

DRAFT

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To: Files

From: Ronald W. Schlorff

Subject: 2005 Bank Swallow population survey, Sacramento River

On June 7 and 8, 2005, staffs of the Resource Assessment Program of the Habitat Conservation Division of the California Department of Fish and Game, Sacramento, and the U.S. Fish and Wildlife Service, Sacramento National Wildlife Refuge, conducted breeding surveys on the Sacramento River for the State threatened bank swallow. The survey employed a jet boat owned and operated by the Refuge. All colonies were located and the total burrow numbers at each colony were double tally counted and averaged for a 10% allowable difference during the two days of survey. The GPS locations of colonies, at the downstream base, also were recorded. Field data were recorded electronically on a hand held computer (PDA) and paper forms. The survey started at a point just below the Red Bluff Diversion Dam at River Mile (RM) 243.0 and continued southward to the last colony that was located at RM 145.5 Left (L). As in previous surveys, the reach from Redding to Red Bluff was estimated based on results of an earlier survey. For the fifth survey year, the reach from Colusa (RM 144.0) to the confluence with the Feather River (RM 80.0) will be based on estimates provided in 2000 by Mr. Craig Swolgaard, an independent researcher (this reach has extensive riprap from Colusa to Knights Landing to a point about 54 miles downstream). The following are the results of counts indexed by RM; left bank side (L) and right bank side (R), traveling southward with the current of the River. Average total burrow count is rounded to nearest tenth.

<u>River Mile*</u>	<u>Side</u>	<u>GPS reading (utm)*</u>	<u>No. Burrows</u>	<u>NWR Units</u>
239.5	R	573048-4443161	20	La BARRanca Unit
236.3	R	573554-4439575	970	Moony Island Unit
235.0	R	574786-4437703	210	Ohm Unit
233.8	L	575126-4436861	130	
232.8	R	574600-4436153	190	Flynn Unit
231.0	L	575898-4434742	290	Blue Heron Is. Unit
228.3	L	576271-4429112	270	
227.4	L	576110-4428205	620	
224.6	L	577417-4426603	550	
221.2	L	578387-4421797	240	
219.7	R	578145-4419480	650	Kopta Slough, TNC
218.7	L	577652-4418426	310	Woodson Bridge
211.1	L	581187-4413270	1570	1 mile long bank
208.5	R	580232-4411817	120	
206.0	L	580686-4408073	190	
205.5	R	581962-4405282	320	
205.5	L	581889-4405312	120	
199.0	L	586596-4400118	280	FWS Pine Creek

<u>River Mile*</u>	<u>Side</u>	<u>GPS reading (utm)*</u>	<u>No. Burrows</u>	<u>NWR Units</u>
194.5	R	589501-4387541	420	DFG Pine Creek
194.5	L	589560-4398454	20	DFG Pine Creek
193.2	R	590433-4394851	110	Capay Unit
192.0	L	589733-4393486	140	M&T Ranch
189.8	R	587380-4392214	90	
185.5	R	587274-4389331	80	
185.0	R	586871-4387744	520	Dead Man's Reach
183.8	R	586960-4386134	330	
182.5	L	587268-4384775	100	Llano Seco Unit
181.6	R	585820-4383418	90	Ryan Is.
175.5	L	586581-4376252	40	DFG land
173.0	R	586445-4373632	1840	
171.3	R	585808-4371450	110	
165.0	L	585599-4363869	680	Prune Dryer
162.0	R	585166-4359696	280	
157.0	L	584285-4353045	910	
156.3	R	584300-4352133	650	
155.5	R	584173-4351906	320	
154.6	R	584426-4350365	100	
146.0	L	586495-4343959	80	
145.2	L	586496-4342822	80	
131.5	L?	??	80**	
130.0	?	??	290**	
129.0	?	??	90**	
128.0	?	??	140**	
100.0	?	??	190**	
87.0	?	??	130**	
83.0	?	??	20**	
82.0	?	??	120**	

* Exact locations will change for each year's survey

**Estimated from the 2000 survey

RESULTS SUMMARY

Total Colonies counted = **39** Total burrows counted = **14,040**

Estimated Cols. Redding to Red Bluff = **5** Est. Burrows = **1,290**

Estimated Cols. Colusa to Feather R. Confluence = **8** Est. Burrows = **1,060**

Survey Total Cols. = **52** Survey Total Burrows = **16,390**

Average Burrows per Colony = **300** (rounded to nearest 10)

Burrow Occupancy Rate = **0.45**

Estimated Number of Pairs (0.45 x 19,410) = **7,380** (rounded to nearest 10)

2004 Estimated Number of Pairs = **8,730**

Population trend = **DOWN** approx. **15** percent from **2004**; **DOWN 43** percent from 1986 baseline of **13,170** pairs in **72** colonies.

Average colony size has **Decreased** from **410** burrows/col. in 1986 to the current **300** burrows/col. (**73** percent of baseline figure)

River Reach Burrow Count Summary (ave. figures rounded to nearest 10):

RM 81-143	1,060 burrows(est.)8 cols.	Ave. =	130 burrows per col.
RM 144-168	2,140 burrows 6 cols.	Ave. =	360 burrows per col.
RM 169-199	5,130 burrows 16 cols.	Ave. =	320 burrows per col.
RM 200-243	6,770 burrows 17 cols.	Ave. =	400 burrows per col.
RM 244-292	1,290 burrows (est.)5 cols.	Ave. =	260 burrows per col.
Totals:	16,390 burrows 52 cols.	Ave. =	320 burrows per col.

