

Mr. Robert R. Treanor
Executive Director
Fish and Game Commission

January 4, 1996

Agenda Item for the Fish and Game Commission's March 7-8, 1996, Meeting Re: Receipt of the Department of Fish and Game's Annual Report on the Status of Recovery of the Threatened Bank Swallow (*Riparia riparia*)

On March 3, 1989, the Commission took action to include the bank swallow as a threatened bird species according to the California Endangered Species Act (CESA) and pursuant to Section 2070, Fish and Game Code, and Section 670.1, Title 14, California Code of Regulations. This action was taken based on a Department petition that documented that the species had declined throughout its range within California, was extirpated from approximately 50 percent of its historic range (primarily in the southern part of the State), and faced further reduction in populations and habitat due to ongoing bank protection projects of the State Reclamation Board and the U.S. Army Corps of Engineers (Corps) on the Sacramento River, Feather River, and major tributaries. Sacramento Valley riparian systems provide habitat for over 70 percent of the remaining population. Department field research conducted during the bank swallow breeding seasons in 1986 and 1987, followed by annual monitoring, established the scientific basis for the petitioned action that recommended listing of the species. In addition, the Department had previously reported in 1978 on the status of the bank swallow in its *Bird Species of Special Concern* publication and concluded at that time that the total population of breeding bank swallows within the State was extremely low relative to that of other species of swallows. The report identified the primary reason for the decline and continuing threat to breeding colonies as channelization of rivers by the Reclamation Board and the Corps. Many colony sites in the Sacramento Valley are threatened by planned bank protection projects currently proposed and approved for construction by the Corps.

A recovery plan for the bank swallow was completed and presented to the Commission for adoption in 1993. It was the first such plan for a species that is State listed only and not also federally listed. A recovery team consisting of representatives of the Department, State Reclamation Board, Corps, State Lands Commission, and members of the public, was formed prior to the completion of the recovery plan in the same year as the listing became final, 1989. Some of the issues discussed at team meetings since 1989 included the development of the recovery plan, mitigation experiments at bank protection projects, and annual population surveys. Each population survey that has been conducted since the Department's initial study in 1986 has included biologists and/or engineers from the various agencies and groups that make up the recovery team. The 1995 population survey was conducted by staff of the Department's Wildlife Management and Environmental Services divisions, and the Region 1 office; an Environmental Specialist from the Corps; and a private consulting biologist working for the Corps.

In 1992, the Department commissioned a population viability analysis (PVA) of the Sacramento River population of bank swallows to attempt to determine the risks of extinction

and reduction based solely on the current biological factors affecting these birds. Habitat loss was not factored in as a population depressing variable. One very important factor facing the current population is simply their small breeding numbers. The findings of the PVA have indicated that a population of 10,000 pairs has a substantial risk of falling to 1,000 pairs or disappearing entirely. However, the results of the 1995 survey indicated an estimated population on the Sacramento River of only about 5,000 pairs. Please refer to Table 1 (attached) for a summary of bank swallow population information and bank swallow population survey results for 1986 through 1995. Breeding pair estimates were derived by multiplying the total burrow count figures (an index of population trend) by an objective estimate of burrow occupancy (45 percent) derived from field studies.

The PVA has been used to estimate the level of population needed to ensure a margin for safety from extinction and allow for recovery of bank swallows in the State. The population estimated in this manner can, therefore, be considered the minimum target population for recovery of the bank swallow. Only after the recovery level population has been achieved can the species be considered for removal from the list of threatened bird species. Even under the most ideal conditions (i.e., no further loss of habitat due to bank protection projects), a population of the current size may require an increase to at least 50,000 pairs to ensure a less than 50 percent chance of falling below 5,000 breeding pairs within the span of the next 50 years. A reasonable recovery target population may be half again as great or 75,000 pairs of bank swallows reproducing normally in habitat that is not threatened with further loss. Our current population estimate of about 5,000 pairs is already at the lower limit postulated in the PVA to represent a situation where there is a serious risk of extinction of the bank swallows on the Sacramento River.

