

Appendix D. Recreation

The assessment of recreation effects was based on estimating current recreation use and spending levels associated with recreation resources potentially affected by the development of a riparian corridor along Sacramento River. Projections of future (2030) use levels, both with and without the proposed habitat restoration, were then made. With-restoration conditions focused on the effect that doubling of catch rates in the Sacramento River would have on fishing activity.

The following sections provide details concerning the data sources, key assumptions, and steps in the analytical process.

DATA SOURCES

Data used to characterize baseline and future with-restoration conditions for recreation and to assess the potential impacts of the restoration on recreation activity and spending were obtained from the following sources. Complete reference information for these sources is included in the Section 8, References.

Current levels of recreation activity: DFG 2001, DWR 1982, U.S. Bureau of Reclamation 1997, California Department of Finance population statistics

Recreation spending profiles, by activity: U.S. FWS (1997), Southern California Edison 1994, Jones & Stokes Associates 1990, California Department of Parks and Recreation 1997

Allocation of recreation-related spending by residents and non-residents: DWR 1982, U.S. Fish and Wildlife Service 1999

Projection of future (2030) recreation activity and spending under without-restoration conditions: population forecasts by the California Department of Finance

Estimates of future (2030) angling activity on the Sacramento River under doubling of catch assumptions: Roach and Loomis 1996

KEY ASSUMPTIONS

The following key assumptions were employed in the assessment of recreation effects.

- Between 1980 and 2000, use levels for activities other than fishing along the Sacramento River have increased at a rate consistent with statewide population changes.
- Future demand for recreation at potentially affected recreation areas in the study area will increase consistent with population growth rates.
- Access and recreation facilities within the study area will remain similar to current conditions and will not constrain future demand.
- Sportfishing opportunities associated with restoration implementation will increase consistent with the doubling of catch rates observed between 1991 and 1994.

ANALYTICAL STEPS

The following steps were followed in conducting the assessment of recreation effects.

Step 1: Estimate current (Year 2000) levels of recreation activity potentially affected by the Habitat Restoration.

Recreation areas and activities that potentially would be affected by the proposed habitat restoration were identified. Key areas included the Sacramento River between Red Bluff and Colusa and the National Wildlife Refuges (NWR) and Wildlife Management Areas (WMA) adjacent to the study area. The NWRs and WMA include the Sacramento NWR, Colusa NWR, Delevan NWR, and Gray Lodge WMA. Key recreation activities potentially affected at the NWRs and WMA included wildlife observation and waterfowl hunting activities. Hunting at private clubs within and adjacent to the study area also was identified as a potentially affected activity but information was insufficient to identify the number of clubs located within the area.

For the key areas, the most recent information on recreation use was obtained. For fishing on the Sacramento River, information was available from field surveys conducted by California Department of Fish and Game (DFG) in 1999 and 2000, which was used to estimate the number of angler days in 2000. To convert angling hours identified in the DFG study to angling days, it was assumed that the average angler day is 3.7 hours. For activities other than fishing along the Sacramento River between Red Bluff and Colusa, the most recent information on annual use is from surveys conducted by California Department of Water Resources (DWR) in 1980. Based on information in the 1980 DWR survey, the number of fishing days was first estimated and then subtracted from the estimates of total recreation activity within the study area. Estimates of non-fishing recreation use during 1980 were then extrapolated to 2000 using the percent change in statewide population between 1980 and 2000. This change was 45%.

For wildlife observation and hunting activities at the NWRs and WMA, use information for 1992 compiled by U.S. Bureau of Reclamation and the U.S. Fish and Wildlife Service and reported in the Programmatic EIS on the Central Valley Project Improvement Act (CVPIA) was used (U.S. Bureau of Reclamation 1997). This information was extrapolated to 2000 using the percent change in statewide population between 1992 and 2000.

The number of recreation days were then allocated to county residents and nonresidents based on information presented in DWR's 1982 report and on population information for the four counties within the study area. Estimates of recreation use of the Sacramento River were allocated to counties based on information collected by DWR on the county of origin of visitors to different reaches of the Sacramento River. Twenty-five percent of the visitors to the NWRs and WMA were assumed to be local (i.e., live within the 4-county area and adjacent counties identified in the DWR study) and 75% to be non-local. For local visitors, the amount of use was allocated to each of the four counties within the study area and adjacent counties based on each county's relative share of the region's population. The results of this allocation are presented in Table D-1.

Step 2: Estimate current recreation spending by county for county residents and nonresidents.

