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To: Files

From: DFG Staff

Subject: 2008 Bank Swallow population survey, Sacramento and Feather Rivers

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The annual survey of the State-threatened Bank Swallow (*Riparia riparia*) population on the Sacramento River was conducted on June 10 and 11, 2008. Surveying was done primarily by staff of the U.S. Fish and Wildlife Service, Sacramento National Wildlife Refuge, and the California Department of Water Resources, with assistance and observers from the Resource Assessment Program of the Wildlife Branch (Sacramento) and the North Central Region (R2, Rancho Cordova) of the California Department of Fish and Game. The survey used jet boats owned and operated by the Refuge and by DFG R2.

The standard annual survey started just below the Red Bluff Diversion Dam, river mile (RM) 243.0, and continued southward to Colusa, RM 144. Total burrow numbers at each colony were tally-counted by two observers and the two counts averaged. Colonies were recounted when the two counts differed by more than 10%. The GPS locations of colonies, at their downstream extent, were recorded. Field data were recorded electronically on a laptop computer.

As in recent years, the Sacramento River reach from Colusa to the confluence of the Feather River primarily was estimated based on a past survey (Craig Swolgaard, 2000 data); however some limited field data were gathered from this reach in relation to a proposed project that might affect the bank (see below).

This report also contains burrow counts from a June 19, 2008 DWR and DFG field survey of the Sacramento River, Redding to Red Bluff reach (RM 295 (Cypress Street Bridge)¹ to RM 243); and June 16-18, 2008 results of a separate field survey by DWR staff of the Feather River from RM 59 (at Thermalito Afterbay Outlet) to its confluence with the Sacramento (see below). These additional surveys followed the counting methods used in the annual Red Bluff to Colusa survey.

The following are the results of 2008 counts along the banks of the Sacramento River, from north to south (L = left bank, R = right bank facing downstream).

Sacramento River, 2008 – Redding to Red Bluff (RM 295-243):

River Mile	Side	Number of Burrows	Owner
263.7	R	154	private
270.5	R	58	private
271.1	R	24	private
271.2	L	167	private
279.9	L	862	private
282.5	L	95	private

¹ The stretch above RM295.1 to Anderson-Cottonwood Irrigation District (ACID) Dam at RM 299 could not be accessed due to construction on the Cypress Street Bridge

Sacramento River, 2008 – Red Bluff to Colusa (RM 243-144):

River Mile*	Side	Number of Burrows	Owner	Unit, Notes
239.2	R	16	USFWS	LaBarranca
237.5	L	28	Private	colony inactive?
237.4	L	12	Private	colony inactive?
236.5	R	367	USFWS	Mooney
235.2	R	60	USFWS	Ohm
235	R	154	USFWS	Ohm
233.4	L	1060	Private	
232.9	R	144	USFWS	Flynn
231.7	L	102	Private	
231.3	L	105	Private	
228.3	L	44	USFWS	Heron Island
227.4	L	287	Private	
226.6	R	538	Private	
225	L	283	Private	
221.5	L	420	Private	
212.2	L	1450	Private	
211.2	R	1916	BLM	Foster Island
210.3	L	315	Private	
209	R	132	Private	
205.4	L	389	Private	
198.8	L	786	USFWS	Pine Creek
195.4	L	39	CDFG	Pine Creek East
195	R	502	CDFG	Pine Creek West
193	R	3	USFWS	Capay
192.3	L	72	Private	
189.5	R	554	Private	
187.7	R	39	CDFG	Shannon Slough
185	L	372	USFWS	Dead Man's
183.5	R	9	Private	
182.5	L	1691	Private	LS riparian easmt.
181.2	R	275	DFG	Jacinto
175.5	L	184	USFWS	Riparian Sanct.
174.4	L	131	TNC	Hartley Island
173.7	R	63	Private	
172.5	R	250	Private	
172.4	R	430	Private	
171.2	R	290	Private	
170.5	L	502	Private	
170.1	L	259	Private	

River Mile*	Side	Number of Burrows	Owner	Unit, Notes
168.3	R	380	USFWS	Codora
166.6	L	13	Private	
166	R	303	DFG	Princeton North
165.2	L	940	USFWS	Drumheller
162.4	L	48	Private	
161.6	R	179	DFG	Princeton South
161.4	L	32	Private	
157	L	160	Private	
156.6	R	158	Private	
155.7	R	854	DFG	Moulton South
154.8	R	40	DFG	Moulton South
150.4	L	33	Private	
146.8	L	320	Private	

* Exact locations will change in each year's survey, due to colony shifts and river migration

Sacramento River, 2008 estimated, Colusa to Feather River confluence:

