

## EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts associated with the proposed critical habitat designation (CHD) for the southwestern willow flycatcher (flycatcher) (*Empidonax traillii extimus*). This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service's (Service) Division of Economics.

### KEY FINDINGS<sup>4</sup>

- **Total impacts:** \$29.2 to \$39.5 million annually using water management Scenario 1, the most likely scenario.
- **Activities most impacted:** 75 percent, or \$25.7 million annually, of forecast future costs are related to water management activities (under Scenario 1), 16 percent to administrative efforts, five percent to grazing activities, two percent to transportation activities, one percent to development activities, one percent to Tribal activities, and one percent to all other activities. Impacts under Scenario 2 are even more heavily weighted to water management and use. Within MUs, impacts are concentrated at water management facilities.
- **Management Units (MUs) with highest impacts:** The areas with the highest forecast costs are within the Lower Colorado MUs: Hoover to Parker (21 percent of total costs), Parker to Southerly (21 percent), Middle Colorado (12 percent). These costs derive primarily from implementation costs related to the Lower Colorado Multi-Species Conservation Program (MSCP), including costs that are coextensive with other species. The Lower Colorado River units have highest impacts under both water management scenarios.
- **Water Management:** Water management impacts are concentrated at water management facilities (specifically, reservoir areas) that fall in CHD areas. Future costs anticipated to result from water management activities are presented under two scenarios:
  - Under Scenario 1 water operators are assumed to pursue and successfully obtain an Incidental Take Permit. Costs under this scenario are estimated at \$25.7 million annually. These costs are principally associated with the implementation of the Lower Colorado MSCP, and are distributed among the Lower Colorado Units on the AZ, CA, NV boundaries.
  - Scenario 2 considers the potential costs of changes in water management activities that may be imposed on water managers and users. Considerable uncertainty surrounds the quantification of estimates under Scenario 2, as the probability of these outcomes occurring is unknown. Costs are quantified for 8 facilities across 5 MUs, and are principally associated with those facilities. Costs of flycatcher conservation under this scenario are substantially higher: 6 to over 200 times as high as Scenario 1, depending on the facility. These costs principally result from an assumed reduction in reservoir storage capacity that results in a loss of water from human beneficial use. Scenario 2 also considers impacts on hydroelectric production, flood control capability and groundwater pumping. Total impacts related to hydropower activities could be \$2.7 million annually. This impact would be borne by two facilities: Parker Dam, AZ, and Roosevelt Dam, AZ. This analysis does not account for any windfall downstream use of water following spillage. This analysis assumes that because of USBR's current position that it lacks discretion to release water from Lake Mead to benefit flycatcher habitat, operational changes under Scenario 2 at Lake Mead are not reasonably foreseeable.
- **Administrative costs:** The administrative costs of flycatcher conservation activities are significant. Costs of consultation efforts and administrative time are forecast to range from \$1.6 to \$5.4 million annually. Highest administrative costs are anticipated in the Santa Ana and San Diego MUs, CA.

<sup>4</sup> All estimates included in the Key Findings section have been discounted to 2004 dollars, assuming a discount rate of seven percent.

#### KEY FINDINGS<sup>4</sup>

- **Livestock grazing:** The analysis considers the economic impacts that could result from a reduction in grazing activity within the proposed designation. Economic efficiency losses resulting from reductions in AUMs grazed are forecast to range from \$0.2 million to \$1.7 million annually. This represents lost permit value as well as other project modifications. These costs are primarily borne by private ranchers who graze livestock within the proposed CHD, but also include costs to ranchers who hold Federal grazing permits. Depending on the assumed scenario, zero to 110 small private ranches could be impacted by grazing restrictions over 20 years. Under a scenario in which livestock grazing activity is limited, future regional economic impacts include up to \$5 million in annual lost regional economic output, as well as the loss of up to 64 jobs. Grazing impacts are distributed across the 6 states in proposed CHD, but are highest in the units in San Luis Valley, CO; Middle Rio Grande, NM; and Owens Valley, CA.
- **Development:** The total cost of future project modifications (including on-site set-aside and “other” project modifications), CEQA, and delay impacts related to flycatcher conservation efforts are estimated to be approximately \$0.5 million annually. These impacts are expected to occur in the Mohave and Santa Ana MUs, CA.
- **Tribes:** Socioeconomic data suggest that the fifteen potentially affected Indian Tribes are economically vulnerable to future impacts from flycatcher conservation efforts. The total cost to Indian Tribes is estimated to be approximately \$0.2 million annually, although there is a great deal of uncertainty regarding future activities on these reservations. Tribal activities potentially affected by flycatcher conservation efforts include development, vegetation clearing and restoration activities.
- **Other effects:**
  - **Transportation:** Project modification costs related to transportation are forecast to total \$ 0.7 million annually.
  - **Recreation:** Restrictions (primarily already in place) on certain uses of recreation areas in Tonto NF, AZ; San Bernardino NF, CA; and at Lake Isabella, CA, will result in reduced opportunities for fishing, hunting, and picnicking and will require additional enforcement. Estimated welfare losses associated with these continued closures are \$0.2 million annually. These closures may result in regional economic impacts totaling approximately \$0.4 million in regional economic output and the loss of six jobs.
  - **Fire management:** Most fire management activities occur outside the riparian zone. Nonetheless, flycatcher conservation efforts are most likely to impact fire management activities where Wildland-Urban Interface (WUI) areas overlap with the proposed CHD. This overlap occurs in 26,000 acres, or approximately 7 percent of proposed CHD.