Spending profiles for locals and non-locals participating in different recreation activities were developed based on available information from existing studies. For sportfishing, spending profiles were developed for local anglers (i.e., live within the county or adjacent county) using information from a Southern California Edison study (1994) and anglers coming from outside the region using survey information from the U.S. Fish and Wildlife Service as reported in the Programmatic EIS on the Central Valley Project Improvement Act (U.S. Bureau of Reclamation 1997).

Spending profiles for locals and non-locals participating in other recreation activities on the Sacramento River also were developed from the Programmatic EIS on the CVPIA using information for persons participating in nonconsumptive recreation activities. Spending information for nonresidents were adjusted (reduced by 30%) to account for spending outside of the study area (at home and enroute to the recreation area).

Information presented in the Programmatic EIS for the CVPIA for persons participating in nonconsumptive recreation activities also was used to develop spending profiles for locals participating in wildlife viewing. Spending profiles for non-local persons participating in wildlife viewing were developed from survey information collected for a study of economic values of San Joaquin Valley's fish and wildlife resources (Jones & Stokes Associates 1990).

Information presented in the Programmatic EIS for the CVPIA for persons participating in waterfowl hunting was used to develop spending profiles for persons participating in hunting at wildlife refuges. Adjustments were made to account for lodging expenditures, with spending being reduced for spending profiles for locals and increased for spending profiles for non-locals.

Lodging expenditure information was derived from a study of visitors to the Sacramento-San Joaquin Delta (California Parks and Recreation 1997). Expenditures by non-locals also were adjusted (reduced by 30%) to account for spending outside of the 4-county area.

These spending profiles, which are estimated amounts per visitor day in the county where the recreation area is located, are presented in Table D-2. All values were adjusted by the consumer price index to be indexed to 2000 dollars. The total value per visitor day was allocated to the types of businesses shown in Table D-2 using information presented in the EIS/EIR on the Trinity River Restoration Project (U.S. Fish and Wildlife Service 1999).

The number of visitor days presented in Table D-1 was then multiplied by the spending profiles in Table D-2 to estimate total spending by county residents and nonresidents associated with current use of the potentially affected recreation areas. These estimates of total spending are presented in Table 6-10 of the Recreation Effects section.

Step 3: Estimate future (Year 2030) recreation spending under without-restoration conditions

Future (Year 2000) spending associated with use of the recreation areas was estimated based on the percent change in statewide population as forecasted by the California Department of Finance. The percent change in population between 2000 and 2030 is projected to be 48%.

Step 4: Estimate changes in future recreation activity and spending associated with a doubling in catch rates on the Sacramento River

The development of a riparian corridor along the Sacramento River is expected to improve fish and wildlife resource conditions, thereby enhancing opportunities for recreation, particularly activities that depend on fish and wildlife resources. Because changes in wildlife resources could not be quantified, the analysis of habitat restoration effects focused on the effects of achieving the goal of doubling catch rates of fish populations in the Sacramento River.

The effects of doubling catch rates on the Sacramento River and major tributaries were analyzed in a study (Roach and Loomis 1996) prepared for the Programmatic EIS on the CVPIA. This study evaluated the effects of doubling catch rates for different species, including shad, catfish, king salmon, rainbow trout, striped bass, steelhead, sturgeon, and non-targeted species.

Results from the Roach and Loomis study were used to estimate the habitat restoration-related change in fishing activity for this analysis. Roach and Loomis estimated that overall fishing activity on the Sacramento River and tributaries would increase by 26.5% as a result of doubling catch rates observed in 1993 and 1994 for all species. This percent change was applied to estimates of recreation activity and spending under 2030 without-restoration conditions (Step 3) to estimate the change in spending associated with the habitat restoration..

Table D-1. Allocation of Recreation Activity Days by Resident and Nonresident Origin

BUTTE COUNTY												
Sportfishing			Other Rec Activities				Wildlife Viewing - Refuges			Refuge Waterfowl Hunting		
Residents	Nonresident but local	Nonresident	Residents	Nonresident but local	Nonresident	Residents	Nonresident but local	Nonresident	Residents	Nonresident but local	Nonresident	
9,503	526	2,471	76,078	668	9,811	8,517	4,252	38,892	2,838	1,418	12,769	
TEHAMA COUNTY												
Sportfishing			Other Rec Activities				Wildlife Viewing - Refuges			Refuge Waterfowl Hunting		
Residents	Nonresident but local	Nonresident	Residents	Nonresident but local	Nonresident	Residents	Nonresident but local	Nonresident	Residents	Nonresident but local	Nonresident	
5600	20481	14512	77371	261328	174721	0	0	0	0	0	0	
GLENN COUNTY												
Sportfishing			Other Rec Activities				Wildlife Viewing - Refuges			Refuge Waterfowl Hunting		
Residents	Nonresident but local	Nonresident	Residents	Nonresident but local	Nonresident	Residents	Nonresident but local	Nonresident	Residents	Nonresident but local	Nonresident	
860	526	2471	9350	668	9811	460	4837	15893	153	1612	5297	
COLUSA COUNTY												
Sportfishing			Other Rec Activities				Wildlife Viewing - Refuges			Refuge Waterfowl Hunting		
Residents	Nonresident but local	Nonresident	Residents	Nonresident but local	Nonresident	Residents	Nonresident but local	Nonresident	Residents	Nonresident but local	Nonresident	
948	11751	17502	3432	46954	67955	540	8017	25672	179	2728	8555	