River Mile	Projected Number of Burrows
ca. 131.5	80**
ca. 130.0	290**
ca. 129.0	90**
ca. 128.0	140**
ca. 100.0	190**
ca. 87.0	130**
ca. 83.0	20**
ca. 82.0	120**

**Estimated from the 2000 survey

A site visit September 5, 2008, to a proposed restoration project in this lower reach that would affect Sacramento River bank found a bank swallow cluster of about 9 burrows at RM 80.5R (James Navicky, DFG R2, Adam Henderson, DWR). A larger colony was observed at RM 82.5R (bank length 350 m) but no precise burrow count was reported. These sites were visited well outside the bank swallow breeding season, so burrow activity assessments could not be conducted at the standard level. This survey does confirm the continued presence of bank swallow in the lower portion of this reach, since the last dedicated survey in 2000.

Data from the 2008 Feather River survey are provided in a table copied at the end of this document and in the data summary below.

2008 BANK SWALLOW SURVEY RESULTS SUMMARY

Sacramento River

Red Bluff to Colusa: total colonies counted = **51** Total burrows = **17,720**
 Redding to Red Bluff: total colonies counted = **6** Total burrows = **1,360**
 Estimated colonies Colusa to Feather R. Confluence = **8** Est. burrows = **1,060**
 Survey Total Colonies = **65** Survey Total Burrows = **20,140**

Average Burrows per Colony = **310** (rounded to nearest 10)

Assumed burrow occupancy rate = **0.45**

2008 Estimated Number of Pairs ($0.45 \times 20,140$) = **9,060** (rounded to nearest 10)

2007 Estimated Number of Pairs = **9,070**

Population trend = approximately **STATIC** from 2007; **DOWN 31** percent from 1986 baseline of **13,170** pairs. 2008 Colony count (**65**): **DOWN 10** percent from 1986 (**72**). Average colony size has **Decreased** from **410** burrows/colony in 1986 to the current **310** burrows/colony (**76** percent of baseline figure).

Feather River

Thermalito outlet to mouth: total colonies = **18** Total burrows = **3,787**

Average Burrows per Colony = **210** (rounded to nearest 10)

2008 Estimated Number of Pairs = **1,700**

See attached table for Feather River details. Adding the Feather River to the Sacramento River totals for 2008, the grand estimated number of pairs was 10,760, with the Sacramento comprising **84** % and the Feather **16** % of the combined population. A caveat to remember is that this survey falls outside the standard Sacramento River population survey, and does not represent an increase in that population estimate. The Feather River survey showed that bank swallows continue to use suitable Feather River bank habitat in densities nearly comparable to the Sacramento River.

The 2008 Feather River estimate of 1700 pairs is nearly **STATIC** from a 2003 estimate of about 1620 pairs, but is **43% lower** than a 1988 Feather River estimate of 2970 pairs.

2008 Sacramento River Reach Data**River Reach Burrow Count Summary (avg. figures rounded to nearest 10):**

RM 244-295	1,358 burrows	6 cols.	Avg. =	230 burrows per col.
RM 200-243	7,818 burrows	19 cols.	Avg. =	410 burrows per col.
RM 169-199	6,448 burrows	19 cols.	Avg. =	340 burrows per col.
RM 144-168	3,457 burrows	13 cols.	Avg. =	270 burrows per col.
RM 80-143	1,060 burrows(est.)	8 cols.	Avg.(est) =	130 burrows per col.
Totals:	20,141 burrows	65 cols.	Ave. =	310 burrows per col.

Summary of past 13 years of Sacramento River 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
2006	Survey aborted after 6 colonies counted, due to boat problem			
2007	20,150	9,070	51	400
2008	20,140	9,060	65	310

SUMMARY AND DATA INTERPRETATION

Results of the 2008 bank swallow population survey on the Sacramento River indicated little change in estimated pair numbers, the 2008 estimate of 9,060 pairs differing by only 10 from 2007's 9,070 pairs. With the exception of a worrisome dip in 2005, the count on the Sacramento River has hovered in the vicinity of 9,000 pairs since 1999 or 2000. 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. By 1997-1998 the Sacramento

River bank swallow population declined to a low of about 5,000 pairs. While the bank swallow's increase from that precarious position of ten years ago is hopeful, the fact that the species appears stalled at 9,000 pairs is an indication that conditions impairing its recovery remain. The most obvious significant impairment is bank-protection modifications preventing use of many miles of habitat along the Sacramento River, and other state rivers.