While most of the State's population of bank swallows exists in the Sacramento Valley and this has become the focus of the Department's recovery effort, there are additional scattered colonies in parts of northern and northeastern California. Some of these colonies are on public lands such as the Department-owned bank swallow colony at Fall River Mills in Shasta County. However, others are on private lands where various threats exist that must be closely monitored to ensure against adverse impacts of local stream channelization projects or riparian habitat degradation. While these colonies make up a small fraction of the statewide population, it is important to preserve them, especially as the core populations in the Sacramento Valley face the threat of further decline and possible elimination.

The U.S. Fish and Wildlife Service, in a 1990 report of a bank swallow habitat inventory and threats to that habitat, estimated that between 1960 and 1989 more than 90 miles of the Sacramento River had been rippapped under the Sacramento Bank Protection Project. The Project is currently in its third phase of planning and constructing of riprap at several work sites on the Sacramento River. Since 1986, approximately 211 miles of the Sacramento River have been surveyed and active or potential bank swallow habitats have been documented by the Department along this entire length annually. About 90 miles of bank is currently under rock revetment installed by the Corps and is currently unusable by bank swallows for nest sites. This revetment mileage must be subtracted from miles surveyed (211×2 ; to account for banks on both sides of the river) to arrive at the total miles of currently available potential bank swallow habitat ($211 \times 2 - 90 = 332$). For various habitat suitability reasons, not all of this available habitat mileage is currently used by the birds to establish nesting colonies. The amount of

available habitat that is apparently suitable and currently used by bank swallows for nesting colonies is between three and seven percent of the total available. Which habitats are used by the birds is largely a function of soil characteristics and local erosion patterns of the river, the latter of which varies from year to year. This variance in the system makes it difficult to develop an accurate predictive model of exactly where active colony sites within the total available bank habitats might be located each breeding season. For this reason, it is critically important to reduce the loss of all available potential habitats that might become suitable each year because of their soils and erosion patterns. Any conservation strategy that focuses only on yearly occupied bank swallow habitat and neglects potential habitats may ultimately see the loss of the entire population due to steady habitat attrition over time.

Between 1986 and 1995 an average of 9,000 pairs of bank swallows in an average 57 colonies nested on the Sacramento River. This represents about 21 pairs in 0.14 colonies per mile of river. Using a very conservative analysis based on the 1986 to 1995 pair and colony densities, habitat for an additional 1,890 pairs may have been lost between 1960 and 1995 as a direct result of habitat made unavailable due to bank protection projects. Additional miles of riprap and consequent habitat loss are scheduled to be installed through the year 2000. These planned work sites will impact additional miles of potential habitat for the bank swallow and may, thereby make it much more difficult to effect the recovery of this State-listed species.

The bank swallow relies on near vertical slopes of friable soils which are often found on eroding river banks in which to construct its nesting burrows. These eroding bank sites are coincidentally the same areas traditionally targeted for bank protection work sites. Therefore, it is difficult to develop effective mitigation for the impacts of projects which are designed to stop natural erosion of earthen banks. Any artificial earth bank structure that was designed to replace lost natural habitat would have to be maintained to fairly rigid specifications annually to make it suitable for nesting bank swallows. The danger of having an entire population of birds solely dependent on artificial structures for their continued existence has presented a serious biological risk. In 1995, it was learned by the Department that the State Reclamation Board proposed to use earth (for a construction project) stored at one artificial bank because the birds had never used it for nesting. The reason for the lack of use is unclear, but soil texture might have been too clay-dominated. Additional sites that were used in past years have recently been abandoned due to deterioration of habitat quality resulting from inadequate annual maintenance. An additional objection to reliance on a series of artificial nesting structures as mitigation is that such a scheme presents a biological limitation to proposing delisting for the species. In this example, it would be risky to assume that all artificial nest sites would be continually maintained and uniformly suitable year after year without interruption due to a variety of natural and man-made factors, such as budget cuts in the latter case, which could make funds unavailable for critically important annual maintenance. Therefore, if it was totally dependent on artificial nest sites, the bank swallow could never be recovered and returned to "normal" status.