Table D-2. Recreation Spending Profiles, by Activity and Visitor Origin

Activity/Visitor Origin	Food Stores	Eat/Drink Establishments	Service Stations	Hotels/motels	Misc Retail	Total
Sportfishing						
residents	\$3.61	\$0.96	\$2.49	\$2.09	\$10.04	\$19.19
nonres, local	\$3.61	\$0.96	\$2.49	\$2.09	\$10.04	\$19.19
nonresidents	\$5.25	\$3.81	\$3.53	\$12.56	\$13.72	\$38.87
Other Recreation Activities						
residents	\$3.73	\$0.99	\$2.58	\$2.16	\$10.37	\$19.83
nonres, local	\$3.73	\$0.99	\$2.58	\$2.16	\$10.37	\$19.83
Nonresidents	\$5.25	\$3.81	\$3.53	\$12.56	\$13.72	\$38.87
Wildlife Viewing - refuges						
residents	\$3.73	\$0.99	\$2.58	\$2.16	\$10.37	\$19.83
nonres, local	\$3.73	\$0.99	\$2.58	\$2.16	\$10.37	\$19.83
nonresidents	\$4.79	\$3.47	\$3.23	\$11.47	\$12.54	\$35.50
Hunting - refuges						
Residents	\$8.21	\$2.18	\$5.67	\$4.76	\$22.86	\$43.68
nonres, local	\$8.21	\$2.18	\$5.67	\$4.76	\$22.86	\$43.68
Nonresidents	\$7.52	\$5.46	\$5.07	\$17.99	\$19.66	\$55.70

Notes:

Values are the amount spent per visitor day in the county where recreation areas are located.

All values are in 2000 dollars.

The allocation of spending by type of business is based on information from the Trinity River Mainstem Restoration Project EIS/EIR (U.S. Fish and Wildlife 1999).

Sources:

Sport fishing: Southern California Edison 1994 and U.S. Bureau of Reclamation 1997

Other recreation activities: U.S. Bureau of Reclamation 1997

Wildlife viewing: U.S. Bureau of Reclamation 1997 and Jones & Stokes Associates 1990

Hunting: U.S. Bureau of Reclamation 1997 and California Department of Parks and Recreation 1997

REFERENCES

- California Department of Fish and Game. 1992. Report of the 1992 Game Taker Hunter Survey. Sacramento, CA.
- California Department of Fish and Game. 2001. Central Valley salmon and steelhead harvest monitoring project. 2000 Angler Survey. Sacramento, CA. Prepared by Kyle Murphy, Tom Schroyer, Mike Harris, and Duane Massa.
- California Department of Parks and Recreation. 1994. Upper Sacramento River Public Lands Access and Recreation Facility Inventory: Maps and Database Table. August 1994. Sacramento, CA.
- California Department of Parks and Recreation. 1997. Sacramento-San Joaquin Delta Recreation Survey. September 1997. Sacramento, CA.
- California Department of Water Resources. 1982. Sacramento River Recreation Survey - 1980. August 1982. Red Bluff, CA.
- Jones & Stokes Associates, Inc. 1990. Environmental benefits study of San Joaquin Valley's fish and wildlife resources. (JSA 87-150.) Sacramento, CA. Prepared by J.B. Loomis, W.M. Hanemann, and T.C. Wegge
- Roach, B. and J. Loomis. 1996. A travel cost analysis of angler benefits by target species along four California rivers. Prepared for Jones & Stokes Associates. January 1996. Sacramento, CA.
- Southern California Edison, 1994. Application for New License for the Kern River #1 Hydroelectric Generating Plant. FERC Project No. 1930.
- U.S. Bureau of Reclamation. 1997. Draft Programmatic Environmental Impact Statement. Recreation Technical Appendix. September 1987. Sacramento, CA.
- U.S. Fish and Wildlife Service. 1999. Trinity River Mainstem Restoration Project. Environmental Impact Statement and Environmental Impact Report. Public Draft. October 1999. Arcata, CA.