

**Lake Tahoe Basin Management Unit
Ecosystem Conservation Department
2007 Annual Wildlife Report**

The Ecosystem Conservation Department of the Lake Tahoe Basin Management Unit (LTBMU) conducted surveys to assess presence/probable absence, reproductive activity and success, and spatial distribution of California spotted owl (*Strix occidentalis occidentalis*), northern goshawk (*Accipiter gentilis*), osprey (*Pandion haliaetus*), willow flycatcher (*Empidonax traillii*), and bald eagle (*Haliaeetus leucocephalus*) in 2007.

California Spotted Owl

METHODS

The LTBMU conducted surveys for California spotted owl in cooperation with California State Parks (CaSP), Nevada Department of Wildlife (NDOW), and Hauge Brueck Associates (contractor for Heavenly Mountain Resort) in 2007. We also coordinated with our neighboring Forests (the Eldorado, Tahoe, and Humboldt-Toiyabe National Forests). However, none of the neighboring forests conducted spotted owl surveys on or immediately adjacent to the LTBMU in 2007. Except where noted, all surveys for California spotted owl followed Forest Service, Region 5, 'Protocol for Surveying for Spotted Owls in Proposed Management Activity Areas and Habitat Conservation Areas' (USDA, revised 1993). Surveys for spotted owls determined survey area occupancy, individual and pair status, nesting status, and reproductive success. We identified pairs based on whether the detections occurred within ¼ mile of each other as described in the regional protocol. A territory was determined to be 'reproductive' if nesting activity was observed or if juveniles were detected during the field season. Fledging was verified when juveniles were detected outside the nest cavity.

The LTBMU and its partners surveyed 26 areas within the Lake Tahoe Basin for California spotted owl in 2007 (Appendix 1). Survey areas were established in highly suitable to marginally suitable habitats within ¼ mile of agency project-implementation sites; including fuels treatment, habitat restoration, and trail reroute projects (Table 1). For LTBMU sites, most routes were surveyed three times, with the first two visits occurring prior to 30 June, per standard 2-year survey protocols. However, select areas received 6 visits (Table 1), with 4 visits before 30 June, as 1-year protocols were necessary due to associated project time constraints. Two rounds of spot calling were completed for the Angora Creek and Tahoe Mountain spotted owl routes; subsequent surveys were altered as a result of the Angora Fire in late June, which incinerated significant portions of the original survey areas. Only call stations outside the burn perimeter were completed for the third round of surveys in these routes. Nest checks were located mostly in areas that were slated for protocol spot calling surveys for 2007, with the exception of the Cold Creek nest (see Results).

Table 1. Areas within the Lake Tahoe Basin surveyed to forest service protocol for California spotted owl by the Lake Tahoe Basin Management Unit, California State Parks (CaSP), Humboldt-Toiyabe National Forest (HTNF), Nevada Department of Wildlife (NDOW) and Hauge Brueck Associates (contractor for Heavenly Mountain Resort) in 2007. Occurrence of historic spotted owl detections near survey areas, number of visits in 2007, and LTBMU projects associated with survey area are also presented for reference.

Route Name	Historical Detections	2007 visits	Associated USFS Projects
Angora Creek	Yes	3	South Shore Healthy Forest Restoration
Angora Ridge	Yes	3	South Shore Healthy Forest Restoration
Blackwood Canyon	Yes	3	Blackwood Stream Restoration Phase III, Quail Fuel Reduction
Burton Creek State Park (CaSP)	Yes	1	Riparian Hardwoods Restoration and Enhancement Project (CaSP project)
Cold Creek	Yes	3	Cold Creek/High Meadows Ecosystem Restoration
Cold Creek nest	Yes	2	N/A

Cookhouse Meadow	Yes	3	Cookhouse Meadow Monitoring
Round Lake	Yes	6	Big Meadow Restoration
Echo Lake	Yes	3	South Shore Healthy Forest Restoration
Fallen Leaf Lake	Yes	3	South Shore Healthy Forest Restoration
Hawley Grade	Yes	3	South Shore Healthy Forest Restoration
Heavenly Ski Resort	No	3	Heavenly Mountain Resort Master Agreement
High Meadow	No	3	Cold Creek/High Meadows Ecosystem Restoration
Meeks Bay	Yes	3	Meeks Creek Meadow Restoration
Round Hill	No	6	Roundhill Fuels Reduction, Lake Tahoe Underburn, Logan Shoals Vista (improvement)
Saxon Creek	Yes	3	South Shore Healthy Forest Restoration, Saxon Creek Low Water Crossing
Secret Harbor	No	6	East Shore Fuel Reduction, Trail Access and Travel Management Plan
Slaughterhouse Canyon	No	6	Slaughterhouse Fuel Reduction, Lake Tahoe Underburn, East Shore Fuel Reduction
South Lake Tahoe Airport	No	3	Upper Truckee River Restoration (multi-agency project)
Spring Creek	Yes	3	South Shore Healthy Forest Restoration
Sugar Pine Point State Park (CaSP)	Yes	3	Riparian Hardwoods Restoration and Enhancement Project (CaSP project)
Tahoe Mountain	Yes	3	South Shore Healthy Forest Restoration, Fallen Leaf Water System Improvements – Phase 4
Taylor Creek	Yes	3	South Shore Healthy Forest Restoration, Taylor Creek Environmental Education Center, Fallen Leaf Water System Improvements – Phase 4
Twin Crags	Yes	3	Twin Crags Fuel Reduction, North Shore Trail Access and Travel Management Plan

Each area was surveyed from an established route along roads and/or trails. Portion(s) of any survey route(s) within a one-mile radius of an active spotted owl nest were not surveyed for the remainder of the season. Survey efforts within a one-mile radius of the active nest focused directly on the nest stand.

Spot-calling surveys were conducted per protocol for California spotted owl from 15 April 2007 through 20 August 2007. Nest checks were conducted prior to the first survey at four south shore locations: Saxon Creek, Spring Creek, Hawley Grade, and Cold Creek. All are historic nest locations and located near areas slated for project work within the next two years. All confirmed spotted owl pairs for 2007 were discovered during nest checks, for which initial visits were made between 24 April and 24 May. Hauge Brueck Associates, conducted surveys for spotted owls at Heavenly Ski Resort. Twelve call stations were called within the boundaries of the resort along with 18 call stations located on Nevada State Park and Forest Service lands around the northwestern perimeter of the resort. California State Parks (CaSP) and the LTBMU jointly conducted a survey for spotted owls at Burton Creek State Park, near LTBMU forest system lands. Only one Burton Creek State Park survey was conducted in 2007, during which a single female spotted owl was detected. Observers inferred that the individual's territory was mostly located on USFS lands bordering Burton Creek State Park, but follow-up surveys were not conducted due to a lack of project work in the area, and thus there was no monitoring priority. Additionally, CaSP surveyed at Sugar Pine Point State Park, and NDOW conducted spotted owl surveys in North Canyon and Van Sickle Bi-State Park. The NDOW surveys consisted of one visit each and therefore were not completed to forest service protocol. The North Canyon survey resulted in a detection of an adult female but no follow-up survey was conducted.

The El Dorado Spotted Owl Demography Study (EDSODS), administered through the University of Minnesota by agreement with the Forest Service, assisted our spotted owl survey efforts from 1998 through 2004. During that time, the EDSODS focused on banding spotted owls and determining reproductive status and success of individuals and pairs in the Lake Tahoe Basin. In 2005, 2006, and 2007, the EDSODS did

not have funding to survey within the LTBMU. Despite consulting with the EDSODS regarding color band observations on individuals observed in 2007 at Cold Creek, Spring Creek, and Saxon Creek, no definitive identifications were made due to observer uncertainty regarding band pattern subtleties or colors.

