

Nesting Swainson's Hawks (*Buteo swainsoni*) in the Natomas Basin Habitat Conservation Plan Area

2002 Annual Survey Results

September 2002



Prepared for:

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BASIN
c o n s e r v a n c y

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in the Natomas Basin Habitat Conservation Plan Area
2002 Annual Survey Results**

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Background

In November 1997, the Natomas Basin Habitat Conservation Plan (NBHCP) (City of Sacramento 1997) was submitted to the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (DFG) in support of an application for a federal permit under Section 10(a)(1)(B) of the Endangered Species Act and a state permit under Section 2081 of the California Fish and Game Code. The USFWS and DFG subsequently approved the plan and issued permits.

Among the 26 species covered in the NBHCP is the Swainson's hawk (*Buteo swainsoni*), a state-threatened species in California. The Swainson's hawk is known to occur throughout portions of the Natomas Basin, and along with the giant garter snake (*Thamnophis gigas*), is one of two focus species covered in the NBHCP.

The NBHCP and its Implementing Agreement specify the agreed-upon conditions upon which the permits are granted. Among these conditions is the requirement to conduct an annual survey of nesting Swainson's hawks (Chapter IV, Section C.2.c of the NBHCP). In compliance with the conditions as described in the NBHCP, this report summarizes the results of 2002 surveys for the Swainson's hawk in the NBHCP area.

On August 15, 2000, Federal Judge David Levi made a ruling related to a federal lawsuit (National Wildlife Federation vs. Bruce Babbitt, Secretary of the Interior) related to the NBHCP that invalidated the Section 10(a)(1)(B) permit issued by the USFWS. One result of the lawsuit is that a revised HCP would be required, which would subsequently result in a new Section 10(a)(1)(B) permit. The revised draft NBHCP, dated July 2002, is expected to be finalized by the end of 2002 and a new 10(a)(1)(B) permit is expected by spring 2003. The revised draft NBHCP also specifies basin-wide annual monitoring for Swainson's hawk. However, until the new permit is issued, the monitoring requirements specified in the original NBHCP, including conducting annual surveys for nesting Swainson's hawk, remain in effect.



Location

The Natomas Basin is a 53,341-acre low-lying area of the Sacramento Valley located in the northern portion of Sacramento County and the southern portion of Sutter County (**Figure 1**). The Natomas Basin is bounded on the west by the Sacramento River, on the east and south by the Natomas East Main Drain Canal, and on the north by the Natomas Cross Canal (**Figure 2**). The NBHCP area includes the interior of the Basin, inside the inner peripheral levees of Sacramento River, Natomas Cross Canal, and Natomas East Main Drain Canal.

Setting

The Natomas Basin is within the historical floodplain of the Sacramento and American Rivers. Prior to agricultural conversion, the Basin consisted of wetlands, narrow streams with associated riparian vegetation, shallow lakes, and grasslands on the higher terraces along the eastern edge of the Basin. During the late 1800's and early 1900s, most of Basin was converted to agriculture. Most native habitats were removed and channelized water delivery systems replaced the natural stream corridors.

The central and northern portions of the Basin are the lowest elevation areas within the Basin. With deep clay soils the flat, largely treeless terrain is characterized primarily by rice farming (**Plate 1**). Very few trees or other vegetation types are present with the exception of the Cross Canal along the northern border of the basin. This area consists of a mature riparian forest and wetland complex throughout its length (**Plate 2**).



Plate 1. Typical Habitat of the North and Central Basin.



Plate 2. Natomas Cross Canal.

Situated primarily on alluvial soils, the southern and western portions of the basin are characterized by a mixture of row, grain, and hay crops. Throughout this area, small remnant stands of valley oak woodland and remnant patches of riparian woodland, such as along Fisherman's Lake, persist in an otherwise entirely agricultural area (**Plate 3**). The southern portion of this area is also rapidly converting to urbanization, primarily residential developments (**Plate 4**). Along the western edge is the Sacramento River, consisting of mature cottonwood-dominated riparian forest (**Plate 5**).