2. Section 4(b)(2) of the Endangered Species Act (Act) requires the Service to designate critical habitat on the basis of the best scientific data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.<sup>1</sup> In addition, this analysis provides information to allow the Service to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).<sup>2</sup> This report also complies with direction from the U.S. 10<sup>th</sup> Circuit Court of Appeals that, when deciding

<sup>1</sup>16 U.S.C. §1533(b)(2).

<sup>2</sup> Executive Order 12866, “Regulatory Planning and Review,” September 30, 1993; 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.

which areas to designate as critical habitat, the economic analysis informing that decision should include “co-extensive” effects.<sup>3</sup>

3. This analysis considers the potential economic effects of efforts to protect the flycatcher and its habitat (hereinafter referred to collectively as “flycatcher conservation activities”) in the proposed CHD. Actions undertaken to meet the requirements of other Federal, State, and local laws and policies may afford protection to the flycatcher and its habitat, and thus contribute to the efficacy of critical habitat-related conservation and recovery efforts. Thus, the impacts of these activities are relevant for understanding the full impact of the proposed CHD.
4. This analysis considers both economic efficiency and distributional effects. In the case of habitat conservation, efficiency effects generally reflect the opportunity costs associated with the commitment of resources to comply with habitat protection measures (e.g., lost economic opportunities associated with restrictions on land use). This analysis also addresses how potential economic impacts are likely to be distributed (distributional effects), including an assessment of any local or regional impacts of flycatcher conservation and the potential effects of conservation activities on small entities and the energy industry. This information can be used by decision-makers to assess whether the effects of the designation might unduly burden a particular group or economic sector. Also, this analysis looks retrospectively at costs that have been incurred since the date the species was listed and considers those costs that may occur after the designation is finalized.
5. To conduct the analysis, best available data are gathered from a variety of sources, including public comments from the scoping process for the National Environmental Policy Analysis (NEPA), government agencies, industry associations, potentially affected private parties, Tribes and municipalities, and other stakeholders. Specifically, data were gathered from the following: Bureau of Reclamation (USBR); Army Corps of Engineers (USACE), Bureau of Land Management (BLM); Bureau of Indian Affairs (BIA); U.S. Forest Service (USFS); National Park Service (NPS); Nevada Department of Wildlife; Arizona Game and Fish, State agencies, including departments of water resources, agriculture, energy, game and fish, natural resources, recreation, transportation, and Salt River Project; Various County and City governments; Private stakeholder groups, including water facility owners and water distributors, farming and ranching associations, development companies, and others; and each of the fifteen potentially affected Tribes. In addition, Census Bureau and other Department of Commerce data were relied on to characterize the regional economy.
6. The proposed CHD for the flycatcher includes approximately 1,555 river miles or 376,000 acres in Arizona, California, Colorado, New Mexico, Nevada and Utah. Approximately 40 percent of the proposed CHD acreage is under Federal ownership, with another 40 percent under private ownership and the remaining 20 percent is State and other ownership. Exhibit ES-1 indicates the current ownership of the proposed CHD.
7. Within the 376,000 acres identified as essential habitat for the flycatcher across six states, approximately 102,000 acres are excluded from CHD, proposed for exclusion from CHD, or

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<sup>3</sup> In 2001, the U.S. 10<sup>th</sup> Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes (*New Mexico Cattle Growers Ass’n v. U.S.F.W.S.*, 248 F.3d 1277 (10<sup>th</sup> Cir. 2001)).

considered for exclusion from CHD.<sup>5</sup> These areas include Tribal lands, lands managed by Department of Defense, National Wildlife Refuges, private lands with legally operative HCPs or draft HCPs, State lands with conservation plans, and other lands with management plans in place for the southwestern willow flycatcher. The main body of this analysis considered impacts associated with the 376,000 acres identified as essential habitat for the flycatcher. Costs associated with areas that are excluded from CHD, proposed for exclusion from CHD, or considered for exclusion from CHD are presented in Appendix C.

<b>Exhibit ES-1</b>	
<b>SUMMARY OF ESTIMATED LAND OWNERSHIP IN PROPOSED FLYCATCHER CRITICAL HABITAT</b>	
<b>(Acres within CHD boundaries)</b>	
<b>Ownership</b>	<b>Total</b>
Federal	152,741
State	24,255
Private	155,444
Other	43,655
<b>TOTAL</b>	<b>376,095</b>
Source: Service estimates included in the Proposed Rule (69 FR 60706).	

### **Results of the Analysis**

8. This analysis addresses the impacts of flycatcher conservation efforts on activities occurring in areas proposed for designation. This analysis uses a number of economic impact measures: lost economic efficiency (including the cost of administrative measures, project modifications, reductions in the value of grazing permits, and the value of water lost from beneficial use), impacts to regional economic output and jobs (quantified for lost livestock grazing and recreation opportunities), reductions in hydroelectric production, and estimates of the potential for reduced effectiveness of fire management efforts (measured as the number of acres of overlap between the proposed CHD and WUIs).
  
9. It is important to note that flycatcher conservation measures may accelerate and compound ongoing trends in natural resource use in the Southwest. For example, many potentially affected areas are currently experiencing population growth, and a long-term, severe drought is ongoing in much of the southwest. As a result, numerous plans for acquiring additional or alternate water supplies are under development, additional power supply facilities have been proposed, and reductions in permitted grazing use have occurred. Flycatcher conservation measures impose costs and changes on top of these significant ongoing trends.