Currently, there are 21 spotted owl PACs on the LTBMU; 12 of the 21 PACs were surveyed this year due to the proximity of LTBMU project-implementation sites. Page Meadow West, Page Meadow East, Twin Peaks, Stanford Rock, Painted Rock, Mount Pluto, Carnelian, Griff Creek, and Hellhole were not surveyed as projects are not scheduled to take place within the boundaries of the PACs or within close proximity (0.25 miles).

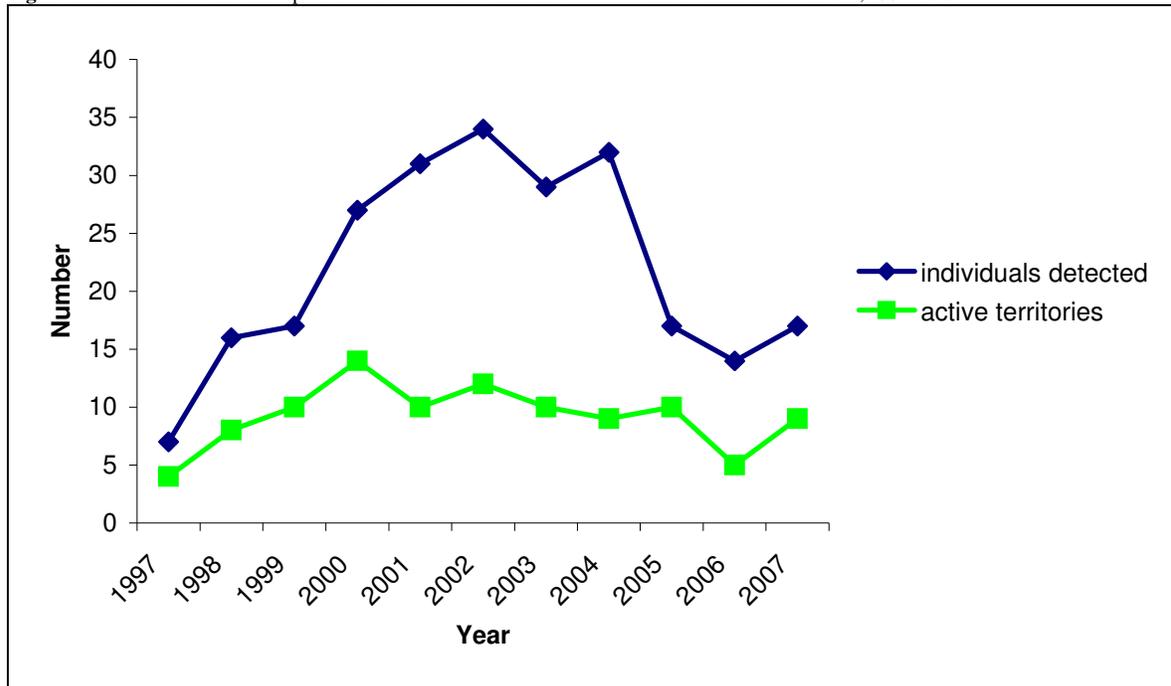
RESULTS

Approximately 20,494 acres (8,294 hectares) were surveyed for California spotted owl by the LTBMU and its partners in the Lake Tahoe Basin in 2007. Acreage was calculated based on the area encompassed within a one-mile radius of nests and the average area effectively surveyed (0.25 mile radius) from call stations during spot-calling surveys. LTBMU wildlife crews surveyed 18,312 acres (7,411 hectares) and helped CaSP survey 31 acres (13 hectares), a single call station, in Burton State Park. CaSP surveyed 31 additional acres at a historical call station in Sugar Pine Point State Park. Hauge Brueck Associates surveyed 1,500 acres (607 hectares) at Heavenly Ski Resort. NDOW surveyed approximately 620 acres (251 hectares) between two survey routes along the east shore area of the Tahoe Basin. The LTBMU, California State Parks, and Hauge Brueck Associates detected a total of 17 individual spotted owls in the Lake Tahoe Basin in 2007 (up 18% from 14 in 2006, and a 35% increase in detections per area surveyed).

2007 Detections

Seventeen individual spotted owls were detected in 2007 (Figure 1): 4 pairs, 1 individual male, 6 individual females, and 2 juveniles.

Figure 1. Number of California spotted owls and active territories detected in the Lake Tahoe Basin, 1997-2007.



Three territories were determined to be active (i.e. Saxon Creek, Spring Creek, and Cold Creek areas) in 2007 based on owl pair observations. One pair was observed together during daylight hours by fire personnel in the Angora Fire area in early July, though no assumption was made regarding reproductive status due to the limited information available (e.g., mousing not conducted) for this owl pair. Lone females were detected at Twin Crags and Meeks Bay. A male and female were detected (audio only) at

Blackwood Canyon but these detections were separated both temporally and spatially, and thus did not yield any conclusive information regarding breeding or pair status. A single female was seen and heard during the joint LTBMU/CaSP survey at Burton Creek State Park. The CaSP survey in Sugar Pine Point State Park detected a lone individual, probably female. NDOW detected an individual female aurally and visually in North Canyon. Pairs were observed directly together at Angora Creek, Saxon Creek, Spring Creek, and Cold Creek (formerly known as Trout 12 and spatially separated from this season's Cold Creek route). One additional spotted owl pair and an equal number of successful nests (4 pairs and one nest) were found in 2007 as compared to the 2006 breeding season. Active territories increased to nine from five in 2006 (Figure 1). Juveniles observed to have fledged decreased from three in 2006 to two this year. In both years, all fledglings came from one nest (Cold Creek in 2006 and Saxon Creek in 2007). Breeding activity comparisons are shown in Figure 2. Six of ten areas with spotted owl detections in 2007 were located in the same routes as 2006 observations. However, breeding status was not the same both years in every area (Table 2). Breeding and territory status for 2007 is summarized in Table 3 (see below).

Figure 2. California spotted owl reproductive activity in the Lake Tahoe Basin, 1997-2007.