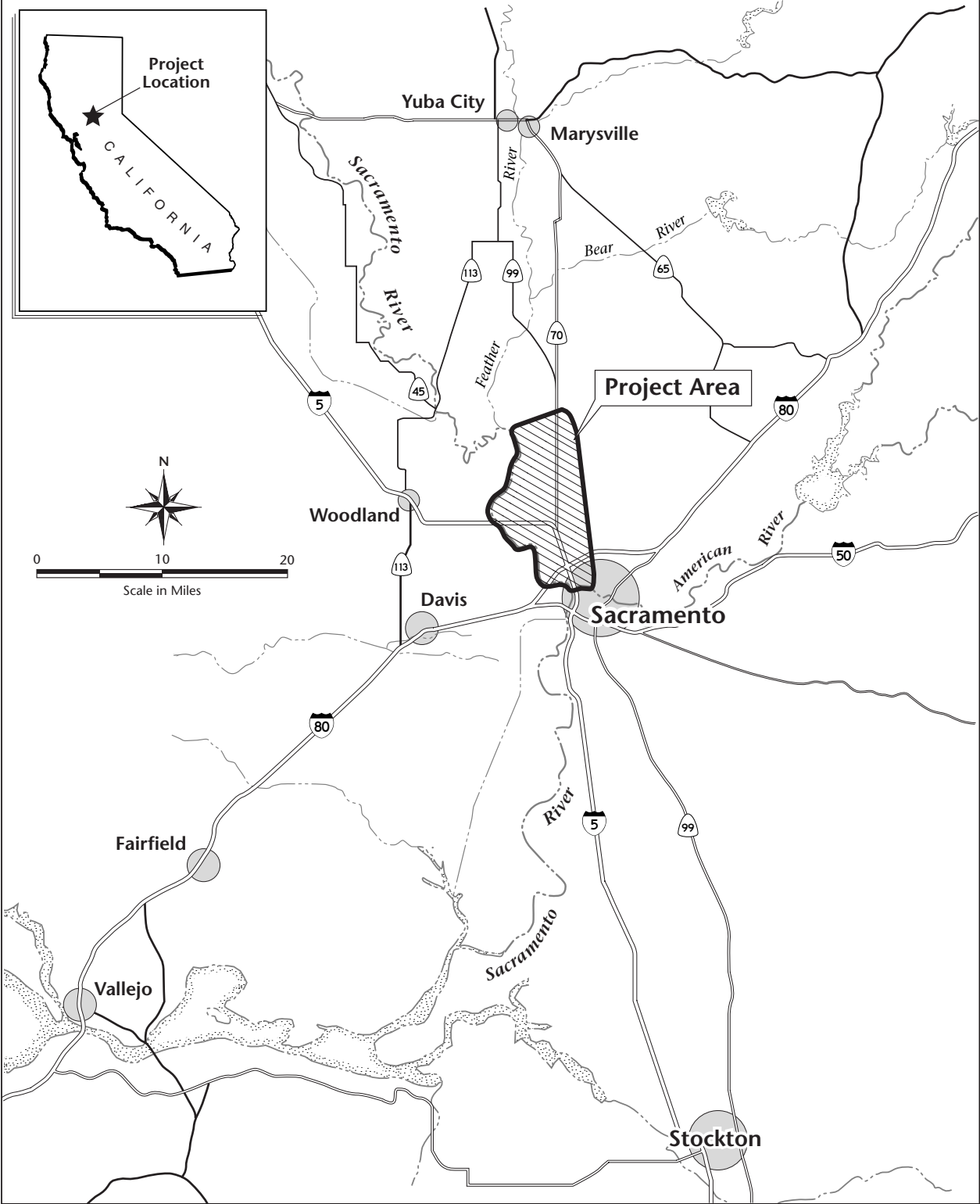


Figure 1. Natomas Basin Regional Location Map

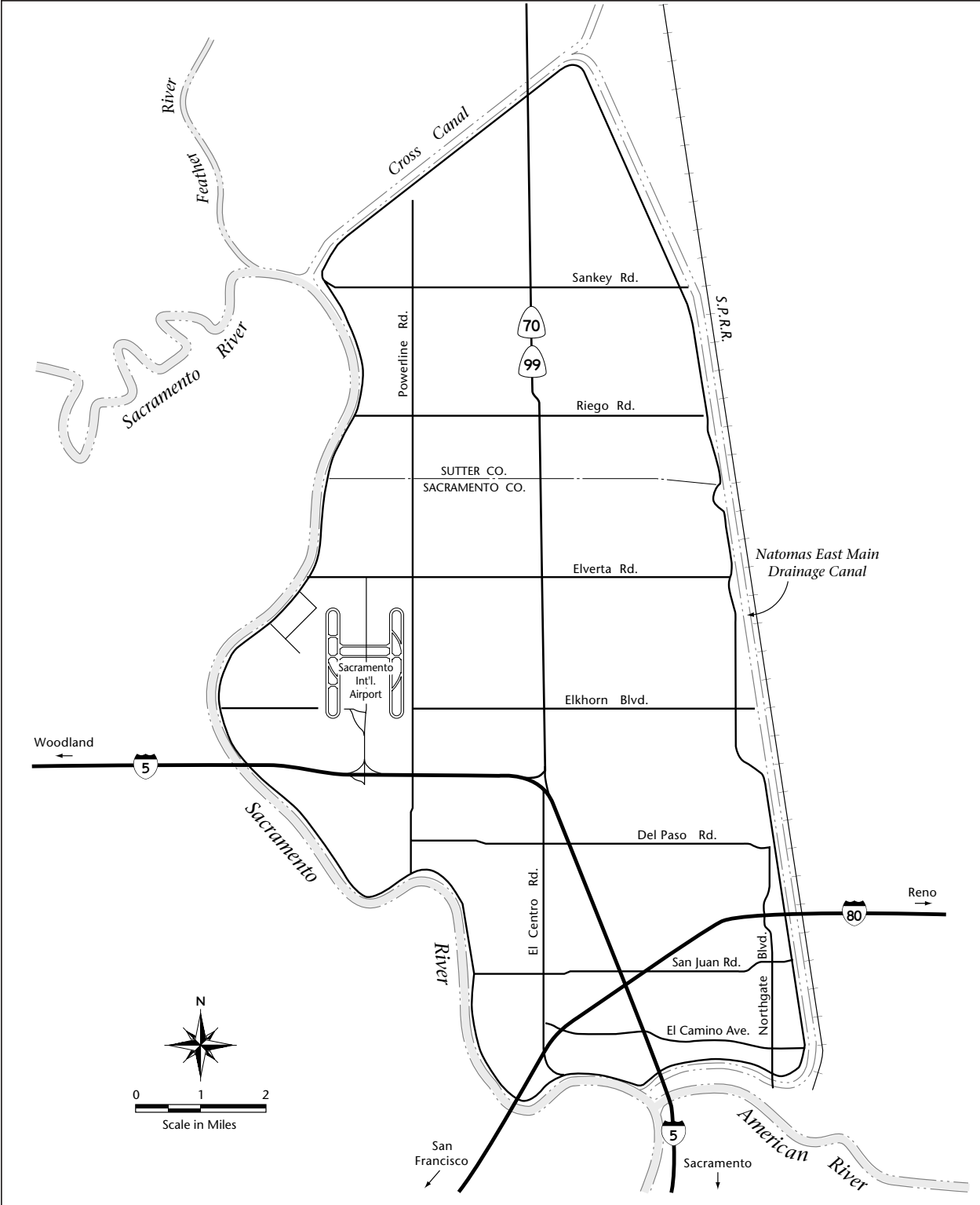


Figure 2. Natomas Basin



Plate 3. Typical Habitat of the West and South Basin.



