withdrawn;
- Flow level necessary to maintain flycatcher habitat and populations;
- The availability of substitute water for mining activities.

572. While the above information is not available, Exhibit 9-2 provides information on the economic resources at risk given potential constraints on surface water and groundwater use.

573. The remainder of this section presents a general overview of the sources of water used by mines located outside proposed critical habitat.

9.4.1 POTENTIAL IMPACTS TO FREEPORT-MCMORAN COPPER & GOLD INC.

574. In 2005, PDC, which merged with Freeport in 2007, identified two operating mines, Bagdad and Tyrone, as well as three non-operating mines, Dos Pobres/San Juan at the Safford site, the Christmas Mine district, and Clarkdale/Jerome at the United Verde site, for which flycatcher impacts were a concern. According to Fennemore Craig, P.C., attorneys who represent Freeport, in their comments on the 2005 CHD for the flycatcher:

[790] Sunding, David L., Richard W. Dunford, and Jamie Glenn. 2005. "Proposed Critical Habitat Designation for the Southwestern willow flycatcher: Potential Economic Impacts on Phelps Dodge Corporation Operations." Prepared for Phelps Dodge Corporation, July 13, 2005.

[791] Honey Creek Resources Inc. 2005. "Economic Impacts of Critical Habitat Designation to Copper Mining, Pinto Creek Basin, Arizona." Prepared for BHP Copper Inc., Honey Creek, Iowa. July 2005.

> "[T]he utility of [Freeport's] operations depends on the certainty of available water supplies. It is well known that mining requires the use and availability of dependable water supplies and that such supplies are in limited quantity in the arid southwest. If the availability of water is curtailed or precluded, [Freeport] operations would be severely impacted and their viability placed at risk."[792]

575. Freeport has also expressed concern that some potential ore reserves may not be exploitable if critical habitat for flycatcher leads to unavailability of water supplies, large mitigation costs and/or project delays. While clearly water availability is a concern for these mining operations, the Service notes that curtailment of water supplies had not happened under previous designations of critical habitat for the species.[793]

576. The following sections discuss the potentially affected mines in more detail, focusing on their connection to proposed critical habitat reaches and associated water rights. This information is further summarized in Exhibit 9-2. As previously stated, this analysis does not answer the question of whether impacts to mining operations are likely (i.e., the probability of such impacts), or define the expected magnitude of these impacts. Therefore, no potential impacts, whether baseline or incremental, are quantified for the following mining operations. All of the following mines, except the Morenci Mine, are located in occupied areas where the presence of the flycatcher is well known.

Bagdad Mine

577. The Bagdad Mine is an open-pit copper mine and sulfide ore concentrator. Freeport reports that it is the largest U.S. producer of concentrate leach material, and currently provides 22 percent of Freeport's net operating income.[794] The potential impact of flycatcher conservation on the Bagdad mine is of concern to Freeport both due to its economic importance to Freeport and its reliance on water withdrawals in the vicinity of proposed critical habitat.[795] In addition, mine operations contribute regional economic benefits, including employment and taxes to Yavapai County.

578. While the Bagdad mine is located 20 miles from the proposed critical habitat, Freeport owns most of the land within and directly adjacent to the proposed stretch of the Big Sandy River in the Bill Williams River watershed that runs from Cane Springs Wash to an area downstream of the Town of Wikieup, Arizona. While the lands are currently used for private grazing activities, Freeport's primary purpose for these lands is as a groundwater well field that follows the length of the Big Sandy, with most wells sited north of the Route 93 bridge crossing. According to Freeport, this water provides 80

[792] Fennemore Craig, P.C., Public Comment on Draft EA for Southwestern Willow Flycatcher, submitted on behalf of the Phelps Dodge Corporation, July 18, 2005.

[793] Written comments of U.S. Fish and Wildlife Service, Arizona Ecological Services Office, received March 15, 2006.

[794] Sunding, David L., Richard W. Dunford, and Jamie Glenn. 2005. "Proposed Critical Habitat Designation for the Southwestern willow flycatcher: Potential Economic Impacts on Phelps Dodge Corporation Operations." Prepared for Phelps Dodge Corporation, July 13, 2005.

[795] *Ibid.*

percent of the industrial water used by the Bagdad mine.[796] En route to the mine, the pipeline for these wells cross federal lands, thus providing a potential Federal nexus for consultation on flycatcher.[797]

579. The Bagdad mine has consistently produced the second or third largest volume of copper sold by Freeport from its U.S. mines (123.3 thousand tons in 2000). Freeport also paid $1.9 million in sales tax to Yavapai County, as well as $2.2 million in severance taxes to the State of Arizona.[798] Freeport employed nearly 800 people at the Bagdad mine in 2010,[799] representing 0.8 percent of the 98,000 person labor force in Yavapai County.[800]

Tyrone Mine

580. The Tyrone mine is an active open-pit copper mine located in Grant County, New Mexico. The Tyrone mine is located 17 miles from the Gila River and relies on surface and groundwater supplies for its mining operations. Freeport maintains a water diversion from within proposed critical habitat that leads to an off-river water storage area called Bill Evans Lake which feeds an underground pipeline to the mine. Although this pipeline does not cross Federal lands, Freeport is concerned that the maintenance of the diversion could act as a Federal nexus for consultation. While the surface water diversion constitutes only a portion of the water used by this mine, the volumes used are significant enough that it may be difficult for this operation to access substitute water sources.[801]

581. Under a hypothetical situation in which restrictions due to critical habitat were to prevent Freeport from using Gila River water rights associated with the Tyrone mine, Freeport would have to seek alternate sources for 7,000 acre-feet. Using an average cost for a water right in New Mexico of $4,174 per acre-foot, Freeport estimates that replacing this water would cost approximately $29.2 million. Freeport notes that replacement costs could, in fact, be higher as this mine is located in remote areas where the water costs may be higher.[802] Using five example transactions from 2001, Freeport estimates that water prices in the Gila River area could be as much as $6,383 per acre-foot, which would result in costs to replace 7,000 acre-feet of $44.7 million.[803]

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[796] *Ibid.*

[797] *Ibid.*

[798] Sunding, David L., Richard W. Dunford, and Jamie Glenn. 2005. "Proposed Critical Habitat Designation for the Southwestern willow flycatcher: Potential Economic Impacts on Phelps Dodge Corporation Operations." Prepared for Phelps Dodge Corporation, July 13, 2005.

[799] Freeport-McMoRan Copper & Gold. "Economic Impact of the Bagdad Mine Upon Yavapai County and Arizona – 2010." Accessed at http://www.fcx.com/operations/USA_Arizona_Bagdad.htm on November 21, 2011.

[800] Labor force statistics by county, August 2010-September 2011. Bureau of Labor Statistics, Local Area Unemployment Statistics. Accessed at http://www.bls.gov/lau/#tables on November 21, 2011.

[801] Sunding, David L., Richard W. Dunford, and Jamie Glenn. 2005. "Proposed Critical Habitat Designation for the Southwestern willow flycatcher: Potential Economic Impacts on Phelps Dodge Corporation Operations." Prepared for Phelps Dodge Corporation, July 13, 2005.

[802] Ibid.

[803] Ibid.

Safford Site (San Juan/Dos Pobres)

582. The Safford Mine (which includes the San Juan/Dos Pobres ore bodies development) became fully operational in 2008.[804] The mine site is located eight miles from proposed critical habitat in the Upper Gila management unit. According to the most recent information available, the current phase of operations utilizes localized groundwater resources.[805] While there is no near-term threat to Safford operations from proposed critical habitat, future mine expansion could lead Freeport to utilize water rights it holds in proposed critical habitat areas on the Gila River.[806] At that time, limitations on water use or mitigation could be required to accommodate the flycatcher. In addition, Freeport did consult on the land exchange plan with regard to the flycatcher, as described above, and has conducted some habitat restoration for the flycatcher as a result.[807]

583. The Safford Mine employed nearly 600 people in Graham County, Arizona, in 2010.[808] This represents nearly four percent of the civilian labor force in Graham County.[809]

Christmas Mine

584. The Christmas mine district is adjacent to proposed critical habitat in the Middle Gila/San Pedro management unit between Cienega Creek and the confluence of the San Pedro and Gila Rivers. This mine was taken off-line in 1983 and is currently in a "care-and-maintenance" phase. There are no plans to reopen the mine.[810] Thus, no immediate threats to Freeport operations are apparent at this site. However, should Freeport seek to secure water for Christmas mining operations in the future, flycatcher considerations could delay or hinder those efforts.

United Verde Mine

585. The United Verde Mine is located near Jerome, Arizona, in Yavapai County. The mine closed in 1953 and is in a "long-term care-and-maintenance" mode. There are no plans to reopen this mine in the foreseeable future. However, should it reopen, future mining operations would necessitate utilization of water rights from the Verde River. Freeport

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[804] Freeport-McMoRan Copper & Gold. Safford Mine website. Accessed at http://www.fcx.com/operations/USA_Safford.htm on November 21, 2011.

[805] Sunding, David L., Richard W. Dunford, and Jamie Glenn. 2005. "Proposed Critical Habitat Designation for the Southwestern willow flycatcher: Potential Economic Impacts on Phelps Dodge Corporation Operations." Prepared for Phelps Dodge Corporation, July 13, 2005.

[806] Ibid.

[807] Ibid.

[808] "Economic Impact of the Morenci and Safford Mines Upon Greenlee/Graham Counties and Arizona – 2010." Freeport-McMoRan Copper & Gold. Accessed at http://www.fcx.com/operations/USA_Safford.htm on November 21, 2011.

[809] Labor force statistics by county, August 2010-September 2011. Bureau of Labor Statistics, Local Area Unemployment Statistics, accessed at http://www.bls.gov/lau/#tables on November 21, 2011.

[810] NERA Economic Consulting, Comments on 'Economic Analysis of Critical Habitat Designation for the Spikedace and Loach Minnow,' prepared by Industrial Economics, Inc. (IEC), July 6, 2006 submitted with public comments by Norman James, Fennemore Craig, on behalf of Phelps Dodge Company, July 6, 2006.

notes that because land values are increasing in this area, the lands and water rights themselves are valuable assets.[811]

586. As described above, a 1997 consultation occurred at this site related to reclamation of tailings associated with historic United Verde mining operations.[812]

Morenci Mine

587. The Morenci mine is an active open-pit copper mine that employs more than 2,300 people in Greenlee County, Arizona.[813] It is located seven miles from proposed segments of the San Francisco River. Water for the Morenci mine is supplied by a combination of sources, including surface water rights in the San Francisco River (proposed as critical habitat and considered by the Service to be subject to possible incremental impacts) and Eagle Creek drainages, groundwater from the Eagle Creek well field, and water leased from the San Carlos Apache Tribe and delivered to Morenci via the Black River Pump Station. Additionally, Freeport diverts water from the Black River into Willow Creek, which is also proposed as critical habitat.[814]

588. Of Freeport's U.S. mines, the Morenci mine has consistently produced the largest volume of copper sold by Freeport (420,300 tons in 2004). Freeport has expressed concern that the maintenance of the diversion dam could act as a Federal nexus for consultation because the diversion dam is subject to Corps 404 permit requirements.[815] Indeed, one consultation on repair to the spillway of this diversion has already occurred, and at that time, the Service recommended that a consultation on the diversion itself be conducted.[816]

589. Freeport has also expressed concern that if critical habitat affects its ability to utilize its current water supplies, it could be forced to undertake a costly search for replacement supplies.[817] In the case of Morenci, Freeport estimates that the combined Eagle Creek and Black River delivery system has provided in excess of 18,000 acre-feet per year for mining operations and for potable uses at the mine itself and the town of Clifton. If

[811] Ibid.

[812] U.S. Fish and Wildlife Service, Phoenix, Arizona Ecological Services Office. 1997. Biological Opinion for the National Pollution Discharge Elimination Program Storm Water permit to Phelps Dodge for the Proposed Verde Valley Ranch Development in Yavapai County, June 11, 1997.

[813] "Economic Impact of the Morenci and Safford Mines Upon Greenlee/Graham Counties and Arizona – 2010." Freeport-McMoRan Copper & Gold. Accessed at http://www.fcx.com/operations/USA_Safford.htm on November 21, 2011.

[814] NERA Economic Consulting, Comments on 'Economic Analysis of Critical Habitat Designation for the Spikedace and Loach Minnow,' prepared by Industrial Economics, Inc. (IEC), July 6, 2006 submitted with public comments by Norman James, Fennemore Craig, on behalf of Phelps Dodge Company, July 6, 2006; Personal communication at meeting with Phelps Dodge, Phoenix, Arizona, on November, 16, 2005.

[815] Ibid.

[816] Ibid.

[817] According to a NERA report submitted by PDC, "identifying viable supplies involves researching and analyzing information on the availability of water and water rights in areas within piping distance of an affected area. This may involve considerable investigation and negotiation by specialist staff to secure and undertake the transaction." NERA Economic Consulting, Comments on 'Economic Analysis of Critical Habitat Designation for the Spikedace and Loach Minnow,' prepared by Industrial Economics, Inc. (IEC), July 6, 2006 submitted with public comments by Norman James, Fennemore Craig, on behalf of Phelps Dodge Company, July 6, 2006.

Freeport had to find alternative sources for 18,000 acre-feet at the average cost for water in Arizona of $1,898 per acre-foot, it would cost $34.2 million.[818] As previously stated, this analysis does not answer the question of whether critical habitat is likely to affect Freeport's water supplies (i.e., the probability of such impacts), and therefore does not quantify any economic impacts associated with the possible need for replacement water supplies. The Service notes that water supplies for mining operations have not been previously affected by CHD.[819]

9.4.2 POTENTIAL IMPACTS TO BHP COPPER, INC.

590. BHP Copper, Inc. expressed concern over impacts to its mining operations during public comment on the previous designation of critical habitat in 2005. BHP Copper, Inc. produces copper in the Pinto Creek basin through leaching operations. The Pinto Valley division is adjacent to lands along the Pinto Creek that form part of the Roosevelt management unit; however, as of 2005, the listing of the flycatcher had not affected the company's operations at Pinto Creek.[820]

591. The Pinto Valley division of BHP Copper, Inc. includes the Pinto Valley sulfide mine, which suspended operations in 1998 due to depressed copper prices and briefly resumed activity in 2007 before closing in 2009, and the Miami in-situ and No. 2 tailings leach operations, both still in production.[821] These sites are approximately nine miles from the Roosevelt management unit in Gila County, Arizona. The Arizona Department of Mines and Mineral Resources estimates that the Miami in-situ deposit contains 172 million tons of copper with an average grade of 0.40 percent copper, and that the No. 2 tailings operation contains 9 million tons also with an average grade of 0.40 percent.[822] Information on water use at these facilities was not available.

592. Honey Creek Resources (HCR), which submitted an analysis on behalf of BHP Copper for the previous designation of critical habitat, analyzed potential impacts to the Pinto Creek mine under three scenarios for future mine operations, and assigned a probability to each. Scenario 1 is continued operation of the present leaching facility at Pinto Creek, which is assumed to be a certainty. Under scenario 2, BHP Copper would lease its processing assets at Pinto Creek to other mining operations that would transport material to Pinto Creek. The assumed probability of Scenario 2 occurring is 60 percent. Under Scenario 3 BHP Copper would recommence open pit mining at Pinto Creek. The assumed probability of Scenario 3 occurring is 20 percent.

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[818] NERA Economic Consulting, Comments on 'Economic Analysis of Critical Habitat Designation for the Spikedace and Loach Minnow,' prepared by Industrial Economics, Inc. (IEC), July 6, 2006 submitted with public comments by Norman James, Fennemore Craig, on behalf of Phelps Dodge Company, July 6, 2006.

[819] Written communication from the Service, Arizona Field Office, on June 13, 2011.

[820] Honey Creek Resources Inc. 2005. "Economic Impacts of Critical Habitat Designation to Copper Mining, Pinto Creek Basin, Arizona." Prepared for BHP Copper Inc., Honey Creek, Iowa. July 2005.

[821] Personal communication with Nyal Niemuth, Mining Engineer, Arizona Department of Mines and Mineral Resources, on November 21, 2011.

[822] Data on Pinto Valley deposits accessed from the website of the Arizona Department of Mines and Mineral Resources at http://www.admmr.state.az.us/Info/mining_update1999.html on November 18, 2011.

593. HCR uses high range, low range, and most likely estimates for a series of variables used to calculate the economic costs incurred under each scenario. These variables include, but are not limited to, section 7 consultation costs, length of consultation, percentage reduction in output, cost of production, and mitigation costs. The "high range," "low range," and "most likely" estimates for each of these variables vary across scenarios. HCR ran a statistical simulation with 10,000 combinations of values from the ranges identified for each variable. When the "most likely" annual costs for each scenario are weighted by their probability of occurrence, the total "most likely" cost to the Pinto Creek mine due to flycatcher critical habitat is $185,059 per year. HCR estimates that there is a 50 percent probability that annual impacts to Pinto Creek will be greater than $325,300 and a 20 percent probability (80th percentile) that the annual economic impact will be $2.3 million or greater. The comment notes that for copper mines, "mine owners primarily bear the burden of the damages to the extent that mitigation reduced profitability. However, if the mitigation ultimately results in a reduction in mine investment, including production being reduced or stopped, then the local communities share the burden through lost employment opportunities and reduced local government revenues."[823]

9.4.3 POTENTIAL IMPACTS TO ASARCO, INC.

594. Asarco Inc. is a subsidiary of Grupo Mexico, S.A. de C.V. and the third largest producer of copper in the world.[824] According to previous public comments from Asarco, flycatcher critical habitat could impact the company's Ray Complex, which includes the Hayden and Ray operations on the Middle Gila River in Arizona.[825] The Ray operation is located roughly five miles north of the Middle Gila/San Pedro management unit. The Hayden operation is located at the convergence of two branches of the Gila River, and therefore lies a half mile to two miles both to the northeast and the northwest of the Middle Gila/San Pedro management unit.[826] Although Asarco LLC filed for Chapter 11 bankruptcy protection in U.S. Bankruptcy Court in August 2005, recent economic performance has been strong. In 2010, Asarco produced over 200,000 tons of copper—a 13 percent increase over 2009 production, largely due to improvements at the Ray Complex.[827] Asarco's Ray and Hayden operations together employ more than 1,200 people in Arizona.[828]

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[823] Honey Creek Resources Inc. 2005. "Economic Impacts of Critical Habitat Designation to Copper Mining, Pinto Creek Basin, Arizona." Prepared for BHP Copper Inc., Honey Creek, Iowa. July 2005.

[824] General information on Asarco operations accessed at http://www.gmexico.com/business-lines/asarco.php.

[825] Public comments of Krishna Parameswaran, ASARCO LLC, "Comments on the U.S. Fish and Wildlife Service Proposal to Designate Critical Habitat for the Southwestern willow flycatcher (Empidonax traillii extimus), 69 Fed. Reg. 60706 (October 12, 2004), July 18, 2005 and May 27, 2004.

[826] Data on mine locations from the U. S. Geological Survey's Mineral Resources Data System accessed at http://tin.er.usgs.gov/mrds/.

[827] Grupo Mexico Annual Report 2010, accessed at http://www.gmexico.com/.

[828] Information on mine operations and employment accessed at http://www.asarco.com/about-us/our-locations/ on November 16, 2011.

9.5 SUMMARY OF IMPACTS TO MINING OPERATIONS

595. Exhibit 9-2 presents data on mines for which water concerns have previously been raised related to flycatcher proposed critical habitat. The active mining operations that are known to utilize water drawn from proposed critical habitat are the Bagdad mine (Bill Williams MU), Tyrone Mine (Upper Gila MU), and Morenci Mine (San Francisco MU). Of these, only the Morenci Mine is located in an area where the designation may provide new information about the presence of the flycatcher.

EXHIBIT 9-2. MINE OPERATIONS FOR WHICH WATER CONCERNS HAVE BEEN RAISED RELATED TO PROPOSED FLYCATCHER CRITICAL HABITAT

OWNER	MINE	STATE	WITHIN CRITICAL HABITAT?	MINE IS OPERATIONAL?	HYDROLOGIC LINK TO PROPOSED CRITICAL HABITAT	DEPENDENCE ON PROPOSED CRITICAL HABITAT	CURRENT OR POTENTIAL SOURCE OF WATER FOR MINING ACTIVITIES	QUANTITY AND VALUE OF PRODUCTION (2004$)
Freeport	Bagdad Mine	AZ	No. Site is 20 miles east of the Big Sandy River in Bill Williams MU.	Yes.	Water withdrawals from well field in proposed critical habitat.	Replacement of current rights is likely to be difficult.	Mine obtains up to 80% of production water from groundwater wells along the Big Sandy River.	676.3 million tons of proven and probable ore reserves. 111,900 short tons of copper produced in 2004 generating $174.9 million in net operating income Expected life: 22 years
Freeport	Tyrone Mine	NM	No. Site is 17 miles southeast of the Gila River in Upper Gila MU.	Yes.	Water diversion from proposed critical habitat.	Surface water provides partial supply to mining operations.	Mine diverts water from Gila River to stores in Bill Evans Lake for operations.	In 2004, 1.1 billion pounds of recoverable copper (net of copper extracted). 43,100 short tons of copper produced generating $28.7 million in net operating income in 2004.
Freeport	Safford Mine (Dos Pobres/ San Juan)	AZ	No. The mine is 8 miles north of the Gila River in the Upper Gila MU.	Yes.	None in near term.	None.	Current phase will use groundwater wells outside of CHD. Future mine expansion could lead Freeport to utilize Gila River water rights.	The copper ore bodies contain an estimated 538 million tons of leachable reserves with an ore grade of 0.37% copper and a potential (present value) future income stream of $1.2 to $1.8 billion.
Freeport	Christmas Mine District	AZ	Yes. At least one site is adjacent to the Gila River in the Middle Gila/San Pedro MU.	No. Production ceased in 1983, and now is in a care and maintenance phase.	Water diversion to support re-opening could come from proposed CHD area.	None.	None. Access to surface and/or groundwater would be required to re-open Christmas Mine. At present no water is drawn from Gila River, although mine does hold water rights.	Freeport estimates the mine contains 1.8 billion pounds of recoverable copper.

OWNER	MINE	STATE	WITHIN CRITICAL HABITAT?	MINE IS OPERATIONAL?	HYDROLOGIC LINK TO PROPOSED CRITICAL HABITAT	DEPENDENCE ON PROPOSED CRITICAL HABITAT	CURRENT OR POTENTIAL SOURCE OF WATER FOR MINING ACTIVITIES	QUANTITY AND VALUE OF PRODUCTION (2004$)
Freeport	United Verde Mine	AZ	No. The site is 6 miles west of the Verde River in the Verde MU.	No. Mine stopped producing in 1953 and is currently in a long-term care and maintenance phase.	Should it reopen, diversions upstream of proposed segment could be required to support future mining operations.	None.	Existing surface water rights in Verde River upstream of proposed CHD and localized groundwater resources.	25 million short tons of geologic material containing 6% zinc, 0.9% copper, and silver and gold estimated to be present at the mine.
Freeport	Morenci Mine	AZ	No. The site is 7 miles southwest of the San Francisco River in the San Francisco MU.	Yes.	Water diversion from proposed critical habitat.	Water supply to the mine is diverted through proposed critical habitat. Land/water leased to farmers and ranchers.	Mine uses water from a variety of sources including surface water rights in the San Francisco River, Chase Creek, and Eagle Creek as well as groundwater from the Upper Eagle Creek wellfield and CAP water from the San Carlos Apache.	420,300 tons of copper produced in 2004. 234,491,000 tons of copper mined in 2004. Using the ten-year average price of copper of $1.05 per lb., the 420,300 tons produced in 2004 has an approximate value of $882.6 million.
BHP Copper Inc.	Pinto Valley Division	AZ	No. Site is 9 miles south of Pinal Creek in the Roosevelt MU.	Partially. Leaching operations continue, though open pit mining ended in 2009.	Unknown.	Unknown.	Mine pumps local groundwater to feed its operations.	The Miami in-situ project contains an estimated 172 million tons at an average grade of 0.40 percent copper; at the No. 2 tailings operation, only 9 million tons at 0.40 percent remain to be processed.
Asarco Inc.	Ray Complex	AZ	No. Sites are 5 miles north of the Gila River in the Middle Gila/San Pedro MU.	Yes.	Unknown.	Unknown.	Mine pumps local groundwater to feed its operations. Surface river water is temporarily diverted from river and then returned to river to avoid potential water contamination by mine. No water is consumed in process.	In 2010 the Ray Complex extracted 105,100 tons of copper and 476,860 oz. of silver.

OWNER	MINE	STATE	WITHIN CRITICAL HABITAT?	MINE IS OPERATIONAL?	HYDROLOGIC LINK TO PROPOSED CRITICAL HABITAT	DEPENDENCE ON PROPOSED CRITICAL HABITAT	CURRENT OR POTENTIAL SOURCE OF WATER FOR MINING ACTIVITIES	QUANTITY AND VALUE OF PRODUCTION (2004$)

Sources:

[1] Sunding, David L. and Robert Dunford, Triangle Economic Research. 2005. "Proposed Critical Habitat Designation for the Southwestern Willow Flycatcher: Potential Economic Impacts on Phelps Dodge Corporation Operations," Prepared for Phelps Dodge Corporation, July 13, 2005.

[2] Ray Complex production figures drawn from the Grupo Mexico Annual Report 2010, accessed at http://www.gmexico.com/ on November 16, 2011.

[3] Public comments of Jeff Parker, BHP Copper Inc. on the Proposed Critical Habitat Designation for the Southwestern willow flycatcher," July 15, 2005.