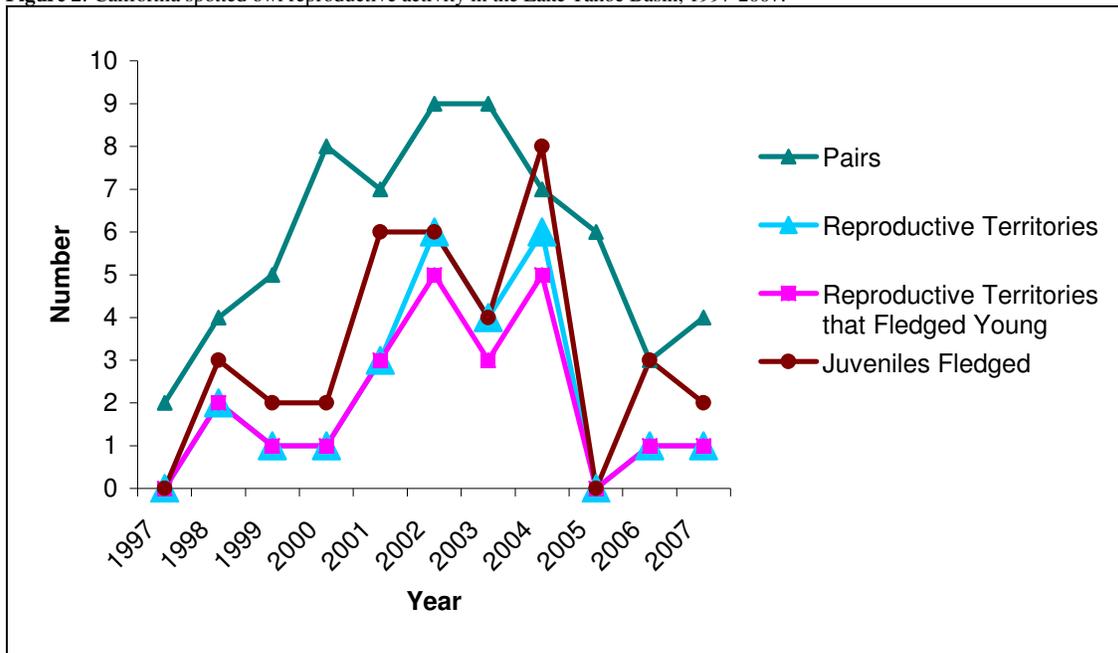


Table 2. Comparison of 2006 and 2007 spotted owl detections at 2007 presence-confirmed sites.

Route	2006		2007	
	Detection	Breeding status	Detection type	Breeding status
Angora Creek	No	N/A	Visual	Unknown
Burton Creek State Park	No	N/A	Audio	Unknown
Blackwood Canyon	Yes	Unknown	Audio	Unknown
Cold Creek (Trout 12)	Yes	Unknown	Audio/ visual	Non-breeding
Meeks Bay	Yes	Unknown	Audio	Unknown
North Canyon	No	N/A	Audio/ visual	Unknown
Saxon Creek	No	N/A	Audio/ visual	Breeding
Spring Creek	Yes	Unknown	Audio	Non-breeding
Sugar Pine Point SP	Yes	Unknown	Audio	Unknown
Twin Crags	No	N/A	Audio	Unknown

Table 3. Status of territories, pairs, reproductive activity and success for California spotted owl in areas surveyed by the Lake Tahoe Basin Management Unit, California State Parks (CaSP), Humboldt-Toiyabe National Forest (HTNF), Nevada Division of Wildlife (NDOW), and Haug Brueck Associates (contractor for Heavenly Ski Resort) in 2007.

Survey Area	Individuals Detected	Territory Active	Pair	Territory Reproductive	Juveniles Fledged
Angora Creek	0	no	no	-	-
Angora Ridge	2	yes	yes	unknown	-
Blackwood Canyon	2	yes	unknown	unknown	-
Burton Creek State Park (CSP)	1	yes	no	-	-
Cold Creek	0	no	no	-	-
Cold Creek nest	2	yes	yes	non-nesting	-
Cookhouse Meadow	0	no	no	-	-
Round Lake	0	no	no	-	-
Echo Lake	0	no	no	-	-
Fallen Leaf Lake	0	no	no	-	-
Hawley Grade	0	no	no	-	-
Heavenly Ski Resort	0	no	no	-	-
High Meadow	0	no	no	-	-
Meeks Bay	1	yes	no	-	-
North Canyon (NDOW)	1	yes	no	unknown	-
Round Hill	0	no	no	-	-
Saxon Creek	4	yes	yes	confirmed	2
Secret Harbor	0	no	no	-	-
Slaughterhouse Canyon	0	no	no	-	-
S. Lake Tahoe Airport	0	no	no	-	-
Spring Creek	2	yes	yes	non-nesting	-
Sugar Pine Point State Park (CSP)	1	yes	no	-	-
Tahoe Mountain	0	no	no	-	-
Taylor Creek	0	no	no	-	-
Twin Crags	1	yes	no	-	-
Van Sickle Bi-State Park	0	no	no	-	-
Total	15	10	4	1 confirmed	2

DISCUSSION

The number of individual California spotted owls detected in the Lake Tahoe Basin increased from 1997 through 2002, remained fairly constant through 2004, decreased in 2005 and 2006, and increased again in 2007 (Figure 1). The upward trend in number of individuals detected 1997-2002 is likely related to a concomitant increase in survey effort and effectiveness (due to increasing familiarity of the biologists conducting the surveys with the local habitat and owl population). The thirty-five percent increase in owls detected per area surveyed in 2007 versus the 2006 field season may serve as an illustration of this possibility; some field personnel were new in 2006 but returned this year with increased local knowledge and experience. Fluctuations in the number of individual spotted owls detected after 2002 (while survey effort was fairly constant) may be related to fluctuations in the number of juveniles fledged, the overall population trend, and environmental factors such as weather, prey availability, and habitat (Seamans et al., 2001). A downward trend in detections of individual spotted owls in 2005 and 2006 is likely related to the absence of an El Dorado Spotted Owl Demography Study survey effort within the Basin. The demography study contributed substantially to the knowledge of spotted owl occurrence, reproductive activity, nest site and pair-fidelity in the Lake Tahoe Basin over the previous 6 years. Finally, as the amount of project work has increased, survey efforts have been focused accordingly (e.g., in suitable habitats near the project area, but not necessarily in historically occupied or prime habitats). Visits to historic territories where a project is not scheduled are not always possible due to time and budget restrictions. Historic territories have been

designated by Gordon Gould at the California Department of Fish and Game. This year, 11 of the 19 historic territories were surveyed.

In Blackwood Canyon, a male 4-note contact call was detected at call stations on two separate occasions. The second evening, during a stand search conducted to locate that individual, a female contact call was heard separately, about 300m from the original male detection. Individuals were observed more than ¼ mile of each other, thus each individual is considered to be a single owl and the reproductive status to be undetermined in 2007 ('status unknown-single owl', USDA 1993). A female was detected only once via contact call at Meeks Creek, during the third visit. As the area was not surveyed in 2005 and only an individual male was detected in 2006, the Meeks female this year is classified 'status unknown-single owl'. Twin Craggs had a single detection in 2007, a female that responded to observers with contact and agitation calls. No spotted owls were found in the area in 2006 and 1 detection occurred in 2005, so the 2007 female is 'status unknown-single owl'.

The Saxon Creek territory contained the only spotted owls with a confirmed active nest in 2007. The pair was found to be using the nest site last utilized in 2002 (Saxon 2002b). Over the course of five visits to the nest site, both adults were observed on or near the nest. Breeding was indicated from the first visit based on male food deliveries to the begging female. Juveniles were first detected on the third visit via soft begging calls. Two nestlings were observed on the fourth visit, and both were confirmed to have successfully fledged by the fifth visit. The Saxon pair was classified as 'nesting confirmed-reproduction confirmed' for 2007.

Two adult individual owls were detected during an initial April visit to a historic nest site on Spring Creek. The pair was detected near the original site, last active in 2002, but was definitely not utilizing the old nest tree, which appeared damaged since the 2006 nesting season. During the first visit, both owls perched near the observers, but only the male took and ate mice, despite begging from the female. On the second visit, both adults took mice, but no deliveries occurred. Caching behavior was observed during the initial nest check and associated follow-up survey the next morning. The pair settled down to roost for the day in the same vicinity both times, and no nesting activity was evident. From caching and roosting observations, a status of 'nonnesting inferred-nonreproduction inferred' was assigned to the Spring Creek pair.

The Angora pair was observed inside the Angora Fire burn area in the Angora Ridge survey polygon in early July, post-fire, and was assigned an active territory. Both individuals were observed together outside of a protocol survey during the day and can thus be assigned pair status. Lacking further information, however, their assigned reproductive status for 2007 is 'nesting unknown-reproduction unknown'.