Plate 4. Residential Development in the South Basin.



Plate 5. Riparian Forest along the Sacramento River.

The eastern edge of the Basin occurs on a slightly higher terrace than the rest of the Basin. This area, consisting primarily of loam and clay-loam soils and gently rolling topography is characterized by annual grasslands and grazed dry and irrigated pastures (Plate 6). This area is bordered on the east by the Natomas East Main Drain, a channelized drainage that supports an extensive wetland complex and sparse riparian vegetation along its length (Plate 7).



Plate 6. Typical Habitat of the East Basin.



Plate 7. Natomas East Main Drain.

Life History and Habitat Associations

Status and Range. The Swainson's hawk (Plate 8) inhabits grassland plains and agricultural regions of western North America during the breeding season and winters in grassland and agricultural regions extending from Central Mexico to southern South America (England et.al 1997, Bradbury et al. *in preparation*). Early accounts described the Swainson's hawk as one of the most common raptors in California, occurring throughout much of lowland California (Sharp 1902). Since the mid-1800s, these native habi-



Plate 8. Adult Swainson's Hawk.

tats have undergone a gradual conversion to agricultural uses. Today, native grassland habitats are virtually nonexistent in the state, and only remnants of the once vast riparian forests and oak woodlands still exist (Katibah 1983). This habitat loss has caused a substantial reduction in the breeding range and the size of the breeding population in California (Bloom 1980, England et al. 1997). Swainson's hawks are also sensitive to habitat fragmentation and will avoid low-density development (e.g., parcels with improvements subdivided to <10 acres) even though suitable prey conditions may exist (Estep and Teresa 1992) (However, Swainson's hawks are known to re-inhabit dense urban areas to nest if suitable nesting trees are present and suitable foraging habitat exists within 2 miles of the nest (England et al. 1995). The state currently supports between 700 and 1,000 Swainson's hawk breeding pairs (Swainson's Hawk Technical Advisory Committee file data), which represents less than 10% of the historic population (Bloom 1979).

The Central Valley population (between 600 and 900 breeding pairs) extends from Tehama County southward to Tulare and Kings Counties. The Central Valley is surrounded by mountains, including the Sierra Nevada on the east and the Cascade Range on the north, and is thus geographically isolated from the rest of the species' range. Extensive banding (Estep 1989, *unpublished data*, P. Bloom *unpublished data*, B. Woodbridge *unpublished data*) suggests that no movement occurs between the Central Valley breeding population and other populations. Results of satellite radio-telemetry studies of migratory patterns

further indicates little to no interaction between the Central Valley population and other populations of Swainson's hawks (Bradbury et al. *In preparation*).

Despite the loss of native habitats in the Central Valley, the Swainson's hawk appears to have adapted relatively well to certain types of agricultural patterns in areas where suitable nesting habitat remains (Plate 9).

The optimal foraging and nesting habitat conditions in Yolo and portions of Sacramento and San Joaquin Counties support the bulk of the Central Valley Swainson's hawk population (Estep 1989, Estep *In preparation*) (Figure 3).



Plate 9. Typical Swainson's Hawk Nesting and Foraging Habitat in the Central Valley.

Habitat Use. Swainson's hawks usually nest in large native trees such as Valley Oak (*Quercus lobata*), cottonwood (*Populus fremontia*), willow (*Salix* sp.) (or occasionally in non-native trees, such as eucalyptus [*Eucalyptus* sp.]). Nests occur in riparian woodlands, roadside trees, trees along field borders, isolated trees, small groves, and on the edges of remnant oak woodlands. Stringers of remnant riparian forest along drainages contain the majority (87%) of known nests in the Central Valley (England et al. 1997, Estep 1984, Schlorff and Bloom 1984). Nests are usually constructed as high as possible in the tree, providing optimal protection and visibility from the nest (Plate 10).

Nesting pairs are highly traditional in their use of nesting territories and nesting trees. Many nest sites in the Central Valley have been occupied annually since 1979 (Estep *unpublished data*), and banding studies conducted since 1986 confirm a high degree of nest and mate fidelity (Estep *in preparation*). Nesting habitat for Swainson's hawks continues to decline in the Central Valley because of flood control projects, agricultural practices, and urban expansion.