[4] Public comments of Krishna Parameswaran, ASARCO LLC, "Comments on the U.S. Fish and Wildlife Service Proposal to Designate Critical Habitat for the Southwestern willow flycatcher (*Empidonax traillii extimus*), 69 Fed.Reg. 60706 (October 12, 2004), July 18, 2005 and May 27, 2004.

[5] Personal communication with Nyal Niemuth, Mining Engineer, Arizona Department of Mines and Mineral Resources on September 2 and 9, 2005, and November 18 and 21, 2011.

CHAPTER 10 | POTENTIAL ECONOMIC IMPACTS TO RECREATIONAL ACTIVITIES

596. A variety of recreational activities occur within areas proposed for CHD, including hiking, camping, picnicking, fishing, hunting, boating, river rafting, and off road vehicle (ORV) use. This section provides an analysis of potential economic impacts to recreational activities associated with conservation efforts for the flycatcher.

597. We first summarize the results of this analysis, including a summary of forecast baseline and incremental impacts. Next, Section 10.2 provides an overview of baseline protections offered the flycatcher by ongoing management efforts in these areas. In Section 10.3, we estimate potential baseline impacts to recreational activities resulting from ongoing management. Section 10.4 concludes by considering the potential for critical habitat to result in changes to recreational activities.

10.1 SUMMARY OF POTENTIAL IMPACTS

10.1.1 INCREMENTAL IMPACTS OF CRITICAL HABITAT

598. As described in Section 10.4, future incremental impacts associated with changes in recreational activity are expected to be confined to areas where flycatcher territories have not previously been detected. Of these areas, two management units contain lands that may be used for recreation. However, recreational activities in these areas are generally limited; therefore, no incremental impacts are forecast.

10.1.2 BASELINE IMPACTS

599. Exhibit 10-1 presents a summary of estimated future baseline impacts related to recreational activities. In total, we estimate quantifiable baseline impacts of $1.9 million, or $170,000 on an annualized basis. The largest share of these impacts is expected to occur in the Roosevelt management unit where past closures have resulted in a decrease in recreational use.

EXHIBIT 10-1. SUMMARY OF BASELINE IMPACTS TO RECREATIONAL ACTIVITIES, 2012 TO 2031 (2010$, DISCOUNTED AT SEVEN PERCENT)

MANAGEMENT UNIT	PRESENT VALUE	ANNUALIZED COSTS
Santa Ana	$39,000	$3,400
Kern	$140,000	$12,000
Roosevelt	$1,700,000	$150,000
Total	**$1,900,000**	**$170,000**

10.2 OVERVIEW OF BASELINE PROTECTIONS

600. Historically, land managers in critical habitat areas have already undertaken numerous conservation efforts to benefit flycatcher. Where flycatcher territories have been detected, land managers may restrict recreational use in the area, erect and maintain fencing around the nesting site, and patrol the area. [829] Other efforts include posting informational signs, installing animal-proof garbage bins to limit predators, and removing picnic tables located in close proximity to the flycatcher site.[830]

601. Land managers also may close areas to recreation. For example, in the Tonto National Forest, USFS implemented closures on both the Salt River and Lake Roosevelt on the Tonto Creek end beginning in 1998. Around Lake Isabella in the Kern management unit, the South Fork Wildlife Area is closed to overnight camping and motorized vehicle traffic. These closures may displace recreation, forcing hunters, fishermen, or boaters to visit alternative recreational sites. The type of conservation measure enacted appears to be relatively site-specific. The following section describes conservation efforts by area in greater detail.

10.3 BASELINE IMPACTS TO RECREATIONAL ACTIVITIES

602. This section provides an overview of recreational areas by management unit, and describes the potential for flycatcher management to result in baseline economic impacts. Recreational areas potentially affected by flycatchers were identified using information from the 2005 economic analysis, public comments submitted on the current rule, and GIS analysis of public lands.

603. As described below, flycatcher management has generally not resulted in substantial changes in recreational use, and the costs of conservation activities has generally been minimal. The analysis quantifies impacts in three management units: the Santa Ana,

[829] See, for example, efforts in the San Bernardino National Forest. Personal communication with Steve Loe, San Bernardino National Forest, on August 24, 2004.

[830] See, for example, efforts in the Cleveland National Forest. Personal communication with Kirsten Winter, Cleveland National Forest, on August 27, 2004.

Kern, and Roosevelt. Total baseline impacts are estimated at $1.9 million in present value terms over twenty years, or $170,000 on an annualized basis.

10.3.1 SANTA ANA MANAGEMENT UNIT

604. Portions of the San Bernardino National Forest fall within this management unit. During the flycatcher breeding season, USFS restricts use on a portion of the Thurman Flats picnic area near a flycatcher nesting location along Mill Creek. Discussions with San Bernardino National Forest indicate that this closure has not affected the level of recreational use in the area because the closure includes only a portion of the picnic area.[831]

605. USFS also undertakes flycatcher conservation efforts around the nesting site, including erecting and maintaining fencing around the site and implementing weekend patrols. These efforts cost approximately $3,400 per year.[832] In present value terms over twenty years, total flycatcher conservation efforts at the picnic site are estimated at $39,000. Because flycatcher territories have been previously detected along Mill Creek and these efforts have been ongoing since 2000, these impacts are considered to be baseline; i.e., they would be incurred absent CHD.

10.3.2 SAN DIEGO MANAGEMENT UNIT

606. This management unit contains portions of the Cleveland National Forest. Within the Cleveland National Forest, there is a flycatcher nesting location adjacent to the San Luis Rey River. However, USFS has not closed off any of the area to accommodate flycatcher; therefore, recreational use of the area has not been affected. USFS has implemented some conservation activities at the picnic area, including:

- Posting informational signs to inform the public and limit activity outside of the established picnic area;
- Installing animal-proof garbage bins to limit predators in the area; and
- Removing some picnic tables close to the flycatcher nesting site.

The cost of these measures has been minimal. Moreover, some of these measures were implemented to also benefit the Least Bell's vireo, another endangered bird.[833] Therefore, we do not quantify the cost of these baseline conservation efforts in this analysis.

[831] Personal communication with Steve Loe, San Bernardino National Forest, on August 24, 2004.

[832] Ibid.

[833] Public comments of Theodore Griswold, Procopio, Cory, Hargreaves, and Savitch on behalf of Lake Cuyamaca Recreation and Park District, on December 10, 2004.

10.3.3 KERN MANAGEMENT UNIT

607. The Kern management unit contains Lake Isabella, a popular recreation area with more than two million visitors per year. USFS has already implemented conservation efforts to protect the flycatcher, including: [834]

- **Efforts to control watercraft, including a five mile per hour speed limit within 100 feet of riparian areas in the South Fork Wildlife Area.** The speed limit is technically in effect year round, but its applicability depends largely on water levels at Lake Isabella. Typically, the areas subject to the speed limit are inundated for only five weeks a year, and, in recent years, there has not been enough water for the speed restriction to affect recreationists.

  Nonetheless, USFS still expects to incur costs related to maintenance and enforcement. These costs include the operation of a patrol boat, maintenance of buoys to mark the speed enforcement area, and personnel salaries. These conservation efforts are estimated at approximately $12,000 annually. In present value terms, total impacts over twenty years are estimated at $140,000.

- **Prohibition on overnight camping and motorized vehicle travel in the South Fork Wildlife Area to protect habitat in the area.** USFS believes this prohibition has resulted in the loss of some recreational activity. In particular, some boaters would launch small boats from a nearby ravine and then camp on a small stretch of shoreline in Sequoia National Forest. However, this area was not designated camping area, and had already been closed to camping since 1994. Boats can still access the area, but the closure to motorized vehicles restricts where boats can be launched. As a result of the closure, small boats must be launched from farther away, potentially making the return trip to the launch site difficult because of wind conditions on the lake. Larger boats that are able to return upwind to launch sites can still be used to access the area.

  This analysis does not quantify impacts deriving from this prohibition for the following reasons: (1) the area has been closed to camping since 1994 and other overnight camping sites are available in the forest, (2) larger boats are still able to access the area, and (3) fishing in the area has not been prohibited.

Flycatcher territories have been detected at Lake Isabella; therefore, impacts in this area are considered to be part of the baseline.

10.3.4 LITTLE COLORADO MANAGEMENT UNIT

608. This management unit contains both Apache-Sitgreaves National Forest and Gila National Forest lands. Within the Apache-Sitgreaves National Forest, the Greer Recreation Area is a popular recreational fishing location. USFS estimates that approximately 70,000 to 75,000 people use the recreation area annually. Because it is a

[834] Fax communication from Sue Porter, USFS, on October 1, 2004.

designated recreation area, it is closed to motorized vehicle use.[835] Therefore, recreational activity in this area is not expected to be affected by flycatcher conservation.

10.3.5 VIRGIN MANAGEMENT UNIT

609. This management unit contains a portion of the Lake Mead National Recreation Area, as well as municipal, BLM, and private lands along the Virgin River used for dispersed recreation. Recreational activity at Lake Mead will be discussed in the following section. On BLM lands, discussions with BLM outdoor recreation staff indicate that recreation has not been affected by flycatcher conservation activities.[836] Along the Virgin River, there are recreational bike trails near the cities of St. George, Hurricane, and Washington City.[837] It is unclear whether these trails have a Federal nexus that might result in section 7 consultation. No previous section 7 consultations have been conducted for these trails for flycatcher. Therefore, no impacts to recreation are quantified.

10.3.6 MIDDLE COLORADO MANAGEMENT UNIT

610. This management unit contains two major recreational areas: Grand Canyon National Park and Lake Mead National Recreation Area. Grand Canyon National Park has implemented various closures to protect flycatcher. In particular, an overnight camping area at mile 50-51 was closed, forcing rafting groups and backcountry campers to continue approximately two or three miles to an alternative campsite. However, given the availability of substitute sites nearby, these closures have not affected the number of visitors to the National Park.[838]

611. A programmatic biological opinion on recreational activities in the Lake Mead National Recreation Area outlined potential flycatcher conservation efforts including additional surveys and closures to restrict access to sites where breeding pairs of flycatchers are found. However, discussions with staff at Lake Mead National Recreation Area indicate that recreation at Lake Mead had not been affected by flycatcher conservation activities.[839] Therefore, this analysis does not quantify impacts to recreation at Lake Mead.

10.3.7 PAHRANAGAT MANAGEMENT UNIT

612. This management unit contains several state-run Wildlife Management Areas, as well as a portion of the Lake Mead National Recreational Area. As discussed above, recreational activity at Lake Mead has not been affected by flycatcher conservation. With respect to the Wildlife Management Areas, discussions with the Nevada Department of Wildlife

[835] Personal communication with Barbara Romero, Recreation Specialist, Apache-Sitgreaves National Forest, on September 9, 2004.

[836] Personal communication with R.J. Hughes, Outdoor Recreation Planner, BLM St. George, Utah office, on September 30, 2004.

[837] Written communication from Utah Field Office, US Fish and Wildlife Service, March 14, 2012.

[838] Personal communication with Elaine Leslie, Biologist, Grand Canyon National Park, on August 30, 2004.

[839] Personal communication with Ross Haley, Wildlife Biologist, Lake Mead National Recreational Area, on July 15, 2004.

indicate that there have not been any flycatcher-related impacts at Overton and Key Pittman Wildlife Management Areas.[840] Therefore, this analysis does not quantify any impacts to recreational activities in this area.

10.3.8 BILL WILLIAMS MANAGEMENT UNIT

613. The Bill Williams management unit contains Alamo Lake and the Bill Williams National Wildlife Refuge. Flycatcher conservation has not affected recreational activities in these areas. The Bill Williams National Wildlife Refuge is managed for recreation and wildlife conservation purposes, and has not implemented conservation measures to protect the flycatcher. Hunting and OHV activities do not overlap with the proposed CHD.[841] Therefore, no impacts to recreation are anticipated in this management unit.

10.3.9 PARKER TO SOUTHERLY INTERNATIONAL BORDER MANAGEMENT UNIT

614. While this management unit contains portions of Cibola and Imperial National Wildlife Refuges, no impacts to recreational activities are expected at either of these refuges. Discussions with Imperial National Wildlife Refuge indicate that flycatcher habitat contains very dense vegetation that is not conducive to recreational use. Therefore, this analysis does not forecast any impacts in this unit.

10.3.10 VERDE MANAGEMENT UNIT

615. The Verde management unit includes portions of the Tonto, Coconino, and Prescott National Forests. Within these forests, only limited recreational activity takes place along the Verde River, and this activity is not expected to be affected by flycatcher conservation activities.[842]

616. The City of Clarkdale is initiating two projects along the Verde River. The planned Verde River Clarkdale Project is intended to be a 40 to 50-acre park with boat launches, restrooms, and educational facilities at the intersection of the Tuzigoot Bridge Road and Broadway in Clarkdale. Initial discussions began in June 2011, and the project is still under development.[843] In addition to the Verde River Clarkdale Project, the American Rivers Association and the City of Clarkdale are cooperating on the Blue Trails Project with the goal of creating an aquatic trail through the Verde River. Funded by the Walton Family Foundation, the project is intended to provide access for boating, birding, and other recreational and educational activities. A kickoff meeting for the Blue Trails Project was held in December 2011.[844] While these projects may need to implement some flycatcher conservation efforts, the projects are still in development stages, making it

[840] Personal communication with Chris Tomlinson, Nevada State Department of Wildlife, on September 14, 2004.

[841] Personal communication with Kathleen Blair, Biologist, Bill Williams National Wildlife Refuge, on August 31, 2004.

[842] Personal communication with Todd Willard, Cave Creek Ranger District, Tonto National Forest, on August 27, 2004.

[843] Ruland, Greg. 2011. "Town of Clarkdale Plans New River Park," JournalAZ.com, July 23, 2011, accessed at http://www.journalaz.com/News/town-of-clarkdale-plans-new-river-park.html.

[844] Mierau, Jamie. 2011. "Verde River Blue Trail Kick-Off," American Rivers, December 29, 2011, accessed at http://www.americanrivers.org/newsroom/blog/jmierau-20111229-verde-river-blue-trail.html .

difficult to determine what types of efforts may be needed. Because one of the goals of the projects is habitat restoration, we anticipate that any conservation efforts beyond those already planned are likely to be minimal. Therefore, this analysis does not forecast any impacts in this management unit.

10.3.11 ROOSEVELT MANAGEMENT UNIT

617. This management unit also contains portions of the Tonto National Forest. Within the proposed CHD, USFS implemented closures on both the Salt River and Lake Roosevelt on the Tonto Creek end beginning in 1998. These closures limit vehicle use and fires, as well as prohibiting fishing and hunting in these areas. Prior to the closures, these areas were used for catfishing and hunting activities. Because participants in these forms of recreation generally prefer to drive to a site rather than haul equipment down the river, it is likely that some fishermen and hunters have chosen to go elsewhere to participate in these activities.[845] Therefore, closures have likely affected the level of recreational use of these sites.

618. To estimate impacts associated with this decrease in recreational use, the analysis first must determine how many visitor days potentially were lost as the result of closures. USFS estimates that the Tonto National Forest as a whole receives approximately 6.2 million visitors per year.[846] While USFS does not track usage of the areas that were included in the 1998 closures, recreation staff at the Tonto Basin Ranger District provided estimates of the number of fishermen or hunters affected annually. The closure on the Salt River may have displaced up to 3,000 catfishermen annually. Of these, approximately 75 percent are assumed to continue to fish at alternative sites in the area, with the remaining 25 percent likely to go elsewhere in Arizona. Similarly, the closure of the Tonto Creek arm may have displaced up to 3,000 fishermen and 2,000 hunters. Of the fishermen, approximately 50 percent are estimated to continue to fish at alternative sites in the area, while the other half likely went elsewhere in Arizona. Of the hunters, approximately 10 percent are assumed to continue to hunt at alternative sites in the Roosevelt Lake area.[847] Therefore, 2,250 angler days and 1,800 hunting days are lost to the region.[848]

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[845] Personal communication with Heidi Plank, Tonto Basin District Biologist, Tonto National Forest, on July 27, 2004.

[846] U.S. Fish and Wildlife Service. 2003. Biological Opinion on the Draft Biological Assessment of 11 Land & Resource Management Plans, USDA Forest Service Southwestern Region. Submitted to the US Fish and Wildlife Service in November 2003, p. 228.

[847] Personal communication with Quentin Johnson, Tonto Basin District Recreation Specialist, Tonto National Forest, on August 20, 2004.

[848] The analysis does not attempt to value the impacts related to displaced fishermen and hunters who continue to participate in fishing or hunting within the Tonto National Forest albeit at less desirable sites. While there may be some loss of consumer surplus associated with the inconvenience of having to use a different location, especially if this area is already congested, data on the value associated with lower trip quality are not available. For example, the loss would depend on a variety of factors including the distance to alternative site and the amount of congestion at the alternative site.

619. The analysis presents economic impacts both in terms of consumer surplus (welfare) values, and in terms of trip expenditures. Consumer surplus values for a user-day of recreation represent the maximum amount that users would be willing to pay above and beyond the current costs of the activity to participate in the activity. By fishing or hunting at Roosevelt Lake, users are able to accrue consumer surplus. The total surplus provided to previous users of closed areas is one measure of the economic values of this area, and thus one measure of the efficiency loss that might result from these closures. Trip expenditures measure the total amount of money a visitor might have spent while fishing or hunting in the closed area. These expenditures provide information on the regional economic contribution of this recreational activity.

620. To identify an appropriate per-trip welfare value for a hunting or fishing trip, we reviewed the economic literature for relevant valuation studies. The results of this review are presented in Exhibit 10-2. Based on these studies, the analysis uses a value of approximately $30 per day for fishing, and $47 per day for hunting. Based on these values and the number of days of fishing and hunting lost due to closures for flycatcher, future welfare losses are estimated at approximately $1.7 million in present value terms over twenty years.

EXHIBIT 10-2. SUMMARY OF FISHING AND HUNTING WELFARE VALUES

AUTHOR	STUDY LOCATION	SPECIES VALUED	VALUE (2010$)*
Fishing			
Roach (1996)	California	Catfish, Black Bass	$29.00
Hay (1988)	Arizona	Bass	$29.93
Vaughn and Russell (1982)	National	Catfish	$30.92
		Average	**$29.95**
Waterfowl Hunting			
Cooper and Loomis (1993)	California	N/A	$39.42
Hay (1988)	Pacific Flyway	N/A	$54.59
		Average	**$47.01**
Note: * Welfare values adjusted to current dollars using the GDP Deflator.			

621. To estimate trip expenditures, this analysis relies on a study funded by the Arizona Game and Fish Department, which provides 2001 data on the economic impacts of hunting and fishing in Arizona at the county level. For Gila County, average expenditures for an angler-day are approximately $99, while average expenditures for a hunting day are $83.[849] Given the estimate of 2,250 angler days and 1,800 hunting days lost to the region, this results in a direct trip expenditure loss of $4.2 million in present value terms over

[849] Adjusted to 2010$ using the GDP Deflator. Silberman, J. 2003. *The Economic Importance of Fishing and Hunting, Economic data on fishing and hunting for the State of Arizona and for each Arizona County*, accessed at www.azgfd.gov/pdfs/w_c/FISHING_HUNTING%20Report.pdf.

twenty years. Note, this result is not additive with the welfare losses also estimated in this section. The two estimates are separate measures of potential economic impact. Because USFS began implementing these closures prior to the original designation of critical habitat in these areas, these costs are attributed to the baseline.

10.4 INCREMENTAL IMPACTS TO RECREATIONAL ACTIVITIES

622. Future incremental impacts associated with changes in recreational activity are expected to be confined to areas where flycatcher territories have not previously been detected. Of these unoccupied areas, two management units contain lands that may be used for recreation. However, recreational activities in these areas are generally limited as described below; therefore, no incremental impacts to recreation are forecast.

10.4.1 SANTA CLARA MANAGEMENT UNIT

623. Within the Santa Clara management unit, no flycatcher territories have previously been detected at Big Tujunga Canyon, Castaic Creek, Little Tujunga Canyon, and the Ventura River. Therefore, any recreational impacts in these areas would be considered an incremental effect of the designation.

624. Big Tujunga Canyon and Little Tujunga Canyon fall within the Angeles National Forest, which offers 364 miles of designated ORV roads. Within the forest, all ORV travel must take place on designated routes or in designated open areas. Because stream banks and lakeshores are considered especially sensitive areas, ORV users are asked to cross streams at a 90 degree angle at a slow speed and not to drive up and down the stream channel itself.[850] While there are public roads near Big Tujunga and Little Tujunga Canyons, there are no designated ORV routes within the proposed designation.[851] Therefore, no impacts to recreation are expected.

10.4.2 POWELL MANAGEMENT UNIT

625. No flycatcher territories have been detected in this management unit or along the Paria River segment. Therefore, any impacts related to flycatcher conservation would be considered incremental effects of the designation.

626. The segment of the Paria River proposed for designation falls within the Grand Staircase Escalante-National Monument, which spans nearly 1.9 million acres. The National Monument offers varied recreational opportunities, including camping, hiking, backpacking, climbing, mountain biking, off-road vehicle use, hunting, and fishing.[852] However, the area proposed for designation does not have any developed or primitive campgrounds or suggested ORV routes. Within the monument, ORVs are limited to

[850] Personal communication with Bill Brown, Biologist, Angeles National Forest, on June 21, 2004.

[851] Angeles National Forest, Motor Vehicle Use Map, accessed at http://www.fs.usda.gov/Internet/FSE_MEDIA/stelprdb5166679.pdf.

[852] See Bureau of Land Management, *Grand Staircase Escalante National Monument: Recreation*, accessed at http://www.blm.gov/ut/st/en/fo/grand_staircase-escalante/Recreation.html.

routes designated as open for their use, while camping is contained to already disturbed areas.[853] Because recreational activities are limited in the proposed area, this analysis does not forecast any incremental impacts to recreation.

[853] See Bureau of Land Management *Grand Staircase Escalante National Monument: Suggested Camping Sites*, accessed at http://www.blm.gov/ut/st/en/fo/grand_staircase-escalante/Recreation/camping/suggested_camping.html; Bureau of Land Management *Grand Staircase Escalante National Monument: Hiking and Backpacking*, accessed at http://www.blm.gov/ut/st/en/fo/grand_staircase-escalante/Recreation/hiking___backpacking.html; Bureau of Land Management *Grand Staircase Escalante National Monument: Suggested Routes*, accessed at http://www.blm.gov/ut/st/en/fo/grand_staircase-escalante/Recreation/off-highway_vehicle/Suggested_Routes.html.

CHAPTER 11 | POTENTIAL ECONOMIC BENEFITS

627. The prior chapters of this report describe the types of conservation efforts (e.g., project modifications) likely to be undertaken as a result of the flycatcher's listing as an endangered species under the Act and the designation of critical habitat for the species. The baseline and incremental costs of these conservation efforts are summarized in the Executive Summary. In this chapter, we discuss the potential benefits resulting from these conservation efforts. First, we introduce the economic methods used to estimate benefits and the availability of existing literature to support valuation in the context of this rulemaking. Then, we provide a qualitative description of the potential categories of benefits resulting from the listing and the designation and indicate the management units where such benefits may occur.

KEY ISSUES AND CONCLUSIONS:

- The primary goal of listing the flycatcher is to ensure its long-term conservation. Conservation and recovery of the flycatcher may result in benefits, including use benefits (wildlife-viewing), non-use benefits (existence values), and ancillary benefits (e.g., improved water quality associated with habitat protection).
- This chapter summarizes available information on use and non-use values of various bird populations. There are no published studies specifically estimating the benefits of conserving southwestern willow flycatchers or their habitat. Therefore, this analysis does not attempt to monetize the baseline or incremental economic benefits of flycatcher conservation.
- This analysis qualitatively discusses the potential benefits resulting from flycatcher conservation efforts described in Chapters 3 through 9 of this report.

11.1 ECONOMIC METHODS USED TO ESTIMATE BENEFITS

628. The primary intended benefit of listing a species and designating its critical habitat is to ensure the long-term conservation of the species.[854] Various economic benefits, measured in terms of social welfare or regional economic performance, may result from conservation efforts. The benefits can be placed into two broad categories: (1) those associated with the primary goal of species conservation (i.e. direct benefits), and (2) those additional beneficial services that derive from the conservation efforts but are not

[854] The term "conservation" means "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary." (16 U.S.C. 1532)

the purpose of the Act (i.e., ancillary benefits, such as reducing downstream water treatment costs as result of controlling upstream non-point source pollution within critical habitat).

629. Because the purpose of the Act is to provide for the conservation of endangered and threatened species, the benefits of actions taken under the Act are often measured in terms of the value placed by the public on species preservation (e.g., avoidance of extinction, and/or increase in a species' population). Such social welfare values for a species may reflect both use and non-use values for the species. Use values derive from a direct use for a species, such as commercial harvesting or recreational wildlife-viewing opportunities. Non-use values are not derived from direct use of the species, but instead reflect the utility the public derives from knowledge that a species continues to exist (e.g., existence or bequest values).

630. As a result of actions taken to preserve endangered and threatened species, such as habitat management, various other benefits may accrue to the public. Conservation efforts may result in improved environmental quality, which in turn may have collateral human health or recreational use benefits. In addition, conservation efforts undertaken for the benefit of a threatened or endangered species may enhance shared habitat for other wildlife. Such benefits may result from modifications to projects, or may be collateral to such actions. For example, a section 7 consultation may result in avoiding the use of pesticides or herbicides within critical habitat. A reduction in the release of such chemicals may benefit water quality, and may also provide collateral benefits of preserving habitat for other species occupying these areas.