Spotted Owl pair roosting after the Angora Fire, 2007
(Photo credit unknown)

Although not located in an LTBMU project area, the historic Cold Creek nest tree was checked in 2007 due to an assumed high probability of detecting a pair. During the first visit, two different individuals were observed, but temporally separated. One of the owls approached the observers during an evening visit, and a separate individual was detected early the next morning. The two owls were surmised to be a pair due to their close proximity. This was confirmed two weeks later, when both were observed together. The male took all mice offered, did not feed the female, and was observed to cache some of the mice taken. The pair roosted side by side for the day in a tree 70m from the initial call location. No nesting activity was apparent. The Cold Creek pair was assigned 'nonnesting inferred-nonreproduction inferred' status for 2007.

The number of active territories followed a similar pattern: increasing until 2000 and then remaining fairly constant through 2005 (Figure 1). Active territories dropped in number in 2006, but returned to “normal” levels in 2007. We surveyed 11 historically active territories and found 6 to be active. Two additional areas (North Canyon and Meeks Bay) that are not considered territories were found to be active in 2007. While we can only speculate on the causes of this decline, looking at each territory individually is helpful in exploring some possibilities (for discussion, see the 2006 annual report). However, some pairs that have gone undetected in past seasons reappear in subsequent years. It is not possible to know why some owl pairs were not detected in 2007; the owls may have shifted beyond the range of the survey as studies have shown spotted owls to forage with the largest rate of movement during the spring and summer (Forsman, E.D. 1980). Finally, it is possible, although highly unlikely, that the owls were present but the surveys failed to detect them.

The number of reproductive territories differs from the number of active territories because we did not detect nesting activity or juvenile spotted owls within all active territories (Figures 1 and 2). In 2007, most of our early nest surveys showed no signs of nesting with the exception of the Saxon Creek territory. Spotted owls may not breed every year, but are able to compensate for this variable annual reproduction because they are long-lived with high adult survival rates (Seamans et al. 2001). During years of low reproduction the perennial nest sites often continue to produce young. This high reproductive success suggests that the habitat or forest structure surrounding perennial nest sites may positively affect reproduction (North et al. 2000). There are 11 known nest sites in the Basin, 8 of which have only been used once. The 3 other perennial nest sites (Sugar Pine Point SP, Burton Creek SP and Cold Creek) have been used successfully 2 or 3 times each. The Saxon Creek nest fledged 2 juveniles in 2004 (last known fledging).

All of the California spotted owl Protected Activity Centers (PACs) and Home Range Core Areas (HRCAs) within the Lake Tahoe basin were re-delineated in June of 2007 following Sierra Nevada Forest Plan Amendment, Final Supplemental Environmental Impact Statement, Record of Decision (2004) guidelines: “As additional nest location and habitat data become available, boundaries of PACs are reviewed and adjusted as necessary to better include known and suspected nest stands and encompass the best available 300 acres of habitat.” New PACs were also established following Forest Plan direction and R5 protocol standards for resident single status and pair status. Four new spotted owl PACs (General Creek, Spring Creek, Mount Pluto and Twin Crags) were created to better manage nesting and foraging habitat. The PAC boundaries were revised or established using the best existing information regarding spotted owl detections, nest locations, habitat suitability, remotely sensed (satellite) imagery, aerial photography, and GIS analysis (habitat modeling, spatial review, etc.). Spotted owl nests, detections and their habitat were paramount in delineating PAC boundaries; however, practical management concerns (e.g., field recognition of land allocation boundaries, land use types, other forest resources, etc.) were also considered. The 2006 annual report suggests that two PACs be eliminated from the Forest: the Echo Lake PAC and the Painted Rock PAC, due to redundant PACs in the Eldorado and Tahoe National Forests. Ultimately, both were simply remapped across forest boundaries and are simultaneously managed by the LTBMU and the neighboring Forest.

The Tahoe Mountain California spotted owl PAC and HRCA were adversely affected by the Angora Fire. The Tahoe Mountain PAC burn intensities (% of acres) (derived from GIS and field data) were high (51%), moderate (44%) and low (5%). The Tahoe Mountain spotted owl HRCA burn intensities were high (34%), moderate (28%), low (5%) and none (32%). The Tahoe Mountain spotted owl PAC and HRCA were re-mapped as the majority of habitat within the PAC had been rendered unsuitable. The PAC was re-mapped within a 1.5 mile radius of the affected land allocation in suitable habitats, although few or no detections of the target species are known from those areas.

To address the concern whether the remapped PACs and HRCA are best located to protect the target species and their habitats, the PACs will be surveyed to Region 5 protocol during the 2008 and 2009 nesting seasons and re-evaluated. If the target species (i.e. spotted owl) are detected, the land allocation boundaries may be adjusted according to management direction for the LTBMU. If the target species are not detected and the habitats are determined to be of insufficient quality or quantity, the land allocations may then be re-evaluated.

MANAGEMENT RECOMMENDATIONS

According to the Region 5 protocol recommendations, nesting status visits in the Sierra Nevada may begin as early as April 1 and should be completed by June 1. Conducting surveys during this early season period is important as California spotted owl reproductive activity (e.g., egg laying, incubation, and nestling) is occurring and is often detectable only during this portion of the year. After June 1, locating nest sites and assessing reproductive activity becomes more difficult as some juveniles fledge early and some nesting attempts may have failed and therefore go undetected. Since 2001, when the LTBMU started conducting surveys for California spotted owl earlier in the season, the number of detections and information about spotted owl reproductive activity has increased substantially. During the 2007 breeding season, spotted owl fieldwork began as soon as there were available personnel, with survey effort beginning on 18 April. Adverse weather conditions may occasionally impede early-season surveys, but the LTBMU should continue to begin conducting surveys for spotted owl early in the season to maximize the effectiveness of the program.

The standardization and definition of local population parameters (e.g., active territories, reproductive territories, etc.) has improved our ability to assess spotted owl activity, territory activity, and fledging success in the Basin. Continued survey efforts over the past several years have revealed patterns which allow LTBMU biologists to better estimate where owl nesting activity may be most likely to occur each year. Thus, these areas can be surveyed with initial efforts, which could more likely detect early-season activity and occupancy, important information needed in order to identify the potential need for new PACs and HRCAs. If annual budget allows, the LTBMU should strive to utilize early-season efforts to maximize nest checks in historically active nesting areas, as a more complete view of spotted owl activity in the LTBMU should lead to better management decisions.

The Angora Fire (24 June –July 19, 2007) may have a significant effect on the movement, foraging activity, and territory occupancy on south shore area owl individuals. Undetected nesting attempts, if made, initiated before the burn in late June were probably destroyed. Territory status of the pair detected in the fire area in July was therefore uncertain. However, the changes in habitat character will not necessarily prohibit occupancy during the 2008 breeding season. Even if canopy cover remains insufficient for prime nesting habitat, it is possible that the area could become worthwhile foraging habitat as small mammal populations rebound. Burn severity was variable through the fire area. In areas of moderate to intense heat, the habitat will not be suitable for spotted owl for some years. Areas only lightly burned and patches of unburned forest inside the burn perimeter may be suitable much sooner.

On 12 September 2007, an aerial hydromulching project was initiated to help stabilize soil and control erosion on 636 acres (257 hectares) that were affected by the Angora Fire and inaccessible to hand treatment. The mixture, deposited via small aircraft, consists of wood mulch, recycled paper, water, and a tackifier, which is guar gum based. It is unknown how the treatment will affect spotted owls and other wildlife. Therefore, it may be important to thoroughly monitor the area over the next few field seasons to capitalize on the opportunity to gather biologically pertinent post-treatment data.