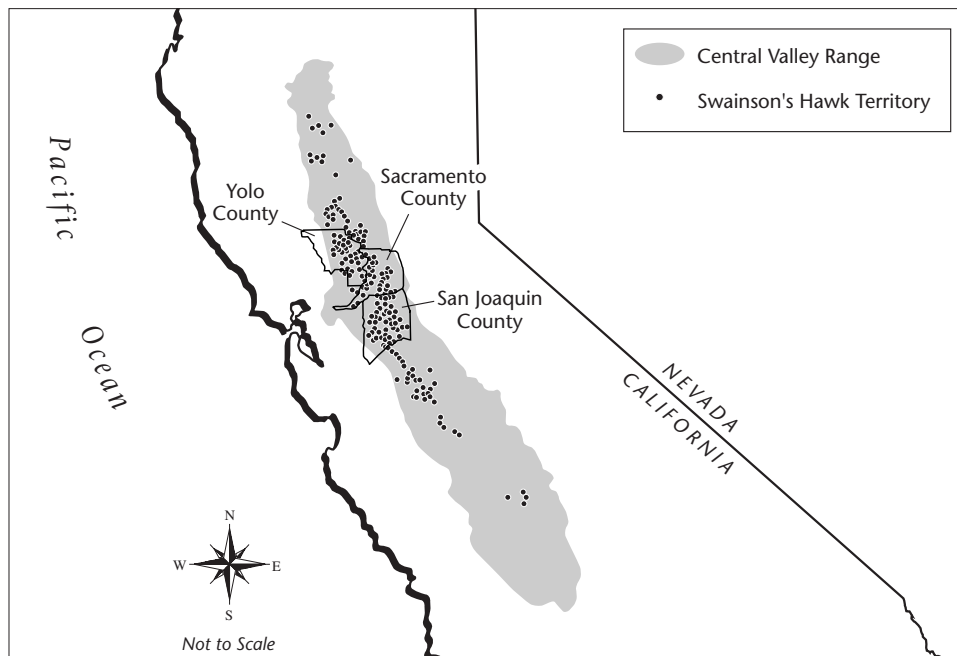


Figure 3. Distribution of the Swainson’s Hawk in the Central Valley of California

In the Central Valley, Swainson’s hawks feed primarily on small rodents, usually in large fields that support low vegetative cover (to provide access to the ground), and provide the highest densities of prey (Bechard 1982, Estep 1989). These habitats include fields of hay and grain crops and certain row crops, such as tomatoes and sugar beets, and lightly grazed pasturelands. Fields lacking adequate prey populations (e.g., flooded rice fields) or those that are inaccessible to foraging birds (e.g., vineyards and orchards) are rarely used (Estep 1989, Babcock 1995). Urban expansion and conversion to unsuitable crop types (e.g., vineyards and orchards) are responsible for a continuing reduction of available Swainson’s hawk foraging habitat in the Central Valley.

Breeding Season Phenology. Swainson’s hawks arrive onto the breeding grounds from early March to early April. Breeding pairs immediately begin constructing new nests or repairing old nests. Eggs are usually laid in mid-to late-April, and incubation continues until mid-May when young begin to hatch. The brooding period typically continues through early- to mid-July when young begin to fledge (England et al. 1997). Studies conducted in the Sacramento Valley indicate that 1 or 2 young and occasionally 3 young typically fledge from successful nests, with an average of 1.4 to 1.8 young per successful nest (Estep *in preparation*) (Plate 11). After fledging, young remain near the nest and are dependent on the adults for about 4 weeks, after which they permanently leave the breeding territory (Anderson et al. *in progress*). By mid-August, breeding territories are no longer defended and Swainson’s hawks begin to form communal groups. These groups begin their fall migration from late August to late-September. Unlike the rest of the species, which migrates to southern Argentina for the winter, the Central Valley population winters primarily in Central Mexico, and to a lesser extent throughout portions of Central and South America (Bradbury et al. *in preparation*).



Plate 10. Typical Swainson's Hawk Nest.

Methods

Surveys were conducted by systematically driving all available roads within the NBHCP area. Where roads were not available to drive (e.g., levee road along the Cross Canal), or where there were no roads to access potential nest trees, the survey was conducted on foot. All potential nesting trees were searched for nests and adult Swainson's hawks using binoculars and/or a spotting scope.

Surveys were conducted in three phases. Phase one was conducted early in the breeding season (late March to mid-April) to detect Swainson's hawk activity at previously known nest sites and in all other suitable nesting habitat. All suitable nesting habitat was checked for the presence of adult Swainson's hawks and to note all nesting activity and behavior (e.g., nest construction, courtship flights, defensive behavior). Activity was noted and mapped on field maps.

Phase two surveys were conducted in mid-May through June to determine if breeding pairs detected during phase one surveys were actively nesting and to resurvey all previously unoccupied potential nesting habitat for active nests.

Phase three surveys were conducted in July to determine nesting success and record the number of fledged young per nest.

Incidental observations were also noted, including foraging and roosting, and other observations of adult Swainson's hawks to determine nesting status.



Plate 11. Nestling Swainson's Hawks.

Results

Nest sites occur primarily in the southern portion of the Basin, or along the far western and northern edges of the Basin. These are areas that support both suitable nesting and foraging habitat. Crop patterns include a mixture of hay, row, and grain crops. Suitable nesting trees occur along roadsides, remnant riparian and oak woodlands, and isolated trees. Most of the Basin north of Elkhorn Boulevard and east of Powerline Road is unsuitable or marginally suitable for nesting or foraging Swainson's hawks, and thus most of the area does not support nesting pairs. The agricultural land use is dominated by rice, which provides limited foraging value to Swainson's hawks; and very few trees exist in the region, limiting potential nesting sites.

A total of 70 Swainson's hawk nesting territories were monitored in 2002 (**Table 1**). Among these are 4 new sites in the interior of the basin (NB-63, NB-64, NB-65, and NB-69) and 3 new territories along the Sacramento River (NB-66, NB-67, and NB-70).