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<sup>5</sup> For a detailed review of various exclusions under consideration, see pages 60724-60731 of the proposed rule to designate critical habitat for the flycatcher (69 FR 60706).

## Efficiency Impacts

10. Efficiency impacts can be broken down into costs associated with implementing flycatcher and flycatcher habitat conservation activities and administrative costs associated with section 7 consultations. Costs associated with flycatcher conservation efforts have been estimated for a variety of activities, including: water management, livestock grazing, transportation, development, recreation and fire management and other activities. Exhibits ES-2, ES-3, and ES-4 present the distribution of efficiency impacts by activity. As shown, water management activities account for 75 percent of total costs (utilizing costs under Scenario 1), followed by administrative efforts at 16 percent, grazing activities at five percent, development activities at one percent, one percent to Tribal activities, and the remaining one percent to all other activities. The efficiency impacts resulting from flycatcher conservation efforts include:

- ***Costs associated with water management activities.*** This analysis identifies past, ongoing, and future costs related to flycatcher management at affected water facilities. Past costs associated with flycatcher management are estimated to be approximately \$58.6 million (2004 dollars). Mitigation activities at Roosevelt Dam in Arizona, Isabella Dam in California, and along the Middle Rio Grande in New Mexico account for approximately 72 percent of past costs. All of these areas were subject to biological opinions that resulted in extensive mitigation efforts. In addition, water operators at Roosevelt Dam developed a complex HCP to mitigate (offset) and minimize the taking of threatened and endangered species, including the flycatcher.

Because uncertainty exists regarding potential future costs that may be associated with flycatcher conservation, this analysis considers two scenarios:

*Scenario 1:* This scenario assumes that each impacted water facility pursues and attains an incidental take permit (ITP), either through a section 7 consultation or Habitat Conservation Plan (HCP). Development and approval of an ITP for current water operations with associated mitigation measures is the historical pattern for water operations that affect flycatchers and their habitat. Costs under this scenario are estimated to be approximately \$330 million over 20 years, or \$25.7 million annually (2004 dollars), and are principally associated with implementation of HCPs, including the Lower Colorado MSCP and the Roosevelt HCP.

*Scenario 2:* This scenario assumes that water operators are forced to change the management regime of their facilities to avoid adverse effects on flycatchers and their habitat. This represents a scenario in which the Service or operators do not cooperate on an ITP, or where a third party intervenes to force an operator to avoid habitat destruction prior to receipt of an ITP. Costs under this scenario are driven by the assumed inability of impacted 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.<sup>6</sup> Specifically, water levels are assumed to be maintained at an elevation that is at or below habitat areas, where such actions are legally or physically feasible. A drawback of this method is that it does not account for any

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<sup>6</sup> 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.

windfall downstream use of water following spillage. For example, one of the largest groundwater storage facilities in the United States is found downstream of Lake Isabella in the Kern MU. Additional releases from there are likely to provide some benefit to groundwater storage. However, these benefits are not quantified in the analysis. Note that it is also possible that management agencies may lack legal discretion to release water for flycatcher management purposes.<sup>7</sup> In the Middle Colorado MU, this analysis assumes that because of USBR's current position that it lacks discretion to release water from Lake Mead to benefit flycatcher habitat, operational changes under Scenario 2 at Lake Mead are not reasonably foreseeable.

Costs of flycatcher conservation under this scenario are substantially higher than Scenario 1: 6 to over 200 times as high as Scenario 1, depending on the facility in question. These costs principally result from an assumed reduction in reservoir storage capacity, resulting in a loss of water from beneficial use. Flood control, hydropower, and potential impacts on groundwater use are also considered under this scenario. Impacts related to this scenario are presented in ES-4.

- ***Reduced livestock grazing resulting from flycatcher-related restrictions.*** This analysis considers a scenario in which livestock grazing activity is limited on private and public lands within the proposed designation. The potential loss resulting from a reduction in AUMs grazed on Federal lands is expected to range from 311 to 1,270 AUMs over the next 20 years. Grazing activity losses on non-Federal lands could range from zero to 89,000 AUMs, depending on the extent to which the designation limits grazing on these lands.<sup>8</sup> Total potential costs associated with impacts on grazing activity are estimated at \$159,000 to \$1,685,000 annually.
- ***Impacts on development activities.*** Future economic impacts to development activities as a result of flycatcher conservation efforts could occur within the Mohave and Santa Ana MUs. The total cost of future project modifications (including on-site set-aside and "other" project modifications), CEQA, and delay is estimated to be approximately \$0.5 million in the proposed CHD.
- ***Impacts on Tribes.*** The economies of Tribes within the proposed CHD are poorer than their respective regional economies, thereby making these communities particularly vulnerable to economic impact associated with increased regulatory burden. Future impacts resulting from flycatcher conservation efforts on Tribal lands, include administrative costs of consultations, surveys and monitoring, development of management plans, modifications to development activities, and potential project modifications to restoration activities and water projects. As