Northern Goshawk

METHODS

The LTBMU conducted northern goshawk surveys in collaboration with California State Parks (CaSP), Nevada Department of Wildlife (NDOW), and Hauge Brueck Associates (contractor for Heavenly Ski Report) in 2007 (Table 4). The Forest Service wildlife crew conducted dawn acoustical, broadcast acoustical, and stand search surveys for northern goshawks following the “Northern Goshawk Inventory and Monitoring Technical Guide (USDA 2006). Dawn acoustical surveys were conducted 8 March through 14 April. Broadcast acoustical surveys began 1 June and ended 27 August (Appendix 2). Stand search surveys followed goshawk detections during broadcast acoustical surveys as necessary. One site near Spooner Summit was surveyed using the stand search protocol (USDA 2002). Suitable habitat was surveyed in proximity to USFS projects and selected areas with a history of goshawk activity.

A survey area was considered occupied during dawn acoustical surveys if there was a visual or audible detection. Similarly, an area was considered occupied during broadcast surveys if there were visual or audible detections or if plucking posts with typical goshawk prey species remains, such as northern flicker, Steller’s jay, etc., were found. Survey areas were considered reproductively active if: 1) an adult bird or nestling(s) were observed on a nest; 2) there was fresh whitewash and goshawk feathers under a nest; or 3) fledglings along with other evidence of nesting were detected within an area. Survey areas were considered reproductively successful if fledgling(s) were detected outside a nest in an area where an active nest was found or where evidence of nesting was found.

Table 4. Areas within the Lake Tahoe Basin surveyed to forest service protocol for Northern Goshawk by the Lake Tahoe Basin Management Unit (LTBMU), Hauge Brueck Associates, Nevada Department of Wildlife (NDOW), and California State Parks (CaSP) in 2007.

Survey Area	Historic Detections	Associated Projects
Angora Creek	Yes	South Shore Healthy Forest Restoration
Big Meadow	Yes	Big Meadow Restoration
Blackwood Canyon	Yes	Blackwood Creek Lower Channel Restoration Phase III, Quail Fuel Reduction
Burke Creek Lower	Yes	Kingsbury Fuel Reduction, Urban Lots Fuels Reduction, and Roundhill Fuel Reduction, Lake Tahoe Underburn
Burton Creek State Park(CSP)	Yes	Riparian Hardwoods Restoration and Enhancement Project (CSP project)
Cold Creek	Yes	Cold Creek /High Meadows Ecosystem Restoration
Cookhouse Meadow	Yes	Cookhouse Meadow Monitoring
Alpine Ridge	Yes	Quail Fuel Reduction
Echo Lake	No	South Shore Healthy Forest Restoration
Fountain Place	Yes	South Shore Healthy Forest Restoration and Freel/Meiss Trail Access and Travel Management Plan
Hawley Grade	No	South Shore Healthy Forest Restoration and Truckee Guard Station Restoration
Heavenly Ski Resort – (Hauge Brueck Associates)	Yes	Heavenly Mountain Resort Master Agreement
High Meadows	Yes	Cold Creek /High Meadows Ecosystem Restoration
Roundhill	No	Roundhill Fuel Reduction and Logan Shoals Vista (improvement)
Marlette Creek	Yes	East Shore Beaches Trail Access and Travel Management Plan
Meeks Bay	Yes	Meeks Creek Watershed Ecosystem Environmental Analysis and Restoration Plan
Memorial Point (NDOW)	No	Unknown
Secret Harbor	No	East Shore Beaches Trail Access and Travel Management Plan
Slaughterhouse Canyon (LTBMU)	Yes	East Shore Beaches Trail Access and Travel Management Plan and Slaughterhouse Fuel Reduction, Lake Tahoe Underburn
Slaughterhouse Canyon (NDOW)	Yes	Unknown
South Lake Tahoe Airport	No	Upper Truckee Restoration (multi-agency project)
Spooner Summit	No	East Shore Fuel Reduction
Spring Creek	Yes	South Shore Healthy Forest Restoration
Sugar Pine (CaSP)	Yes	Riparian Hardwoods Restoration and Enhancement Project (CSP project)
Tahoe City	Yes	North Shore Trail Access and Travel Management Plan, Twin Crags Fuel Reduction

Tahoe Mountain	Yes	Fallen Leaf Water System Improvements - Phase 4; South Shore Healthy Forest Restoration
Tahoe Valley	Yes	South Shore Healthy Forest Restoration
Taylor Creek	Yes	Taylor Creek Environmental Education Center, Fallen Leaf Water System Improvements - Phase 4, South Shore Healthy Forest Restoration
Trout Creek	Yes	Freel/Meiss Trail Access and Travel Management Plan, Off-highway Vehicle Wildlife Protection Program, South Shore Healthy Forest Restoration
Upland Project (NDOW)	Unknown	Unknown
Zephyr Cove	Yes	Roundhill Fuels Reduction, Lake Tahoe Underburn

Dawn acoustical surveys for goshawk were conducted starting 45 minutes before sunrise and ending 1½ hours after sunrise, in cooperation with our partners. For each survey, we distributed surveyors approximately 300 meters apart around focal areas (e.g., nest stands) where, historically, goshawk activity occurred. The number of surveyors participating varied between 1 and 4 dependent upon the size of the area to be surveyed and the availability of qualified observers to assist. These surveys were intended to be non-invasive: surveyors avoided approaching nests and did not broadcast calls.

Broadcast acoustical surveys were conducted in cooperation with our partners. Surveys were mostly conducted by 2 person crews. Alarm calls were broadcast during the nestling period (early June through mid-July) and a combination of juvenile begging, male food delivery call, adult wail, and alarm calls during the post-fledgling period (early July through late August). Goshawk calls were broadcast every 250 meters or less along transects within the survey polygon using a FoxPro broadcast system or MP3 players with a megaphone. Approximate locations of all broadcast locations, transects, and detections were plotted on site maps. Given this species' high degree of territory and nest stand fidelity; historic nest sites were surveyed first in an attempt to improve the assessment of nesting activity within the Basin. Following detection of an active goshawk nest, nest checks were conducted and broadcast-calling surveys were discontinued within a one-mile radius of the nest.



Northern Goshawk Juvenile and Adult (Photo by David Brinker)

Nest checks were conducted approximately every 2 weeks after discovering an active nest. Nest checks began by first cautiously approaching the nest to determine if there was activity in the nest. Then, if there was no activity in the nest (i.e., adult incubating or juveniles present), the nest stand was surveyed visually to determine if there were fledglings or adults nearby. When goshawks were not detected visually, then a broadcast survey was conducted in proximity of the nest stand using a combination of juvenile begging and adult alarm calls, starting at the nest and working outward in concentric circles up to a distance of 400 meters. The nest check was complete if goshawks were not detected within approximately one hour. Surveyors returned to repeat the process approximately 2 weeks later and if goshawks were not detected during a second nest check, it was assumed that the nest had failed.

In 2004, the nest stand habitat assessment protocol was substantially revised and expanded. Nest stand habitat assessments quantified the following characteristics: dominant habitat type, canopy cover, shrub cover, number of stems (less than 20 centimeters in diameter at breast height), duff depth; live and dead

tree diameters (greater than 20 centimeters at breast height), heights, and species composition; and quantity of coarse woody debris. These characters were measured along 50 meter belted and line-transects oriented on 060° and 330° azimuths from the nest tree. The following nest tree characteristics were quantified: species, height, diameter at breast height, relative condition; and nest type and orientation. From the nest tree, we also measured slope, aspect, elevation, and distance to nearest. In 2007, one new goshawk nest was discovered and surveyed. We also finished the process of placing “Wildlife Tree” placards with a unique nest ID on all known nest trees.