During 1999 and 2000 surveys, Sacramento River data were separated from the rest of the NBHCP Swainson's hawk data because of inconsistent coverage. 2001 and 2002 surveys included the Sacramento River nesting pairs during all phases of monitoring, and thus all known nest sites within the NBHCP boundaries and peripheral areas (i.e., Sacramento River, Natomas Cross Canal, and Natomas East Main Drain) are now combined into one data base. This area, the NBHCP area and peripheral drainages, is heretofore referred to as the survey area.

Of the 70 known nesting territories in the survey area, 43 were active (i.e., at least one adult was present on the nesting territory) and 27 were inactive (i.e., neither adult was observed on the nesting territory) in 2002. Of the 43 active sites, 24 were occupied by breeding pairs that successfully nested (i.e., reared young to fledging), producing a total of 38 fledglings. Eighteen of the remaining 19 active sites did not successfully reproduce; and the reproductive outcome of 1 site was undetermined. Eleven of these nested but failed to rear young to fledging and 7 were occupied by the adult breeding pair but they did not attempt nesting. **Table 2** presents the activity and reproductive data available for all 70 known nesting territories in the survey area between 1998 and 2002.

Overall reproductive performance was similar to 2001 but low compared with 1999 and 2000 results (Swainson's Hawk Technical Advisory Committee 1999, 2000, 2001) (**Table 3**). While the total number of known nests and active nests has increased each year since 1999, the proportion of these successfully reproducing has declined. However, the number of young per successful nest has remained relatively stable between these years (**Table 3**), and is generally consistent with the Sacramento Valley population as a whole since the mid-1980s (Estep *in preparation*).

**Table 1. Results of 2002 Swainson's Hawk Survey,
Natomas Basin Habitat Conservation Plan Area**

Nest Site Number	Status	Number of Young	Nesting Habitat	Nest Tree Species
NB-1	inactive at farmstead	0	remnant grove	walnut
NB-2	inactive	0	ornamental	cottonwood
NB-3	inactive	0	two isolated cottonwood trees	cottonwood
NB-4	inactive	0	riparian	cottonwood
NB-5	inactive	0	riparian	willow
NB-6	active/not nesting	0	ornamental	eucalyptus
NB-7	inactive	0	nest trees removed in 2002	none
NB-8	active/successful	1	ornamental landscaping	cottonwood
NB-9	inactive	0	riparian along irrigation channel	cottonwood
NB-10	inactive	0	isolated tree	cottonwood
NB-11	active/failed	0	riparian	cottonwood
NB-12	active/did not nest	0	riparian	cottonwood
NB-13	active/successful	2	riparian	cottonwood
NB-14	active/successful	2	ornamental	eucalyptus
NB-15	inactive	0	nesting habitat removed in 2002	none
NB-16	inactive	0	remnant oak grove	valley oak

Table 1, Continued

Nest Site Number	Status	Number of Young	Nesting Habitat	Nest Tree Species
NB-17	inactive	0	lone tree, removed in 1998	ornamental mulberry
NB-18	active/successful	2	lone tree, just south of former site	cottonwood
NB-19	active/failed	0	tree along irrigation channel	willow
NB-20	inactive	0	nest tree removed in 2002	none
NB-21	active/did not nest	0	riparian	cottonwood
NB-22	active/did not nest	0	tree along irrigation channel	cottonwood
NB-23	active/successful	2	riparian	cottonwood
NB-24	active/successful	2	riparian	valley oak
NB-25	active/did not nest	0	riparian	walnut
NB-26	inactive	0	nesting habitat removed in 2002	none
NB-27	active/successful	2	riparian	cottonwood
NB-28	active/successful	2	riparian	cottonwood
NB-29	inactive	0	riparian	cottonwood
NB-30	inactive	0	riparian	cottonwood
NB-31	active/successful	1	riparian	cottonwood
NB-32	inactive	0	riparian	cottonwood
NB-33	active/successful	1	riparian	willow

Table 1, Continued

Nest Site Number	Status	Number of Young	Nesting Habitat	Nest Tree Species
NB-34	active/did not nest	0	riparian	cottonwood
NB-35	active/successful	2	riparian	cottonwood
NB-36	active/failed	0	riparian	cottonwood
NB-37	inactive	0	riparian	cottonwood
NB-38	active/failed	0	riparian	cottonwood
NB-39	active/failed	0	riparian	cottonwood
NB-40	active/failed	0	riparian	cottonwood
NB-41	active/successful	1	riparian	cottonwood
NB-42	inactive	0	riparian	cottonwood
NB-43	active/successful	2	riparian	cottonwood
NB-44	active/failed	0	riparian	cottonwood
NB-45	active/did not nest	0	riparian	valley oak
NB-46	inactive	0	riparian	cottonwood
NB-47	active/successful	2	riparian	cottonwood
NB-48	inactive	0	riparian	valley oak
NB-49	active/successful	1	riparian	cottonwood
NB-50	inactive	0	riparian	sycamore

Table 1, Continued

Nest Site Number	Status	Number of Young	Nesting Habitat	Nest Tree Species
NB-51	active/successful	1	riparian	cottonwood
NB-52	active/successful	2	riparian	cottonwood
NB-53	inactive	0	riparian	cottonwood
NB-54	inactive	0	riparian	cottonwood
NB-55	active/successful	2	riparian	cottonwood
NB-56	inactive	0	riparian	cottonwood
NB-57	inactive	0	riparian	cottonwood
NB-58	inactive	0	riparian	cottonwood
NB-59	inactive	0	riparian	cottonwood
NB-60	inactive	0	riparian	cottonwood
NB-61	active/failed	0	riparian	cottonwood
NB-62	active/failed	0	riparian	cottonwood
NB-63	active/successful	2	lone tree	willow
NB-64	active/successful	2	riparian	cottonwood
NB-65	active/failed	0	riparian	cottonwood
NB-66	active/successful	1	riparian	cottonwood

