SUMMARY
ECONOMIC ANALYSIS OF PROPOSED CRITICAL HABITAT DESIGNATION FOR THE SOUTHWESTERN WILLOW FLYCATCHER
May 2005

Background

In October 2004, the U.S. Fish and Wildlife Service published a proposed critical habitat designation (CHD) for the southwestern willow flycatcher (flycatcher) *(Empidonax traillii extimus*). The essential habitat identified for the flycatcher includes approximately 1,555 river miles and 376,000 acres in Arizona, California, Colorado, New Mexico, Nevada and Utah. Approximately 40 percent of the habitat is under Federal ownership, with another 40 percent under private ownership and the remaining 20 percent under State and other ownership.[1]

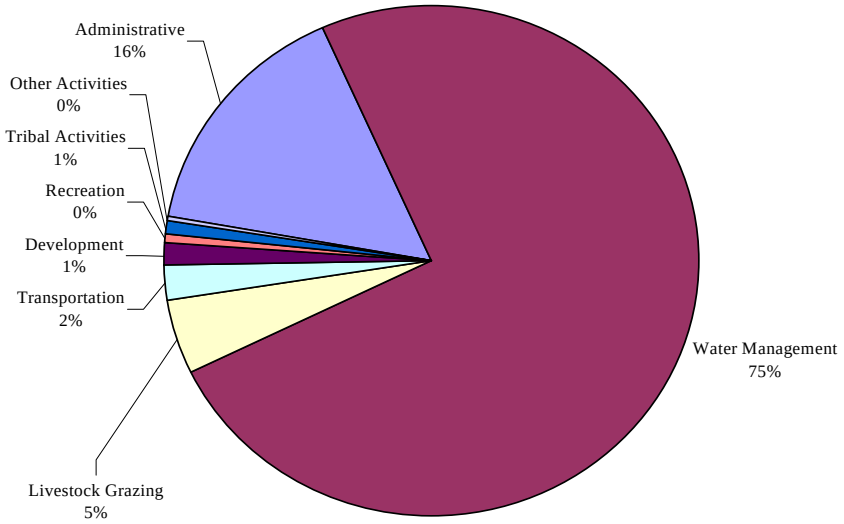
The economic analysis considers and attempts to quantify the potential economic effects of efforts to protect the flycatcher and its habitat (flycatcher conservation activities) in the proposed CHD as well as the economic effects of protective measures taken as a result of the listing or other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation.

KEY FINDINGS[2]

- **Future Economic Impacts** associated with flycatcher conservation are forecast to range from $29.2 to $39.5 million annually (under Scenario 1, the most likely scenario).
- **Activities Most Impacted:** Water management activities account for $25.7 million annually, or 75 percent of total costs (under Scenario 1). Sixteen percent of costs are related 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 Management Units (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.

[1] Of the 376,000 acres identified as essential habitat for the flycatcher, approximately 102,000 acres are excluded, proposed for exclusion, or considered for exclusion from CHD. 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 flycatcher. For a detailed review of various exclusions under consideration, see pages 60724-60731of the proposed rule to designate critical habitat for the flycatcher (69 FR 60706).
[2] All estimates included in this summary have been discounted to 2004 dollars, assuming a discount rate of seven percent.

Exhibit 1
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.

The economic 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). The 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.

Results of the Analysis

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.

Water Management impacts are concentrated at water management facilities (specifically, reservoir areas) that fall in CHD areas. This analysis considers two scenarios:

- **Scenario 1** assumes that water operators obtain an Incidental Take Permit (ITP) that allows current operations to continue as long as appropriate mitigation is undertaken. This has been the historical pattern for water operations that affect flycatchers and their habitat. Costs under this scenario are estimated at $25.7 million annually. These costs are principally associated with the implementation of the Lower Colorado MSCP, including some efforts associated with multiple species in the MSCP. Costs are distributed among the Lower Colorado Units on the AZ, CA, and NV state borders.

- **Scenario 2** considers the potential costs of changes in water management activities that may be imposed on water managers and users. This scenario assumes that operators will attempt to avoid inundation of flycatcher habitat, and thus will not allow water levels to rise above current levels, leading to a loss of storage capacity at these facilities.[3] This scenario further assumes that a reduction in reservoir storage capacity causes a loss of water for human beneficial use. The analysis does not account for any windfall downstream use of water following spillage. 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. Costs under this scenario are substantially higher than under Scenario 1--six to over 200 times as high, depending on the facility.[4]

  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 at two facilities, Parker Dam, AZ, and Roosevelt Dam, AZ. This analysis also does not account for any windfall downstream use of water following spillage.