RESULTS

The LTBMU and partner agencies conducted broadcast surveys within 32 areas around the Basin in 2007 (Table 5). The USFS surveyed a total of 16,824 acres (6,808 hectares) and combined with partner agencies, a total of 24,650 acres (9,975 hectares) were surveyed in 2007. Goshawks were detected within 0% (0 of 4) of the areas where dawn acoustic surveys were conducted and within 34% (11 of 33) of the areas where broadcast surveys were conducted in 2007. We found reproductive activity (2 active nests found) within 2 areas in 2007. A total of 3 fledglings were observed within territories where evidence of breeding was found. Including incidental sightings, there were goshawk detections within 13 areas in 2007.

Table 5. Survey Areas and results of northern goshawk surveys conducted by Lake Tahoe Basin Management Unit (LTBMU), Hauge Brueck Associates, Nevada Department of Wildlife (NDOW), and California State Parks (CaSP) within the Lake Tahoe Basin in 2007.

Area	Dawn Acoustic Survey	Dawn Acoustic Detection	Broadcast Survey	Broadcast Detection	Nest Found	Nest Outcome
Angora Creek ¹	No	N/A	Yes	No	No	N/A
Big Meadow ²	No	N/A	Yes	Yes	Yes	1 Fledgling
Blackwood Canyon	Yes	No	Yes	Yes	No	N/A
Burke Creek Lower	No	N/A	Yes	No	No	N/A
Burton Creek State Park(CSP)	Yes	Yes	Yes	Yes	Yes	2 Fledglings
Alpine Ridge ³	Yes	No	No	No	No	N/A
Cold Creek	No	N/A	Yes	No	No	N/A
Cookhouse Meadow	No	N/A	Yes	No	No	N/A
Echo Lake	No	N/A	Yes	No	No	N/A
Fountain Place	No	N/A	Yes	Yes	No	N/A
Griff Creek ³	Yes	No	No	No	No	N/A
Hawley Grade	No	N/A	Yes	No	No	N/A
Heavenly Ski Resort (Hauge Brueck)	Yes	No	Yes	No	No	N/A
High Meadows ⁴	No	N/A	Yes	Yes	No	N/A
Roundhill	No	N/A	Yes	No	No	N/A
Marlette Creek	No	N/A	Yes	No	No	N/A
Marlette Lake (NDOW) ⁵	Yes	No	Yes	No	No	N/A
Meeks Bay ⁴	No	N/A	Yes	No	No	N/A
Memorial Point (NDOW) ⁵	Yes	No	Yes	No	No	N/A
North Canyon (NDOW) ⁵	Yes	No	No	No	No	N/A
Osgood Swamp	No	N/A	Yes	No	No	N/A
Slaughterhouse Canyon	No	N/A	Yes	No	No	N/A
Slaughterhouse Canyon (NDOW) ⁵	Yes	No	No	No	No	N/A
South Lake Tahoe Airport	No	N/A	Yes	No	No	N/A

Spring Creek ¹	No	N/A	Yes	No	No	N/A
Sugar Pine Point State Park(CaSP)	Yes	Yes	Yes	No	No	N/A
Tahoe City ⁴	No	N/A	Yes	No	No	N/A
Tahoe Mountain ¹	No	N/A	Yes	Yes	No	N/A
Tahoe Valley	No	N/A	Yes	No	No	N/A
Trout Creek	No	N/A	Yes	No	No	N/A
Upland Project (NDOW) ⁵	Yes	Yes	Yes	No	No	N/A
Van Sickle Bi-State Park (NDOW) ⁶	No	N/A	Yes	No	No	N/A
Zephyr Cove	No	N/A	Yes	No	No	N/A

¹ No detections during broadcast surveys but several incidental sightings in the area.

² Detection close to historical nests within Big Meadow territory

³ Dawn acoustic survey conducted in area of recent nests but broadcast surveys were not.

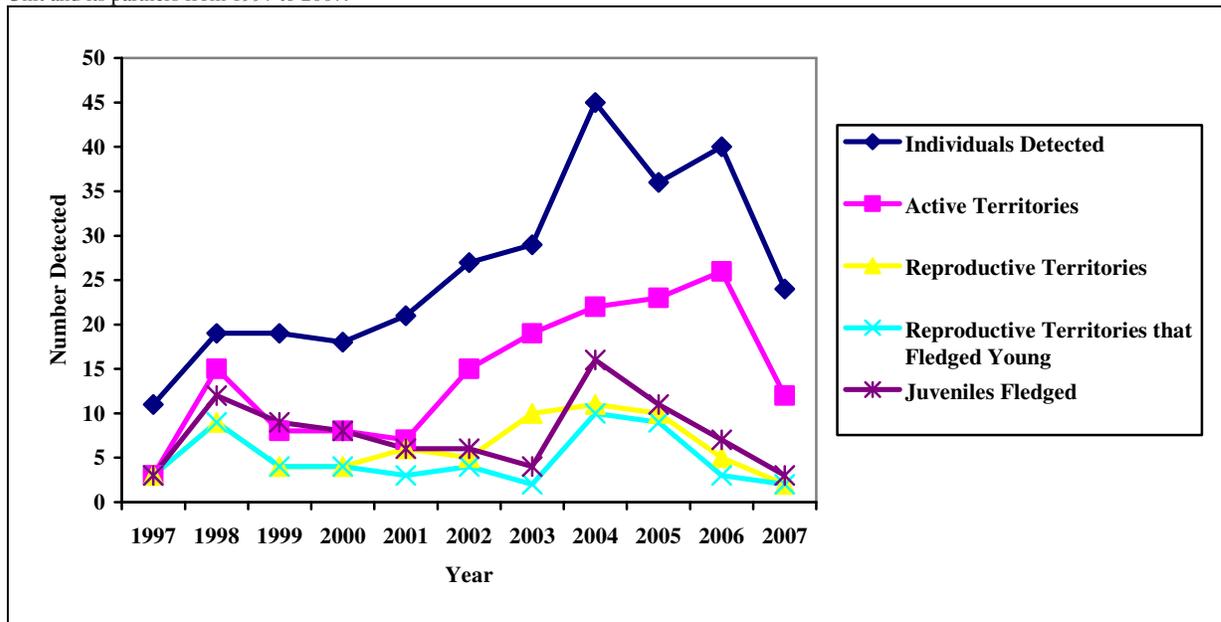
⁴ Project area did not cover historical nesting area.

⁵ Surveyed to protocol due to two dawn acoustic surveys.

⁶ This area was not surveyed to protocol. It received two broadcast survey visits, but at different locations.

Each year, some survey areas are based on project areas that need wildlife surveys to be in compliance with NEPA. Survey areas were established in highly suitable to marginally suitable habitats within ¼ mile of agency project-implementation sites; including fuels treatment, habitat restoration, and trail reroute projects. These surveys are conducted to determine presence/absence within or near a project area. The following tentative representation of northern goshawk individuals, active territories, and reproductive success (for 2007 project survey areas) is included for the sake of continuity between annual reports. The LTBMU and its partners detected 24 individual goshawks (down 40% from 40 in 2006), 12 active territories (down 54% from 26 in 2006), 2 reproductively active territories (down 60% from 5 in 2006), 2 reproductively active territories that fledged young (down 33% from 3 in 2006), and 3 juveniles fledged (down 58% from 7 in 2006) in 2007 (Fig. 3).