Table 1, Continued

Nest Site Number	Status	Number of Young	Nesting Habitat	Nest Tree Species
NB-67	active/successful	1	riparian	cottonwood
NB-68	active/successful	1	riparian	cottonwood
NB-69	active/successful	1	freeway	willow landscape tree
NB-70	active/unknown outcome	unknown	riparian	valley oak
<p>Active = at least one adult observed on the nesting territory Inactive = neither adult observed on the nesting territory Successful = young reared to fledging Failed = nesting attempted with no young reared to fledging Unknown Outcome = nesting attempted, but unknown if young reared to fledging Did not nest = adults present on the nesting territory but not nesting</p>				

Table 2. Swainson's Hawk Nesting Status and Reproductive Data, 1998 through 2002, Natomas Basin Habitat Conservation Plan Area

Nest Site	1998	1999	2000	2001	2002
NB-1	no data successful;	active; successful;	active; successful; 2 young	active; 2 young	inactive 1 young
NB-2	active; unknown outcome	active; successful; 2 young	active; did not nest; 0 young	inactive	inactive
NB-3	no data successful; 1 young	active; successful; 3 young	active; did not nest; 0 young	active;	inactive
NB-4	no data successful; 2 young	active; did not nest; 0 young	active;	inactive	inactive
NB-5	no data	active; successful; 1 young	inactive	active; failed; 0 young	inactive
NB-6	active; unknown outcome	active; successful; 2 young	inactive	inactive	active; did not nest 0 young
NB-7	active; unknown outcome	active; successful; 2 young	active; successful; 3 young	active; successful; 2 young	inactive
NB-8	active; unknown outcome	active; successful; 3 young	active did not nest; 0 young	active; successful; 2 young	active; successful; 1 young
NB-9	active; unknown outcome	active; successful; 2 young	active; successful; 2 young	active did not nest; 0 young	inactive
NB-10	no data	active; successful; 1 young	active; failed; 0 young	inactive	inactive
NB-11	active; unknown outcome	active; successful; 2 young	active; failed; 0 young	active; failed; 0 young	active; failed; 0 young
NB-12	active; failed; 0 young	active; successful; 1 young	active; did not nest; 0 young	active; did not nest; 0 young	active; did not nest; 0 young
NB-13	active; unknown outcome	active; successful; 2 young	active; successful; 2 young	active; successful; 2 young	active; successful; 2 young
NB-14	active; unknown outcome	active; successful; 2 young	active; successful; 2 young	active; successful; 2 young	active; successful; 2 young

Table 2, Continued

Nest Site	1998	1999	2000	2001	2002
NB-15	active; failed; 0 young	active; failed; 0 young	inactive	inactive	inactive
NB-16	active; unknown outcome	inactive	inactive	inactive	inactive
NB-17	active failed; 0 young	inactive	inactive	inactive	inactive
NB-18	active; failed; 0 young	inactive	inactive	inactive	active; successful; 2 young
NB-19	no data	no data	active; failed; 0 young	active; successful; 2 young	active; failed; 0 young
NB-20	no data	no data	active; successful; 1 young	active; failed; 0 young	inactive
NB-21	no data	no data	active; failed; 0 young	active; failed; 0 young	active; did not nest; 0 young
NB-22	no data	no data	active; successful; 1 young	active; failed; 0 young	active; did not nest; 0 young
NB-23	no data	no data	active; successful; 2 young	active; successful; 2 young	active; successful; 2 young
NB-24	no data	no data	active; successful; 2 young	active; successful; 1 young	active; successful; 2 young
NB-25	no data	no data	no data	active; failed; 0 young	active; did not nest; 0 young
NB-26	no data	no data	no data	active; successful; 2 young	inactive
NB-27	no data	no data	no data	active; successful; 2 young	active; successful; 2 young

Table 2, Continued

Nest Site	1998	1999	2000	2001	2002
NB-28	no data	no data	active; unknown outcome	active; successful; 1 young	active; successful; 2 young
NB-29	no data	no data	active; unknown outcome	inactive	inactive
NB-30	no data	no data	no data	active; failed; 0 young	inactive
NB-31	no data	no data	active; unknown outcome	active; did not nest; 0 young	active; successful; 1 young
NB-32	no data	no data	active; unknown outcome	active did not nest; 0 young	inactive
NB-33	no data	no data	no data	active; successful; 1 young	active; successful; 1 young
NB-34	no data	no data	active; unknown outcome	active; did not nest; 0 young	active; did not nest; 0 young
NB-35	no data	no data	active; unknown outcome	inactive	active; successful; 2 young
NB-36	no data	no data	active; unknown outcome	active; failed; 0 young	active; failed; 0 young
NB-37	no data	no data	active; unknown outcome	active; did not nest; 0 young	inactive
NB-38	no data	no data	no data	active; failed; 0 young	active; failed; 0 young
NB-39	no data	no data	no data	active; failed; 0 young	active; failed; 0 young
NB-40	no data	no data	active; unknown outcome	active; failed; 0 young	active; failed; 0 young