631. Economists apply a variety of methodological approaches in estimating both use and nonuse values for species and for habitat improvements, including stated preference and revealed preference methods. Stated preference techniques include such tools as the contingent valuation method, conjoint analysis, or contingent ranking methods. In simplest terms, these methods employ survey techniques, asking respondents to state what they would be willing to pay for a resource or for programs designed to protect that resource. A substantial literature has developed that describes the application of this technique to the valuation of natural resource assets.

632. More specific to use values for species or habitats, revealed preference techniques examine individuals' behavior in markets in response to changes in environmental or other amenities (i.e., people "reveal" their value by their behavior). For example, travel cost models are frequently applied to value access to recreational opportunities, as well as to value changes in the quality and characteristics of these opportunities. Basic travel cost models are rooted in the idea that the value of a recreation resource can be estimated by analyzing the travel and time costs incurred by individuals visiting the site. Another revealed preference technique is hedonic analysis, which is often employed to determine the effect of specific site characteristics on property values.

11.1.1 ESTIMATING BASELINE ECONOMIC BENEFITS

633. Numerous published studies estimate individuals' willingness to pay to protect endangered species.[855] The economic values reported in these studies reflect various groupings of benefit categories (including both use and non-use values). For example, these studies assess public willingness to pay for wildlife-viewing opportunities, for the option for seeing or experiencing the species in the future, to assure that the species will exist for future generations, and simply knowing a species exists, among other values. This literature, however, addresses a relatively narrow range of species and circumstances compared to the hundreds of species and habitats that are the focus of the Act. Importantly for this analysis, we are not aware of any published studies that estimate the value the public places on conserving the southwestern willow flycatcher.

634. Absent primary research specific to the policy question, resource management decisions can often be informed by applying the results of existing valuation research to a new policy question – a process known to economists as benefit transfer. Benefit transfer involves the application of unit value estimates, functions, data, and/or models from existing studies to estimate the benefits associated with the resource under consideration.

635. OMB has written guidelines for conducting credible benefit transfers. The important steps in the OMB guidance are: (1) specify the value to be estimated for the rulemaking; and (2) identify appropriate studies to conduct benefits transfer based on the following criteria:

- The selected studies should be based on adequate data, sound and defensible empirical methods and techniques.
- The selected studies should document parameter estimates of the valuation function.
- The study and policy contexts should have similar populations (e.g., demographic characteristics). The market size (e.g., target population) between the study site and the policy site should be similar.
- The good, and the magnitude of change in that good, should be similar in the study and policy contexts.
- The relevant characteristics of the study and policy contexts should be similar.
- The distribution of property rights should be similar so that the analysis uses the same welfare measure (i.e., if the property rights in the study context support the use of willingness-to-accept measures while the rights in the rulemaking context support the use of willingness-to-pay measures, benefits transfer is not appropriate).
- The availability of substitutes across study and policy contexts should be similar.

[855] See, for example, the summary in Richardson, L. and J. Loomis. March 2009. The Total Economic Value of Threatened, Endangered, and Rare Species: An Updated Meta-Analysis. Ecological Economics 68(5): 1535-1548.

Available Literature Valuing Bird Populations

636. We undertook a literature review to identify existing research regarding the use and non-use values the public holds for conserving bird species and the habitats they rely upon. This review revealed no economic benefit or valuation studies of the southwestern willow flycatcher or its habitats.[856] A discussed above, an ideal study for estimating economic use and non-use values of listing and critical habitat designation would be specific to the species in question (or would address a closely related species), would consider valuation in a context close to the policy issues in question (i.e., economic benefits of listing an endangered species and designating critical habitat for this species), and would address a relevant population holding these values (citizens of the United States). Again, no such study was identified. There is a somewhat sizeable literature investigating use and non-use economic values of other avian populations in a variety of contexts, which provides some context for the values the public holds for avian species conservation. This literature is discussed further below.

637. The use value of flycatchers is essentially the value derived from bird-watching for the species (i.e., the species is not reported to be hunted or otherwise harvested by humans). The most comprehensive study looking at the value the public holds for bird-watching was published by the Service as an addendum to its 2001 National Survey of Fishing, Hunting and Wildlife-Associated Recreation. The net economic value for wildlife viewing, estimated using a series of contingent valuation questions to determine net willingness to pay, was found to be $35 per day (bird-watching by in-state residents) to $134 per day (bird-watching by out-of-state residents[857]). In this study, the value of bird-watching was not disaggregated by species.

638. A more recent study estimated the recreational use value of viewing shorebirds on Delaware Bay. Using a contingent valuation survey, a daytrip was valued in the range of $67-$91 per household and an overnight trip was valued in the range of $202-$430 per household.[858] These use values were found to be consistent with four additional studies that found the value of bird-watching trips to vary from $64 per trip per person to $447 per trip per person.

639. Unfortunately, while the literature supports the notion that the public is willing to pay for the opportunity to bird-watch, there are no data to indicate how many trips are associated with the flycatcher, how seeing a flycatcher would contribute to the value of a bird-viewing trip, or how listing of this species or designation of critical habitat will increase the probability of seeing a flycatcher.

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[856] The USGU Colorado Plateau Research Station manages a comprehensive database of over 300 references, both published and unpublished agency reports, related to willow flycatchers. A search through these references revealed no valuation or economic benefit studies. (USGS. Colorado Plateau Research Station. 2012. Southwestern Willow Flycatcher Reports and Publications. http://sbsc.wr.usgs.gov/cprs/research/projects/swwf/reports.asp#1994.)

[857] U.S. Fish & Wildlife Service. 2001. Birding in the United States: A Demographic and Economic Analysis. Addendum to the 2001 National Survey of Fishing, Hunting and Wildlife-Associated Recreation. Report 2001-1.

[858] Myers, K.H. G.R. Parson, and P.E.T. Edwards. 2010. Measuring the Recreational Use Value of Migratory Shorebirds on the Delaware Bay. Marine Resource Economics. 25(3):247-264.

640. In addition to use values, the literature supports the notion that the public holds a non-use value for conservation of bird species. For example, a study that considered the non-use value of birds by Desvousges et al. (1993), included as a reference in the Report of the NOAA Panel on Contingent Valuation by Arrow et al. (1993),[859] found average willingness to pay to prevent the deaths of 2,000 non-endangered migratory bird species in oil-filled ponds to be $80.[860] The authors concluded that this value was essentially the same as that for preventing 20,000 or 200,000 birds from dying ($78 and $88, respectively).[861] In a separate study the non-use value the public holds for increases in Central Plains grassland bird populations as a consequence of the implementation of the Conservation Reserve Program by the USDA Farm Service Agency was estimated to be $33 million per year.[862] Outside of the United States, willingness-to-pay surveys were employed to estimate the value of native bird conservation in Waikata, New Zealand.[863] The value of regional conservation initiatives aimed at protecting or restoring native bird populations was calculated to be approximately $10.4 million. While these studies address the value the public holds for the bird, they consider only bird populations in general. No study attempts to disaggregate values by bird species.

641. One published study specifically investigates the economic benefits arising from designating critical habitat for an endangered bird species in the southwestern U.S. The benefits of critical habitat for the Mexican spotted owl in the four corners area were explored using a contingent valuation survey.[864] The mean willingness to pay for protecting the critical habitat for the Mexican spotted owl found in this study was $55 per household.

642. While this study evaluates the value of critical habitat for an endangered species, the Mexican spotted owl is sufficiently dissimilar from the flycatcher that the public response to each would be expected to differ. Previous spotted owl protection efforts have heightened public perception of threat to spotted owls and their old growth habitat.

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[859] Arrow, K., R. Solow, P.R. Portney, E.E. Leamer, R. Radner, and H. Schuman. 1993. Report of the NOAA Panel on Contingent Valuation. January 11, 1993.

[860] Desvousges, W.H., F.R. Johnson, R.W. Dunford, K.J. Boyle, S.P. Hudson, and K.N. Wilson. 1993. Measuring Natural Resource Damage with Contingent Valuation: Tests of Validity and Reliability. In Hausman, J. ed. Contingent Valuation: A Critical Assessment. Amsterdam: North Holland Press, 91-164.

[861] These authors were attempting to determine whether respondent's willingness to pay was sensitive to changes in the scale of the "good" being valued (i.e., they were conducting a "scope" test of the methodology). Several authors have criticized the methodology used by Desvousges et al, in developing this scoping test, citing that the survey questions emphasized actions not resources thereby heavily influencing responses. (Diamond, P.A. and J.A. Hausman. 1994. Contingent Valuation: Is Some Number better than No Number?. The Journal of Economic Perspectives. 8(4):45-64.)

[862] Ahearn, M.C., K.C. Boyle, and D.R. Hellerstein. 2006. Designing a CV study to estimate the benefits of the CRP on grassland bird populations. In: Alberini, A. and J.R. Kahn (Eds.) Handbook on Contingent Valuation. Edward Elgar Publishing. Northampton, Massachusetts, USA, pp.204-231.

[863] Kaval, P. and M. Roskruge. 2009. The value of native bird conservation: A New Zealand case study. Department of Economics Working Paper Series, Number 09/11. Hamilton, New Zealand: University of Waikato.

[864] Loomis, J. and E. Ekstrand. 1997. Economic Benefits of Critical Habitat for the Mexican Spotted Owl: A Scope Test Using a Multiple-Bounded Contingent Valuation Survey. Journal of Agricultural and Resource Economics. 22(2):356-366.

Additionally, the visceral characteristics of the two birds differ such that the two species would be expected to be viewed differently in terms of endangered species protection.[865]

643. While Loomis and Ekstrand place a value on critical habitat designation, they do not consider the marginal value of protecting an additional species or its habitat. Doing so would require (a) addressing the willingness to pay for a conservation action additional to all other existing conservation actions and (b) understanding the expected probability and timing of changes in the species population. As raised by Desvousges et al., it is not clear from the existing literature if the public's willingness to pay for protecting the flycatcher and its habitat would be any different from the public's willingness to pay for all endangered and threatened species. Loomis and Ekstrand did find a significant difference between their determined value of critical habitat designation for one bird species and their calculated value for a cohort of species (which included the bird species). However, this difference is small and the authors themselves note that stated preference valuations of critical habitat designation benefits for individual species are neither additive nor necessarily comparable. They recognize that the value of a cohort of species is not numerically equivalent to a single species multiplied by the number of species comprising the cohort.

644. Expected changes in the Mexican spotted owl population as a result of the critical habitat designation were not defined in Loomis and Ekstrand's study. Without such information, their study is answering a different question than the current flycatcher valuation problem is asking. They are essentially examining the value of designating critical habitat generally, not determining the marginal value of increasing the probability of conservation of the Mexican spotted owl. Furthermore, even if the changes in Mexican spotted owl population dynamics as a result of the critical habitat designation were known and incorporated into the valuation study, the marginal change in flycatcher population as a result of designating critical habitat is unknown, further preventing an reliable benefits transfer.

645. While these studies provide some indication of the use and non-use values of bird populations, this analysis is unable to apply these values to estimate a public willingness to pay for flycatcher conservation. Employing any of the above studies in a benefits transfer analysis would fail to fully meet the OMB criteria for conducting credible benefits transfers. Specifically, contexts differ substantially between the studies presented above and the current policy situation such that the characteristics defining the studies and policy context, including the availability of substitutes, are considerably dissimilar. Given both the absence of relevant flycatcher studies and the unsuitability of available bird valuation studies to be used in a benefits transfer exercise, economic benefits are discussed qualitatively in Section 11.2.

[865] Metrick, A. and M.L. Weitzman. 1996. Patterns of Behavior in Endangered Species Preservation. Land Use. 72(1):1-16.

11.1.2 ESTIMATING INCREMENTAL ECONOMIC BENEFITS

646. Quantification and monetization of the incremental benefits of designating critical habitat first requires information about the change in the probability that the species will be conserved as a result of the designation. In this case, we refer to the change in conservation probability that is distinct and separate from the change in conservation probability associated with the listing (i.e., the change that results from the specific conservation efforts that would not be undertaken absent the designation). No studies exist that provide such information for the flycatcher. Even if this information existed, the published valuation literature does not support the monetization of incremental changes in the conservation probability for this species. [866] As discussed in the previous section, none of the published valuation literature specifically addresses values for conserving flycatchers. Because we cannot quantify or monetize the incremental benefits of the designation, we discuss potential benefits qualitatively at the end of this chapter.

11.1.3 ESTIMATING ANCILLARY BENEFITS

647. Other benefits may also be achieved through the species listing or designation of critical habitat. For example, the public may hold a value for habitat conservation, beyond its willingness to pay for conservation of a specific species. Studies have estimated the public's willingness to pay to preserve wilderness areas, for wildlife management and preservation programs, and for wildlife protection in general. These studies address categories of benefits (e.g., ecosystem integrity) that may be similar to the types of benefits provided by the listing or critical habitat, but do not provide values that can be used to establish the incremental values associated with this proposed critical habitat designation (i.e., the ecosystem and species protection measures considered in these studies are too dissimilar from the habitat protection benefits that may be afforded by this designation).

648. Similarly, economists have conducted research on the economic value of open space. Open space can provide aesthetic benefits, with subsequent positive impacts on property values in the surrounding community. Such benefits are not the purpose of the listing or critical habitat designation. Thus, because open space preservation is not the goal of the Act, the Service has decided not to include such estimates in the Economic Analysis. The remainder of this chapter includes a qualitative benefits discussion, summarizing the flycatcher conservation efforts described in Chapters 3 through 10 of this report and linking them with potential categories of economic benefit that may derive from their implementation.

[866] Richardson and Loomis (2009) developed a model to estimate the value of critical habitat designations based on a meta-analysis of 31 studies published between 1985 and 2005. The model generates composite willingness to pay values for species conservation based on an estimate of the percent change in species population likely to result from the critical habitat designation. Implementation of the model requires information regarding the change in the population likely to result from the conservation efforts undertaken in response to the listing or critical habitat designation. Such information is not available for this designation. (Richardson, L. and J. Loomis. March 2009. The Total Economic Value of Threatened, Endangered, and Rare Species: An Updated Meta-Analysis. Ecological Economics 68(5): 1535-1548.)

11.2 QUALITATIVE DISCUSSION OF BASELINE AND INCREMENTAL BENEFITS OF CONSERVATION EFFORTS FOR THE FLYCATCHER

649. This section describes the categories of benefits potentially resulting from flycatcher conservation efforts within the study area. Exhibit 11-1 summarizes potential benefits associated with the specific conservation efforts for the flycatcher described in Chapters 3 through 10 of this report. The first column summarizes the conservation efforts by land use activity. The second column identifies potential categories of ancillary benefits that may derive from implementation of these conservation efforts. A description of these categories of benefits is provided below. The final column of the exhibit identifies the management units in which baseline or incremental benefits may occur.

650. The categories of economic benefit that may derive from conservation efforts for the flycatcher described in this report include:

- **Improved water quality:** Implementation of a storm water pollution prevention plan and sedimentation controls may reduce adverse impacts to downstream water quality. Improved water quality may reduce water treatment costs and have human or ecological health benefits.
- **Decreased development in flood prone areas:** Flycatcher conservation efforts may lead to less development in flood prone areas resulting in some benefit to society.
- **Property value benefits:** Open space preservation or decreased density of development resulting from flycatcher conservation may increase adjacent or nearby property values.
- **Aesthetic benefits:** Social welfare gains may be associated with enhanced aesthetic quality of the habitat. Preferences for aesthetic improvements may be measured through increased willingness-to-pay to visit a habitat region for recreation or increased visitation.
- **Educational benefits:** Surveying and monitoring of project sites for the flycatcher confers educational benefits in that more is known about the species and where populations exist. This knowledge could help direct future conservation efforts.
- **Public safety benefits:** Imposing or enforcing speed limits for water craft in areas near flycatcher habitat may result in a reduction in boating accidents resulting in injuries or property damage.

651. In addition to these categories of potential benefits, all of the conservation efforts described in Exhibit 11-1 are related to the broader conservation and recovery of the species. All conservation efforts therefore relate to the maintenance or enhancement of the use and non-use value (e.g., existence value) that the public may hold specifically for the flycatcher. Further, many of the conservation efforts undertaken for the flycatcher may also result in improvements to ecosystem health that are shared by other, coexisting species. The maintenance or enhancement of use and non-use values for these other

species, or for biodiversity in general, may also result from these conservation efforts for the flycatcher.

11.3 DISCUSSION

652. As described above, the existing literature does not provide an adequate basis to monetize the baseline or incremental benefits of the flycatcher conservation measures considered in this economic analysis. The implementation of a benefit transfer for purposes of this report is not possible due to the lack of appropriate studies. Sufficient differences exist between most bird valuation studies and the current political context in terms of populations, market sizes, and available substitutions, among other elements, to render a benefits transfer analysis inappropriate. Furthermore, no studies address the marginal value of protecting a particular species and its habitat in the context of existing conservation measures.

653. The quantification of the incremental benefits of designating critical habitat for the flycatcher is additionally impeded by the absence of studies which provide information on the flycatcher conservation probability related to the habitat designation, which is distinct and separate from the conservation probability associated with the listing. The change in flycatcher population likely to result from the conservation efforts undertaken in response to the critical habitat designation would be necessary to monetize the change in conservation probability and no such studies currently exist.

654. Qualitative consideration of the potential benefits associated with the flycatcher conservation efforts discussed in Chapters 3 through 10 of this report reveal a number of categories of economic benefits additional to the use and non-use values individuals hold for the flycatcher itself, including water quality, property value, and aesthetic benefits.

EXHIBIT 11-1. CONSERVATION EFFORTS FOR THE FLYCATCHER AND POTENTIAL ASSOCIATED BENEFITS

CONSERVATION EFFORT	POTENTIAL ASSOCIATED BENEFITS	MANAGEMENT UNITS APPLIED	
		BASELINE BENEFIT	INCREMENTAL BENEFIT
WATER MANAGEMENT ACTIVITIES			
Purchase mitigation lands, buffers around riparian habitat, or water rights necessary to maintain riparian habitat	• Improved water quality • Decreased development in flood prone areas • Property value benefits • Aesthetic benefits	Santa Clara, Santa Ana, San Diego, Owens, Kern, Amargosa, Little Colorado, Middle Colorado, Pahranagat, Bill Williams, Hoover to Parker Dam, Parker Dam to Southerly International Border, Verde, Roosevelt, Upper Gila, Middle Rio Grande	Santa Clara, Mohave, San Francisco
Habitat restoration, management (e.g., invasive species control), and maintenance	• Improved water quality • Aesthetic benefits		
Exclusion of cattle from habitat	• Improved water quality		
Cowbird control	• Conservation benefits for the flycatcher		
Flycatcher surveys	• Educational benefits		
GRAZING			
Reduction in the intensity of grazing activity (reduced AUMs)	• Improved water quality	Santa Ynez, Santa Clara, Santa Ana, Owens, Kern, Amargosa, Little Colorado, Virgin, Middle Colorado, Pahranagat, Bill Williams, Hoover to Parker Dam, Parker to Southerly International Border, San Juan, Powell, Verde, Roosvelt, Middle Gila and San Pedro, Upper Gila, Santa Cruz, San Francisco, Hassayampa and Agua Fria, San Luis Valley, Upper Rio Grande, Middle Rio Grande, Lower Rio Grande	Mohave, Powell, San Francisco
Cowbird trapping	• Conservation benefits for the flycatcher		
RESIDENTIAL AND COMMERCIAL DEVELOPMENT			
Reduction in the density of development in habitat	• Improved water quality • Decreased development in flood prone areas • Property value benefits • Aesthetic benefits	Santa Ynez, Santa Clara, Santa Ana, San Diego, Mohave, Hoover to Parker Dam	Santa Clara
TRANSPORTATION ACTIVITIES			
Flycatcher surveys	• Educational benefits	Santa Ana, Mohave, Little Colorado, Virgin, Bill	Little Colorado, Powell, Santa Cruz, San Francisco

CONSERVATION EFFORT	POTENTIAL ASSOCIATED BENEFITS	MANAGEMENT UNITS APPLIED	
		BASELINE BENEFIT	INCREMENTAL BENEFIT
Timing restrictions for construction activities to avoid breeding season	• Conservation benefits for the flycatcher	Williams, San Juan, Verde, Roosevelt, Middle Gila and San Pedro, Upper Gila, San Luis Valley, Upper Rio Grande, Middle Rio Grande, Lower Rio Grande	
Activities intended to avoid sedimentation or pollution of waterway (e.g., erosion control, ensure vehicles do not release fluids or oil, avoid chemical use within a certain buffer, avoid stream crossings in habitat areas)	• Improved water quality • Aesthetic benefits		
Avoid using river water for construction or fire management	• Improved water quality		
Avoid fragmenting habitat with access roads	• Conservation benefits for the flycatcher		
Monitoring	• Educational benefits		
Exclusionary fencing for elk	• Improved water quality		
Habitat restoration on-site and enhancement of off-site parcels	• Improved water quality • Property value benefits • Aesthetic benefits		
RECREATION			
Water craft speed limits within 100 feet of riparian areas	• Public safety benefits	Kern	N/A
Prohibitions against overnight camping, fires, and motorized vehicle use in habitat areas	• Improved water quality • Aesthetic benefits	Roosevelt	N/A

Notes:
1. Conservation efforts derived from detailed discussions in activity-specific chapters of this report.
2. All conservation efforts are intended to support the survival and/or recovery of the species. However, if the specific activity is primarily intended for this purpose and has potentially few ancillary benefits (e.g., cowbird trapping), the potential for conservation benefits is explicitly noted in the exhibit.
3. Benefits are anticipated in the management units where these conservation efforts are undertaken, as described in detail in the activity-specific chapters throughout this report.
4. N/A = not applicable

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APPENDIX A | SMALL BUSINESS AND ENERGY IMPACTS ANALYSES

655. This appendix considers the extent to which incremental impacts from critical habitat designation may be borne by small entities and the energy industry. The analysis presented in Section A.1 is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. The energy analysis in Section A.2 is conducted pursuant to Executive Order No. 13211.

656. The analyses of impacts to small entities and the energy industry rely on the estimated incremental impacts resulting from the proposed critical habitat designation. The incremental impacts of the rulemaking are most relevant for the small business and energy impacts analyses because they reflect costs that may be avoided or reduced based on decisions regarding the composition of the final rule.

A.1 SBREFA ANALYSIS

657. When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions as defined by the RFA).[867] No initial regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities. To assist in this process, this appendix provides a screening level analysis of the potential for flycatcher critical habitat to affect small entities.

658. To ensure broad consideration of impacts on small entities, the Service has prepared this small business analysis without first making the threshold determination in the proposed rule regarding whether the proposed critical habitat designation could be certified as not having a significant economic impact on a substantial number of small entities. This small business analysis will therefore inform the Service's threshold determination.

[867] 5 U.S.C. § 601 et seq.

A.1.1 BACKGROUND AND FRAMEWORK FOR THE THRESHOLD ANALYSIS

659. This analysis is intended to improve the Service's understanding of the potential effects of the proposed rule on small entities and to identify opportunities to minimize these impacts in the final rulemaking. The Act requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable. Section 4(b)(2) of the Act requires that the Service designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts, of specifying any particular area as critical habitat." This section grants the Secretary [of the Interior] discretion to exclude any area from critical habitat if (s)he determines "the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat". However, the Secretary may not exclude an area if it "will result in the extinction of the species."

660. Three types of small entities are defined in the RFA:

- **Small Business -** Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently owned and operated and is not dominant in its field of operation. The Small Business Administration (SBA) has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR 121.201. The size standards are matched to North American Industry Classification System (NAICS) industries. The SBA definition of a small business applies to a firm's parent company and all affiliates as a single entity.
- **Small Governmental Jurisdiction -** Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.
- **Small Organization -** Section 601(4) defines a small organization as any not-for-profit enterprise that is independently owned and operated and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc.

661. The courts have held that the RFA/SBREFA requires Federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy Regulatory Commission (FERC),* FERC proposed regulations affecting the manner in which generating utilities incorporated construction work in progress in their rates. The

generating utilities that expected to be regulated were large businesses; however, their customers -- transmitting utilities such as electric cooperatives -- included numerous small entities. In this case, the court agreed that FERC simply authorized large electric generators to pass these costs through to their transmitting and retail utility customers, and FERC could therefore certify that small entities were not directly impacted within the definition of the RFA.[868]

662. Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency* (EPA) addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and particulate matter.[869] The basis of EPA's RFA/SBREFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of State plans that incorporated the standards. The court found that, while EPA imposed regulation on States, it did not have authority under this rule to impose regulations directly on small entities and therefore small entities were not directly impacted within the definition of the RFA.

663. The SBA in its guidance on how to comply with the RFA recognizes that consideration of indirectly affected small entities is not required by the RFA, but encourages agencies to perform a regulatory flexibility analysis even when the impacts of its regulation are indirect.[870] "If an agency can accomplish its statutory mission in a more cost-effective manner, the Office of Advocacy [of the SBA] believes that it is good public policy to do so. The only way an agency can determine this is if it does not certify regulations that it knows will have a significant impact on small entities even if the small entities are regulated by a delegation of authority from the Federal agency to some other governing body."[871]

664. The regulatory mechanism through which critical habitat protections are realized is section 7 of the Act, which directly regulates only those activities carried out, funded, or permitted by a Federal agency. By definition, Federal agencies are not considered small entities, although the activities they may fund or permit may be proposed or carried out by small entities. Given the SBA guidance described above, this analysis considers the extent to which this designation could potentially affect small entities, regardless of whether these entities would be directly regulated by the Service through the proposed rule or by a delegation of impact from the directly regulated Federal agency. However, while it considers businesses that may be affected indirectly, it forecasts impacts only to those entities for which the regulatory link would not be measurably diluted.