Figure 3. Northern goshawk individuals, active territories, and reproductive success detected by the Lake Tahoe Basin Management Unit and its partners from 1997 to 2007.



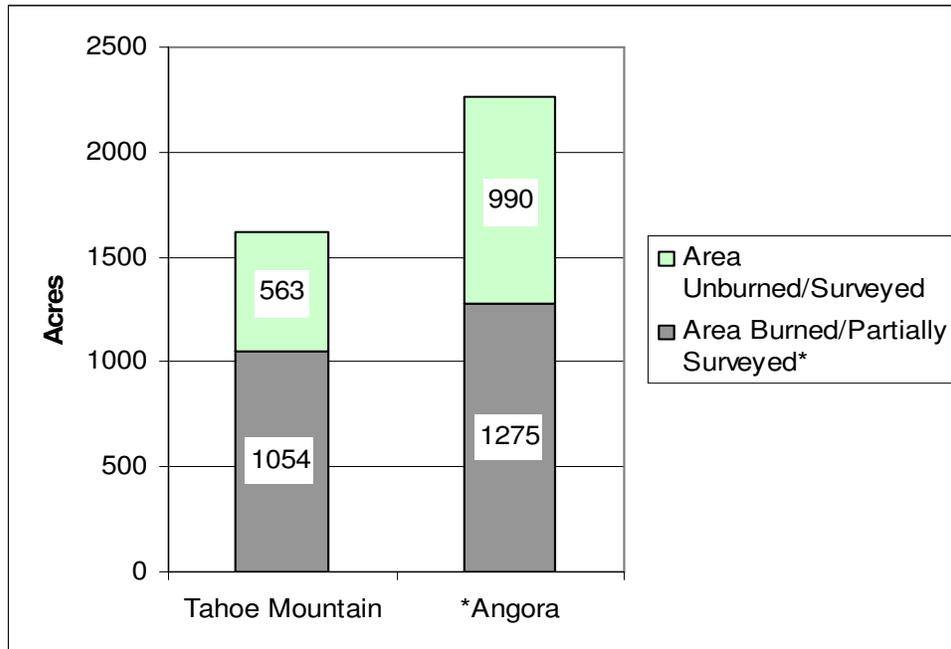
DISCUSSION

The USFS focused survey efforts largely on project areas in 2007. Most of these projects involved thinning which should move the existing forest structure toward pre-settlement conditions, enhance goshawk foraging habitat, and reduce the likelihood of stand-replacing fires. Other projects include trail re-alignment to reduce erosion, meadow restoration and stream channel restoration. We did not conduct broadcast surveys within all historical territories or check the status of all known existing nests during the breeding season. Only 23% (6 of 26) of the broadcast survey polygons contained historic nest sites.

Survey efforts in 2004-06 were greater than in 2007 and previous years while the Northern Goshawk Nesting Territory Assessment was conducted. The Northern Goshawk Territory Assessment focused on historic territories and activity centers, and was conducted by a graduate student (Rich Young) from Humboldt State University in conjunction with University of Nevada, Reno. Knowledge about goshawk reproductive success this year is minimal because of a decrease in survey effort in historic territories and at known nest sites. Also, the number of goshawk detections this year is down (40%) from the previous year. The warm, dry winter (on average, the warmest winter on record) this year may have also had some negative effects on nest initiation and breeding success. Survey areas with evidence of reproduction activity last year, such as Spring Creek, Blackwood Canyon and Fountain Place were found active but reproductive status was not determined this year because nests were not found and fledglings were not observed.

The Angora Fire burned much of the Angora Creek and the Tahoe Mountain survey polygons (Figure 4). A single Angora Creek broadcast survey was completed before the fire burned 56% of the survey polygon. The remaining 990 acres of the polygon that were not burned and contained suitable habitat were surveyed a second time and met protocol requirements. There were five goshawk detections in unburned or lightly burned parts of the survey polygons and in the surrounding suitable habitat during post-fire surveys and an incidental sighting. Undetected 2007 nesting attempts initiated before the fire, if any, were almost certainly destroyed.

Figure 4. Angora Creek and Tahoe Mountain Northern Goshawk survey polygons area burned and unburned during the Angora Fire June 24 to July 19, 2007.



The Angora Fire will likely have substantial short and long term effects on local goshawk activity and territory occupancy. The Seneca Pond and North Angora northern goshawk PACs were adversely affected by the Angora Fire. North Angora goshawk PAC burn intensities (% of acres) were determined (using GIS

and field data) to be high (94%), moderate (6%) and low (0%); and Seneca Pond goshawk PAC burn intensities were high (96%), moderate (3%) and low (1%). The North Angora goshawk PAC will be eliminated from the network as habitat within the PAC was rendered unsuitable and there are no opportunities for re-mapping the PAC in proximity to the affected land allocation. There are no opportunities for re-mapping due to unsuitable habitat to the east and south, and an existing goshawk PAC to the northwest. The Seneca Pond northern goshawk PAC was re-mapped nearby as habitat within the PAC was rendered unsuitable.

The remapped PAC will be surveyed to Region 5 protocol during the 2008 and 2009 nesting seasons and then re-evaluated to determine if the PAC is best located to protect the target species and their habitat. If goshawks are detected, the land allocation boundaries may be adjusted according to management direction for the LTBMU. If the target species are not detected and/or the habitats are determined to be of insufficient quality or quantity, the decision to re-map the land allocations may then be re-evaluated.



Adult goshawk perched in mixed conifer/Aspen forest. (Photo credit unknown)

An aerial hydromulching treatment plan started on September 12, 2007 to control erosion and prevent runoff. Hydromulch was deposited by small aircraft on 636 acres affected by the burn that are inaccessible for hand treatment. The hydromulch sticks to the hillside and minimizes soil erosion. By trapping moisture inside, it provides a favorable environment for seeds to sprout and fulfill their role as natural soil stabilizers. The hydromulch consists of wood mulch, recycled paper, water, and a tackifier, which is guar gum based and binds the ingredients together. The mixture is completely organic and is said to pose no health risks to animals or humans.

MANAGEMENT RECOMMENDATIONS

Not much is known about what specific effects the burn will have on goshawks in the Angora Creek and Tahoe Mountain areas. Protocol survey efforts (e.g. dawn acoustic, broadcast) in the burned area next season would be useful in determining whether goshawks occur in the burned areas or the surrounding unburned habitat.

Reproductive information can be better collected by prioritizing dawn acoustic surveys in more areas in future years to assess early season reproductive activity and emphasizing broadcast surveys within areas where detections occurred during dawn acoustic surveys. Expanding the coverage of project area broadcast surveys to include adjacent historical nesting areas if time and budget permits may increase detections, nesting status results and reproductive success information.

Osprey

METHODS

The LTBMU led collaborative surveys with TRPA to assess the spatial location and reproductive activity of osprey nesting in the Lake Tahoe Basin in 2007. TRPA led osprey monitoring efforts prior to 2004 and provided monitoring records of osprey nesting activity collected from 1976-2003. In 2004, the USFS took the lead for the osprey surveys and data management in the Lake Tahoe Basin. Surveys were conducted for osprey and osprey nests within approximately ¼ mile of the shorelines of Lake Tahoe, Fallen Leaf Lake, Cascade Lake, Lower Echo Lake, and at the following sites located further inland: CAB01, CAB03, CRB01, CRB02, MMP04, MMP06, MMP07, SKH08, SKH11, DMP09, DMP10, GLB03, CVR03,

CVR04, CVR05, and FLP02 (Appendix 3). California State Parks conducted independent surveys in the near-shore areas of Bliss, Sugar Pine Point, Burton, and Emerald Bay State Parks between 10 May and 8 August 2007. Nevada Department of Wildlife (NDOW) monitored Marlette Lake, Tunnel Creek, and Memorial Point for osprey activity during the 2007 breeding season.