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. The highest administrative costs are anticipated in the Santa Ana and San Diego MUs, CA.

Livestock grazing efforts could be reduced if livestock are excluded from proposed CHD areas. Economic efficiency losses resulting from grazing effort reductions and other project modifications are forecast to range from $0.2 million to $1.7 million annually. These costs are primarily borne by ranchers who graze livestock on non-Federal land, 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.[5] Approximately 105 Federal grazing allotments could also experience AUM reductions of approximately one percent. 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.

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[3] 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.

[4] This analysis assumes that because of United States Bureau of Reclamation'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.

[5] This analysis did not identify any past flycatcher consultations for livestock grazing activities on non-federal lands.

Residential and Commercial Development impacts (other than impacts on water supply as described under Scenario 2) are estimated to be approximately $0.5 million annually, including project modifications (on-site set-aside and other project modifications), California Environmental Quality Act, and delay impacts related to flycatcher conservation efforts. These impacts are expected to occur in the Mohave and Santa Ana MUs, CA.

Tribes: The fifteen potentially affected Tribes are economically vulnerable to future impacts from flycatcher conservation efforts. The total cost to Tribes is estimated to be approximately $0.2 million annually, although there is uncertainty regarding future activities on Tribal lands. Tribal activities potentially affected include development, vegetation clearing and restoration activities.

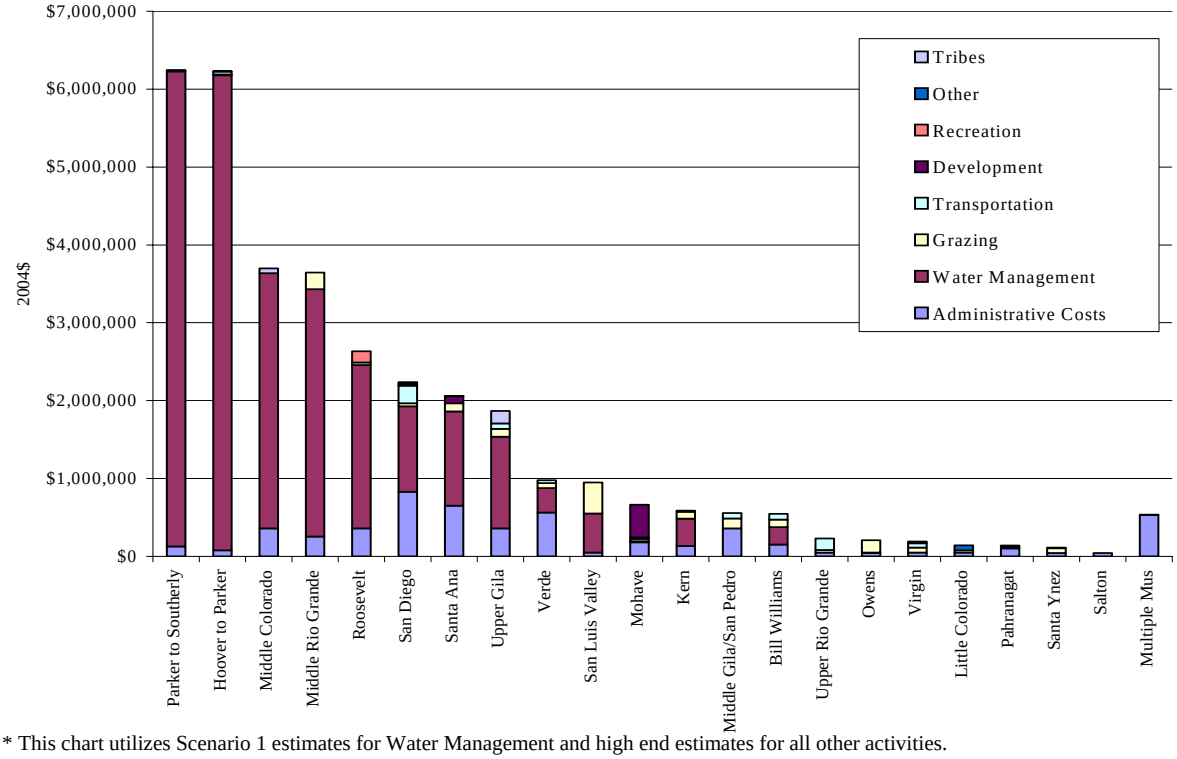
Transportation projects in the proposed CHD may incur costs related to timing restrictions, fencing, survey and monitoring, and habitat conservation and restoration. The future cost of flycatcher conservation measures for transportation projects are expected to be approximately $0.7 million annually.