[868] 773 F. 2d 327 (D.C. Cir. 1985).

[869] 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

[870] Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act, pg. 20.

[871] *Ibid.*, pg. 21.

A.1.2 RESULTS OF THE THRESHOLD ANALYSIS

665. This analysis focuses on small entities that may bear the incremental impacts of this rulemaking quantified in Chapters 3 through 10 of this economic analysis. Specifically, this economic analysis quantifies the incremental impact of critical habitat designation on water management activities, livestock grazing, residential and related development, Tribes, transportation activities, mining and oil and gas development, and recreation. The most significant costs on a per entity basis arise from the implementation of conservation activities, such as surveying, purchasing mitigation lands, preserving land on-site, and managing the habitat. Small entities also may participate in section 7 consultation as a third party (the primary consulting parties being the Service and the Federal action agency). It is therefore possible that the small entities may spend additional time considering critical habitat during section 7 consultation for the flycatcher. Additional incremental costs of consultation that would be borne by the Federal action agency and the Service are not relevant to this screening analysis as these entities (Federal agencies) are not small.

666. Of the activities described in Chapter 3 through 10 of this analysis, small entities are not anticipated to incur incremental costs associated with three activities, for the following reasons:

- **Tribes.** Chapter 6 of this analysis details the potential incremental impacts of critical habitat designation on 20 Tribes with lands overlapping the proposed designation. Tribes are generally not subject to review under the RFA/SBREFA. For example, in its guidance on preparing analyses in compliance with the RFA/SBREFA, the EPA states that, "for the purposes of the RFA, States and Tribal governments are not considered small governments but rather as independent sovereigns."[872,873]
- **Mining.** Chapter 9 of this analysis discusses the potential for flycatcher critical habitat to affect mining activities. As discussed in the chapter, at this time, we do not forecast incremental impacts to these activities. Moreover, the known mining companies pursuing activities in the vicinity of critical habitat are not small entities. To be considered a small entity in this industry, companies must employ

[872] EPA. "Regulatory Flexibility Act/Small Business Regulatory Enforcement Fairness Act (RFA/SBREFA). What is a "small government?" Accessed at http://www.epa.gov/sbrefa/government.htm on August 10, 2005.

[873] Tribal businesses, like other businesses, can be considered small entities under RFA/SBREFA if they meet the requisite size standards. The Small Business Size Regulations state that "Business concerns owned and controlled by Indian Tribes, Alaska Native Corporations (ANCs) organized pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601 *et seq.*), Native Hawaiian Organizations (NHOs), Community Development Corporations (CDCs) authorized by 42 U.S.C. 9805, or wholly-owned entities of Indian Tribes, ANCs, NHOs, or CDCs are not considered affiliates of such entities. Small Business Size Regulations, Title 13: Business Credit and Assistance, Chapter I: Small Business Administration, Part 121: Small Business Size Regulations. In Chapter 6, this analysis forecasts incremental administrative costs and qualitatively discusses concerns that are difficult to monetize, such as potential restrictions on the Tribes' ability to make use of natural resources, including water rights, on their sovereign lands. These monetized costs and potential non-monetized impacts are assumed to be borne by the Tribal government, and not Tribal businesses. As noted in Chapter 6, because Tribal governments generally have far fewer resources to draw from and often serve especially disadvantaged populations, impacts due to critical habitat designation may have a disproportionately negative effect on Tribes.

fewer than 500 people. Freeport employs more than 29,700 people.[874] Grupo Mexico, the parent company of Asarco, Inc., employed 23,931 people in 2010, while BHP Billiton, the parent company of BHP Copper, employs 41,000 people.[875]

- **Recreation.** Chapter 10 of this analysis presents the potential impacts to recreational activities such as hiking, camping, picnicking, fishing, hunting, boating, river rafting, and ORV use. The chapter does not forecast any incremental impacts; therefore, no incremental impacts to small entities are anticipated.[876]

667. Incremental impacts associated with five remaining activities (water management, grazing, residential and related development, oil and gas development, and transportation) may be borne by small entities, and thus are the focus of this threshold analysis. Following RFA and SBREFA, the purpose of this threshold analysis is to determine if the critical habitat designation will have a significant economic impact on a substantial number of small entities. Importantly, the impacts of the rule must be *both* significant *and* substantial to prevent certification of the rule. If a substantial number of small entities are affected by the critical habitat designation, but the per-entity economic impact is not significant, the Service may certify. Likewise, if the per-entity economic impact is likely to be significant, but the number of affected entities is not substantial, the Service may also certify. To assist the Service in making this determination, this analysis presents information on both the number of small entities that may be affected and the magnitude of the expected impacts.

668. Exhibits A-1 and A-2 describe the number of entities that may bear incremental impacts related to water management, grazing, development, and oil and gas development. Exhibit A-1 presents the relevant small entity thresholds by NAICS code, the total number of entities in the study area, and the total number of small entities in the study area. For purposes of this screening analysis, the study area includes the 49 counties overlapping the proposed critical habitat designation.[877] Exhibit A-2 then summarizes the number and percentage of those entities that may be affected by critical habitat

[874] Freeport McMoRan, *About Us*, accessed at: http://www.fcx.com/company/who.htm on January 26, 2012.

[875] Grupo Mexico, *Annual Report 2010*, accessed at: http://www.gmexico.com/files/GMexico%20Annual%20Report%202010.pdf. BHP Billiton, *A Great Place to Work*, accessed at: http://www.bhpbilliton.com/home/people/workplace/Pages/default.aspx on January 26, 2012.

[876] The baseline impacts to recreational activities are expected to be borne largely by Federal land managers. Lost trip expenditures associated with ongoing closures for flycatcher may affect small entities in the local communities serving the relevant recreation areas. However, these impacts are considered baseline, and therefore are not considered in this screening analysis.

[877] These counties include Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, and Ventura counties in California; Clark, Lincoln, and Nye counties in Nevada; Kane, San Juan, and Washington counties in southern Utah; Alamosa, Conejos, Costilla, La Plata, and Rio Grande counties in Colorado; Apache, Cochise, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Pima, Pinal, Santa Cruz, Yavapai, and Yuma counties in Arizona; and Catron, Cibola, Dona Ana, Grant, Hidalgo, McKinley, Mora, Rio Arriba, Santa Fe, San Juan, Sierra, Socorro, Taos, and Valencia counties in New Mexico.

designation. The assumptions used to estimate the number of affected small entities are described in greater detail by activity in the following sections. Finally, Exhibit A-3 summarizes forecast incremental impacts as a percentage of these affected small entities' annual revenues. The assumptions underlying these estimates are described in greater detail in the activity-specific bullets on the following pages.

EXHIBIT A-1. OVERVIEW OF NUMBER OF SMALL ENTITIES WITHIN STUDY AREA

ACTIVITY	INDUSTRY (NAICS CODES)	SMALL ENTITY SIZE STANDARD	TOTAL NUMBER OF ENTITIES IN STUDY AREA[1]	NUMBER OF SMALL ENTITIES IN STUDY AREA[2]
[A]	[B]	[C]	[D]	[E]
Water Management	Water Supply and Irrigation (221310)	$7.0 million	1,599	1,350
Grazing	Beef Cattle Ranching and Farming (112111)	$750,000	554	517
Development	New Single-Family Housing Construction (236115)	$33.5 million	62,140	61,827
	New Multifamily Housing Construction (236116)		5,287	5,177
	New Housing Operative Builders (236117)		973	857
	Land Subdivision (237210)	$7.0 million	8,948	8,655
Oil and Gas	Oil and Gas Extraction (211)	500 employees	393	300

Source: Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifier," on January 25, 2012.

Notes:

1. The total number of entities in the study area was calculated by querying the Dun and Bradstreet database to identify the number of entities in the relevant NAICS codes for each industry (as shown in Column [B]) across the 49 counties with areas proposed as critical habitat.

2. The total number of small entities in the study area was calculated by querying the Dun and Bradstreet database to identify the number of entities falling under the small entity size standard for the relevant NAICS code as developed by the Small Business Administration (see Column [C]).

EXHIBIT A-2. PERCENTAGE OF SMALL ENTITIES AFFECTED BY CRITICAL HABITAT DESIGNATION

ACTIVITY	TYPE OF IMPACTS[1]	NUMBER OF AFFECTED SMALL ENTITIES[2]	NUMBER OF SMALL ENTITIES IN STUDY AREA[3]	PERCENTAGE OF SMALL ENTITIES AFFECTED
[A]	[B]	[C]	[D]	[E] = [C] / [D]
Water Management	Project modification and administrative costs	1	1,350	0.07%
Grazing	Project modification and administrative costs	3	517	0.49%
	Administrative costs only	29		5.6%
Development	Land value loss and administrative costs	1	76,516	<0.01%
	Administrative costs only	6		<0.01%
Oil and Gas	Administrative costs only	7	300	2.3%

Source: Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifier," on January 25, 2012.

Notes:

1. The analysis distinguishes between entities expected to bear project modification costs and those expected to bear only administrative costs because the expected magnitude of impacts differs significantly across the two groups.

2. To estimate the number of affected small entities, this analysis assumes one small entity per forecast section 7 consultation in areas with incremental impacts. For water management, the analysis forecasts incremental impacts to two dams that are not federally owned or operated. Revenue information was not publicly available for the entities operating these dams, therefore we make the conservative that they are small.

3. As shown in Column [E] of Exhibit A-1. For development, it sums the number of small entities in each of the four NAICS codes. If we conservatively assume that impacts are borne solely by entities in the New Housing Operative Builders industry (NAICS 236117) with only 973 small entities across the study area, affected entities expected to bear project modification costs comprise only 1.13 percent of the total number of small entities in the study area. Affected entities expected to bear only administrative costs comprise only 12.85 percent of the total number of small entities in the study area.

EXHIBIT A-3. SUMMARY OF POTENTIAL INCREMENTAL IMPACTS TO SMALL ENTITIES

ACTIVITY	TYPE OF IMPACTS	AFFECTED SMALL ENTITIES[1]	TOTAL PRESENT VALUE IMPACTS[2]	PRESENT VALUE IMPACTS EXCLUDING FEDERAL COSTS[3]	ANNUALIZED INCREMENTAL IMPACTS[4]	ANNUALIZED IMPACTS PER ENTITY	IMPACTS AS % OF ANNUAL REVENUES[5]
[A]	[B]	[C]	[D]	[E]	[F]	[G] = [F] / [C]	[H]
Water Management	Project modification and admin. costs	Luna Irrigation Co.	$29,000 to $94,000	$12,000 to $77,000	$930 to $5,800	$930 to $5,800	0.01% to 0.08%
Grazing	Project modification and admin. costs	3	$1.4 to $2.8 million	$34,000 to $61,000	$3,000 to $5,300	$1,000 to $1,800	0.24% to 0.43%
	Admin. costs only	29	$720,000	$160,000	$14,000	$480	0.12%
Development	Land value loss and admin. costs	1	$300,000	$200,000	$200,000	$200,000	5.72%
	Admin. costs only	6	$510,000	$120,000	$11,000	$1,800	0.05%
Oil and Gas	Admin. costs only	7	$11,000	$2,200	$198	$28	<0.01%

Notes:

1. See Column [C] of Exhibit A-2.
2. As estimated in Chapters 3 through 5.
3. This estimate excludes the additional incremental costs of consultation that would be borne by the Federal action agency and the Service. These costs are not relevant to this screening analysis as these entities (Federal agencies) are not small.
4. Present value impacts as presented in Column [E] are annualized over twenty years for grazing and development activities and over thirty years for water management activities. Land value losses for development are not annualized because these losses are assumed to occur in the year that critical habitat is designated and represents a one-time loss.
5. Revenue information is not available for the water project; therefore we assume its annual revenues are equivalent to the small business threshold of $7 million. For grazing, average revenues were developed using the USDA, National Agricultural Statistics Service. 2007 Census of Agriculture. Volume 1, Chapter 2: County Level Data, Table 1. County Summary Highlights: 2007 and Table 11. Cattle and Calves - Inventory and Sales: 2007 and 2002. For development and oil and gas activities, weighted average annual revenues are estimated using Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2010 to 2011,* 2010. Revenue levels are discussed in greater detail in the text of this Appendix. Percentages may not calculate due to rounding.

- **Water Management.** Across the study area, approximately 1,599 businesses are engaged in the water supply and irrigation industry. Of these, 1,350 or 84 percent have annual revenues at or below the small business threshold of $7.0 million, and thus are considered small entities (see Exhibit A-1). As described in Chapter 3, only one of the dams expected to incur incremental impacts is not operated by the Federal government. The Luna dam in the San Francisco management unit is owned by the Luna Irrigation Company. Because revenue information is not publicly available for this company, we conservatively assume that it is small. This small entity represents approximately 0.08 percent of the total number of small entities in the study area (see Exhibit A-2).

  Luna Irrigation Company is expected to incur annualized incremental impacts ranging from $930 to $5,800. These impacts consist primarily of implementing flycatcher conservation efforts such as land acquisition, habitat restoration, survey and monitoring. Revenue information is not publicly available for this company. Assuming that it has annual revenues at the small business threshold of $7.0 million, annualized impacts per small entity are expected to range from 0.01 to 0.15 percent of annual revenues (see Exhibit A-3). If the company's annual revenues are less than $7.0 million, impacts as a percentage of revenues will be greater.

- **Grazing.** Across the study area, 554 businesses are engaged in the beef cattle ranching and farming industry. Of these, 517, or 93 percent, have annual revenues at or below the small business threshold of $750,000, and thus are considered small (see Exhibit A-1).

  A section 7 consultation on grazing activity may cover one or more grazing allotments, and a small entity may be permitted to graze on one or more of these allotments. Because the number of allotments and grazing permittees varies from consultation to consultation, this analysis makes the simplifying assumption that one small entity is affected by each forecast consultation.[878] The analysis forecasts a total of three incremental formal section 7 consultations; therefore, we assume three small entities may incur project modification costs (primarily reductions in AUMs) as a result of critical habitat designation. These three small entities represent approximately 0.49 percent of small grazers across the study area. A further 29 entities may incur some minor administrative costs associated with informal consultations and technical assistance efforts. These 29 entities represent approximately 5.6 percent of small grazing entities across the study area (see Exhibit A-2).

  To estimate average annual revenues per grazing entity, the analysis relies on data from the National Agricultural Statistics Service, which provides

[878] This assumption may over- or under-estimate the number of affected entities. If a single small entity grazes on multiple allotments, it may be involved in multiple consultations, and thus the number of affected entities would be overstated. If a consultation covers multiple allotments owned by multiple small entities, the number of affected small entities would be understated.

information on the value of calf and cattle sales as well as the number of farms. Using these data, we estimated a value of calf and cattle sales per farm for all the counties in the study area. We then averaged this value across the counties to estimate annual revenues per grazing entity of $413,000 (see Exhibit A-4). We note that this average is significantly below the threshold level defining a small entity.

EXHIBIT A-4. ESTIMATED ANNUAL REVENUES PER GRAZING ENTITY

COUNTY	STATE	CALF AND CATTLE SALES ($)	NUMBER OF FARMS	SALES PER FARM
Apache	AZ	$6,255,000	786	$7,958
Cochise	AZ	N/A	436	N/A
Gila	AZ	$2,490,000	101	$24,653
Graham	AZ	$3,309,000	108	$30,639
Greenlee	AZ	N/A	47	N/A
La Paz	AZ	N/A	13	N/A
Maricopa	AZ	N/A	334	N/A
Mohave	AZ	$5,724,000	168	$34,071
Pima	AZ	$7,501,000	186	$40,328
Pinal	AZ	$314,075,000	203	$1,547,167
Santa Cruz	AZ	$3,653,000	93	$39,280
Yavapai	AZ	$12,174,000	290	$41,979
Yuma	AZ	N/A	23	N/A
Imperial	CA	$530,557,000	51	$10,403,078
Inyo	CA	N/A	39	N/A
Kern	CA	$132,073,000	358	$368,919
Los Angeles	CA	$1,700,000	83	$20,482
Mono	CA	$3,346,000	35	$95,600
Orange	CA	$244,000	9	$27,111
Riverside	CA	$33,193,000	185	$179,422
San Bernardino	CA	$69,369,000	194	$357,572
San Diego	CA	N/A	216	N/A
Santa Barbara	CA	$20,023,000	211	$94,896
Ventura	CA	$4,161,000	94	$44,266
Alamosa	CO	$3,947,000	89	$44,348
Conejos	CO	$9,505,000	217	$43,802
Costilla	CO	$3,550,000	81	$43,827
La Plata	CO	$8,891,000	316	$28,136

COUNTY	STATE	CALF AND CATTLE SALES ($)	NUMBER OF FARMS	SALES PER FARM
Rio Grande	CO	$11,476,000	115	$99,791
Catron	NM	N/A	167	N/A
Cibola	NM	$4,216,000	118	$35,729
Dona Ana	NM	N/A	104	N/A
Grant	NM	$7,508,000	173	$43,399
Hidalgo	NM	N/A	85	N/A
McKinley	NM	N/A	731	N/A
Mora	NM	$5,490,000	270	$20,333
Rio Arriba	NM	$7,910,000	471	$16,794
San Juan	NM	$8,785,000	407	$21,585
Santa Fe	NM	$3,053,000	108	$28,269
Sierra	NM	N/A	110	N/A
Socorro	NM	$11,574,000	221	$52,371
Taos	NM	$2,878,000	168	$17,131
Valencia	NM	$7,758,000	247	$31,409
Clark	NV	$3,406,000	37	$92,054
Lincoln	NV	N/A	67	N/A
Nye	NV	N/A	66	N/A
Kane	UT	N/A	81	N/A
San Juan	UT	$5,411,000	173	$31,277
Washington	UT	$5,426,000	219	$24,776
			Average sales per farm	$412,719

Source: USDA, National Agricultural Statistics Service. 2007 Census of Agriculture. Volume 1, Chapter 2: County Level Data, Table 1. County Summary Highlights: 2007 and Table 11. Cattle and Calves - Inventory and Sales: 2007 and 2002.

Notes: For some counties, data are withheld to avoid disclosing data for individual farms.

We estimate total annualized impacts to the three entities that may incur project modification costs of $3,000 to $5,300, or $1,000 to $1,800 per entity.[879] Assuming each has annual revenues of $413,000, these annualized impacts per small entity are expected to range from 0.24 percent to 0.43 percent of annual revenues. The remaining 29 entities are expected to incur approximately $14,000 in annualized administrative costs, or $480 per entity. Assuming each company has annual revenues of $413,000, annualized impacts per small entity are estimated at 0.12 percent of annual revenues.[880]

These estimated impacts reflect only the direct impacts of critical habitat on entities' ability to graze. Although Chapter 4 provides information on the distributional impacts of changes in grazing activity (e.g., the ripple effect of reduced grazing activity on local, non-grazing businesses), these distributional impacts are not considered in this screening analysis.

- **Residential and Commercial Development.** Across the study area, 77,348 businesses are engaged in residential and related development.[881] Of these, 76,516 or nearly 99 percent have annual revenues at or below the relevant small business thresholds for their respective NAICS codes, and thus are considered small (see Exhibit A-1).

  To determine how many entities may be affected by the designation, this screening analysis makes the simplifying assumption that one small entity is affected by each forecast consultation. This assumption may be conservative because a small developer may own multiple projects that each undergo separate section 7 consultation. The analysis forecasts a total of one formal section 7 consultations in areas incurring incremental impacts. Therefore, we assume that one small developer incurs costs associated with land set asides, time delays, other project modification, and administrative activities as a result of critical habitat designation. This small developer represents less than 0.01 percent of small developers across the study area. The analysis forecasts an additional six informal consultations and technical assistance efforts that are not expected to incur land value losses. The six small entities assumed to participate in these consultations represent less than 0.01 percent of small developers across the study area (see Exhibit A-2).

[879] These estimates do not include incremental fencing costs, which, according to conversations with BLM and USFS land managers, are often borne by the Federal agencies rather than the ranchers when fencing is required as a conservation measure.

[880] Annual revenues are estimated using Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2010 to 2011*, 2010.

[881] To estimate the number of businesses in this industry, the analysis relies on four separate NAICS codes: New Single Family Housing Construction (NAICS 236115), New Multifamily Housing Construction (NAICS 236116), New Housing Operative Builders (236117), and Land Subdivision (NAICS 237210).

We estimate total impacts to the one small entity that may incur costs associated with changes to its projects of $200,000.[882] Assuming the average small entity has annual revenues of approximately $3.5 million, these annualized impacts per small entity represent approximately 5.7 percent of annual revenues.[883] The remaining six entities are expected to incur approximately $11,000 in annualized administrative costs, or $1,800 per entity. Assuming each company has annual revenues of $3.5 million, annualized impacts per small entity represent approximately 0.05 percent of annual revenues.

For development activities, potential impacts to small development firms may be overstated because much or all of the costs of flycatcher conservation efforts may ultimately be borne by current landowners in the form of reduced land values. Many of these landowners may be individuals or families that are not legally considered to be businesses. No NAICS code exists for landowners, and the SBA does not provide a definition of a small landowner.

- **Oil and Gas Development.** Across the study area, 393 businesses are engaged in the oil and gas industry.[884] A total of 15 oil and gas companies are located within La Plata County, Colorado and San Juan County, Utah, and may be affected by critical habitat. Of these 15 companies, 11 entities, or approximately 73 percent, employ fewer than 500 employees, and thus are considered small.

  To determine how many entities may be affected by the designation, this screening analysis makes the simplifying assumption that one small entity is affected by each forecast consultation. This assumption may be conservative because a single oil and gas company may own several wells that each undergo separate section 7 consultation. The analysis forecasts a total of seven formal and informal section 7 consultations. Therefore, we assume that seven small oil and gas companies incur costs incremental administrative costs associated with section 7 consultation. These seven small entities may incur total administrative costs of $200, or $28 per entity. Assuming the average small entity has annual revenues of approximately $2.2 million, these annualized impacts per small entity represent less than 0.01 percent of annual revenues.[885]

- **Transportation.** Impacts to transportation activities are expected to be incurred largely by Federal and State agencies. These entities are not considered small.

[882] We do not annualize development costs associated with formal section 7 consultations (land set asides, other project modifications, time delays, and administrative costs) because we assume that these costs affect the value of designated parcels in the first year critical habitat is designated. In other words, the value of those parcels will decrease immediately, reflecting the change in the allowable future productive uses of those parcels.

[883] Annual revenues are estimated by averaging revenue data for the four development NAICS codes obtained from Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2011 to 2012,* 2011.

[884] To estimate the number of businesses in this industry, the analysis relies on NAICS code 211 (Oil and Gas Extraction).

[885] Annual revenues are estimated by averaging revenue data for NAICS code 211111 obtained from Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2011 to 2012,* 2011. Because the small business size standard for this NAICS codes is based on employees, annual revenues are based on revenues for entities with less than $2 million in sales.

However, the analysis forecasts some administrative costs associated with roads that may be managed by county or city governments. Using GIS data to identify where roads cross the proposed critical habitat designation, the analysis forecasts informal and technical assistance efforts in four counties out of the 49 counties in the study area. Of these counties, three counties, or 75 percent, have populations falling below 50,000 and therefore are considered small (see Exhibit A-5). Third-party administrative costs for these three counties total $8,300 on an annualized basis. These impacts represent between 0 and 0.06 percent of the respective county's annual revenues (see Exhibit A-5).

The results of the threshold analysis are summarized below in Exhibit A-6

EXHIBIT A-5. SUMMARY OF POTENTIALLY AFFECTED GOVERNMENTAL JURISDICTIONS

GOVERNMENTAL JURISDICTION	SMALL ENTITY SIZE STANDARD	TOTAL POPULATION	SMALL ENTITY UNDER THE RFA	ANNUALIZED INCREMENTAL ECONOMIC IMPACTS (7%)	IMPACTS AS % OF ANNUAL REVENUES
Apache County, AZ	50,000 people	71,158	No	N/A	N/A
Santa Cruz County, AZ		47,420	Yes	$858	<0.01%
Catron County, NM		3,725	Yes	$3,430	0.06%
Kane County, UT		7,125	Yes	$858	0.01%

Source: US Census Bureau, State and County Quickfacts, accessed at: http://quickfacts.census.gov/qfd/index.html on January 26, 2012. Revenue information obtained from county budgets where publicly available and CGR, *Govistics*, accessed at: http://www.govistics.com/.

EXHIBIT A-6. RFA/SBREFA THRESHOLD ANALYSIS RESULTS SUMMARY

ACTIVITY	INDUSTRY/ENTITY (NAICS CODES)	NUMBER OF SMALL ENTITIES AFFECTED	PERCENT OF SMALL ENTITIES AFFECTED IN THE STUDY AREA	PER ENTITY ANNUALIZED COSTS AS A PERCENT OF ANNUAL REVENUES
Water Management	Luna Irrigation Company[1] (Water Supply and Irrigation (221310))	1	0.08%	0.01% to 0.15%
Grazing	Beef Cattle Ranching and Farming (112111)	3	0.49%	0.24% to 0.43%
		29	5.6%	0.12%
Development	New Single-Family Housing Construction (236115); New Multifamily Housing Construction (236116); New Housing Operative Builders (236117); Land Subdivision (237210)	1	<0.01%	5.72%
		6	<0.01%	0.05%
Tribes	Tribes are not considered to be small entities; rather, they are treated as sovereign nations under the RFA/SBREFA	N/A	N/A	N/A
Transportation	County and city governments serving populations less than 50,000	3	unknown	<0.01% to 0.06%
Mining	Freeport, Grupo Mexico (Asarco), and BHP Billiton are not small entities (Mining (212))	0	N/A	N/A
Oil and Gas	Oil and Gas Extraction (211)	7	2.3%	<0.01%
Recreation	No incremental impacts.	N/A	N/A	N/A

Source: Detailed analysis presented in this Appendix.
Notes: (1) Because revenue information is not readily available, we assume this non-Federal water management entity is small.