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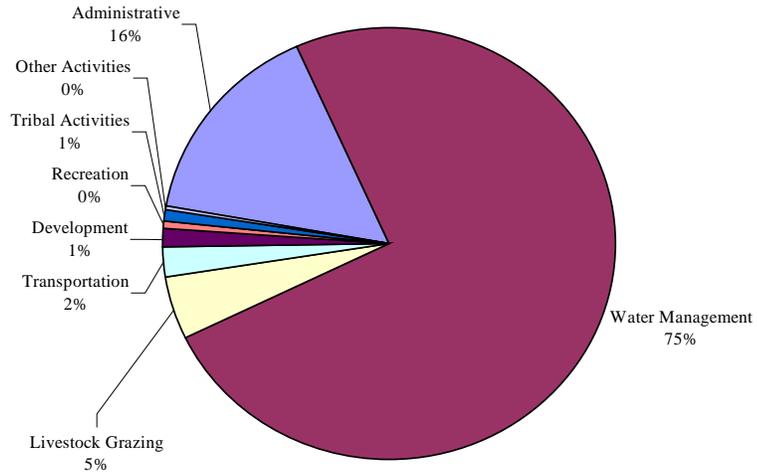
<sup>7</sup> For example, currently there is no legal requirement for USBR to maintain water levels below flycatcher habitat at the lake created by Hoover Dam, *Southwest Center for Biological Diversity v. U.S. Bureau of Reclamation*, 143 F.3d 515 (9<sup>th</sup> Cir. 1998). Service and USBR Solicitors further state that the Department of Interior has interpreted the U.S. Supreme Court's injunction in *Arizona v. California*, 376 U.S. 340 (1964) as precluding the release of water from Lake Mead for the sole purpose of protecting flycatcher habitat. Congress has also enacted legislation to prohibit USBR from releasing San Juan/Chama water for flycatcher management purposes at Heron Reservoir. Comments of the Southwest Regional Solicitor's Office, December 15, 2004.

<sup>8</sup> This analysis did not identify any past flycatcher consultations for livestock grazing activities on non-federal lands.

specific plans are unavailable for many of these activities, costs are largely unknown. Flycatcher conservation activities for which costs are known, however are anticipated to result in a future impact of approximately \$0.2 million per year.

- ***Impacts on transportation activities.*** Transportation projects in the proposed CHD may incur costs related to timing restrictions, fencing, survey and monitoring, and habitat conservation and restoration. The future average cost of flycatcher conservation measures for transportation projects is calculated based on historical costs per-project-mile, and are expected to cost approximately \$0.7 million annually.
- ***Impacts to recreation activities.*** Vehicle, smoking, and fire closures in Tonto NF, San Bernardino NF, and at Lake Isabella will result in reduced opportunities for fishing, hunting, and picnicking. Additional enforcement measures will also need to be taken at Lake Isabella. Estimated welfare losses associated with these continued closures are \$ 0.09 million annually.
- ***Impacts on fire management activities.*** Most fire management activities occur outside the riparian zone. Nonetheless, impacts on fire management activities are likely to be greatest in areas where WUI areas overlap with flycatcher CHD: the proposed CHD overlaps with 26,128 WUI acres. The acreage of overlap between WUI areas and the proposed CHD represents seven percent of the total 376,000 acres included in the proposed CHD. The majority of WUI area overlap occurs in San Diego, San Bernardino Counties, CA; Pinal, Yavapai, and Gila Counties, AZ; Rio Arriba, NM; and Washington County, UT.
- ***Administrative costs borne by the Service, Action agencies, and third parties associated with flycatcher conservation activities.*** Administrative costs are costs associated with attending meetings, preparing letters and biological assessments and management plans, and in the case of formal consultations, the development of a Biological Opinion. Administrative costs resulting from flycatcher conservation activities are expected to range from \$1.6 to \$5.4 million annually.

**Exhibit ES-2**  
**ANNUALIZED COSTS OF FLYCATCHER CONSERVATION ACTIVITIES**  
**BY ACTIVITY TYPE (SEVEN PERCENT DISCOUNT RATE)\***



\*This chart utilizes Scenario 1 estimates for Water Management activities and high end estimates for all other activities.