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 is most likely to be affected by flycatcher conservation activities where Wildland-Urban Interface (WUI) areas overlap with the proposed CHD. This overlap occurs on 26,000 acres, or approximately 7 percent of 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.

Other Activities include **Exotic Species Removal** activities, such as efforts to remove tamarisk, which could be affected by the need to avoid removal of vegetation during flycatcher breeding season, and by requiring additional survey and monitoring efforts. Costs associated with additional survey and monitoring efforts are $0.1 million annually across the CHD.

Exhibit 2
ANNUALIZED COSTS OF FLYCATCHER CONSERVATION BY ACTIVITY AND MANAGEMENT UNIT
(2004$, SEVEN PERCENT DISCOUNT RATE)



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

Exhibit 3
ANNUALIZED COSTS ASSOCIATED WITH SCENARIO 2 FOR WATER MANAGEMENT ACTIVITIES
(2004$, HIGH END ESTIMATES)

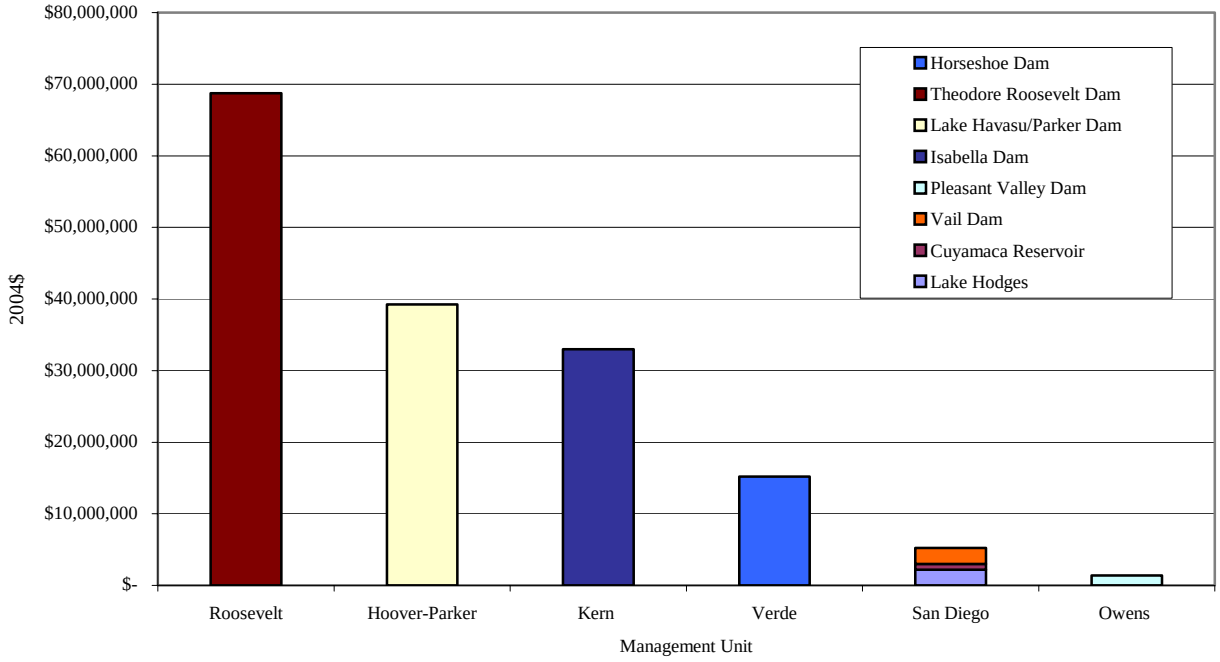


Exhibit 4
SUMMARY OF FUTURE EFFICIENCY EFFECTS
(Annual, 2004 dollars, discounted at seven percent) Thousands of Dollars ($1000's)

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[1]	$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
	Pahranagat	$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
Total		**$1,640**	**$5,384**		**$25,648**	**$159**	**$1,685**	**$737**	**$505**	**$159**	**$140**	**26,128**
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 5

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

Recovery Unit	Management Unit	Tribe(s)
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
Total		$249

Exhibit 6

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.