A.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

669. Pursuant to Executive Order No. 13211, "Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use," issued May 18, 2001, Federal agencies must prepare and submit a "Statement of Energy Effects" for all "significant energy actions." The purpose of this requirement is to ensure that all Federal agencies "appropriately weigh and consider the effects of the Federal Government's regulations on the supply, distribution, and use of energy."[886]

670. The Office of Management and Budget provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute "a significant adverse effect" when compared with the regulatory action under consideration:

- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
- Reductions in fuel production in excess of 4,000 barrels per day;
- Reductions in coal production in excess of 5 million tons per year;
- Reductions in natural gas production in excess of 25 million Mcf per year;
- Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
- Increases in energy use required by the regulatory action that exceed the thresholds above;
- Increases in the cost of energy production in excess of one percent;
- Increases in the cost of energy distribution in excess of one percent; or
- Other similarly adverse outcomes.[887]

671. Chapter 3 discusses the potential for critical habitat to affect water management activities. While some of the dams within the critical habitat have installed hydroelectric capacity, the analysis does not forecast any changes to the timing or amount of water spilled at these dams.

672. Furthermore, we discuss potential impacts to oil and gas development in Chapter 8. Specifically, industry representatives express concern that development activity in San Juan County, Utah and LaPlata County, Colorado would be subject to section 7 consultation as a result of the designation. They estimate additional per project costs of $20,000, and potential time delays, associated with the consultation activity. Total energy production from natural gas wells in these counties totaled 433 million Mcf in 2010, or approximately 1.6 percent of the 26.86 billion Mcf produced in the United States in the same year.

[886] Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, http://www.whitehouse.gov/omb/memoranda/m01-27.html.

[887] Ibid.

673. Based on the protections already afforded riparian habitat, we project only seven formal and information consultations over the timeframe for the analysis. Because total present value incremental administrative costs are $11,000 over 20 years, costs associated with section 7 consultation are unlikely to increase the cost of energy production in the U.S. in excess of one percent.[888]

[888] U.S. Energy Information, *Annual Energy Information*, Table 6.2 Natural Gas Production, 1949-2010, October 19, 2011. Accessed at: http://205.254.135.24/totalenergy/data/annual/showtext.cfm?t=ptb0602. Utah Division of Oil, Gas, and Mining, *Annual Production Data*, Table 4.5 Natural Gas Gross Production in Utah by County, 1993-2010. Accessed at: http://geology.utah.gov/emp/energydata/statistics/naturalgas4.0/pdf/T4.5%20&%20F4.5.pdf. Search of the Colorado Oil and Gas Information Service, accessed at: http://cogcc.state.co.us/cogis/ProductionSearch.asp on January 30, 2012.

APPENDIX B | SENSITIVITY OF RESULTS TO DISCOUNT RATE

674. This appendix first summarizes the baseline and incremental impacts calculated assuming a three percent discount rate. We provide these exhibits to demonstrate the sensitivity of our results to the discount rate selected, and they can be compared with similar exhibits, presented in the Executive Summary and activity-specific chapters, which present results assuming a seven percent discount rate. We also present the stream of undiscounted costs for each activity.

EXHIBIT B-1 SUMMARY OF INCREMENTAL IMPACTS BY MANAGEMENT UNIT, 2012 TO 2041 (2010$, THREE PERCENT DISCOUNT RATE)

MANAGEMENT UNIT	PRESENT VALUE (2012-2031)		PRESENT VALUE (2032-2041)		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
Santa Ynez	$21,000	$21,000	$0	$0	$1,400	$1,400
Santa Clara	$750,000	$2,600,000	$93,000	$690,000	$49,000	$170,000
Santa Ana	$650,000	$650,000	$24,000	$24,000	$42,000	$42,000
San Diego	$270,000	$270,000	$9,700	$9,700	$18,000	$18,000
Owens	$5,700	$5,700	$0	$0	$290	$290
Kern	$26,000	$26,000	$7,300	$7,300	$1,700	$1,700
Mohave	$1,600,000	$9,500,000	$320,000	$2,700,000	$100,000	$620,000
Salton	$21,000	$21,000	$0	$0	$1,400	$1,400
Amargosa	$100,000	$100,000	$0	$0	$6,600	$6,600
Little Colorado	$910,000	$910,000	$0	$0	$59,000	$59,000
Virgin	$340,000	$340,000	$0	$0	$22,000	$22,000
Middle Colorado	$48,000	$48,000	$7,300	$7,300	$3,100	$3,100
Pahranagat	$48,000	$48,000	$0	$0	$3,100	$3,100
Bill Williams	$210,000	$210,000	$2,400	$2,400	$14,000	$14,000
Hoover to Parker Dam	$100,000	$100,000	$3,600	$3,600	$6,700	$6,700
Parker Dam to Southerly International Border	$61,000	$61,000	$3,600	$3,600	$4,000	$4,000
San Juan	$250,000	$250,000	$0	$0	$17,000	$17,000
Powell	$990,000	$1,200,000	$0	$0	$64,000	$79,000
Verde	$270,000	$270,000	$2,400	$2,400	$18,000	$18,000
Roosevelt	$100,000	$100,000	$2,400	$2,400	$6,800	$6,800
Middle Gila and San Pedro	$170,000	$170,000	$2,400	$2,400	$11,000	$11,000
Upper Gila	$480,000	$480,000	$0	$0	$32,000	$32,000
Santa Cruz	$780,000	$780,000	$0	$0	$51,000	$51,000
San Francisco	$4,800,000	$5,900,000	$3,200	$27,000	$320,000	$380,000

MANAGEMENT UNIT	PRESENT VALUE (2012-2031)		PRESENT VALUE (2032-2041)		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
Hassayampa and Agua Fria	$5,200	$5,200	$0	$0	$340	$340
San Luis Valley	$170,000	$170,000	$0	$0	$11,000	$11,000
Upper Rio Grande	$260,000	$260,000	$0	$0	$17,000	$17,000
Middle Rio Grande	$350,000	$350,000	$7,300	$7,300	$23,000	$23,000
Lower Rio Grande	$180,000	$180,000	$0	$0	$12,000	$12,000
Total	**$14,000,000**	**$25,000,000**	**$490,000**	**$3,500,000**	**$910,000**	**$1,600,000**
Note: Totals may not sum due to rounding.						

EXHIBIT B-2 SUMMARY OF BASELINE IMPACTS BY MANAGEMENT UNIT, 2012 TO 2041 (2010$, THREE PERCENT DISCOUNT RATE)

MANAGEMENT UNIT	PRESENT VALUE (2012-2031)		PRESENT VALUE (2032-2041)		PRESENT VALUE (2042-2061)		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
Santa Ynez	$510,000	$530,000	$0	$0	$0	$0	$33,000	$35,000
Santa Clara	$20,000,000	$22,000,000	$120,000	$720,000	$0	$0	$1,300,000	$1,400,000
Santa Ana	$30,000,000	$49,000,000	$860,000	$6,700,000	$0	$0	$2,000,000	$3,200,000
San Diego	$4,900,000	$10,000,000	$260,000	$1,900,000	$0	$0	$320,000	$660,000
Owens	$35,000	$180,000	$5,400	$45,000	$0	$0	$2,100	$11,000
Kern	$6,500,000	$6,600,000	$2,000,000	$2,000,000	$0	$0	$420,000	$430,000
Mohave	$6,500,000	$6,500,000	$0	$0	$0	$0	$420,000	$420,000
Salton	$63,000	$63,000	$0	$0	$0	$0	$4,100	$4,100
Amargosa	$900,000	$1,600,000	$12,000	$98,000	$0	$0	$58,000	$110,000
Little Colorado	$3,900,000	$4,300,000	$10,000	$87,000	$0	$0	$260,000	$280,000
Virgin	$8,300,000	$10,000,000	$0	$0	$0	$0	$540,000	$660,000
Middle Colorado	$160,000,000	$160,000,000	$51,000,000	$51,000,000	$47,000,000	$47,000,000	$11,000,000	$11,000,000
Pahranagat	$580,000	$1,200,000	$6,200	$52,000	$0	$0	$38,000	$79,000
Bill Williams	$8,400,000	$9,600,000	$1,800,000	$1,800,000	$0	$0	$550,000	$620,000

MANAGEMENT UNIT	PRESENT VALUE (2012-2031)		PRESENT VALUE (2032-2041)		PRESENT VALUE (2042-2061)		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
Hoover to Parker Dam	$9,100,000	$9,100,000	$1,200,000	$1,200,000	$1,100,000	$1,100,000	$590,000	$590,000
Parker Dam to Southerly International Border	$2,300,000	$2,400,000	$680,000	$680,000	$620,000	$620,000	$150,000	$150,000
San Juan	$4,700,000	$5,300,000	$0	$0	$0	$0	$300,000	$340,000
Powell	$6,100	$25,000	$0	$0	$0	$0	$400	$1,600
Verde	$10,000,000	$12,000,000	$1,800,000	$1,800,000	$2,000,000	$2,000,000	$680,000	$800,000
Roosevelt	$17,000,000	$20,000,000	$3,900,000	$3,900,000	$5,100,000	$5,100,000	$1,100,000	$1,300,000
Middle Gila and San Pedro	$2,800,000	$3,600,000	$7,300	$7,300	$0	$0	$180,000	$240,000
Upper Gila	$12,000,000	$49,000,000	$1,600,000	$13,000,000	$0	$0	$750,000	$3,200,000
Santa Cruz	$53,000	$210,000	$0	$0	$0	$0	$3,500	$13,000
San Francisco	$150,000	$910,000	$0	$0	$0	$0	$9,800	$59,000
Hassayampa and Agua Fria	$21,000	$55,000	$0	$0	$0	$0	$1,400	$3,600
San Luis Valley	$5,400,000	$5,600,000	$0	$0	$0	$0	$350,000	$370,000
Upper Rio Grande	$4,300,000	$4,500,000	$0	$0	$0	$0	$280,000	$290,000
Middle Rio Grande	$16,000,000	$100,000,000	$3,700,000	$31,000,000	$0	$0	$1,100,000	$6,700,000
Lower Rio Grande	$5,400,000	$5,500,000	$0	$0	$0	$0	$350,000	$360,000
Total	**$340,000,000**	**$500,000,000**	**$69,000,000**	**$120,000,000**	**$56,000,000**	**$56,000,000**	**$22,000,000**	**$33,000,000**

Note: Totals may not sum due to rounding.

EXHIBIT B-3. INCREMENTAL IMPACTS TO WATER MANAGEMENT ACTIVITIES BY MANAGEMENT UNIT, 2012 TO 2041 (2010$, DISCOUNTED AT THREE PERCENT)

MANAGEMENT UNIT	PRESENT VALUE		ANNUALIZED	
	LOW	HIGH	LOW	HIGH
Santa Ynez	$0	$0	$0	$0
Santa Clara	$400,000	$2,900,000	$20,000	$140,000
Santa Ana	$110,000	$110,000	$5,200	$5,200
San Diego	$50,000	$50,000	$2,500	$2,500
Owens	$5,000	$5,000	$250	$250
Kern	$30,000	$30,000	$1,500	$1,500
Mohave	$1,300,000	$11,000,000	$67,000	$560,000
Salton	$0	$0	$0	$0
Amargosa	$5,000	$5,000	$250	$250
Little Colorado	$10,000	$10,000	$500	$500
Virgin	$0	$0	$0	$0
Middle Colorado	$30,000	$30,000	$1,500	$1,500
Pahranagat	$5,000	$5,000	$250	$250
Bill Williams	$15,000	$15,000	$750	$750
Hoover to Parker Dam	$15,000	$15,000	$750	$750
Parker Dam to Southerly International Border	$15,000	$15,000	$750	$750
San Juan	$0	$0	$0	$0
Powell	$0	$0	$0	$0
Verde	$10,000	$10,000	$500	$500
Roosevelt	$10,000	$10,000	$500	$500
Middle Gila and San Pedro	$10,000	$10,000	$500	$500
Upper Gila	$5,000	$5,000	$250	$250
Santa Cruz	$0	$0	$0	$0
San Francisco	$33,000	$130,000	$1,700	$6,600
Hassayampa and Agua Fria	$0	$0	$0	$0
San Luis Valley	$0	$0	$0	$0
Upper Rio Grande	$0	$0	$0	$0
Middle Rio Grande	$35,000	$35,000	$1,700	$1,700
Lower Rio Grande	$0	$0	$0	$0
Total	**$2,100,000**	**$15,000,000**	**$110,000**	**$720,000**

Note: Totals may not sum due to rounding.

EXHIBIT B-4. BASELINE IMPACTS TO WATER MANAGEMENT ACTIVITIES BY MANAGEMENT UNIT (2010$, DISCOUNTED AT THREE PERCENT)

MANAGEMENT UNIT	PRESENT VALUE		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH
Santa Ynez	$0	$0	$0	$0
Santa Clara	$500,000	$3,000,000	$25,000	$150,000
Santa Ana	$3,600,000	$28,000,000	$180,000	$1,400,000
San Diego	$1,100,000	$8,100,000	$54,000	$400,000
Owens	$37,000	$200,000	$1,800	$10,000
Kern	$8,200,000	$8,200,000	$410,000	$410,000
Mohave	$0	$0	$0	$0
Salton	$0	$0	$0	$0
Amargosa	$63,000	$420,000	$3,100	$21,000
Little Colorado	$73,000	$390,000	$3,600	$19,000
Virgin	$0	$0	$0	$0
Middle Colorado	$260,000,000	$260,000,000	$10,000,000	$10,000,000
Pahranagat	$41,000	$230,000	$2,000	$11,000
Bill Williams	$7,400,000	$7,400,000	$360,000	$360,000
Hoover to Parker Dam	$6,000,000	$6,000,000	$240,000	$240,000
Parker Dam to Southerly International Border	$3,400,000	$3,400,000	$140,000	$140,000
San Juan	$0	$0	$0	$0
Powell	$0	$0	$0	$0
Verde	$9,500,000	$9,500,000	$370,000	$370,000
Roosevelt	$21,000,000	$21,000,000	$800,000	$800,000
Middle Gila and San Pedro	$30,000	$30,000	$1,500	$1,500
Upper Gila	$6,500,000	$54,000,000	$320,000	$2,700,000
Santa Cruz	$0	$0	$0	$0
San Francisco	$0	$0	$0	$0
Hassayampa and Agua Fria	$0	$0	$0	$0
San Luis Valley	$0	$0	$0	$0
Upper Rio Grande	$0	$0	$0	$0
Middle Rio Grande	$15,000,000	$130,000,000	$770,000	$6,400,000
Lower Rio Grande	$0	$0	$0	$0
Total	**$340,000,000**	**$540,000,000**	**$14,000,000**	**$24,000,000**

Note: Totals may not sum due to rounding.
Hoover to Parker, Parker to Southerly, Roosevelt, and Verde management units, costs are forecast either over fifty years or the remaining length of a 50-year permit. All other costs are forecast over 30 years.

EXHIBIT B-5. INCREMENTAL IMPACTS TO GRAZING ACTIVITIES BY MANAGEMENT UNIT, 2012 TO 2031 (2010$, DISCOUNTED AT THREE PERCENT)

MANAGEMENT UNIT	PRESENT VALUE		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH
Santa Ynez	$11	$11	$1	$1
Santa Clara	$1,500	$1,500	$96	$96
Santa Ana	$3,100	$3,100	$200	$200
San Diego	$0	$0	$0	$0
Owens	$700	$700	$45	$45
Kern	$3,300	$3,300	$220	$220
Mohave	$400,000	$870,000	$26,000	$57,000
Salton	$0	$0	$0	$0
Amargosa	$97,000	$97,000	$6,300	$6,300
Little Colorado	$4,600	$4,600	$300	$300
Virgin	$110,000	$110,000	$7,400	$7,400
Middle Colorado	$1,100	$1,100	$71	$71
Pahranagat	$43,000	$43,000	$2,800	$2,800
Bill Williams	$150,000	$150,000	$9,700	$9,700
Hoover to Parker Dam	$1,000	$1,000	$68	$68
Parker Dam to Southerly International Border	$7,300	$7,300	$480	$480
San Juan	$24,000	$24,000	$1,500	$1,500
Powell	$230,000	$460,000	$15,000	$30,000
Verde	$43,000	$43,000	$2,800	$2,800
Roosevelt	$73,000	$73,000	$4,700	$4,700
Middle Gila and San Pedro	$88,000	$88,000	$5,800	$5,800
Upper Gila	$73,000	$73,000	$4,700	$4,700
Santa Cruz	$28,000	$28,000	$1,800	$1,800
San Francisco	$930,000	$1,900,000	$61,000	$120,000
Hassayampa and Agua Fria	$5,200	$5,200	$340	$340
San Luis Valley	$6,300	$6,300	$410	$410
Upper Rio Grande	$1,600	$1,600	$110	$110
Middle Rio Grande	$200,000	$200,000	$13,000	$13,000
Lower Rio Grande	$14,000	$14,000	$930	$930
Total	**$2,500,000**	**$4,200,000**	**$170,000**	**$270,000**

Note: Totals may not sum due to rounding.

EXHIBIT B-6. BASELINE IMPACTS TO GRAZING ACTIVITY BY MANAGEMENT UNIT, 2012 TO 2031 (2010$, DISCOUNTED AT THREE PERCENT)

MANAGEMENT UNIT	PRESENT VALUE		ANNUALIZED COSTS	
	LOW	HIGH	LOW	HIGH
Santa Ynez	$7,800	$30,000	$510	$2,000
Santa Clara	$29,000	$86,000	$1,900	$5,600
Santa Ana	$230,000	$530,000	$15,000	$35,000
San Diego	$0	$0	$0	$0
Owens	$3,500	$21,000	$230	$1,400
Kern	$64,000	$170,000	$4,200	$11,000
Mohave	$9,400	$9,400	$610	$610
Salton	$0	$0	$0	$0
Amargosa	$850,000	$1,300,000	$55,000	$85,000
Little Colorado	$36,000	$130,000	$2,400	$8,200
Virgin	$1,300,000	$3,100,000	$85,000	$200,000
Middle Colorado	$270,000	$630,000	$18,000	$41,000
Pahranagat	$550,000	$1,000,000	$36,000	$67,000
Bill Williams	$1,300,000	$2,500,000	$85,000	$160,000
Hoover to Parker Dam	$21,000	$56,000	$1,400	$3,700
Parker Dam to Southerly International Border	$44,000	$100,000	$2,800	$6,700
San Juan	$570,000	$1,200,000	$37,000	$77,000
Powell	$6,100	$25,000	$400	$1,600
Verde	$1,300,000	$3,200,000	$86,000	$210,000
Roosevelt	$1,800,000	$4,400,000	$120,000	$290,000
Middle Gila and San Pedro	$480,000	$1,300,000	$32,000	$88,000
Upper Gila	$610,000	$1,500,000	$40,000	$97,000
Santa Cruz	$53,000	$210,000	$3,500	$13,000
San Francisco	$150,000	$910,000	$9,800	$59,000
Hassayampa and Agua Fria	$21,000	$55,000	$1,400	$3,600
San Luis Valley	$79,000	$350,000	$5,200	$23,000
Upper Rio Grande	$87,000	$300,000	$5,700	$19,000
Middle Rio Grande	$660,000	$830,000	$43,000	$54,000
Lower Rio Grande	$120,000	$270,000	$7,800	$18,000
Total	**$11,000,000**	**$24,000,000**	**$700,000**	**$1,600,000**

Note: Totals may not sum due to rounding.

EXHIBIT B-7. INCREMENTAL AND BASELINE IMPACTS TO RESIDENTIAL AND COMMERCIAL DEVELOPMENT BY MANAGEMENT UNIT, 2012 TO 2031 (2010$, DISCOUNTED AT THREE PERCENT)

MANAGEMENT UNIT	INCREMENTAL		BASELINE	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Santa Ynez	$21,000	$1,400	$500,000	$33,000
Santa Clara	$440,000	$28,000	$19,000,000	$1,300,000
Santa Ana	$270,000	$18,000	$20,000,000	$1,300,000
San Diego	$150,000	$9,700	$3,800,000	$250,000
Owens	$0	$0	$0	$0
Kern	$0	$0	$0	$0
Mohave	$110,000	$6,900	$5,300,000	$350,000
Salton	$0	$0	$0	$0
Amargosa	$0	$0	$0	$0
Little Colorado	$0	$0	$0	$0
Virgin	$0	$0	$0	$0
Middle Colorado	$0	$0	$0	$0
Pahranagat	$0	$0	$0	$0
Bill Williams	$0	$0	$0	$0
Hoover to Parker Dam	$48,000	$3,100	$5,200,000	$340,000
Parker Dam to Southerly International Border	$0	$0	$0	$0
San Juan	$0	$0	$0	$0
Powell	$0	$0	$0	$0
Verde	$31,000	$2,000	$94,000	$6,100
Roosevelt	$0	$0	$0	$0
Middle Gila and San Pedro	$0	$0	$0	$0
Upper Gila	$0	$0	$0	$0
Santa Cruz	$0	$0	$0	$0
San Francisco	$0	$0	$0	$0
Hassayampa and Agua Fria	$0	$0	$0	$0
San Luis Valley	$0	$0	$0	$0
Upper Rio Grande	$0	$0	$0	$0
Middle Rio Grande	$0	$0	$0	$0
Lower Rio Grande	$0	$0	$0	$0
Total	**$1,100,000**	**$70,000**	**$54,000,000**	**$3,500,000**

Note: Totals may not sum due to rounding.

EXHIBIT B-8. INCREMENTAL AND BASELINE IMPACTS TO TRIBAL ACTIVITIES BY MANAGEMENT UNIT, 2012 TO 2031 (2010$, DISCOUNTED AT THREE PERCENT)

MANAGEMENT UNIT	TRIBE	INCREMENTAL IMPACTS		BASELINE IMPACTS	
		PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Santa Ana	Ramona Band of Cahuilla Indians	$85,000	$5,500	$250,000	$17,000
San Diego	La Jolla Band of Mission Indians	$21,000	$1,400	$63,000	$4,100
San Diego	Barona Band of Mission Indians and Viejas Band of Kumeyaay Indians	$21,000	$1,400	$63,000	$4,100
San Diego	Pala Band of Mission Indians	$21,000	$1,400	$63,000	$4,100
San Diego	Rincon Band of Luiseno Indians	$21,000	$1,400	$63,000	$4,100
Salton	Iipay Nation of Santa Ysabel	$21,000	$1,400	$63,000	$4,100
Hoover to Parker Dam	Chemehuevi Tribe	$21,000	$1,400	$63,000	$4,100
Hoover to Parker Dam	Fort Mojave Indian Tribe	$21,000	$1,400	$63,000	$4,100
Little Colorado	Zuni Pueblo	$24,000	$1,600	$72,000	$4,700
Middle Colorado	Hualapai Tribe	$24,000	$1,600	$72,000	$4,700
Parker Dam to Southerly International Border	Colorado River Indian Tribes	$21,000	$1,400	$63,000	$4,100
Parker Dam to Southerly International Border	Quechan Tribe	$21,000	$1,400	$63,000	$4,100
San Juan	Navajo Nation	$24,000	$1,600	$72,000	$4,700
San Juan	Southern Ute Tribe	$72,000	$4,700	$220,000	$14,000
Upper Gila	San Carlos Apache Tribe	$240,000	$16,000	$720,000	$47,000
Verde	Yavapai-Apache Nation	$96,000	$6,200	$290,000	$19,000
Upper Rio Grande	Pueblo de San Ildefonso	$24,000	$1,600	$72,000	$4,700
Upper Rio Grande	Ohkay Owingeh Tribe	$24,000	$1,600	$72,000	$4,700
Upper Rio Grande	Santa Clara Indian Pueblo	$96,000	$6,200	$290,000	$19,000
	Total	**$900,000**	**$59,000**	**$2,700,000**	**$180,000**

Note: Totals may not sum due to rounding.

EXHIBIT B-9. INCREMENTAL AND BASELINE IMPACTS TO TRANSPORTATION ACTIVITIES BY MANAGEMENT UNIT, 2012 TO 2031 (2010$, DISCOUNTED AT THREE PERCENT)

MANAGEMENT UNIT	INCREMENTAL		BASELINE	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Santa Ynez	$0	$0	$0	$0
Santa Clara	$0	$0	$0	$0
Santa Ana	$200,000	$13,000	$7,200,000	$470,000
San Diego	$0	$0	$0	$0
Owens	$0	$0	$0	$0
Kern	$0	$0	$0	$0
Mohave	$33,000	$2,100	$1,200,000	$75,000
Salton	$0	$0	$0	$0
Amargosa	$0	$0	$0	$0
Little Colorado	$870,000	$57,000	$3,800,000	$250,000
Virgin	$220,000	$15,000	$7,000,000	$460,000
Middle Colorado	$0	$0	$0	$0
Pahranagat	$0	$0	$0	$0
Bill Williams	$48,000	$3,100	$1,500,000	$98,000
Hoover to Parker Dam	$0	$0	$0	$0
Parker Dam to Southerly International Border	$0	$0	$0	$0
San Juan	$120,000	$7,800	$3,800,000	$250,000
Powell	$750,000	$49,000	$0	$0
Verde	$96,000	$6,200	$3,000,000	$200,000
Roosevelt	$24,000	$1,600	$750,000	$49,000
Middle Gila and San Pedro	$72,000	$4,700	$2,300,000	$150,000
Upper Gila	$170,000	$11,000	$5,300,000	$340,000
Santa Cruz	$750,000	$49,000	$0	$0
San Francisco	$3,900,000	$250,000	$0	$0
Hassayampa and Agua Fria	$0	$0	$0	$0
San Luis Valley	$170,000	$11,000	$5,300,000	$340,000
Upper Rio Grande	$120,000	$7,800	$3,800,000	$250,000
Middle Rio Grande	$120,000	$7,800	$3,800,000	$250,000
Lower Rio Grande	$170,000	$11,000	$5,300,000	$340,000
Total	**$7,800,000**	**$510,000**	**$54,000,000**	**$3,500,000**

Note: Totals may not sum due to rounding.