**Exhibit ES-3**

**SUMMARY OF FUTURE EFFICIENCY EFFECTS (Annual, 2004 dollars, discounted at 7 percent) Thousands of Dollars (\$1000's)**

Recovery Unit	Management Unit	Administrative Costs		Water Management Impacts under Scenario 1		Grazing Impacts		Transportation	Development	Recreation	Other	Fire management (WUI acres)
		Low	High	Facilities	Scenario 1	Low	High					
Coastal California	Santa Ynez	\$14	\$45	None	\$0	\$0	\$60	\$8	\$0	\$0	\$0	418
	Santa Ana	\$203	\$651	Seven Oaks Dam	\$1,212	\$0	\$106	\$0	\$88	\$3	\$2	1,437
	San Diego <sup>1</sup>	\$259	\$830	Hodges Dam*, Cuyamaca Dam*, Vail Dam*	\$1,100	\$13	\$39	\$225	\$0	\$0	\$21	3,735
Basin and Mojave	Owens	\$14	\$45	Pleasant Valley Dam*	\$6	\$0	\$158	\$0	\$0	\$0	\$0	2
	Kern	\$42	\$135	Lake Isabella*	\$350	\$13	\$88	\$0	\$0	\$14	\$0	0
	Mohave	\$56	\$180	Mohave Dam	\$14	\$0	\$31	\$21	\$417	\$0	\$0	471
	Salton	\$14	\$45	None	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0
Lower Colorado	Little Colorado	\$15	\$51	None	\$0	\$13	\$27	\$0	\$0	\$0	\$64	61
	Virgin	\$15	\$51	None	\$0	\$14	\$62	\$58	\$0	\$0	\$21	2,794
	Middle Colorado	\$108	\$359	Mead/Hoover Dam*	\$3,278	\$0	\$0	\$0	\$0	\$0	\$0	0
	Pahrnagat	\$31	\$103	None	\$0	\$0	\$14	\$0	\$0	\$0	\$21	35
	Bill Williams	\$46	\$154	Alamo Dam	\$222	\$11	\$99	\$71	\$0	\$0	\$0	37
	Hoover to Parker	\$23	\$77	Parker Dam*	\$6,100	\$0	\$13	\$34	\$0	\$0	\$0	624
	Parker to Southerly	\$38	\$128	Headgate Rock Dam, Imperial, Laguna, and Senator Wash Dams	\$6,100	\$0	\$18	\$0	\$0	\$0	\$0	747
Gila	Verde	\$169	\$564	Horseshoe Dam*	\$314	\$29	\$63	\$36	\$0	\$0	\$2	3,256
	Roosevelt	\$108	\$359	Theodore Roosevelt Dam*	\$2,100	\$10	\$32	\$0	\$0	\$142	\$0	2,603
	Middle Gila/San Pedro	\$108	\$359	Ashurst-Hayden Diversion Dam	\$0	\$4	\$129	\$68	\$0	\$0	\$0	3,399
	Upper Gila	\$108	\$359	Coolidge Dam	\$1,178	\$26	\$102	\$70	\$0	\$0	\$0	1,431
Rio Grande	San Luis Valley	\$15	\$51	None	\$502	\$0	\$396	\$0	\$0	\$0	\$0	1,309
	Upper Rio Grande	\$15	\$51	None	\$0	\$13	\$33	\$146	\$0	\$0	\$1	2,680
	Middle Rio Grande	\$77	\$256	None	\$3,174	\$13	\$215	\$0	\$0	\$0	\$0	1,089
Multiple Mus		\$162	\$531		\$0	\$0	\$0	\$0	\$0	\$0	\$8	0
<b>Total</b>		<b>\$1,640</b>	<b>\$5,384</b>		<b>\$25,648</b>	<b>\$159</b>	<b>\$1,685</b>	<b>\$737</b>	<b>\$505</b>	<b>\$159</b>	<b>\$140</b>	<b>26,128</b>

**Grand Total (Low) 28,994**

**Grand Total (High) 34,264**

Notes:

Discounted at a 7 percent discount rate. In addition to the impacts presented here, military activities at Camp Pendleton occur in the San Diego Unit. This exhibit does not include costs to Tribes, which are presented separately below.

\* Assessed in Scenario 2.

**Exhibit ES-4**

**SUMMARY OF EFFICIENCY EFFECTS FOR TRIBES  
(Annual, 2004 dollars, discounted at 7 percent) Thousands of Dollars (\$1000's)**

<b>Recovery Unit</b>	<b>Management Unit</b>	<b>Tribe(s)</b>
Coastal California	San Diego	Pala: \$23.12, La Jolla, Rincon, Santa Ysabel: Unknown
Lower Colorado	Middle Colorado	Hualapai: \$60.5
	Hoover to Parker	CRIT: \$6.7; Fort Yuma, Fort Mohave: Unknown
Gila	Verde	Camp Verde: Unknown
	Upper Gila	San Carlos Apache:\$158.1
Rio Grande	Upper Rio Grande	San Ildefonso, San Juan, Santa Clara, Isleta: Unknown
<b>Total</b>		\$249

11. As stated above, Scenario 2 represents a scenario in which the Service or operators do not cooperate on an ITP, or where a third party intervenes to force an operator to avoid habitat destruction prior to receipt of an ITP. Costs under this scenario are driven by the assumed inability of impacted 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.<sup>9</sup> As stated above, it is possible that management agencies may lack legal discretion to release water for flycatcher management purposes. Note also that the Recovery Plan states that flycatcher management must fit into existing operating rules at reservoirs.<sup>10</sup> However, third parties have occasionally made separate assessments that have resulted in injunctions on allowing facilities to inundate flycatcher habitat.<sup>11</sup> As a result, the likelihood of such occurrences in the future is unknown. Exhibit ES-5 presents the preliminary estimates associated with Scenario 2.

<sup>9</sup> 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.

<sup>10</sup> Recovery Plan for the Southwestern willow flycatcher, Service, 2003.

<sup>11</sup> For example, at Lake Isabella in California. See the discussion of Lake Isabella in the Kern River MU in this Section.

**Exhibit ES-5**

**SUMMARY OF FUTURE IMPACTS ASSOCIATED WITH  
WATER MANAGEMENT ACTIVITIES UNDER SCENARIO 2  
(Annual, 2004\$)**

Management Unit	Water Project	Water operations/ supply		Hydropower	Flood control
		Low	High		
Santa Ana	Seven Oaks Dam	n/a	n/a	n/a	Possible
San Diego	Lake Hodges	\$539,000	\$2,200,000	n/a	n/a
	Cuyamaca Reservoir	\$197,000	\$810,000	n/a	n/a
	Vail Dam	\$539,000	\$2,200,000	n/a	n/a
Mojave	Mojave Dam	n/a	n/a	n/a	Possible
Owens	Pleasant Valley Dam	\$344,000	\$1,400,000	Data not available	n/a
Kern	Isabella Dam	\$8,000,000	\$33,000,000	n/a	Possible
Middle Colorado*	Lake Mead/Hoover Dam	Not expected	Not expected	Not expected	Not expected
Hoover-Parker*	Lake Havasu/Parker Dam	\$35,300,000	\$39,100,000	\$157,958	n/a
Parker-Southerly*	Lake Moovalya/ Headgate Rock Dam	Not expected	Not expected	Not expected	n/a
	Imperial, Laguna, and Senator Wash Dams	Not expected	Not expected	Not expected	n/a
Bill Williams	Alamo Dam	n/a	n/a	n/a	Possible
Roosevelt	Theodore Roosevelt Dam***	\$33,680,900	\$66,134,200	\$2,600,000	Likely to be small
Verde	Horseshoe Dam	\$13,710,000	\$15,180,000	n/a	Likely to be small
Upper Gila	Coolidge Dam	Not expected	Not expected	n/a	Not applicable
Middle Rio Grande	MRG Operations	Not expected	Not expected	n/a	Not applicable

Source: IEC analysis.