Table 2, Continued

Nest Site	1998	1999	2000	2001	2002
NB-41	no data	no data	no data	active; successful; 2 young	active; successful; 1 young
NB-42	no data	no data	no data	active; failed; 0 young	inactive
NB-43	no data	no data	active; unknown outcome	active; failed; 0 young	active; successful; 2 young
NB-44	no data	no data	active; unknown outcome	active; successful; 1 young	active; failed 0 young
NB-45	no data	no data	no data	active; successful; 2 young	active; did not nest; 0 young
NB-46	no data	no data	no data	active; successful; 2 young	inactive
NB-47	no data	no data	active; unknown outcome	active; successful; 2 young	active; successful; 2 young
NB-48	no data	no data	active; unknown outcome	inactive	inactive
NB-49	no data	no data	no data	active; successful; 2 young	active; successful; 1 young
NB-50	no data	no data	active; unknown outcome	inactive	inactive
NB-51	no data	no data	active; unknown outcome	active; successful; 2 young	active; successful; 1 young
NB-52	no data	no data	active; unknown outcome	active; successful; 2 young	active; successful; 2 young
NB-53	no data	no data	active; unknown outcome	active; failed; 0 young	inactive

Table 2, Continued

Nest Site	1998	1999	2000	2001	2002
NB-54	no data	no data	no data	active; successful; 1 young	inactive
NB-55	no data	no data	no data	active; successful; 1 young	active; successful; 2 young
NB-56	no data	no data	active; unknown outcome	inactive	inactive
NB-57	no data	no data	active; unknown outcome	inactive	inactive
NB-58	no data	no data	no data	active; failed; 0 young	inactive
NB-59	no data	no data	active; unknown outcome	inactive	inactive
NB-60	no data	no data	active; unknown outcome	inactive	inactive
NB-61	no data	no data	no data	active; successful; 1 young	active; failed; 0 young
NB-62	no data	no data	active; unknown outcome	active; successful; 2 young	active; failed; 0 young
NB-63	no data	no data	no data	no data	active; successful; 2 young
NB-64	no data	no data	no data	no data	active; successful; 2 young
NB-65	no data	no data	no data	no data	active; failed; 0 young
NB-66	no data	no data	no data	no data	active; successful; 1 young

Table 2, Continued

Nest Site	1998	1999	2000	2001	2002
NB-67	no data	no data	no data	no data	active; successful; 1 young
NB-68	no data	no data	no data	no data	active; successful; 1 young
NB-69	no data	no data	no data	no data	active; successful; 1 young
NB-70	no data	no data	no data	no data	active; unknown outcome
<p>Active = at least one adult observed on the nesting territory Inactive = neither adult observed on the nesting territory Successful = young reared to fledging Failed = nesting attempted with no young reared to fledging Unknown Outcome = nesting attempted, but unknown if young reared to fledging Did not nest = adults present on the nesting territory but not nesting No Data = Survey not conducted or no activity detected during the year indicated</p>					

Table 3. Reproductive Data for Active Swainson's Hawk Territories in the Natomas Basin Habitat Conservation Plan Area, from 1999 to 2002

Year	Number Active Territories	Number Successful Nests	Number Failed Nests	Number Active but not Nesting	Number Young Reared to Fledging	Number Young per Active Territory	Number Young per Occupied Nest	Number Young per Successful Nest
Excluding Sacramento River¹								
1999	15	14	1	0	25	1.67	1.67	1.79
2000	18	10	4	4	20	1.11	1.43	2.00
2001	19	10	6	3	18	0.95	1.13	1.80
Including Sacramento River								
2001	46	24	15	7	40	0.87	1.03	1.67
2002	42 ²	24	11	7	38	0.90	1.09	1.58
<p>1) The Sacramento River territories are excluded here because only two years (2001 and 2002) of reproductive data are available.</p> <p>2) NB-70 is excluded because reproductive outcome at that active site was undetermined. The actual number of active territories in 2002 was 43.</p>								

Development and Acquisition

To date, acquisition of conservation lands (Table 4) has kept pace with the number of acres of development permitted under the HCP, using the 0.5:1 ratio required under the HCP. Figure 4 illustrates the approximate locations of lands permitted for development under the HCP and lands acquired as conservation lands by the Natomas Basin Conservancy. As of September 1, 2002, a total of 4,061.84 acres of land has been permitted for development under the HCP, and (with the addition of two parcels for which the sale has not closed as of this report [Table 4]) a total of 2,782 acres on 15 parcels will have been acquired and will be managed as conservancy lands. Site-specific management plans have been prepared and approved by the Natomas Basin Conservancy for 11 of the 15 conservation land parcels (Wildlands, Inc. 2001, 2002).

Recommendations

1. Rely on survey results to strategize acquisition efforts with the goal of sustaining the existing Swainson's hawk population. Many of the pairs are within or near areas that will be impacted by current or planned development. Thus, a net loss of suitable nesting and foraging habitat, and breeding pairs, is expected. To sustain the population in the basin and to offset this loss, efforts should be made to create new nesting and foraging habitat in protected areas.
2. Focus acquisition efforts within 1 mile of the Sacramento River. This is the area that is currently most critical to sustaining the existing population because it supports suitable nesting and foraging habitat, and the majority of breeding pairs that use the basin. Enhancement efforts (i.e., converting unsuitable habitat to suitable habitat) within this area will help to offset the loss described in number 1 above.
3. Focus acquisition and restoration efforts on upland habitats. While seasonal wetlands can provide some foraging value to Swainson's hawks, permanent uplands provide the highest value foraging habitat. Permanent uplands include non-rice agricultural fields, grasslands, and pastures.
4. Develop a Basin-wide strategy for acquisition and management of Swainson's hawk habitat. Identify areas throughout the Basin that could contribute to sustaining and/or expanding the Swainson's hawk population through management, enhancement, or creation of suitable habitat.
5. Carefully select and give preference to conservation sites that provide potential for additional acquisition of neighboring properties.
6. Preference should be given to utilizing simple management techniques and existing farm resources for the Swainson's hawk components of the reserve lands. Efforts should be made to integrate surrounding farmlands with reserve lands.