EXHIBIT B-10. BASELINE IMPACTS TO RECREATIONAL ACTIVITIES BY MANAGEMENT UNIT, 2012 TO 2031 (2010$, DISCOUNTED AT THREE PERCENT)

MANAGEMENT UNIT	BASELINE	
	PRESENT VALUE	ANNUALIZED
Santa Ynez	$0	$0
Santa Clara	$0	$0
Santa Ana	$53,000	$3,400
San Diego	$0	$0
Owens	$0	$0
Kern	$180,000	$12,000
Mohave	$0	$0
Salton	$0	$0
Amargosa	$0	$0
Little Colorado	$0	$0
Virgin	$0	$0
Middle Colorado	$0	$0
Pahranagat	$0	$0
Bill Williams	$0	$0
Hoover to Parker Dam	$0	$0
Parker Dam to Southerly International Border	$0	$0
San Juan	$0	$0
Powell	$0	$0
Verde	$0	$0
Roosevelt	$2,300,000	$150,000
Middle Gila and San Pedro	$0	$0
Upper Gila	$0	$0
Santa Cruz	$0	$0
San Francisco	$0	$0
Hassayampa and Agua Fria	$0	$0
San Luis Valley	$0	$0
Upper Rio Grande	$0	$0
Middle Rio Grande	$0	$0
Lower Rio Grande	$0	$0
Total	**$2,600,000**	**$170,000**
Note: Totals may not sum due to rounding.		

EXHIBIT B-11. INCREMENTAL AND BASELINE IMPACTS TO OIL AND GAS DEVELOPMENT ACTIVITIES BY MANAGEMENT UNIT, 2012 TO 2031 (2010$, DISCOUNTED AT THREE PERCENT)

MANAGEMENT UNIT	INCREMENTAL		BASELINE	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
San Juan	$15,000	$960	$44,000	$2,900
Total	**$15,000**	**$960**	**$44,000**	**$2,900**
Note: Totals may not sum due to rounding.				

EXHIBIT B-12. SUMMARY OF UNDISCOUNTED INCREMENTAL IMPACTS TO WATER MANAGEMENT ACTIVITIES BY MANAGEMENT UNIT (2010$)

MANAGEMENT UNIT	ANNUAL COST (YEAR 2012)		ANNUAL COST (YEARS 2013 THROUGH 2041)	
	LOW	HIGH	LOW	HIGH
Santa Ynez	$0	$0	$0	$0
Santa Clara	$39,063	$161,536	$19,063	$141,536
Santa Ana	$10,000	$10,000	$5,000	$5,000
San Diego	$12,000	$12,000	$2,000	$2,000
Owens	$5,000	$5,000	$0	$0
Kern	$1,500	$1,500	$1,500	$1,500
Mohave	$81,045	$569,412	$66,045	$554,412
Salton	$0	$0	$0	$0
Amargosa	$5,000	$5,000	$0	$0
Little Colorado	$10,000	$10,000	$0	$0
Virgin	$0	$0	$0	$0
Middle Colorado	$1,500	$1,500	$1,500	$1,500
Pahranagat	$5,000	$5,000	$0	$0
Bill Williams	$5,500	$5,500	$500	$500
Hoover to Parker Dam	$750	$750	$750	$750
Parker Dam to Southerly International Border	$750	$750	$750	$750
San Juan	$0	$0	$0	$0
Powell	$0	$0	$0	$0
Verde	$500	$500	$500	$500
Roosevelt	$500	$500	$500	$500
Middle Gila and San Pedro	$500	$500	$500	$500
Upper Gila	$5,000	$5,000	$0	$0
Santa Cruz	$0	$0	$0	$0
San Francisco	$20,663	$25,563	$663	$5,563
Hassayampa and Agua Fria	$0	$0	$0	$0
San Luis Valley	$0	$0	$0	$0
Upper Rio Grande	$0	$0	$0	$0
Middle Rio Grande	$6,500	$6,500	$1,500	$1,500
Lower Rio Grande	$0	$0	$0	$0
Total	**$210,771**	**$826,510**	**$100,771**	**$716,510**

EXHIBIT B-13. SUMMARY OF UNDISCOUNTED BASELINE IMPACTS TO WATER MANAGEMENT ACTIVITIES BY MANAGEMENT UNIT (2010$)

MANAGEMENT UNIT	ANNUAL COST (YEAR 2012)		ANNUAL COST (YEARS 2013 THROUGH 2041)		ANNUAL COST (YEARS 2042 THROUGH 2054)	ANNUAL COST (YEARS 2055 THROUGH 2057)	ANNUAL COST (YEARS 2058 THROUGH 2061)
	LOW	HIGH	LOW	HIGH			
Santa Ynez	$0	$0	$0	$0	$0	$0	$0
Santa Clara	$39,217	$162,830	$24,217	$147,830	$0	$0	$0
Santa Ana	$192,418	$1,393,410	$177,418	$1,378,410	$0	$0	$0
San Diego	$82,644	$427,549	$52,644	$397,549	$0	$0	$0
Owens	$16,100	$24,237	$1,100	$9,237	$0	$0	$0
Kern	$405,909	$405,909	$405,909	$405,909	$0	$0	$0
Mohave	$0	$0	$0	$0	$0	$0	$0
Salton	$0	$0	$0	$0	$0	$0	$0
Amargosa	$17,393	$35,087	$2,393	$20,087	$0	$0	$0
Little Colorado	$32,137	$47,940	$2,137	$17,940	$0	$0	$0
Virgin	$0	$0	$0	$0	$0	$0	$0
Middle Colorado	$10,494,410	$10,494,410	$10,494,410	$10,494,410	$10,489,910	$0	$0
Pahranagat	$16,273	$25,683	$1,273	$10,683	$0	$0	$0
Bill Williams	$378,915	$378,915	$363,915	$363,915	$0	$0	$0
Hoover to Parker Dam	$243,070	$243,070	$243,070	$243,070	$240,820	$0	$0
Parker Dam to Southerly International Border	$139,980	$139,980	$139,980	$139,980	$137,730	$0	$0
San Juan	$0	$0	$0	$0	$0	$0	$0
Powell	$0	$0	$0	$0	$0	$0	$0
Verde	$374,237	$374,237	$374,237	$374,237	$372,737	$372,737	$0
Roosevelt	$804,319	$804,319	$804,319	$804,319	$802,819	$802,819	$802,819
Middle Gila and San Pedro	$1,500	$1,500	$1,500	$1,500	$0	$0	$0
Upper Gila	$334,918	$2,700,527	$319,918	$2,685,527	$0	$0	$0
Santa Cruz	$0	$0	$0	$0	$0	$0	$0
San Francisco	$0	$0	$0	$0	$0	$0	$0
Hassayampa and Agua Fria	$0	$0	$0	$0	$0	$0	$0
San Luis Valley	$0	$0	$0	$0	$0	$0	$0
Upper Rio Grande	$0	$0	$0	$0	$0	$0	$0
Middle Rio Grande	$779,722	$6,401,135	$764,722	$6,386,135	$0	$0	$0
Lower Rio Grande	$0	$0	$0	$0	$0	$0	$0
Total	**$14,353,163**	**$24,060,741**	**$14,173,163**	**$23,880,741**	**$12,044,016**	**$1,175,556**	**$802,819**

EXHIBIT B-14. SUMMARY OF UNDISCOUNTED INCREMENTAL IMPACTS TO GRAZING ACTIVITIES BY MANAGEMENT UNIT (2010$)

MANAGEMENT UNIT	ANNUAL COST (YEAR 2012)		ANNUAL COST (YEAR 2013 THROUGH 2031)	
	LOW	HIGH	LOW	HIGH
Santa Ynez	$1	$1	$1	$1
Santa Clara	$96	$96	$96	$96
Santa Ana	$201	$201	$201	$201
San Diego	$0	$0	$0	$0
Owens	$45	$45	$45	$45
Kern	$218	$218	$218	$218
Mohave	$307,172	$503,203	$6,683	$25,414
Salton	$0	$0	$0	$0
Amargosa	$6,334	$6,334	$6,334	$6,334
Little Colorado	$299	$299	$299	$299
Virgin	$7,437	$7,437	$7,437	$7,437
Middle Colorado	$71	$71	$71	$71
Pahranagat	$2,803	$2,803	$2,803	$2,803
Bill Williams	$9,656	$9,656	$9,656	$9,656
Hoover to Parker Dam	$68	$68	$68	$68
Parker Dam to Southerly International Border	$478	$478	$478	$478
San Juan	$1,538	$1,538	$1,538	$1,538
Powell	$155,083	$248,601	$5,427	$14,616
Verde	$2,813	$2,813	$2,813	$2,813
Roosevelt	$4,740	$4,740	$4,740	$4,740
Middle Gila and San Pedro	$5,764	$5,764	$5,764	$5,764
Upper Gila	$4,745	$4,745	$4,745	$4,745
Santa Cruz	$1,818	$1,818	$1,818	$1,818
San Francisco	$629,162	$1,030,920	$21,101	$58,525
Hassayampa and Agua Fria	$341	$341	$341	$341
San Luis Valley	$411	$411	$411	$411
Upper Rio Grande	$105	$105	$105	$105
Middle Rio Grande	$12,964	$12,964	$12,964	$12,964
Lower Rio Grande	$935	$935	$935	$935
Total	**$1,155,299**	**$1,846,606**	**$97,093**	**$162,436**

EXHIBIT B-15. SUMMARY OF UNDISCOUNTED BASELINE IMPACTS TO GRAZING ACTIVITIES BY MANAGEMENT UNIT (2010$)

MANAGEMENT UNIT	ANNUAL COST (YEAR 2012)		ANNUAL COST (YEAR 2013 THROUGH 2031)	
	LOW	HIGH	LOW	HIGH
Santa Ynez	$6,048	$10,686	$123	$1,349
Santa Clara	$20,587	$35,702	$561	$3,523
Santa Ana	$175,678	$292,587	$4,106	$16,515
San Diego	$0	$0	$0	$0
Owens	$229	$1,368	$229	$1,368
Kern	$39,691	$63,665	$1,680	$7,385
Mohave	$615	$615	$615	$615
Salton	$0	$0	$0	$0
Amargosa	$514,179	$699,529	$23,323	$42,306
Little Colorado	$2,374	$8,248	$2,374	$8,248
Virgin	$653,967	$1,147,638	$45,538	$133,618
Middle Colorado	$197,629	$324,163	$4,998	$21,326
Pahranagat	$347,635	$525,212	$13,956	$35,180
Bill Williams	$698,359	$1,129,058	$42,420	$93,786
Hoover to Parker Dam	$14,372	$24,510	$486	$2,209
Parker Dam to Southerly International Border	$15,630	$26,753	$1,952	$5,250
San Juan	$389,664	$631,639	$12,315	$38,408
Powell	$397	$1,608	$397	$1,608
Verde	$865,392	$1,498,440	$32,074	$116,263
Roosevelt	$1,098,168	$1,875,678	$50,718	$178,476
Middle Gila and San Pedro	$31,575	$88,057	$31,575	$88,057
Upper Gila	$229,349	$395,611	$26,333	$76,141
Santa Cruz	$3,453	$13,500	$3,453	$13,500
San Francisco	$9,795	$59,421	$9,795	$59,421
Hassayampa and Agua Fria	$4,823	$9,003	$1,138	$3,203
San Luis Valley	$5,152	$30,842	$5,152	$22,262
Upper Rio Grande	$47,332	$85,158	$2,801	$14,675
Middle Rio Grande	$85,531	$120,968	$39,989	$49,343
Lower Rio Grande	$61,898	$103,157	$3,986	$11,880
Total	**$5,519,519**	**$9,202,812**	**$362,085**	**$1,045,913**

EXHIBIT B-16. SUMMARY OF UNDISCOUNTED IMPACTS TO RESIDENTIAL AND COMMERCIAL DEVELOPMENT ACTIVITIES BY MANAGEMENT UNIT (2010$)

MANAGEMENT UNIT	ANNUAL COST (YEAR 2012)		ANNUAL COST (YEARS 2013 THROUGH 2031)	
	BASELINE	INCREMENTAL	BASELINE	INCREMENTAL
Santa Ynez	$95,951	$1,380	$28,499	$1,380
Santa Clara	$16,025,398	$67,134	$227,993	$25,776
Santa Ana	$14,437,566	$17,934	$370,489	$17,934
San Diego	$963,227	$9,657	$199,494	$9,657
Owens	$0	$0	$0	$0
Kern	$0	$0	$0	$0
Mohave	$3,283,610	$6,898	$142,496	$6,898
Salton	$0	$0	$0	$0
Amargosa	$0	$0	$0	$0
Little Colorado	$0	$0	$0	$0
Virgin	$0	$0	$0	$0
Middle Colorado	$0	$0	$0	$0
Pahranagat	$0	$0	$0	$0
Bill Williams	$0	$0	$0	$0
Hoover to Parker Dam	$4,359,964	$3,125	$58,095	$3,125
Parker Dam to Southerly	$0	$0	$0	$0
San Juan	$0	$0	$0	$0
Powell	$0	$0	$0	$0
Verde	$93,740	$31,247	$0	$0
Roosevelt	$0	$0	$0	$0
Middle Gila and San Pedro	$0	$0	$0	$0
Upper Gila	$0	$0	$0	$0
Santa Cruz	$0	$0	$0	$0
San Francisco	$0	$0	$0	$0
Hassayampa and Agua Fria	$0	$0	$0	$0
San Luis Valley	$0	$0	$0	$0
Upper Rio Grande	$0	$0	$0	$0
Middle Rio Grande	$0	$0	$0	$0
Lower Rio Grande	$0	$0	$0	$0
Total	**$39,259,455**	**$137,372**	**$1,027,067**	**$64,767**

EXHIBIT B-17. SUMMARY OF UNDISCOUNTED IMPACTS TO TRIBAL ACTIVITIES BY MANAGEMENT UNIT (2010$)

MANAGEMENT UNIT	TRIBE	ANNUAL COST (YEARS 2012 THROUGH 2031)	
		BASELINE	INCREMENTAL
Santa Ana	Ramona Band of Cahuilla Indians	$16,554	$5,518
San Diego	La Jolla Band of Mission Indians	$4,139	$1,380
San Diego	Barona Band of Mission Indians and Viejas Band of Kumeyaay Indians	$4,139	$1,380
San Diego	Pala Band of Mission Indians	$4,139	$1,380
San Diego	Rincon Band of Luiseno Indians	$4,139	$1,380
Salton	Iipay Nation of Santa Ysabel	$4,139	$1,380
Hoover-Parker	Chemehuevi Tribe	$4,139	$1,380
Hoover-Parker	Fort Mojave Indian Tribe	$4,139	$1,380
Little Colorado	Zuni Pueblo	$4,687	$1,562
Middle Colorado	Hualapai Tribe	$4,687	$1,562
Parker Dam to Southerly International Border	Colorado River Indian Tribes	$4,139	$1,380
Parker Dam to Southerly International Border	Quechan Tribe	$4,139	$1,380
San Juan	Navajo Nation	$4,687	$1,562
San Juan	Southern Ute Tribe	$14,061	$4,687
Upper Gila	San Carlos Apache Tribe	$46,870	$15,623
Verde	Yavapai-Apache Nation	$18,748	$6,249
Upper Rio Grande	Pueblo de San Ildefonso	$4,687	$1,562
Upper Rio Grande	Ohkay Owingeh Tribe	$4,687	$1,562
Upper Rio Grande	Santa Clara Indian Pueblo	$18,748	$6,249
	Total	**$175,662**	**$58,554**

EXHIBIT B-18. SUMMARY OF UNDISCOUNTED INCREMENTAL IMPACTS TO TRANSPORTATION ACTIVITIES BY MANAGEMENT UNIT (2010$)

MANAGEMENT UNIT	ANNUAL COST (2012)	ANNUAL COST (2015)	ANNUAL COST (2020)	ANNUAL COST (2025)	ANNUAL COST (2013-2014, 2016-2019, 2021-2024, 2026-2031)
Santa Ynez	$0	$0	$0	$0	$0
Santa Clara	$0	$0	$0	$0	$0
Santa Ana	$0	$27,590	$179,335	$55,180	$0
San Diego	$0	$0	$0	$0	$0
Owens	$0	$0	$0	$0	$0
Kern	$0	$0	$0	$0	$0
Mohave	$0	$0	$41,385	$0	$0
Salton	$0	$0	$0	$0	$0
Amargosa	$0	$0	$0	$0	$0
Little Colorado	$56,998	$56,998	$56,998	$56,998	$56,998
Virgin	$43,745	$12,499	$12,499	$12,499	$12,499
Middle Colorado	$0	$0	$0	$0	$0
Pahranagat	$0	$0	$0	$0	$0
Bill Williams	$3,125	$3,125	$3,125	$3,125	$3,125
Hoover to Parker Dam	$0	$0	$0	$0	$0
Parker Dam to	$0	$0	$0	$0	$0
San Juan	$7,812	$7,812	$7,812	$7,812	$7,812
Powell	$49,186	$49,186	$49,186	$49,186	$49,186
Verde	$6,249	$6,249	$6,249	$6,249	$6,249
Roosevelt	$1,562	$1,562	$1,562	$1,562	$1,562
Middle Gila and San	$4,687	$4,687	$4,687	$4,687	$4,687
Upper Gila	$10,936	$10,936	$10,936	$10,936	$10,936
Santa Cruz	$49,186	$49,186	$49,186	$49,186	$49,186
San Francisco	$253,742	$253,742	$253,742	$253,742	$253,742
Hassayampa and Agua	$0	$0	$0	$0	$0
San Luis Valley	$10,936	$10,936	$10,936	$10,936	$10,936
Upper Rio Grande	$7,812	$7,812	$7,812	$7,812	$7,812
Middle Rio Grande	$7,812	$7,812	$7,812	$7,812	$7,812
Lower Rio Grande	$10,936	$10,936	$10,936	$10,936	$10,936
Total	**$524,724**	**$521,067**	**$714,197**	**$548,657**	**$493,477**

EXHIBIT B-19. SUMMARY OF UNDISCOUNTED BASELINE IMPACTS TO TRANSPORTATION ACTIVITIES BY MANAGEMENT UNIT (2010$)

MANAGEMENT UNIT	ANNUAL COST (2012)	ANNUAL COST (2015)	ANNUAL COST (2020)	ANNUAL COST (2025)	ANNUAL COST (2013-2014, 2016-2019, 2021-2024, 2026-2031)
Santa Ynez	$0	$0	$0	$0	$0
Santa Clara	$0	$0	$0	$0	$0
Santa Ana	$0	$972,752	$6,322,887	$1,945,504	$0
San Diego	$0	$0	$0	$0	$0
Owens	$0	$0	$0	$0	$0
Kern	$0	$0	$0	$0	$0
Mohave	$0	$0	$1,459,128	$0	$0
Salton	$0	$0	$0	$0	$0
Amargosa	$0	$0	$0	$0	$0
Little Colorado	$245,930	$245,930	$245,930	$245,930	$245,930
Virgin	$1,377,210	$393,489	$393,489	$393,489	$393,489
Middle Colorado	$0	$0	$0	$0	$0
Pahranagat	$0	$0	$0	$0	$0
Bill Williams	$98,372	$98,372	$98,372	$98,372	$98,372
Hoover to Parker Dam	$0	$0	$0	$0	$0
Parker Dam to	$0	$0	$0	$0	$0
San Juan	$245,930	$245,930	$245,930	$245,930	$245,930
Powell	$0	$0	$0	$0	$0
Verde	$196,744	$196,744	$196,744	$196,744	$196,744
Roosevelt	$49,186	$49,186	$49,186	$49,186	$49,186
Middle Gila and San	$147,558	$147,558	$147,558	$147,558	$147,558
Upper Gila	$344,302	$344,302	$344,302	$344,302	$344,302
Santa Cruz	$0	$0	$0	$0	$0
San Francisco	$0	$0	$0	$0	$0
Hassayampa and Agua	$0	$0	$0	$0	$0
San Luis Valley	$344,302	$344,302	$344,302	$344,302	$344,302
Upper Rio Grande	$245,930	$245,930	$245,930	$245,930	$245,930
Middle Rio Grande	$245,930	$245,930	$245,930	$245,930	$245,930
Lower Rio Grande	$344,302	$344,302	$344,302	$344,302	$344,302
Total	**$3,885,699**	**$3,874,730**	**$10,683,992**	**$4,847,482**	**$2,901,978**

EXHIBIT B-20. SUMMARY OF UNDISCOUNTED BASELINE IMPACTS TO RECREATIONAL ACTIVITIES BY MANAGEMENT UNIT (2010$)

MANAGEMENT UNIT	ANNUAL COST (YEAR 2012 THROUGH 2013)	ANNUAL COST (YEAR 2014)	ANNUAL COST (YEARS 2015 THROUGH 2031)
Santa Ynez	$0	$0	$0
Santa Clara	$0	$0	$0
Santa Ana	$3,441	$3,441	$3,441
San Diego	$0	$0	$0
Owens	$0	$0	$0
Kern	$11,698	$15,139	$11,698
Mohave	$0	$0	$0
Salton	$0	$0	$0
Amargosa	$0	$0	$0
Little Colorado	$0	$0	$0
Virgin	$0	$0	$0
Middle Colorado	$0	$0	$0
Pahranagat	$0	$0	$0
Bill Williams	$0	$0	$0
Hoover to Parker Dam	$0	$0	$0
Parker Dam to Southerly International Border	$0	$0	$0
San Juan	$0	$0	$0
Powell	$0	$0	$0
Verde	$0	$0	$0
Roosevelt	$152,003	$152,003	$152,003
Middle Gila and San Pedro	$0	$0	$0
Upper Gila	$0	$0	$0
Santa Cruz	$0	$0	$0
San Francisco	$0	$0	$0
Hassayampa and Agua Fria	$0	$0	$0
San Luis Valley	$0	$0	$0
Upper Rio Grande	$0	$0	$0
Middle Rio Grande	$0	$0	$0
Lower Rio Grande	$0	$0	$0
Total	**$167,142**	**$170,582**	**$167,142**

EXHIBIT B-21. SUMMARY OF UNDISCOUNTED BASELINE AND INCREMENTAL IMPACTS TO OIL AND GAS DEVELOPMENT ACTIVITIES BY MANAGEMENT UNIT (2010$)

MANAGEMENT UNIT	ANNUAL BASELINE COST (YEAR 2012 THROUGH 2031)	ANNUAL INCREMENTAL COST (YEAR 2012 THROUGH 2031)
San Juan	$2,888	$963
Total	**$2,888**	**$963**

APPENDIX C

INCREMENTAL EFFECTS MEMORANDUM TO IEc

United States Department of the Interior

U.S. Fish and Wildlife Service
Arizona Ecological Services Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 Fax: (602) 242-2513

In reply refer to:

AESO/SE

October 21, 2011

Memorandum
Email Transmission

To: Industrial Economics, Inc., Cambridge, Massachusetts
(Attention: Leslie Genova)

From: Field Supervisor

Subject: Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Re-Designate Critical Habitat for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*) (flycatcher)

The purpose of this memorandum is to provide information to serve as a basis for conducting an economic analysis for the proposed revisions to southwestern willow flycatcher (flycatcher) critical habitat. This information will fulfill the request as identified in the November 30, 2010, Memorandum, *Guidance for Preparing Incremental Effects Memo* (from Jennifer Baxter, Industrial Economics, Inc., to Douglas Krofta, Service).

Section 4(b)(2) of the Endangered Species Act (Act) requires the Service to consider the economic, national security, and other impacts of designating a particular area as critical habitat. The Service may exclude an area from critical habitat if it determines that the benefits of exclusion outweigh the benefits of including the area as critical habitat, unless the exclusion will result in the extinction of the species. To support its weighing of the benefits of excluding versus including an area as critical habitat, the Service prepares an economic analysis for each proposed critical habitat rule describing and monetizing, where possible, the economic impacts (costs and benefits) of the proposed regulation.

Determining the economic impacts of critical habitat designation involves evaluating the "without critical habitat" baseline versus the "with critical habitat" scenario. Impacts of a designation equal the difference, or the increment, between these two scenarios. Measured differences between the baseline (area without critical habitat) and the designated critical habitat (area with critical habitat) may include (but are not limited to) changes in land or resource use, environmental quality, or time and effort expended on administrative and other activities by Federal landowners, Federal action agencies, and in some instances, State and local governments or private third parties. These are the "incremental effects" that serve as the basis for the economic analysis.

There are a number of ways that designation of critical habitat could influence activities, but one of the important functions of this memorandum is to explain any differences between actions required to avoid jeopardy versus actions that may be required to avoid adverse modification. The Service is working to update the regulatory definition of adverse modification since it was invalidated by several Courts of Appeal, including the Ninth Circuit and the Fifth Circuit.[1] At this time (without updated regulatory language) the Service is analyzing whether destruction or adverse modification would occur based on the statutory language of the Act itself, which requires the Service to consider whether the agency's action is likely "to result in the destruction or adverse modification of habitat which is determined by the Service to be critical" to the conservation of the species. To perform this analysis, the Service considers how the proposed action is likely to affect the function of the critical habitat unit to serve the intended conservation role. The information provided below is intended to identify the possible differences for this species under the different section 7 standards.