If the current trend continues in 1996, the population may face an even greater threat of extinction. A five-year review of the status of the bank swallow was reported to the Commission in early 1994. In that report, it was stated that should the results of annual population monitoring show continued deterioration on the Sacramento River, which is the core of the remaining population in the State, then the Department may be forced to recommend

endangered status for the species within one to two years. The population status as of the 1995 breeding season is close to that which meets the criteria for endangered species designation as specified under CESA.

A copy of the recovery plan is attached for the Commission's reference. If you have any questions regarding the matter, please contact Mr. Terry M. Mansfield, Chief of the Department's Wildlife Management Division, at 1416 Ninth Street, Sacramento, California 95814, telephone (916) 653-7203. Department staff will be available at the January meeting to respond to questions or comments from the Commission.

C. F. Raysbrook
Interim Director

Attachment

cc: Ms. Susan Cochrane
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Mr. Terry M. Mansfield
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bc: Mr. Rich Elliott
Department of Fish and Game
Sacramento, California

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Rancho Cordova, California

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TABLE 1
BANK SWALLOW POPULATION INFORMATION
by River Reach on the Sacramento River, California
1986-1995

RIVER REACH	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Avg.
RM 81-143											
Verona to Colusa											
Number of Colonies	13	12	9 ^a	6	6	6	9	8	6	4	8 ^b
Total Burrows	2,480 ^c	3,720	1,870	750	980	1,870	1,650	1,610	2,470	540	1,790
Avg. Burrows/Colonies	190 ^c	310	210	130	160	310	180	200	410	140	220
RM 144-168											
Colusa to Butte City											
Number of Colonies	15	13	18	14 ^a	15	9	14	15	11	12	14
Total Burrows	6,060	6,600	7,790	6,580	7,440	6,110	6,840	5,230	4,870	2,080	5,960
Avg. Burrows/Colonies	400	510	430	470	500	680	490	350	440	170	450
RM 169-199											
Butte City to Hamilton City											
Number of Colonies	15	16	28	21	15	14	15	11	10	11	16
Total Burrows	7,530	5,070	9,570	6,970	4,850	3,960	4,500	1,950	3,400	2,510	5,030
Avg. Burrows/Colonies	500	320	340	330	320	280	300	180	340	230	310
RM 200-243											
Hamilton City to Red Bluff											
Number of Colonies	23	20	16 ^a	16 ^a	15	13	14	10	10	15	15
Total Burrows	11,530	8,540	6,520	6,520	6,880	4,300	4,050	3,820	4,440	4,660	6,130
Avg. Burrows/Colonies	500	430	400	400	460	330	290	380	440	310	390
RM 243-292											
Red Bluff to Redding											
Number of Colonies	6	5	5 ^a	5 ^a	3	5 ^a	5 ^a	5 ^a	5 ^a	5	5
Total Burrows	1,660	1,400	1,290	1,290	820	1,290	1,290	1,290	1,290	1,290	1,290
Avg. Burrows/Colonies	280	280	260	260	270	260	260	260	260	260	260
Survey Total - RM 81-292											
Verona to Redding											
Number of Colonies	72 ^d	66	76	62	54	47	57	49	42	47	57 ^e
Total Burrows	29,260	25,330	27,040	22,110	20,970	17,530	18,330	13,900	16,470	11,080	20,200 ^e
Avg. Burrows/Colonies	410	380	360	360	390	370	320	280	390	240	350 ^e
Total Breeding Pairs ^f	13,170	11,400	12,170	9,950	9,440	7,890	8,250	6,260	7,410	4,990	9,090
% of Baseline Population	100	87	92	76	72	60	63	48	56	38	69
% of Population Decline	0	13	8	24	28	40	37	52	44	62	31

- a Averages based on survey information were included as an estimate for years without surveys.
- b Reach averages based on available survey data for that Reach; these data are the most illustrative of population trends within the Reach.
- c Burrow numbers rounded to nearest 10 burrows.
- d Annual survey totals include Reach averages for years without surveys; yearly totals are not as accurate for inferring population trends as Reach averages.
- e Includes annual totals that have estimates based on Reach averages.
- f Total burrows X average burrow occupancy rate (0.45) = total breeding pairs.