

DRAFT

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To: Files

From: Ronald W. Schlorff

Subject: 2007 Bank Swallow population survey, Sacramento River

On June 12 and 13, 2007, staffs of the Resource Assessment Program of the Wildlife Branch 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 145.3 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>
236.5	R	573451-4439597	100	La Barranca,1000'
235.1	R	574406-4437966	40	Moony,100'
235.0	R	574697-4437709	400	Ohm,500'
233.5	L	575334-4436829	1190	Spanfelder,600'
232.0	L	575895-4434778	140	Flynn,100'
231.8	L	575957-4434490	290	Blue Heron Is.,150'
228.1	L	576293-4429100	110	100'
226.6	R	575930-4427462	970	800'
225.0	L	577431-4426653	140	100'
212.2	L	581424-4413302	1650	1500'
211.1	R	580217-4411792	1280	800'
210.3	L	580252-4410819	510	200'
200.8	L	584251-4401813	60	50'
199.0	L	586623-4400089	1130	FWS Pine Ck.,800'

<u>River Mile*</u>	<u>Side</u>	<u>GPS reading (utm)*</u>	<u>No. Burrows</u>	<u>NWR Units</u>
195.5	L	589846-4398097	120	DFG Pine Ck.,150'
195.0	R	589471-4397559	270	DFG Pine Ck.,500'
193.2	R	590483-4394759	220	Capay, 1500'
192.0	L	590178-4393368	110	M&T, 100'
189.5	R	587402-4392264	300	1200'
185.0	L	587073-4387845	200	rubble riprap
183.0	L	587037-4384772	3640	LlanoSeco, 1800'
174.5	L	586088-4375300	260	Hartley
172.6	R	586077-4373612	230	600'
171.2	R	585836-4371409	270	Prune,2500'
170.2	L	586459-4370312	420	1500'
168.3	R	586386-4367516	850	Gaines
166.8	L	585784-4365502	20	Afton, 20'
166.0	R	585810-4364788	510	DFG
164.9	L	585557-4363853	1130	1 mile
162.6	L	585646-4360601	250	50'
158.4	R	583526-4355000	10	threatened
156.9	L	584368-4353357	100	DFG
156.0	R	584338-4351982	290	DFG
147.1	L	586532-4344122	200	800'
146.1	L	586195-4343309	90	PVT
145.5	R	586025-4342805	240	Low
145.4	R	585667-4342571	20	Low
145.3	L	585728-4342225	40	Low, sandy
*****Need to revise all GPS above*****				
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 = **38** Total burrows counted = **17,800**
 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. = **51** Survey Total Burrows = **20,150**
 Average Burrows per Colony = **400** (rounded to nearest 10)
 Burrow Occupancy Rate = **0.45**
2007 Estimated Number of Pairs (0.45 x 20,150) = **9,070** (rounded to nearest 10)
2005 Estimated Number of Pairs = **7,380**
 Population trend = **UP** approx. **19** percent from **2005**; **DOWN 31** percent from 1986
 baseline of **13,170** pairs. 2007 Colony count (**51**) **DOWN 29** percent from 1986 (**72**).
 Average colony size has **Decreased** from **410** burrows/col. in 1986 to the current **400**
 burrows/col. (**98** 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	3,750 burrows 13 cols.	Ave. = 290 burrows per col.
RM 169-199	7,170 burrows 12 cols.	Ave. = 600 burrows per col.
RM 200-243	6,880 burrows 13 cols.	Ave. = 530 burrows per col.
RM 244-292	1,290 burrows (est.)5 cols.	Ave. = 260 burrows per col.
Totals:	20,150 burrows 51 cols.	Ave. = 400 burrows per col.

Summary of past 12 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

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2006 Survey aborted after 6 colonies counted, due to boat accident

2007 20,150 9,070 51 400

BANK SWALLOW HABITAT ON THE SACRAMENTO RIVER, CONDITION AND SUITABILITY, A PARTIAL LIST, JUNE 2007 SURVEY

RIVER MILE	SIDE (RIGHT, LEFT)	HABITAT NOTES	OWNERSHIP/NAME
233.5	L	GOOD, 600' FACE	PVT, SPANDFELDER
220.5	R	TOO LOW FOR BANS	KOPTA SLOUGH
216.1	L	LONG, 1 MILE, TOO STRAIGHT, LOW	RIO VISTA
212.1	L	1500', GOOD SITE FOR MITIGATION FOR 182	PVT?
210.3	L	200', RECOMMEND FOR MITIGATION SITE	DESERET FARMS
193.2	R	TO BE ROCKED, 1500' OF SUTITABLE HABITAT	M/T RANCH
192.0	L	TOO LOW, GOOD RIPARIAN, 100' BANK HABITAT	M/T RANCH
191.0	R	POTENTIAL ROCK REMOVAL SITE, 1/2 MILE	PVT?
189.5	R	GOOD HIGH BANK, 1/4 MILE	STONECK, PVT?
186.0	R	RUBBLED, LIMITED MITIGATION, W/REMOVAL	ENGLISH
172.2	L	600', GOOD POTENTIAL	PVT?
171.2	R	2500', GOOD POTENTIAL	PVT?
170.2	L	1500', GOOD POTENTIAL	PVT?
168.3	R	CONSERVATION POTENTIAL	GAINES, STATE
164.9	L	EXCELLENT HABITAT FOR BIG COLS.	FWS
162.6	L	MORE GOOD HABITAT THAN OCCUPIED	PVT?
156.9	L	LARGE AMT OF HABITAT	MOULTON, DFG
147.1	L	900' GOOD HABITAT	PVT?

SUMMARY AND DATA INTERPRETATION

Results of the 2007 bank swallow population survey on the Sacramento River

indicated an increase in estimated pair numbers to 9,070 after a three year period of increase from 1999 to 2001, followed by a reduction to 8,330 in 2002 and an increase to 9,590 in 2003, and a reduction to 8,730 in 2004, and decrease to 7,380 in 2005. No survey was conducted in 2006 due to boat malfunction after 6 colonies were counted. 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 (9,070) represent a 19 percent increase from the 2005 pair estimate of 7,380. 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 21 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 1999-2007 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 two years, 2004-05, saw 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. In 2007 only 38 colonies were counted, the remaining 13 were estimated, as in previous years for the northern most and southern most reaches, for a total of 51 colonies this year. There were 6 colonies with 1000+ burrows and one with 970 burrows and a huge colony of 3,640 burrows indicating a large concentration and percentage (49%) of the entire population at only a few sites supporting a total of 4,410

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pairs; many of these colonies are threatened with bank protection work. Unfortunately the drop in colony number from 57 (2002) to 51 (2007) in the last few years is not an encouraging sign; we need not only big colonies, but many of them to increase the population upward toward recovery levels (approximately 50,000 pairs).

Although the bank swallow population generally continues to rebound over the past several 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. The count in 2007 is disturbing in that the “all eggs in a few baskets” trend is even more marked, with about half the River population in only 6 colonies, out of a low count of 51 overall.

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

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locales.

Despite the recent increases to levels not seen for several years, the population remains a candidate for endangered status. And the concentration of most of the population at a few sites in 2007 is cause for grave concern. This particularly true since

many of the colonies are threatened with bank protection and other projects, and no conservation strategy has been developed by the state to mitigate lost colony habitat sites. 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. And the fact that that number is currently in only a few colonies at risk may also precipitate a status change due to the worrisome population concentration/threat factor, despite the encouraging overall population number of 9,000+ pairs in 2007. 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 is that, despite recent increases, the population today, at 9,000 pairs, 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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