Background

In total, we are proposing approximately 2,090 stream miles (mi) (3,363 kilometers (km) in 29 Management Units across California (CA), Arizona (AZ), Nevada (NV), Utah (UT), Colorado (CO), and New Mexico (NM) for designation as flycatcher critical habitat (76 FR 50542-50629). The proposed critical habitat designation includes lands under Federal (36 percent), state (5 percent), private (31 percent), tribal (13 percent), and unclassified (16 percent) land ownership (76 FR 50561, Table 1).

Our approach to the 2011 flycatcher critical habitat proposal revision was based on the recovery recommendations from the Southwestern Willow Flycatcher Recovery Plan (Recovery Plan). The Recovery Plan recommended that a specific number of territories and double the amount of habitat needed to maintain those territories through time be established in 29 of the overall 32 Management Units. Our proposed river segments were created in order to meet those territory- and habitat-related goals. This change in methodology is the primary reason there is an increase in the amount of stream miles proposed in 2011 when compared to our 2004 proposal. In 2004, we targeted large populations or small populations that in close proximity made up a large population. In 2011, our primary goal was to generate river segments that could provide habitat to reach the numerical and habitat recovery goals established in the Flycatcher Recovery Plan. While we also captured those same large populations identified in 2004, some areas of the flycatcher's range (where there were recovery goals) did not have a large population (or the area surrounding an existing large population was still not adequate to reach recovery goals). Additional areas were proposed to meet these recovery goals. In this memo we primarily compare and contrast the 2004 and 2011 proposals, because we have yet to make exclusions and finalize this proposal and because the previous economic analysis also evaluated the 2004 proposed critical habitat designation (rather than the 2005 final critical habitat designation).

There are numerous activities within lands proposed for critical habitat that could potentially be affected by the designation. Parts of the lands proposed as critical habitat are subject to groundwater pumping, surface water diversion, river damming, and water storage; livestock

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[1] *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, 378 F.3d 1059 (9th Cir. 2004); *Sierra Club v. U. S. Fish and Wildlife Service*, 245 F.3d 434 (5th Cir. 2001).

grazing and management; fire suppression; road/bridge construction and maintenance; mining; agriculture; flood control; vegetation removal and planting; recreation developments and activities including off-road vehicle use, trail development, campgrounds, and hiking use; and other activities. However, as previously outlined by our Solicitor's Office, some Federal actions within the range of the flycatcher have been found to be exempt from modification under section 7 consultation because the Federal agency lacks discretion to make any changes in its actions. Our description of possible agency actions, as outlined in this memo, must be read in conjunction with the earlier Solicitor's Office legal memo which describes where section 7 consultation requirements are not applicable.

Twenty-eight of the 29 Management Units where critical habitat is proposed are known to have had flycatcher territories since 1991 (76 FR 50560-50561). The only entire Management Unit where flycatchers have not been detected nesting since 1991 is in the Powell Management Unit (mostly occurring in AZ and UT), where we proposed a segment of the Paria River in UT (76 FR 50572). Overall, there are 12 river segments proposed as critical habitat within 7 different Management Units where flycatcher territories have not been detected since 1991 (76 FR 50560-50561). These streams are not currently known to be occupied with flycatcher territories: Mono, Temescal, Deep, Castaic, and Willow creeks, Big and Little Tujunga canyons, and the Ventura and West Fork Mohave rivers in CA; the West Fork Little Colorado and Santa Cruz rivers in AZ, and the Paria River in UT.

Because the flycatcher is a neo-tropical migrant, it also occupies migratory stop-over areas over a broader area than the locations where it eventually nests. Section 7 consultation under the Act could occur for riparian areas that are only known to be used by migrant flycatchers, but we expect this would rarely occur. However, Federal agencies could undertake that analysis while developing their biological assessments.

Baseline Analysis

Within the flycatcher proposed critical habitat rule, there are short narratives describing about 40 Plans (76 FR 50584-50594) that we will consider for exclusion from critical habitat due to Section 4(b)(2) of the Act. We have not replicated those discussions in this memo due to the overall length of the text, but they represent Habitat Conservation Plans, State Wildlife Areas, Tribal Land Management, private land management, and a nearly completed Safe Harbor Agreement that are expected to provide a conservation benefit to the flycatcher.

Conservation plans and regulatory mechanisms that provide protection to the species and its habitat without critical habitat designation

The following list includes other areas, plans, regulations, and actions that have, and likely will continue to, provide protections to the flycatcher and its habitat without a critical habitat designation. All of these areas represent actions/areas that are anticipated to occur within the proposed revised designation. If there is a specific Management Unit addressed in the item, we include it within parentheses at the end of the paragraph.

Conservation Plans/Efforts

The following are ongoing conservation efforts that provide some benefits to the flycatcher and are considered part of the baseline because these activities will occur with or without critical habitat designation.

1. Recovery Plan

While not a regulatory document, the Recovery Plan describes conservation strategies and those measures that can be implemented to recover the flycatcher. A Recovery Implementation Sub-group structure was described in the Recovery Plan, but there is no active recovery coordinator solely conducting and coordinating recovery actions throughout the bird's range. Instead, these actions are carried out by a collection of agencies, land managers, and land owners, many of whom are members of the group of stakeholders involved in the development of the Recovery Plan (see Stakeholder list in the Recovery Plan).

2. Research

Since the early 1990s, statewide surveys have been initiated in AZ, NM, and CA, generally as part of the Partners In Flight program. Standardized survey protocols were developed in 1994 and updated in 1997, 2000, and 2010. Flycatcher survey training (including natural history and recovery planning) is conducted and offered by many FWS offices in conjunction with state wildlife departments and other contributors in CA, AZ, NM, CO, and UT. Statewide and rangewide status reports have been generated from these annual surveys.

In the mid-1990s, intensive breeding and migration ecology, demography, and habitat research was being conducted at several sites in AZ, NV, and NM. Rangewide population genetics work was also initiated at that time. Collaborative research was conducted throughout the flycatcher's range. Collectively, this body of inventory, monitoring, and research has provided sound quantitative data addressing key questions relative to the recovery and conservation of the flycatcher. Work has occurred on the presence and potential impacts of environmental contaminants at selected flycatcher breeding sites in AZ. Recent research has also investigated the status, distribution, habitat use, and ecology of the flycatcher on its wintering grounds in Central America.

Much of this valuable work is expected to continue into the future (given continued funding), and will yield valuable insights on flycatcher status, distribution, and ecology. The overall goal of these efforts is to improve design, execution, and evaluation of flycatcher conservation and management actions. As this occurs, it will be important to maintain local, statewide, and rangewide data synthesis and reporting, and the collaborative sharing of research needs, ideas, and information.

All of these efforts help to identify where flycatchers are located, their habitats, preferences, stressors, and natural history, which helps to frame the protection and conservation needed while implementing projects and working towards recovery goals.

3. Walton Family Memorandum of Understanding

In response to the movement of the introduced tamarisk leaf beetle expanding beyond its anticipated range into the flycatcher's range and affecting its habitat, the Walton Family Foundation is developing a Memorandum of Understanding with the Service to voluntarily fund flycatcher habitat-improvement projects along the Colorado River drainage (Virgin River in particular, etc.) in NV, UT, and AZ. This effort is attempting to offset the impacts from the tamarisk beetle by establishing vegetation the flycatchers rely upon that would not expect to regenerate naturally. (Virgin Management Unit)

4. Riparian Habitat Management

Throughout the Southwest, there have been numerous private, local, State, and regional efforts aimed at improving and/or reducing the degradation of riparian and wetland habitats. Specific examples include, but are not limited to: the Santa Clara River Enhancement and Management Plan; the Cascabel Community Conservation Plan; the San Pedro Riparian and Las Cienegas National Conservation Areas; the Verde River Management Plan; riparian habitat development downstream of the Nogales International Waste Water Treatment Plant; Las Vegas Wash wetlands restoration program; willow riparian restoration at Key Pittman Wildlife Management Area; San Juan Pueblo post-fire riparian restoration program; Santa Ana Pueblo riparian restoration project; Pueblo of Zuni riparian restoration program; restoration of instream flows on the Agua Fria below Lake Pleasant; water (effluent) releases into the Gila River below Phoenix; experimental releases of beaver on the San Pedro River; Middle Rio Grande Collaborative Endangered Species Program, and riparian fuels reduction research on the Rio Grande. These projects are at varying stages of development and implementation.

Private Land Purchased/Managed Due to Section 7 Consultations/HCPs

The following projects resulting from past section 7 consultations provide site-specific benefits to the flycatcher and are considered part of the baseline because these benefits will continue with or without critical habitat designation.

5. Salt River Project

The Salt River Project (SRP) and Bureau of Reclamation (USBR) have purchased lands along the Verde, Gila, and San Pedro rivers within this proposal that are being managed for flycatcher habitat. These properties were purchased and managed as a result of ongoing operations of Roosevelt and Horseshoe Dams in central AZ and the habitat conservation plans and biological opinions associated with them. The SRP and USBR brought in The Nature Conservancy (TNC) to help manage these lands. Currently, TNC and SRP are the parties managing these properties. None of these properties are currently being considered for exclusion. (Verde, Middle Gila/San Pedro Management Units)

6. Orange County Water District

In conjunction with efforts to conserve and recover the endangered least Bell's vireo and southwestern willow flycatcher, species monitoring, cowbird trapping, and habitat restoration and conservation efforts have been undertaken in the Prado Basin and contiguous reaches of the Santa Ana River in southern CA since 1996. Although the local management effort, funded largely by the Orange County Water District pursuant to

several Biological Opinions, originally emphasized monitoring and management of the vireo, the conservation of the small breeding population of the flycatcher has been the top priority since the species was listed as endangered. (Santa Ana Management Unit)

Private Land Purchased and Managed Due to Private Actions

The following projects resulting from past private land acquisition and management provide site-specific benefits to the flycatcher and are considered part of the baseline because these benefits will continue with or without critical habitat designation.

7. The Nature Conservancy Preserves

TNC owns and manages property along the Hassayampa and Verde Rivers in AZ within the proposed designation that conserve the riparian habitat flycatchers rely upon. They also have property along the San Pedro River outside of the proposed designation that contributes toward flycatcher conservation by protecting riparian habitat values, retiring water rights, and improving populations. Along the Gila River in the Cliff-Gila Valley, NM, TNC has initiated habitat enhancement on its lands, including reducing levees to allow controlled flooding and subsequent establishment of riparian vegetation for nesting flycatchers. (Hassayampa/Agua Fria, Verde, and Upper Gila Management Units)

8. Audubon Kern River Preserve

The Audubon Kern River Preserve (in cooperation with agencies and groups such as the Southern Sierra Research Station, Army Corps of Engineers, CA Department of Fish and Game, and others) works to protect habitat in the southern Sierra Nevada, especially in Kern County, CA. The 456 ha (1127 ac) Kern River Preserve (KRP) was purchased in 1981 by TNC. The land had been operated as a cattle ranch since the mid-1800s. TNC removed cattle from the riparian areas shortly after they purchased the property in order to enhance the riparian habitat. However, some riparian areas are lightly to moderately grazed during the winter. The change in management resulted in the regeneration of at least 150 ha (370 ac) of riparian forest. In addition, TNC has planted over 125 ha (309 ac) of riparian habitat. In 1997, Audubon CA took over management of the KRP and continues to manage the property for riparian values. The land protected by efforts of Audubon and its partners now exceeds 8,903 ha (22,000 ac) to be protected for the benefit of biodiversity and future generations. Along the South Fork Kern River, the flycatcher is one of the key riparian bird species that is managed by the Audubon Society. (Kern Management Unit)

9. Canebrake Ecological Preserve

The State of CA Department of Fish and Game manages the Canebrake Ecological Preserve at the confluence of the South Fork Kern River and Canebrake Creek. This area contains riparian vegetation suitable for nesting flycatchers. This is an area that we may consider for exclusion, but we were unable to obtain management documents about the property to include a discussion on how the area is specifically managed. (Kern Management Unit)

Federal Regulations/Acts

The following Federal laws and regulations provide some benefits to the flycatcher and are considered part of the baseline because these benefits will continue with or without critical habitat designation.

10. Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 U.S.C. 701-711) was enacted in 1916 between the governments of the United States and Great Britain (representing Canada), subsequently Mexico in 1936, Japan in 1972, and the Union of Soviet Socialist Republics in 1976. The Migratory Bird Treaty Act expanded the definition of migratory birds to include virtually all birds found in the United States. It establishes provisions regulating take, possession, transport, and import of migratory birds, including nests and eggs.

11. Federal Land Policy and Management Act

The Federal Land Policy and Management Act of 1976 requires that ". . . the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that . . . will preserve and protect certain public lands in their natural condition; (and) that will provide food and habitat for fish and wildlife . . ." Furthermore, it is the policy of the Bureau of Land Management "to manage habitat with emphasis on ecosystems to ensure self-sustaining populations and a natural abundance and diversity of wildlife, fish, and plant resources on public lands" (BLM manual 6500.06).

12. National Forest Management Act

The National Forest Management Act of 1976 directs that the National Forest System "...where appropriate and to the extent practicable, will preserve and enhance the diversity of plant and animal communities." Additionally, sec. 219.12(g) requires the maintenance of viable populations of native vertebrates in National Forests.

13. Clean Water Act

Congress passed the Federal Water Pollution Control Act Amendments of 1972 and the Clean Water Act (CWA) of 1977 to provide for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's lakes, streams, and coastal waters. Primary authority for the implementation and enforcement of the CWA now rests with the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (COE). In addition to the measures authorized before 1972, the CWA implements a variety of programs, including: Federal effluent limitations and state water quality standards, permits for the discharge of pollutants and dredged and fill materials into navigable waters, and enforcement mechanisms.

Section 404 of the CWA is the principal Federal program that regulates activities affecting the integrity of wetlands. Section 404 prohibits the discharge of dredged or fill material in jurisdictional waters of the United States, unless permitted by COE under § 404 (a) (individual permits), 404 (e) (general permits), or unless the discharge is exempt from regulation as designated in § 404 (f).

There is controversy in administration of the COE's permit system and their responsibilities pursuant to the Act. The limits of jurisdictional waters of the United States (the area covered under § 404) are determined by: 1) in the absence of adjacent wetlands, jurisdiction extends to the ordinary high water mark; or 2) when adjacent wetlands are present, jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands; or 3) when the water of the United States consists only of wetlands, jurisdiction extends to the limit of the wetland. Riparian habitat in the Southwest is usually above the ordinary high water mark and often does not meet the definition of jurisdictional wetlands of the United States.

Section 402 of the CWA is the principal Federal program that regulates activities affecting water quality. One of the most significant features of the 1972 CWA is the creation of a national pollutant discharge elimination system (NPDES). Except as otherwise provided in the CWA, industrial sources and publicly owned treatment works may not discharge pollutants into navigable waters without a permit. The EPA or state authorized programs may issue a permit for discharge upon condition that the discharge meets applicable requirements, which are outlined extensively in the CWA and which reflect, among other things, the need to meet Federal effluent limitations and state water quality standards.

14. Other Listed Species

A large number of species listed as threatened or endangered under the Act also occur within the riparian and/or aquatic habitats used by the flycatcher, as listed in the Recovery Plan (page 56). As a result, the flycatcher receives some collateral benefits in area of habitat overlap. For example, because water is also essential for fish, their habitat requirements can help protect similar flycatcher habitat needs.

Federal Land Management

The following Federal agencies own and manage lands within the some of the areas designated as critical habitat. Their ongoing land management activities are considered part of the baseline because they will provide some benefits to the flycatcher with or without critical habitat designation. For those future proposed activities that may affect the flycatcher or its critical habitat, section 7 consultation has or will occur and may be considered as part of the incremental effects of critical habitat designation (see further discussions that follow).

15. U.S. Forest Service

The Forest Service actively manages for the flycatcher, as many historical and current populations occur on or near Forest Service lands (Fishlake, Manti-LaSal, and Dixie NFs UT; Tonto, Prescott, Coconino, and Apache-Sitgreaves NFs, AZ; Angeles, Cleveland, San Bernardino, Los Padres, and Sequoia NFs, CA; Rio Grande and San Juan NFs, CO; Carson, Cibola, and Gila NFs, NM; and Toiyabe NF, NV). The Gila and Tonto NFs, in particular, have worked to improve conditions for flycatchers along the Gila River and Tonto Creek/Roosevelt Lake/Salt River area by restoring vegetation, removing land management stressors, building cattle fences, establishing seasonal fenced closures, managing off-road vehicles, and preventing and fighting wildfires.

16. U.S. Bureau of Land Management

In AZ, the Bureau of Land Management (BLM) also manages flycatcher habitat. The BLM helps conduct flycatcher management from the Kingman, Hassayampa, Safford, Lake Havasu, and Yuma Field Offices. The BLM administers the Las Cienegas and upper San Pedro River National Conservation Areas (where flycatcher territories have been detected). Similar to the Forest Service, the BLM management includes cattle grazing, recreation, and fire.

17. U.S. Fish and Wildlife Service National Wildlife Refuges

There are nine National Wildlife Refuges (NWR) within the proposed critical habitat units that occur in NV (Ash Meadows, Pahranagat NWRs), the CA/AZ boundary along the Colorado River (Havasu, Cibola, Imperial NWRs), AZ (Bill Williams NWR), NM (Bosque del Apache, Sevilleta NWRs), and Colorado (Alamosa NWR). These NWRs have conservation plans that strive to manage for migratory birds, riparian habitat, and listed species (including the flycatcher). These NWRs are not identified as areas we are currently considering for exclusion. All of these NWRs, with exception of the Ash Meadows NWR were proposed and excluded in our 2005 flycatcher critical habitat rule. NWRs along the Colorado River are included within the Lower Colorado River Multi-Species Conservation Plan, and the Alamosa NWR in Colorado is part of the developing San Luis Valley HCP. (Amargosa, Pahranagat, Hoover to Parker, Parker to Southerly International Border, Middle Rio Grande, San Luis Valley Management Units)

18. San Pedro River

Due to a national settlement agreement associated with conducting a Federal Natural Resource Damage Assessment for resource impacts committed by ASARCO (a mining company), a portion of the settlement agreement was to acquire and manage about four miles of land along the San Pedro River to compensate for wildlife habitat impacts. Breeding flycatcher habitat occurs on these lands, and is anticipated to be improved and protected in perpetuity. (Middle Gila/San Pedro Management Unit)

State Wildlife Laws

The following wildlife laws by the states where the flycatcher occurs provide some benefits to the flycatcher and are considered part of the baseline because these benefits will continue with or without critical habitat designation.

19. Arizona

The State of AZ describes the flycatcher a "species of greatest conservation need" in their Wildlife Action Plan. Under AZ Revised Statutes, for a nongame passerine bird like the flycatcher, permits are required to take (R12-4-304), possess, sell, transport, import, and export carcasses (R12-4-305), and collect for scientific purposes (R12-4-418).

20. California

The State of CA classifies willow flycatchers breeding within the state (all three subspecies) as endangered (CA Department of Fish and Game 1992). Under the CA Endangered Species Act of 1984 (Fish and Game Code Sections 2050-216), the southwestern willow flycatcher therefore has the following protections: unless permitted by the CA Department of Fish and Game (CDFG), a listed species shall not be imported into CA or exported from CA, and shall not be taken, possessed, purchased, or sold within CA (Summary of Fish and Game Code Section 2080). Section 86 of the Fish and Game Code defines take as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill". The following restrictions and regulations from the CDFG Code apply to a nongame passerine bird like the southwestern willow flycatcher: All birds occurring naturally in CA that are not resident game birds, migratory game birds, or fully-protected birds are nongame birds. It is unlawful to take any nongame bird except as provided in the Fish and Game Code or in accordance with regulations of the Fish and Game Commission or in a mitigation plan for a mining operation approved by the CDFG (Fish and Game Code Section 3800). It is unlawful to take or possess any bird except as provided in the code or in regulations adopted by the commission pursuant to the Code (Summary of Section 2000). It also is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird (§3503). Further, it is unlawful to take or possess any migratory nongame bird designated in the Migratory Bird Treaty Act except as provided by rules and regulations adopted by the U.S. Secretary of the Interior (§3513).

The CA Environmental Quality Act (CEQA [Public Resources Code Sections {PRC}] 21000-21178.1) and the regulations enacting it (CA Code of Regulations [CCR] 15000-15387) are important tools for protecting biological resources in CA. CEQA, which is similar to the National Environmental Policy Act (NEPA), has three primary purposes: 1) Minimizing impacts on the environment by identifying impacts and then applying mitigation measures; 2) Disclosing to decision-makers and the public the potential impacts of a proposed action and associated mitigation measures; and 3) Disclosing the rationale behind decision makers' determinations to the public. With the exception of a few exempt actions, CEQA must be followed by all state and local public agencies for discretionary projects.

Projects are defined as those actions carried out, funded, or permitted by the agencies. CEQA is affected by completing documentation appropriate for the level of impact. Documentation ranges from a Negative Declaration for low-no impact projects to Environmental Impact Reports (EIR) for larger, more complex, or more impacting projects. Review and opportunity to comment by the public, and agencies other than the action agency, is mandatory. There is no enforcement agency for CEQA compliance; its intents are realized by the good-faith efforts of the decision-making agency, or through litigation. The CA Department of Fish and Game is entitled, under certain circumstances involving noncompliance with CEQA, to replace another state or local public entity as lead agency.

The impacts of a project on biological resources are considered to be significant if the project has the potential to substantially reduce the habitat of fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, and/or reduce the number or restrict the range of an endangered, rare or threatened species. Further, it directs that threats be viewed as both those posed directly by the project and those posed cumulatively by the project and other ongoing projects. CEQA defines endangered, rare, or threatened species as those listed under the Federal and state Endangered Species Acts and also any other species that meet the definition under those Acts, even if no listing action has been taken.

Decision-making agencies may deny projects which may cause a significant impact after mitigation, or for which the proponent is unwilling to accept mitigation conditions attached to the permit. On the other hand, if after applying feasible mitigation measures, the project still will result in significant impacts, the decision-making agency may still approve the action by adopting a "Statement of Overriding Considerations." In this, the decision-making body must describe in writing the specific reasons (economic, legal, social, technological, or other benefits) which override the adverse environmental effects.

21. Colorado

The State of CO listed the flycatcher as endangered in May 1998. The flycatcher is therefore protected under Colorado Revised Statutes (C.R.S.) 33-2-105. Section 3 of this statute states that "... it is unlawful for any person to take, possess, transport, export, process, sell or offer for sale, or ship and for any common or contract carrier to knowingly transport or receive for shipment any species or subspecies of wildlife appearing on the list of wildlife indigenous to this state determined to be endangered within the state pursuant to subsection (1) of this section." Section 4 contains identical language for taxa listed as threatened. Penalties for the take of state-listed endangered species are established in C.R.S. 33-6-109(3)(a). These penalties are ". .a fine of not less than two thousand dollars and not more than one hundred thousand dollars, or by imprisonment for not more than one year in the county jail, or by both such fine and such imprisonment, and an assessment of twenty points." The Colorado Division of Wildlife is also authorized to pursue civil action to recover the value of wildlife. C.R.S. 33-6-110(1)(a) establishes a minimum value of $1,000 for any endangered species. Colorado Wildlife Commission Regulation #1315 (a) provides that a "...Scientific Collecting License may be issued for the purpose of marking or banding or temporary or permanent possession of wildlife specimens outside of established seasons."

22. Nevada

In NV, the flycatcher was re-classified to state Endangered status in 2004. The flycatcher is also a protected bird under the NV Administrative Code (NAC) §503.050. This protection means "...there is no open season and a person shall not capture or kill this wildlife or possess any part thereof, without first obtaining the appropriate license, permit, or written authorization from the NV Division of Wildlife." (NAC §503.090, §503.093). Penalties for violation include fines up to $500 and/or up to six months in prison (NV Revised Statute §501.385). There are no state habitat designations that govern land use practices or are analogous to the designation of critical habitat, under the Act.

23. New Mexico

The State of NM listed the flycatcher as Threatened (then called 'Group 2') in 1988 (NMDGF 1988), then re-classified the subspecies to Endangered status in 1996. The flycatcher is therefore protected under NM's Wildlife Conservation Act (WCA) (17-2-37 to 17-2-46 NMSA 1978) of 1974. This protection means "except as otherwise provided in the WCA, it is unlawful for any person to take (including 'harass, hunt, capture or kill, or attempt to do so'), possess, transport, export, sell or offer for sale, or ship" the flycatcher in NM. Penalties for violation include fines up to $1,000 or up to one year in prison. The WCA provides for no habitat designations analogous to the designation of critical habitat, and does not govern land use practices. The WCA provides for the issuance of permits for take, possession, transport, export or shipment for scientific, zoological or educational purposes, or for propagation in captivity.

24. Utah

The State of UT (updated by UT Division of Wildlife Resources in 2011) lists the flycatcher as an endangered species on its UT Sensitive Species List. This list, compiled pursuant to Policy Number W2NAT-1 (State Sensitive Species), is intended to stimulate management actions (e.g., conservation strategies) to benefit listed species. The list carries no regulatory authority. However, under Title 23, Wildlife Resources Code of UT, the flycatcher may not be collected and possessed (R657-3-21), or imported and possessed (R657-3-32). The flycatcher may be transported live through UT, and imported to a state or federally regulated establishment (R657-3-37 and 38).