**Results in Perspective**

- Scenario 2 assumes that water operators are forced to change the management regime of their facilities to avoid adverse effects on flycatcher habitat, resulting in a loss of storage capacity at these facilities. Exhibit ES-6 summarizes the estimated water losses in acre-feet and provides perspective on the number of water users for each facility that could be affected if water is spilled and not captured for beneficial use.

**Exhibit ES-6**

**WATER USERS POTENTIALLY AFFECTED BY FLYCATCHER CHD UNDER SCENARIO 2**

Management Unit	Facility Name	Estimated Water Losses Under Scenario 2 (acre-feet)	Current Water Delivery <sup>1</sup>		Average Annual Water Use		Users of Affected Water	
			Res/Comm/Municipal	Agriculture	Res/Comm (per household) <sup>2</sup>	Agriculture (per acre) <sup>3</sup>	Res/Comm Households	Agriculture acres
San Diego	Lake Hodges	4,686	100%	0%	0.4	3.2	11,716	0
	Cuyamaca Reservoir	1,712	100%	0%	0.4	3.2	4,280	0
	Vail Dam	4,461	50%	50%	0.4	3.2	5,576	697
Owens	Pleasant Valley Reservoir	2,989	100%	0%	0.4	3.2	7,473	0
Kern	Isabella Dam	69,779	10%	90%	0.4	3.2	17,445	19,625
Roosevelt	Theodore Roosevelt (low)	24,700	50%	50%	0.4	4.6	30,875	2,685
	Theodore Roosevelt (high)	81,700	50%	50%	0.4	4.6	102,125	8,880
Verde	Horsehoe Dam	21,000	1%	99%	0.4	4.6	525	4,520
Hoover to Parker	Parker Dam/Lake Havasu <sup>2</sup>	77,338	47%	53%	0.4	3.9	90,872	10,510
						<b>TOTAL:</b>	<b>270,886</b>	<b>46,917</b>

Notes:

1 Based on communications with facility owners and operations.

2 Average annual acre-feet water use per year estimated based on information in the City of Santa Cruz 2000 Urban Water Management Plan, Chapter 4 Past, Current, and Projected Water Use and Jacobs and Worden (2004), Water in Arizona: Challenges Met and Remaining.

3 Agricultural water use per acre is calculated from the average acre-feet per acre of water use by farms from off-farm surface water suppliers in affected states (2003 Farm and Ranch Irrigation Survey, NASS).

## Distributional Impacts

13. This analysis also analyzes how potential economic impacts are likely to be distributed across the affected communities in order to assess whether a particular group or economic sector bears an undue proportion of the impacts. This section includes an assessment of any local or regional impacts of flycatcher conservation and the potential effects of conservation activities on small entities and the energy industry.
- ***Distributional impacts related to restrictions on grazing activity in the area.*** As noted above, this analysis considers a scenario in which livestock grazing activity is limited on private and public lands within the proposed CHD. Flycatcher-related reductions in livestock production may result in a regional economic impact of up to five million annually. Reductions in livestock production may also impact as many as 64 jobs.
  - ***Distributional impacts related to reduced recreational activity in Tonto NF area.*** This analysis considers the potential impact of flycatcher conservation on recreational activity, and the resulting regional impacts of changes in these activities. Flycatcher-related regional economic impacts of \$0.4 million in revenue and as many as six jobs are expected.
  - ***Distributional impacts on Tribal activities resulting from flycatcher conservation efforts.*** Many of the affected Tribes have expended resources for flycatcher survey and monitoring and preparing flycatcher management plans. In addition, flycatcher-related impacts to development activities on Tribal lands have the potential to greatly affect the economies of some Tribes. While details are not available on expected impacts for some tribes, this analysis provides descriptions of known potentially affected projects (Section 7 of this analysis).
  - ***Impacts on small businesses associated with flycatcher conservation efforts.*** This analysis considers the potential for impacts on small businesses associated with (1) changes in water management; (2) changes in grazing practices; (3) changes in residential development; and (4) changes in recreational behavior. Estimates of the number of affected entities and the expected annual impact is provided in Appendix A.
  - ***Water management activities.*** Section 4 presents a regulatory scenario in which reservoir pools are limited to current levels to avoid take of flycatcher habitat, thus resulting in a loss of water from human beneficial use. Small business entities that are at greatest risk of impacts under this scenario are agricultural water users, dependent on the drought reserves provided by these systems. That is, given limits in the storage capacities of these reservoirs, lower priority agricultural water users could experience a loss in irrigation water during some years. Approximately twelve major water supply dams and reservoirs are included in the proposed CHD. Of these, nine dams on four river systems provide water to agricultural users, including: Isabella Dam (Kern River); Roosevelt Dam and Horseshoe Dam (Salt River Project system); Coolidge Dam (Gila and San Pedro Rivers); and Hoover, Parker, Headgate Rock, Imperial, Laguna, and Senator Wash Dams (Lower Colorado River).

While limits on the storage capacity of affected dams could ultimately affect small businesses in other economic sectors (e.g., residential construction), data and models to identify these potentially affected parties are not available.