**Table 4. Natomas Basin Habitat Conservation Plan
Mitigation Land Acquisition as of August, 2002**

Property	Date Acquired	Acres
Silva	1-7-99	159.200
Betts	4-5-99	138.992
Kismat	4-16-99	40.293
Bennett (North)	5-17-99	226.675
Bennett (South)	5-17-99	132.486
Lucich North*	5-18-99	247.31
Lucich South	5-18-99	351.889
Brennan	6-15-00	241.376
Frazer	7-31-00	92.600
Souza**	7-02-01	44.68
Natomas Farms	7-09-01	96.46
Ayala	2-20-02	317.3674
Sills***	7-15-02	575.5559
Alleghany 50	Not Closed	50.2601
Cummings	Not Closed	66.8307
Total		2,781.9751

* Lucich reduced from records reflecting up to 20.68 acres conveyed to SAFCA (pending).

** Agreement of Purchase and Sale provides that seller can partition 3.68 acres during a 24-month period following sale.

*** Partially donated in lieu of Acquisition Fund portion of fee, partially paid for by TNBC.

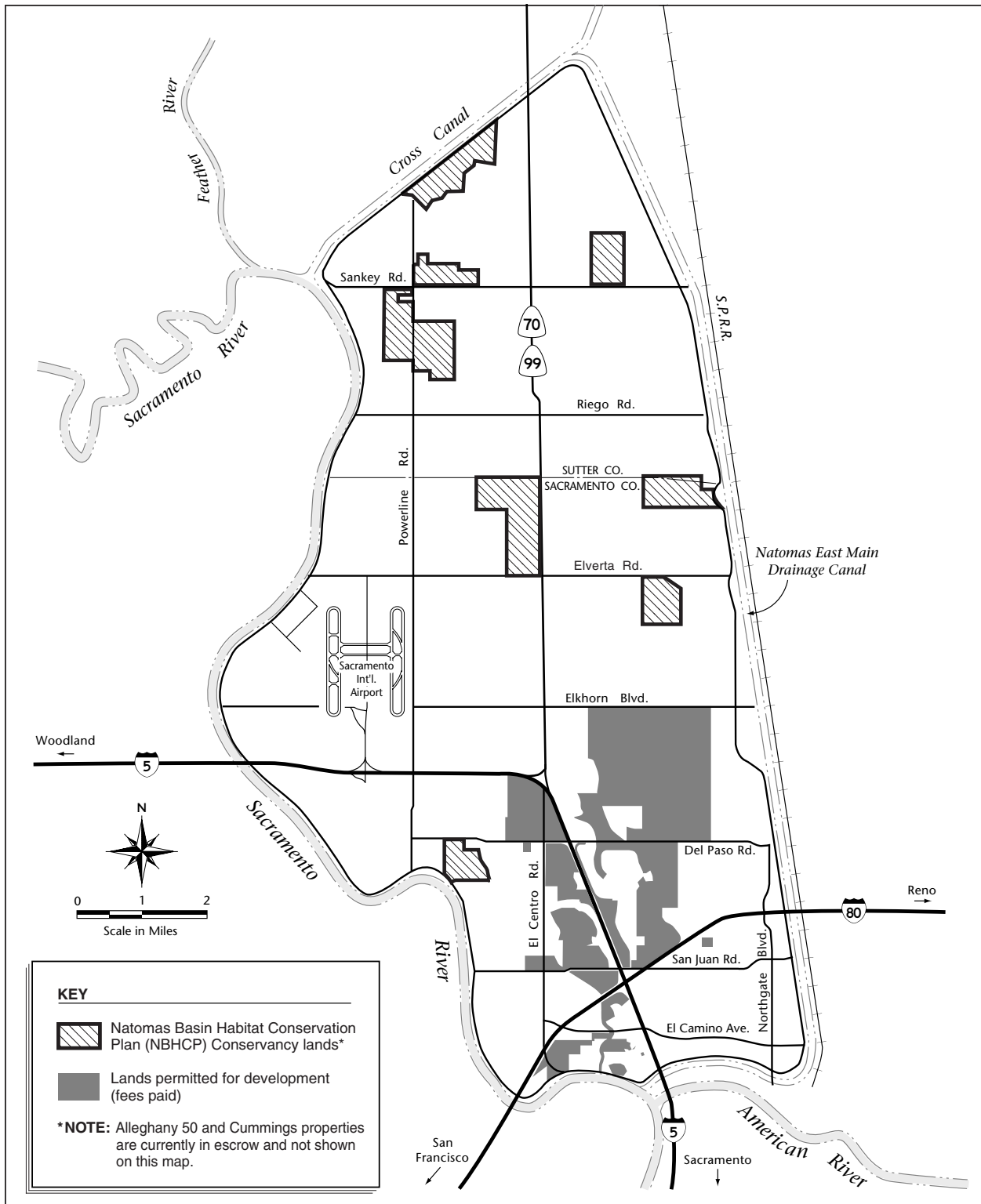


Figure 4. Conservancy Lands and Lands Permitted for Development within the Natomas Basin Habitat Conservation Plan Area as of September 30, 2002.

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