Average colony size was approximately 310 burrows during the 2008 Sacramento River survey. Four of 65 colonies were larger than 1,000 burrows, and 50% of the total population was concentrated in 9 large colonies (14% of all colonies). Large (1000+ burrows) colonies may indicate general health of the population and function as breeding centers to re-populate former range. However, they represent a potentially risky concentration of the population at a small number of sites; for example, some of these colonies may be threatened by bank protection work. We need not only big colonies but many of them to increase the population toward recovery levels of approximately 50,000 pairs.

The 2008 Feather River survey was encouraging in that it showed bank swallows continue to use suitable habitat elsewhere in the region in substantial numbers. The presence of apparently successful colonies there and elsewhere represents a bolstering of total population size and spreading of risk from the Sacramento River population. However, the Feather River data also are consistent with the pattern of historic decline and lack of recent progress toward population recovery seen on the Sacramento River.

The bank swallow population still is threatened by activities that reduce its habitat. There are still new bank protection sites planned on the Sacramento River. If all proposed sites were rip-rapped then 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 other lands and are not protected from habitat alteration due primarily to bank protection.

The status of the bank swallow population remains of concern. This is particularly true since recovery of the Sacramento River population appears stalled at about 9,000 pairs. Annual monitoring of the species should continue. According to the Population Viability Analysis we 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 trend of government and privately financed rip rapping, and other bank stabilization and erosion control projects, if they continue to impact nesting habitat or cause mortality to young birds, could further degrade the population status of the bank swallow in California. Overall, the bank swallow's depleted conservation status underscores the need for stronger measures to protect and restore the species and its habitat.

Resource Assessment Program
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Copy of "Figure 2. 2008 Survey Results Summary Table" from DWR draft Feather River bank swallow (BANS) survey report

2008 Feather River BANS Attribute Table												
Date Obs	Active Colony	Colony Number	River Bank	Burrow Average	Occupancy	Elevation Above Water (meter)	Elevation Above Slope(meter)	Flow (cfs)	Gauge	Notes	Bank Height (ft)	Ownership
6/16/2008	Y	55	L	10	4	2	1	2833	GRL		11-20	Private
6/16/2008	N	49.3	L	0	0			2833	GRL			Private
6/16/2008	N	45.6	R	0	0			2833	GRL			Private
6/16/2008	Y	44.8	L	498	224	3	1.5	2833	GRL	highly active 2 weeks prior to survey; lots of potential habitat	21-30	Private
6/16/2008	Y	44.3	R	70	32	1	1	2833	GRL		6-10	Private
6/16/2008	N	44	R	0	0			2833	GRL	approx. 15 clear entrances with no cobweb		Private
6/16/2008	Y	43.8	L	82	37	2	1	2833	GRL		11-20	Private
6/16/2008	Y	43.5	L	825	371	1.5	1	2833	GRL		21-30	Private
6/16/2008	Y	42.2	L	154	69	5	.5	2833	GRL		21-30	Private
6/16/2008	Y	40.4	L	107	48	1.5	1.5	2833	GRL		11-20	Private
6/16/2008	Y	40.2	R	188	85	1.5	1	2833	GRL		11-20	Private
6/16/2008	N	40	L	0	0			2833	GRL			Private
6/16/2008	Y	39.5	L	250	112	2.5	1.5	2833	GRL		11-20	Private
6/17/2008	Y	35.8	L	27	12	2	.5	3441	GRL + MRY	no birds observed at time of survey	21-30	Private
6/17/2008	Y	34.7	L	87	39	4.5	1	3441	GRL + MRY	birds observed at time of survey	11-20	Private
6/17/2008	Y	34.3	R	572	257	3	1	3441	GRL + MRY	lower section elevation above water 2m and above slope .5	11-20	CDFG
6/17/2008	Y	31	L	28	13	2.5	1	3441	GRL + MRY		21-30	Private
6/17/2008	Y	30.6	R	24	11	5.5	0	3441	GRL + MRY		21-30	Private
6/17/2008	Y	25.6	R	82	37	1	.5	3441	GRL + MRY		11-20	Private
6/17/2008	N	23.3	L	0	0			3441	GRL + MRY			Private
6/17/2008	Y	20.7	R	210	94	1.5	1	3441	GRL + MRY		11-20	CDFG
6/17/2008	Y	20.8	R	158	71	1	.5	3441	GRL + MRY		11-20	CDFG
6/17/2008	N	19.4	L	0	0			3441	GRL + MRY			Private
6/17/2008	N	19.2	L	0	0			3441	GRL + MRY			CDFG
6/17/2008	Y	11.5	L	415	187	3	.5	3441	GRL + MRY	birds present, upper end of colony elev above water 1.5	11-20	Private