Summary of past 10 years of Bank Swallow Survey Data

Year	Burrow Count	Pair estimate	Number cols.	Ave. Col. Size
1996	12,820	5,770	52	250
1997	11,540	5,190	52	220
1998	11,090	4,990	42	260
1999	18,250	8,210	57	320
2000	20,470	9,210	46	450
2001	21,520	9,680	51	420
2002	18,500	8,330	57	320
2003	21,300	9,590	61	350
2004	19,410	8,730	56	350
2005	16,390	7,380	52	300

SUMMARY AND DATA INTERPRETATION

Results of the 2005 bank swallow population survey on the Sacramento River indicated a decrease in estimated pair numbers to 7,380 after a three year period of increase from 1999 to 2001, followed by a reduction to 8,330 in 2002 and an increase

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to 9,590 in 2003, and a reduction to 8,730 in 2004. In 1986, when the first survey was conducted, about 13,170 pairs were estimated breeding along the 211 miles of river

bank habitat between Redding and the Feather River confluence on the Sacramento River. Since that time, the population has declined in numbers of pairs until 1999 to 2001 when numbers began to increase again. This year's results (7,380) represent a 15 percent drop from the 2004 pair estimate of 8,730. During 1986-98, the Sacramento River bank swallow population had a generally declining trend to 4,990 pairs (1998), the lowest population ever documented in the 19 consecutive years of monitoring. Since the population was deemed close to extirpation in 1998, a petition for endangered status was drafted for presentation to the Fish and Game Commission.

The reason for the general population decline for 13 years and subsequent turnaround of the 1999-2003 years is not fully understood, but it may be related environmental factors, especially rainfall and bank erosion patterns and the consequent variations in habitat quality. The past two years, 2004-05 has seen a decline to numbers not observed since the early to mid-1990's. Declines may have corresponded to the drought years of the mid-late 1980's. There also may have been changes occurring on the wintering ground in north central South America. While the bank swallow pair numbers are generally up in the past six years, since their lowest ebb in 1998 (4,990), the average number of colonies counted recently is still lower compared to earlier survey results. In 1986, there were 72 different locations on the Sacramento River supporting active colonies; in 2002 there were only 57 colony sites (79 percent as many). In 2003 there were an encouraging total of 61 colonies. Average colony size in 2003 (350 burrows per colony) was 60 burrows less than in 1986. In 2004, we documented 4 colonies of 1,000 burrows and larger compared with 7 located in 2001. There were, however, an additional two colonies between 800 and 1000 burrows in 2004. In 2005, only two of 52 total colonies (down 44 percent from the 1986 baseline number of 72) were over 1000 burrows in size, but both were "super colonies" of over 1500 burrows each (1570 and 1840). Large (1000+ burrows) colonies are an indicator of general health of the population and they may function as breeding centers that could result in the re-population of former range along the Sacramento River in succeeding years. Unfortunately the drop in colony number from 57 to 52 in the last year is not an encouraging sign; we need big colonies and many of them to trend the population upward toward recovery.

Although the bank swallow population generally continues to rebound over the past seven years, it is still threatened by activities that will reduce its habitat. In the recent past there have generally been fewer but larger colonies, thus concentrating the population into a few breeding centers of critical importance. Such a concentration of the population exposes it to the risk of a catastrophe. In 2003, we saw a return to large sized and more total colonies, an encouraging sign that failed to continue in 2004 and 2005.

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There are still planned new bank protection sites on the Sacramento River. If all proposed sites were rip-rapped then the habitat for the population could be severely affected resulting in further declines in the future. A large number of colonies found in

this year's survey were located on Sacramento River National Wildlife Refuge lands and are thus afforded a measure of security and protection. Additional colonies are located on State lands of the Department of Fish and Game. However, a large number of colonies still exist on lands and are not protected from habitat alteration due primarily to bank protection.

The apparent reason for general population increases starting in 1999 is not fully understood but may be related to the fact that no mortality caused by bank protection activities has occurred at nesting colonies since 1985. The population may have taken these 20+ years to recover its breeding potential after a previous period of 25 years (1960 to 1985) of catastrophic losses of all reproduction at many colonies.

There are no estimates for the population on the Sacramento River prior to the DFG's 1986 study which estimated 13,170 pairs. However, accounts from DFG biologists, and other observers, indicate that, during that previous era, active colonies were routinely destroyed by bank protection activities during the height of the breeding season. This construction activity, because it collapsed and buried many active and occupied burrows, likely resulted in the death of all young bank swallows at many colonies for a period of several years. Enforcement of the legal protection of the bank swallow under the federal Migratory Bird Treaty Act in 1985-88, and the California Endangered species Act (1989, when the species was listed by the Fish and Game Commission as a threatened species, to the present) has essentially curtailed this form of mortality at most State and federally sponsored bank protection projects. However, we witness annually that human activity, including the covering of active colonies with various kinds of debris in order to curtail erosion of river banks, continues at certain locales.

Despite the recent increases to levels not seen for several years, the population remains a candidate for endangered status. The general decline for several years from 1986 followed by the more recent pattern of increases and decreases from year to year underscores the need for annual monitoring of the population before changes in status are contemplated. As mentioned above, a listing petition for endangered status has been drafted and may be submitted to the Fish and Game Commission if the population should decline again for a few consecutive years. Falling below 5,000-6,000 pairs again could trigger recommendation to "emergency list" the bank swallow as an endangered species. This action may underscore the need for stronger measures to protect the species and its habitat. It also would be a testament of the true status of the bird's population in the State. According to the Population Viability Analysis we have conducted on this species in 1992, bank swallows on the Sacramento River continue to be in danger of further population declines or eventual extirpation. The reason for this

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is that, despite recent increases, the population today still remains below a risk threshold level of 10,000 pairs. The trend of government and privately financed rip rapping, and other methods of erosion control projects, if they severely impact nesting habitat or cause mortality to young birds, could hasten the extirpation of the bank

swallow population from the Sacramento River.

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