- ***Livestock grazing activities.*** Limitations on livestock grazing are expected to impact ranchers in the region. As discussed in Section 5, under the high estimate, flycatcher conservation activities could result in a reduction in the level of grazing effort within the proposed CHD of 89,300 AUMs, of which 1,300 are Federally permitted, and 88,000 are on private lands. The AUM reduction would represent approximately 1 percent of AUMs for each of 105 affected ranchers holding Federal grazing permits in proposed CHD cumulatively over 20 years. On non-Federal lands, impacts are more uncertain since maps describing the overlap of privately grazed lands and the designation are not available (i.e., the portion of each ranch that could be impacted by the designation). In addition, no consultations or HCPs currently exist that affect private grazing in flycatcher habitat areas. The Service also questions the assumption that critical habitat designation will affect private grazing efforts in the future.<sup>12</sup> However, if ranchers reduce grazing effort to avoid incidental take of flycatchers, then impacts on those ranches would occur. If each affected ranch is small, then zero to 110 ranches cumulatively over 20 years could experience a total reduction in private lands grazing effort. (See Section A.2 for details). This impact would represent approximately 0.3 percent of beef cow operations in affected states.
- ***Land Development Activities.*** As discussed in Section 6, impacts to development activities within the proposed CHD, include land value loss, other project modifications, CEQA costs, and delay costs for a total of \$5.3 million, or \$505,000 annually in the Mohave and Santa Ana MUs in California. Some of these impacts will be felt by small land development businesses in the affected counties of these MUs, including San Bernardino, San Diego and Santa Barbara Counties. Assuming that only small businesses are affected by the proposed CHD, less than one percent of land developers will be affected, and 0.02 percent of annual revenues of small land developers in this area may be lost.
- ***Recreation activities.*** As detailed in Section 9, due to limitations on vehicle use, fires and smoking in two areas near Roosevelt Lake on the Tonto NF (Gila County, AZ), fewer trips to the area for hunting and fishing are expected in the future resulting from existing closures. A reduction in the number of recreation trips will result in an annual sales loss of approximately \$386,000. Approximately 72 percent to 100 percent of businesses serving the recreation industry in Gila County are small businesses. Collectively, these businesses generate \$157.1 million in sales each year. Thus, the total annual impact of \$386,000 represents approximately 0.25 percent of annual small business revenues in Gila County.

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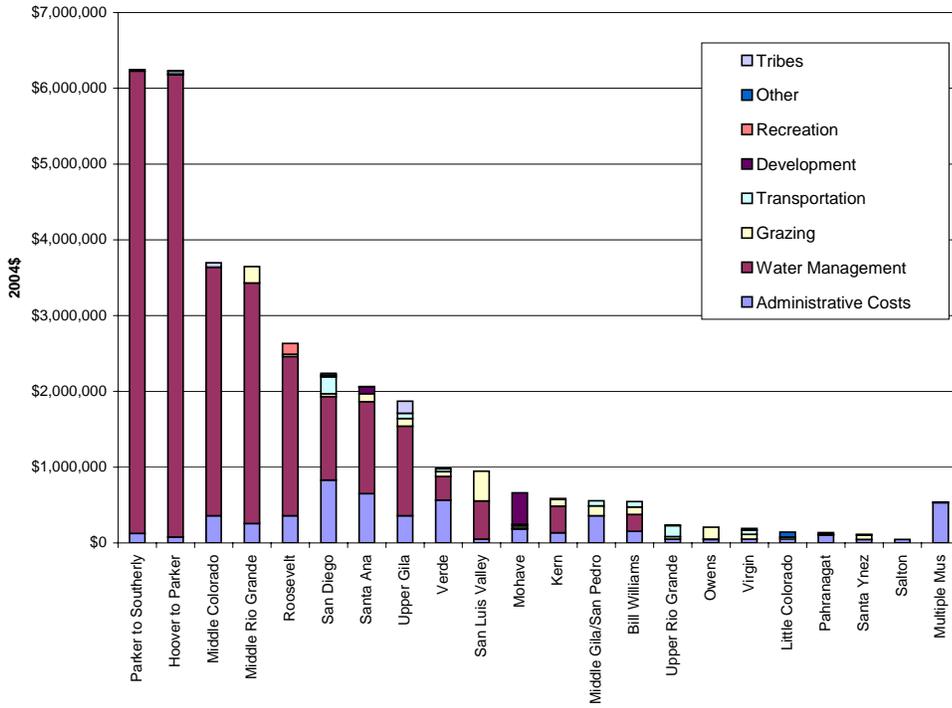
<sup>12</sup> Comments of Regional Director, Service Region 2, Albuquerque, NM, January 5, 2005; Comments of Southwest Regional Office of the Solicitor, January 3, 2005; Comments of Service, Grand Junction, Colorado, Ecological Services Office, January 3, 2005.

- ***Impacts on energy production and distribution associated with flycatcher conservation efforts.*** Under Scenario 2, total financial impacts related to hydropower activities could be \$2.7 million annually, which would represent 0.02 percent of the estimated annual baseline cost of regional energy production. This is well below the one percent threshold suggested by OMB. This impact is likely to be borne at two AZ facilities: Lake Havasu/Parker Dam and Roosevelt Dam.