Some Federal agencies and other project proponents that are likely to consult with the Service under section 7 without critical habitat

In the baseline scenario, section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of the flycatcher.

Some of the Federal agencies and projects that would likely go though the section 7 consultation process whether or not critical habitat is designated include the following:

1. U.S. Army Corps of Engineers (bridge projects, stream restoration, vegetation management, urban development).

2. U.S. Bureau of Land Management (fire suppression, fuel-reduction treatments, land and resource management plans, livestock grazing and management plans, mining permits, renewable energy development).

3. U.S. Bureau of Reclamation (transportation, storage, and delivery of water).

4. U.S. Department of Homeland Security (border security infrastructure and operations).

5. U.S. Department of Transportation (highway and bridge construction and maintenance).

6. U.S. Fish and Wildlife Service (issuance of section 10 enhancement of survival permits, habitat conservation plans, and safe harbor agreements; National Wildlife Refuge planning; Partners for Fish and Wildlife program projects benefiting the flycatcher, Wildlife and Sportfish Restoration program).

7. U.S. Forest Service (vegetation management, noxious weed treatments, fire-management plans, fire suppression, fuel-reduction treatments, forest plans, livestock-grazing-allotment management plans, mining permits, travel-management plans).

Service administrative effort for section 7 consultations without critical habitat

Since the flycatcher was listed in 1995, we have completed approximately 205 formal section 7 biological opinions rangewide (none have occurred in TX). Our improved knowledge about flycatcher habitat, distribution, abundance, recovery planning, and approach to designating critical habitat has influenced the locations proposed and designated as critical habitat in 1997, 2005, and this current proposal. These changes could influence the abundance and occurrence of future consultations.

Flycatcher critical habitat has not been designated continuously throughout the period in which it has been listed. The flycatcher was listed as an endangered species in February 1995 and remained listed without critical habitat for about 28 months (period 1). The first critical habitat designation occurred in July 1997 and the critical habitat designation was in place about 46 months until May 2001 (period 2). A judicial decision[2] then invalidated the 1997 critical habitat designation, and the flycatcher was listed without critical habitat for about 53 months from May 2001 to October 2005 (period 3). The Service again designated critical habitat, and that designation has been in place since October 2005, which is about 70 months, as of August 11, 2011 (period 4). It will remain designated under the 2005 designation until the current proposal is final.

In AZ, where the flycatcher is listed statewide and 41 percent of all formal consultations have occurred (85/205), the proportion of formal consultations completed over these periods is as approximately as follows:

Period 1: 15 formals/28 months = 0.53 formals per month w/out critical habitat

[2] *New Mexico Cattle Growers Association v U. S. Fish and Wildlife Service*, 248 F.3d 1277 10th Cir. 2001)

Period 2: 22 formals/46 months = 0.47 formals per month w/ critical habitat

Period 3: 15 formals/53 months = 0.28 formals per month w/out critical habitat

Period 4: 33 formals/70 months = 0.47 formals per month w/ critical habitat

There is no obvious pattern associated with these time periods and numbers, but with some consideration for the timeline of events, a pattern for an incremental increase in administrative effort due to the critical habitat designation might be a reasonable conclusion. Period 1 was immediately after the flycatcher was listed as endangered, and as a result, we would expect agencies to evaluate ongoing actions and new actions for effects to flycatchers. Compared to the overall consultation history, we could anticipate that right after listing is a time where the highest proportion of consultations occurs. While this time frame is actually the highest, it is only marginally more and very similar to Periods 2 and 4 (when critical habitat was designated). We can also anticipate that with a new critical habitat designation, there will be an incremental increase in consultations. As a result, it may be that the similarities between Periods 1, 2, and 4 are because in each instance a new event occurred that caused consultations to incrementally increase (a new listing and subsequently two different critical habitat designations). In contrast, Period 3 may be lower than the rest, because a) the flycatcher had already been listed for three years and critical habitat was already addressed for ongoing actions (and the immediate increase in consultations had subsided) and b) there was no critical habitat designation. Therefore, while it is difficult to find an obvious pattern in these numbers, it may be that the administrative effort of somewhere near 0.20 consultations per month (the incremental difference between about 0.5 and 0.3 consultations per month) could be attributed to the designation of critical habitat.

Many of these formal consultations evaluated more than one species. However, there have been consultations where the flycatcher and its designated critical habitat were the only items addressed in a biological opinion.

What types of project modifications are currently recommended or will likely be recommended by the Service to avoid jeopardy (i.e., the continued existence of the species)?

To date, there have been at least four biological opinions that have resulted in jeopardy determinations for the flycatcher. These opinions occurred within the first six years of the bird being listed as endangered, during periods without a critical habitat designation, and during a time when the status of the species was not as well known. In the past, jeopardy has been avoided through proposed conservation measures and project modification, such as land acquisition and management, research, and monitoring. There may be additional future consultations that require avoidance of jeopardy, however, many of the potentially significant Federal projects known within the flycatcher's range have already either developed Habitat Conservation Plans (Lower Colorado River and Roosevelt and Horseshoe Dams, for example) or have completed non-jeopardy section 7 consultations under the Act (Lake Isabella, for example).

If we determine that an action jeopardizes flycatchers in future section 7 consultations, recommended project modifications could include one or more of the measures listed below, depending on the proposed action. This is not an exhaustive list, but reflects project-implementation guidance found in the Recovery Plan. These items focus primarily on concepts of habitat loss and mitigation. For further information and ideas about potential alternatives, the

Stepdown and Narrative Outline Recovery Actions and general management recommendations found in Recovery Plan Appendices (Appendices D-M) provide guidance on how to address issues associated with water and land management for the benefit of the flycatcher. While these are presented in the context of recovery, they can also be components of how to appropriately respond to land-and water-management actions that might cause jeopardy.

The Recovery Plan listed recommendations for designing projects that could minimize impacts to the flycatcher.

1. Research, monitoring, and survey projects should be used to evaluate the efficacy of measures intended to minimize or reduce impacts from project-related effects, but should not be used to offset actions that may result in loss, fragmentation, or modification of designated critical habitat, or areas not officially designated but that contain occupied or potential breeding habitat.

2. Cowbird trapping should not be used to offset actions that may result in loss, fragmentation, or modification of designated critical habitat, or occupied or potential breeding habitat. Rather, cowbird control should be implemented at a site only after data collection shows that at least 20-30 percent of flycatcher nests are parasitized for two or more successive years as described in the Recovery Plan (Appendix E).

3. All efforts should focus on preventing loss of flycatcher habitat. However, where occupied, unoccupied, suitable, or unoccupied potential breeding habitat is to be lost, modified, fragmented, or otherwise degraded, habitat should be replaced, permanently protected, and managed within the same Management Unit. All efforts should strive to acquire, protect, restore, and manage compensation habitat prior to project initiation. Recent research explores adequate replacement of both the land area and functional values of riparian and other wetland systems. Field data collected at flycatcher sites show that currently-suitable habitat patches on free flowing rivers occupy up to 20 percent of the floodplain in any given year and change in spatial location over time. Given the flycatcher's endangered status and typically small population sizes, there is a high degree of uncertainty as to whether flycatchers will colonize compensation habitat. There also is uncertainty regarding the comparability of ecological values between affected lands and compensation lands and regarding the long-term success of compensation lands. Given these uncertainties and the available data, specific analyses must be conducted on a project-by-project basis to determine the amount of compensation habitat required to approach no net loss. For instance, a relatively high compensation ratio may be required if the affected habitat has a higher than average population density; if the habitat has been occupied with flycatcher territories consecutively over the long-term; if the habitat contains a large population (>25 territories); or if compensation lands are not nearby to affected habitat or metapopulation.

4. Permanent habitat loss, modification, or fragmentation resulting from agency actions should be offset with habitat that is permanently protected, including adequate funding to ensure the habitat is managed permanently for the protection of the flycatcher.

5. Habitat loss, modification, or fragmentation of Federal lands should not be offset with protection of other Federal lands that would otherwise qualify for protection if the

standards set forth in the Recovery Plan or other agency guidance were applied to those lands. (In other words, lands protected as mitigation from habitat loss should not be Federal lands that are already under some form of protection or management.)

6. Areas slated for protection as a means of offsetting impacts to other lands should be identified using existing documents that have evaluated habitat conservation priorities rangewide; and should be conserved based on the following priorities: (1) occupied, unprotected breeding habitat; (2) unoccupied, suitable breeding habitat that is currently unprotected; (3) unprotected, potential breeding habitat.

7. Modifying or converting occupied breeding habitat dominated by exotic vegetation to habitat dominated by native vegetation does not constitute reduction or minimization of effects.

8. Occupied breeding habitat is considered occupied year-round for project-related effects that degrade habitat quality.

Adverse Modification Analysis

The following discussion describes the regulatory circumstances and setting that are anticipated with the proposed revision of flycatcher critical habitat. The existing critical habitat rule, finalized in 2005, will stay in place until this revision is finalized in 2012.

The 2011 flycatcher critical habitat proposed revision includes 94 percent (1,450 miles) of the stream miles proposed for critical habitat in 2004. As a result, we can anticipate that many areas proposed and designated as critical habitat in 2004/2005 will not experience a change in status with the completion of this revision. In contrast, in this 2011 proposal, we did not include some segments previously proposed and designated in 2004/2005 (East Fork Little Colorado River and northern portion of Middle Rio Grande on Isleta Pueblo). Therefore, some portions of river segments will likely have critical habitat removed.

There is an overall increase in the amount of stream miles proposed in 2011 compared to what was proposed in 2004. The greatest difference between the 2004 and 2011 proposals occurs with new stream segments identified for designation within the Santa Clara, Amargosa, Agua Fria/Hassayampa, Santa Cruz, San Francisco, San Juan, Powell, and Lower Rio Grande Management Units. In 2004, we proposed segments in 21 of 29 (72 percent) Management Units where there are recovery goals. In contrast, in our 2011 revision, we proposed segments in the remaining 8 Management Units (8/29 = 28 percent) so that all 29 Management Units with recovery goals contained proposed stream segments. . Similarly, the 1,450 stream miles proposed in 2004 are 70 percent (1,450/2,090) of the 2,090 stream miles proposed in 2011. Overall, these represent a 38 and 44 percent increase in Management Units and stream miles, respectively.

One likely source of incremental effects of the proposed critical habitat is expected to come from the inclusion of unoccupied areas (where flycatchers are not known to be nesting). Overall, there are 12 river segments proposed as critical habitat in seven different Management Units (totaling about 86 river miles) where flycatcher territories have not been detected since surveys began in

1991 (76 FR 50560-50561). These streams include: Mono, Temescal, Deep, Castaic, and Willow creeks, Big and Little Tujunga canyons, the Ventura and West Fork Mohave rivers in CA; the West Fork Little Colorado and Santa Cruz rivers in AZ; and the Paria River in UT. These areas are described thoroughly below when making conclusions about potential incremental effects of the proposed designation.

Once critical habitat is designated in these areas, section 7 of the Act requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat. The key factor related to evaluating potential adverse modification is whether, with implementation of the proposed Federal action, the affected critical habitat will continue to have the capability to serve its intended conservation role for the species. From section 3(3) of the Act: The terms "conserve," "conserving," and "conservation" means to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided under the Act are no longer necessary. Thus, designation of critical habitat helps ensure that proposed project actions will not result in the adverse modification of habitat to the point that the species will not achieve recovery.

What Federal agencies or project proponents are likely to consult with the Service under section 7 with designation of critical habitat? What kinds of additional activities are likely to undergo consultation with critical habitat?

The same seven Federal agencies listed above under the baseline analysis are also anticipated to be the primary agencies that would consult with the Service under section 7 on flycatcher critical habitat. We expect consultation to primarily involve actions occurring within floodplains that could impact riparian habitat and stream function (also listed above and in the proposed rule, 76 FR 50577-50578). We do not anticipate that different types of activities in the future will undergo evaluation and consultation with this proposed revision of flycatcher critical habitat compared to those activities which previously occurred during our flycatcher consultation history. We do anticipate that there will be some Federal agencies with responsibilities in specific flycatcher Management Units that will now consider consultation on flycatcher habitat where it may have only been rarely addressed in the past. We also believe that an incremental effect will be most likely to occur along designated streams where nesting flycatchers have yet to be detected.

Because the Physical or Biological Features (PBF) and Primary Constituent Elements (PCE) are nearly identical to the 2005 critical habitat designation, we do not anticipate that different or new agencies will be consulting on previously unknown activities as a result of this proposed revision. The flycatcher's habitat needs have been clearly described over about a 15-year time frame in listing documents, the Recovery Plan, two previous critical habitat designations, and associated USGS reports. The basic PCEs are riparian plant species that flycatchers use for nesting, perching, cover, and foraging. The PBFs that support the development of the PCEs are the existence, function, and interaction between rivers and groundwater to create, maintain, and recycle riparian streamside vegetation (76 FR 50546-50552).

Because of the similarities between the PCEs and PBFs described in our 2011 proposal and our 2005 critical habitat designation, we do not anticipate that Federal actions already evaluated for critical habitat effects would need to re-initiate consultation.

Because of the current wide distribution of the flycatcher, its ability to move its nesting sites from one season to the next, the dynamic aspect of its habitat, and its migratory nature, most of the Management Units and stream segments proposed as critical habitat in 2011 have had flycatcher territories detected within them since 1991. Flycatcher territories have been detected in 28 of the 29 Management Units and along 68 of the 80 streams (78 percent) we have proposed as critical habitat. Because of these detections, agencies are more aware of the presence of the flycatcher, the presence of migratory flycatchers, and the ability of habitat to hold territories. Therefore, those agencies will be more likely to survey habitat for flycatchers when appropriate in order to evaluate upcoming projects.

As a result of the flycatcher critical habitat designation, Federal agencies may need to reinitiate previously completed section 7 consultations for actions that only addressed the flycatcher under the jeopardy standard (due to its listing as an endangered species) in areas newly proposed as critical habitat. The administrative efforts required for any reinitiation of consultation due to the new areas included in the proposed designation of critical habitat would be an incremental effect of critical habitat designation. The streams or portions of streams where flycatchers have been detected (or are believed to occur) and are being proposed as critical habitat for the first time are: Santa Ynez (upper segments), Piru Creek, San Gabriel River, Santa Clara River, Bautista Creek, Canada Gobernadora, Canebrake Creek, Amargosa River, Ash Meadows Riparian Areas, Carson Slough, Rio Nutria, Zuni River, San Juan River, Los Pinos River, Pinal Creek, Cienega Creek, San Francisco River, Hassayampa River, lower Gila River near Phoenix, Rio Fernando, and lower Rio Grande. Therefore, while these areas have been occupied with flycatcher territories in the past and may have undergone some section 7 consultation, they are now being proposed as critical habitat and may require new consultation efforts for proposed Federal actions or reinitiating consultation for ongoing Federal actions.

In addition to re-initiation of ongoing projects occurring on these specific stream segments (paragraph above), there could be some incremental effect of designating these streams which could cause agencies to be more aware of the stream segments and their function in flycatcher recovery. Therefore, the streams designated as critical habitat might receive more agency awareness, and therefore, the agencies may consult with the Service on actions for which they may have previously not considered as needing consultation. The Management Units where these streams occur are within the Santa Ynez, Santa Clara, Santa Ana, San Diego, Kern, Amargosa, Little Colorado, San Juan, Roosevelt, Santa Cruz, San Francisco, Hassayampa/Agua Fria, upper Rio Grande, and lower Rio Grande.

We do anticipate, with reasonable certainty, that there will be an incremental effect of critical habitat when completing consultations for projects occurring along stream segments where flycatcher territories have not yet been detected. There are 12 river segments (listed previously) proposed as critical habitat in seven different Management Units (totaling about 86 river miles) where flycatcher territories have not been detected (post-1991) (76 FR 50560-50561). These stream segments occur within the Santa Ynez, Santa Clara, Mohave, Little Colorado, Santa Cruz, and Powell Management Units. Within these particular stream segments (representing about 4 percent of the total stream miles proposed), unless flycatcher territories are detected, evaluation of projects for the flycatcher would not likely occur without the designation of flycatcher critical habitat. Many of these segments have not been thoroughly surveyed for flycatcher territories in the past.

The Powell Management Unit, where we proposed a segment of the Paria River in southeast UT, is the only Management Unit throughout the flycatcher's range where territories have not yet been confirmed since recent monitoring (post-1991). However, there have been few surveys in this area to seek out flycatcher territories, and future surveys may detect flycatcher territories. In 1997, the UT Department of Wildlife Resources detected three flycatchers on June 24 and considered them probable breeders. The Bureau of Land Management is the primary land manager in this area, so we would expect land uses such as recreation and cattle grazing could be evaluated. We anticipate with reasonable certainty that designation of critical habitat along the Paria River would result in an incremental effect. Also, as described above, this designation could potentially generate increased awareness (and thus an incremental effect) for the overall importance of the Powell Management Unit to flycatcher recovery and stimulate surveys and project evaluation in other areas not designated as critical habitat.

Finally, there could be some additional section 7 consultations within proposed critical habitat segments that we considered occupied at the time of listing by nesting flycatchers, even though some portions of the stream segment might not be considered occupied by other Federal agencies for section 7 consultation. For the proposed critical habitat, any stream segment along a stream where flycatchers were found nesting from 1991 to 1994 was considered occupied at the time of listing. This may be a larger area than a Federal agency would consider as occupied, and the Federal agency may consider a consultation to be based only on critical habitat. Some incremental effects may arise if any section 7 adverse modification consultations occur in these areas. This is because a Federal agency might not have consulted with the Service under section 7 in the absence of the critical habitat designation.

How much administrative effort does or will the Service expend to address adverse modification in its section 7 consultations with critical habitat? Estimate the difference compared to baseline.

Based on the potential increase in consultations resulting from new areas proposed as critical habitat (described in the section above), we anticipate some increase in overall consultation workload and administrative efforts. Some of the increased efforts are tempered by the fact that we have such a long history of consultation on this species, and we have a recovery plan from which to draw. This situation will likely make any new consultations that would result from the proposal of new critical habitat areas relatively straightforward. In others words, our experience provides the Service and Federal action agencies some certainty in what to expect under consultations both for analysis and avoidance of jeopardy and adverse modification. Nevertheless, an increase in administrative effort would be anticipated to carry out new consultations in new areas where critical habitat is being proposed.

The amount of increased administrative effort due to proposed critical habitat is difficult to foresee and quantify. When we complete a consultation for the flycatcher with critical habitat, each consultation will evaluate whether that project would result in adverse modification. As a result, each formal consultation that "may affect" critical habitat has to consider adverse modification. On a broad scale we could assume about a 35 to 45 percent increase in critical habitat evaluations included in formal consultations based on the overall increase in the amount of proposed critical habitat. This effort of course will depend on the nature and complexity of any future consultation. Overall, we do not anticipate a substantial number of consultations that would result in adverse modification and, therefore, neither do we anticipate a substantial increase in administrative effort to work on measures to avoid adverse modification.

However, for those proposed critical habitat areas where the flycatcher is known to have only a few or no territories and there are few critical habitat areas being proposed in a given Management Unit, there is some increased likelihood that a proposed action could result in adverse modification without resulting in jeopardy. This is based on the fact that any substantial reduction in the conservation value of a proposed critical habitat segment in a Management Unit with few or no territories could potentially result in an adverse modification without reaching jeopardy. This would cause an increase in administrative efforts to develop measures to avoid the adverse modification. Because flycatcher recovery goals are established by Management Unit, the Management Units with the fewest territories have an increased possibility of an adverse modification finding where a finding of jeopardy would be unlikely (Salton, Amargosa, San Juan, Paria, Santa Cruz, San Francisco, Hassayampa/Agua Fria, and lower Rio Grande Management Units).

What project proponents are likely to pursue HCPs under section 10 after the designation of critical habitat?

As a result of this critical habitat revision, it is possible that the private landowners or a collection of non-federal entities may pursue creation of a new SHA or a HCP. However, because the flycatcher has been listed for over 15 years, with critical habitat previously designated for much of the proposed area, many areas of concern have already developed HCPs. For example, a collection of southern CA counties has already developed multi-species HCPs. Similarly, operation of major dams and water delivery of major dams along the lower Colorado River and central AZ have developed HCPs. An HCP in the San Luis Valley, CO, by a local partnership, has been in development since prior to the 2005 designation, and a SHA (Tres Rios) along the Gila River in Maricopa County, AZ (in the Hassayampa/Agua Fria Management Unit), by the City of Phoenix, has been in development for about 10 years. These two efforts are expected to be completed near the finalization of this current designation, but could be finalized after. However, we are not familiar with any ongoing or upcoming HCPs. We are familiar with efforts by the Bureau of Reclamation to evaluate the operation of Elephant Butte Dam along the middle Rio Grande, NM, where around 300 flycatcher territories are known to occur within the conservation space. Because of the variety of irrigators and other private interests associated with water delivery, it is possible that, similar to the operation of lower Colorado River dams, that instead of completing a section 7 consultation, an HCP could be developed, but we are not aware of any plans to do so.

What types of project modifications might the Service make during a section 7 consultation to avoid destruction or adverse modification of critical habitat that are different than those for avoiding jeopardy?

There are no previous section 7 consultations where the Service found a proposed Federal action would result in adverse modification of critical habitat. So, despite the long past consultation record, we have no instances where actual project modifications were previously required to avoid destruction or adverse modification of critical habitat. However, we expect that for a proposed action to result in adverse modification (in other words substantially reduce the conservation value of that stream segment to reach recovery goals in a specific management unit), it would likely have to dramatically alter large sections of river that would impact the PBFs and the development of PCEs, such as large-scale groundwater pumping, levee construction, river diversion, channelization, and/or damming (or other water and land resource actions). In

these instances, the list below provides a sample of possible project modifications that could be sought to avoid adverse modification:

- Altering dam operations to more closely mimic the natural hydrograph.
- Altering dam operations to improve the overall longevity of habitat within the conservation space of a reservoir.
- Reducing or retiring of other water consumptive stressors (such as water diversion or groundwater pumping) to offset impacts.
- Increase the width between levees.
- Modify grazing operations through fencing, reconfiguration of grazing units, off-site water development, and seasons of use.
- Modify ORV management through fencing, signage, education, areas and timing of use.
- Improve the development of native riparian vegetation through reducing land-and water-management stressors.
- Retain riparian vegetation.

However, for those proposed critical habitat segments occupied with flycatcher territories it is difficult for us to predict the differences between actions required to avoid jeopardy (baseline) and actions required to avoid adverse modification (incremental effects). Although we do not currently have a regulatory definition of adverse modification, we rely on the statutory definition in light of the *Gifford Pinchot* ruling that provides some guidance in distinguishing different standards for determination of jeopardy and adverse modification. Adverse modification is considered a higher standard of preventing substantial loss of the conservation value of the critical habitat segment to allow for flycatcher recovery goals to be met in a given Management Unit. As a result, there could be some limited instances where a proposed Federal action could result in adverse modification without resulting in jeopardy. We anticipate that the measures to remove jeopardy and adverse modification would likely have some overlap because the impacts in either case will most likely be affecting the persistence, development, and recycling of habitat. For those proposed critical habitat segments not, or only sparsely, occupied by flycatcher territories, we could foresee some level of conservation measures being implemented to avoid adverse modification above those that would be necessary to avoid jeopardy.

Management Units that have fewer total stream miles designated as critical habitat but are still occupied by the flycatchers provide the most likely circumstances where a section 7 consultation analysis under the adverse modification standard could potentially result in a different economic impact than would occur under the jeopardy standard. If a proposed Federal action were found to substantially reduce the conservation role of a relatively large amount of the critical habitat designated in that particular Management Unit, then we may find the proposed action would result in an adverse modification of critical habitat. Whether the same Federal action would harm enough individual flycatchers to constitute jeopardy to the species as a whole is a different question. It is possible that enough critical habitat within the Management Unit could be lost to constitute adverse modification, yet not cause harm to enough flycatchers to cause jeopardy.

In a scenario where a section 7 consultation resulted in both a jeopardy and adverse modification finding under each different standard, it is likely that conservation measures by the Federal agency that might be required to avoid jeopardy would be similar, if not identical, to those required to avoid adverse modification. The required consultation measures would depend on the specific circumstances of the situation and are beyond our ability to predict with any certainty with the available information and consultation history.

These predictions must be considered in conjunction with the legal restraints on some Bureau of Reclamation operations and BIA/tribal water rights issues discussed in the Solicitor's first legal memo on the 2005 critical habitat designation.

Conclusion

In summary, the incremental effects of the designated critical habitat for the flycatcher are limited by the relatively large overlap this revision has with the existing designation because many Federal actions have already undergone section 7 consultations for the effects on critical habitat. Overall, there is an increase in river miles proposed in this revision compared to our 2004 flycatcher critical habitat proposal where we can anticipate an incremental effect of the current revision. An incremental effect of the critical habitat designation could occur under the following scenarios (these are not all mutually exclusive): (1) an increased workload for action agencies and the Service to conduct re-initiated consultations for ongoing actions in new designated areas where flycatchers have been detected; (2) completing consultations for new projects occurring along the 12 stream segments where flycatcher territories have not yet been detected (post-1991); (3) new consultations from project proponents that previously did not consult due to a lack of awareness of the recovery goals for some river segments in 14 Management Units where territories are known; and (4) possible project modifications to avoid adverse modification of critical habitat in areas where a significant alteration of habitat is proposed.

We appreciate the opportunity to provide this information for you. If you have any questions or request clarification of any the items described here, please do not hesitate to call Debra Bills or Greg Beatty at 602-4242-0210.

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