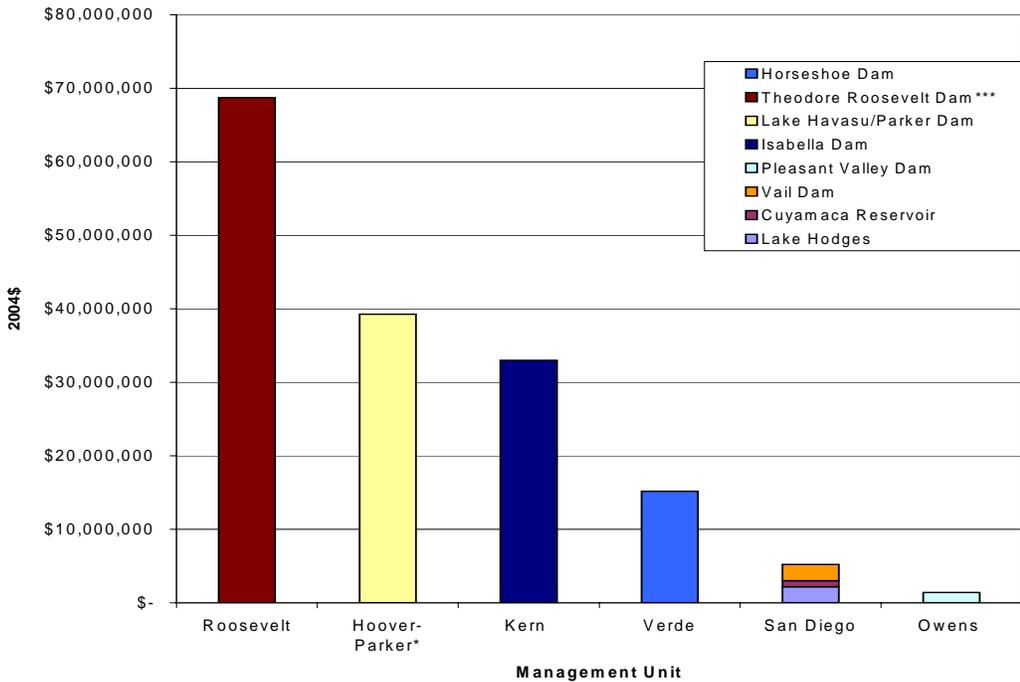
14. It is important to note that measures of regional economic impact are entirely distinct from the reported efficiency effects. As such these two measures of impact cannot be directly compared and should not be summed.

15. Future economic impacts expected to result from flycatcher conservation efforts are summarized in Exhibits ES-7, ES-8, and discussed below. To illustrate where impacts are expected to occur, the results of the analysis are presented by MU.

**Exhibit ES-7  
ANNUALIZED COSTS OF FLYCATCHER CONSERVATION BY ACTIVITY AND MANAGEMENT UNIT (7 PERCENT DISCOUNT RATE)**



**Exhibit ES-8  
ANNUALIZED COSTS ASSOCIATED WITH SCENARIO 2 FOR WATER MANAGEMENT ACTIVITIES (2004\$, High End Estimate)**



## **Summary of Areas Most Likely to Experience Impacts**

16. Exhibit ES-7 presents annualized costs of flycatcher conservation by activity and MU, using Scenario 1 for water management activities. Exhibit ES-8 presents annualized costs associated with Scenario 2 for water management activities. The areas most likely to experience impacts include:
- For water management activities, future costs under Scenario 1 are largely driven by co-extensive costs associated with the Lower Colorado Multi-Species Conservation Program (MSCP), which covers 26 species. Implementation of the Lower Colorado MSCP will affect the entire Lower Colorado River, including the proposed sections of the Middle Colorado, Hoover to Parker, and Parker to Southerly MUs. Costs associated with implementation of this MSCP contribute 65 percent of total projected future costs.
  - Future costs under Scenario 2 are highly uncertain. Costs estimated under this scenario are largest for Lake Havasu (Hoover to Parker MU), Lake Roosevelt (Roosevelt MU), and Lake Isabella (Kern MU). Costs of modifying current operations on hydropower are projected at Lake Havasu (Hoover to Parker MU) and Lake Roosevelt. Although impacts on water supply are reported as annual costs, it is highly unlikely that these costs would be incurred in every year. As a result, this analysis does not sum these costs.
  - The MUs likely to experience the greatest impacts from livestock grazing restrictions include the San Luis Valley and Middle Rio Grande MUs, where the majority of the private lands are located.
  - The areas most likely to experience any potential impacts on development activities are in California. Due to conservation measures associated with the flycatcher, of the 38 developable acres within the CHD, eight acres will likely be developed and 29 acres are expected to be set aside. The value of the land set aside is \$3.7 million. Approximately 0.5 projects are anticipated to occur in these MUs. Project modifications are anticipated to be \$1,648,000, not including CEQA costs of \$12,000, and delay costs of \$1,000. In the Mohave MU, total costs of approximately \$4.4 million may occur over the next 20 years. In addition, \$0.9 million in development impacts are expected in the Santa Ana MU. Given the fact that the expected acreage set-aside represents less than 0.04 percent of county-level real estate supply for each affected county, impacts associated with flycatcher protection are not expected to affect the dynamics of regional real estate markets.
  - The Roosevelt Lake area of Tonto NF is the area most likely to experience impacts related to restrictions on recreational activity resulting from areas closures for flycatcher protection. Closures on the Tonto NF will reduce the number of fishing and hunting opportunities, resulting in welfare losses of approximately \$1.7 million over the next 20 years (2004\$). In terms of regional economic impacts, the Roosevelt Lake area may experience annual impacts of approximately \$386,000 in lost sales, six jobs, \$62,000 in salaries and wages, and \$15,000 in state taxes (2004\$).