We followed the “TRPA Osprey Boat/Walk-In Protocol” and conducted surveys from 16 May 2007 through 21 September 2007. Surveyors visited all known osprey nest sites during the initial visiting period in May. Once a month over the next four months, LTBMU biologists continued to visit all historical sites for which the nest tree was confirmed to still be standing, with a minimum of 17 days between return visits. The Lake Tahoe shoreline was surveyed from aboard a TRPA boat at low speed (<8 mph) approximately 75 meters from shore on 16 May, 20 June, 23 July, 21 August, and 21 September 2007. The remaining sites were surveyed shortly before or after each boat survey by hiking to vantage points near and above (if possible) nest sites, but far enough away to avoid disturbing nesting activity. Nests were considered active if nesting activity was observed on any visit. Surveyors spent at least 10 minutes per visit at each active nest site to assess nesting activity and conducted additional visits as necessary through 21 September 2007 to determine nest fate and reproductive success. Nests that had never been detected before were labeled with a 3-letter prefix to indicate relative location (per method developed by TRPA, see Appendix 3) and with a numerical suffix to indicate order of discovery for that area. For example, the fifth recorded nest in the Cave Rock area, a new initiation this field season, was labeled CVR05.

We collected digital photographs of new nests to facilitate nest tree identification as part of a photo-inventory project begun by TRPA in 2000. We also photographed old nests not previously included in the inventory and those which had changed in character substantially (e.g., half of the nest tree had fallen) since the last photograph was taken. Pictures were taken at many sites, particularly those where the tree was likely gone but were not photographed originally while the nest tree was standing, to complete the photo-inventory.

RESULTS

The LTBMU, NDOW, CaSP, and TRPA surveyed 15,807 (6,397 hectares) acres of suitable osprey habitat and made initial visits to 132 historical nest sites. Following ‘tree gone’ site confirmation during the May surveys, visits were made to 83 nest sites during the four additional rounds of surveying. California State Parks visited 21 historic nest sites and observed current active nests at 11 of those trees. NDOW observed osprey activity at Marlette Lake, Tunnel Creek, Slaughterhouse Canyon, and Memorial Point throughout the 2007 season, locating one new nest in the process (MMP07). In total, the LTBMU and its partners surveyed 139 nest sites and detected 36 intact nests (plus 6 dilapidated), 24 (67%) of which were active, in the Lake Tahoe Basin (Table 6). Seven new nests were located during the 2007 survey season. Substantial effort was put forth again in 2007 to determine which osprey nest trees had fallen or were otherwise no longer suitable for nesting to eliminate such nest sites from future surveys. We determined that, of the 139 nest sites in the Lake Tahoe Basin, 49 nest trees had fallen or been removed. These nest sites will remain in the database but will be removed from the GIS layers showing current osprey nest sites.

Table 6. The total number of osprey nests, active nests, and successfully fledged juveniles detected by LTBMU and its partners, 1997-2007, within the Lake Tahoe Basin.

Nest Site	Nest Present	Nest Active	Juveniles Fledged	Nest Site	Nest Present	Nest Active	Juveniles Fledged
CAB01	Yes	Yes	2	GLB01	No		
CAB02	TG			GLB02	No		
CAB03	No			GLB03	Yes	Unk	
CHB01	Unk ²	NV		MAL01	Yes	Yes	1
CHB02	No			MMP01	TG		
CHB03	Unk ²	NV		MMP02	No		
CRB01	No			MMP03	TG		
CRB02	Yes ³	Yes		MMP04	Yes	Unk	
CSL01	TG			MMP05	Yes ⁵	Yes	2
CSL02	TG			MMP06 ⁴	Yes ³	No	

CSL03	TG			MMP07*	Yes	Yes	1
CSL04	No			RUB01	TG		
CSL05	TG			RUB02	TG		
CSL06	No			RUP01	Yes	Unk	
CSL07*	Yes	Yes		RUP02	TG		
CSL08*	Yes	Unk		RUP03	ND		
CVR01	TG			RUP04	Yes	Yes	
CVR02	TG			RUP05	TG		
CVR03	Yes	Yes		RUP06	TG		
CVR04	TG			RUP07	No		
CVR05*	Yes	Unk		RUP08	TG		
DMP01	TG			RUP09	Yes	Yes	2
DMP02	TG			RUP10	TG		
DMP03	Yes	Yes	2	RUP11	No		
DMP04	Unk	NV		RUP12	TG		
DMP05	TG			RUP13	No		
DMP06	Unk			RUP14	TG		
DMP07	Unk			RUP15	No		
DMP08	Yes	Unk		RUP16	Yes	Yes	1
DMP09	ND			RUP17	TG		
DMP10	Yes	Yes	1	RUP18	No		
ECO01	TG			RUP19	TG		
ECO02	TG			RUP20	Yes	Unk	
EMB01	TG			RUP21	No		
EMB02	Yes	Yes		RUP22	No		
EMB03	TG			RUP23	No		
EMB04	TG			RUP24	No		
EMB05	Yes	Yes	1	RUP25	ND		
EMB06	TG			RUP26	No		
EMB07	TG			SAH01	Unk ²	NV	
EMB08	TG			SAH02	Yes	Yes	2
EMB09	No			SAH03	Unk ²	NV	
EMB10	TG			SAH04	TG		
EMB11	No			SAH05	Unk ²	NV	
EMB13	TG			SAH06	No		
EMB14	Yes	Yes	1	SAH07	No		
EMB15	ND			SCH01	Unk ²	NV	
EMB17	ND			SCH02	Yes	Yes	1
EMB18	Yes	Unk		SCH03	No ²		
EMB19	No			SCH04	TG		
EMB20	Yes ³	Yes	2	SCH05	Unk ²	NV	
EMB21	Yes	Unk		SCH06	No		
FLL01	TG			SCH07	No		
FLL02	TG			SKH01	TG		
FLL03	TG			SKH02	TG		
FLL04	Yes	Unk		SKH03	No		
FLL05	TG			SKH04	Unk ²	NV	
FLL06	No			SKH05	Unk ²	NV	
FLL07	TG			SKH06	No		
FLL08	TG			SKH07	No		
FLL09	Yes	Yes		SKH08	TG ²		
FLL10	TG			SKH09	No		
FLL11	TG			SKH10	No		

FLL12	TG			SKH11	ND		
FLL13	TG			SLT01	Yes	Unk	
FLL14*	Yes	Yes		SLT02	Yes	Yes	2
FLL15*	Yes	Yes		SLT03	No		
FLP01	No			SLT04*	Yes	Yes	
FLP02	No			SPP01	TG		
				SPP02	Yes	Yes	
Subtotal	19	13	9	Subtotal	17	11	12
				Grand Total	36	24	21

* Indicates new nest detected during 2007 surveys.

TG indicates that nest tree is gone (fallen or removed due to hazard potential).

ND indicates a dilapidated nest (falling apart or obviously unmaintained).

¹ Not surveyed by NDOW in 2007

² Indicates uncertainty regarding status of nest tree

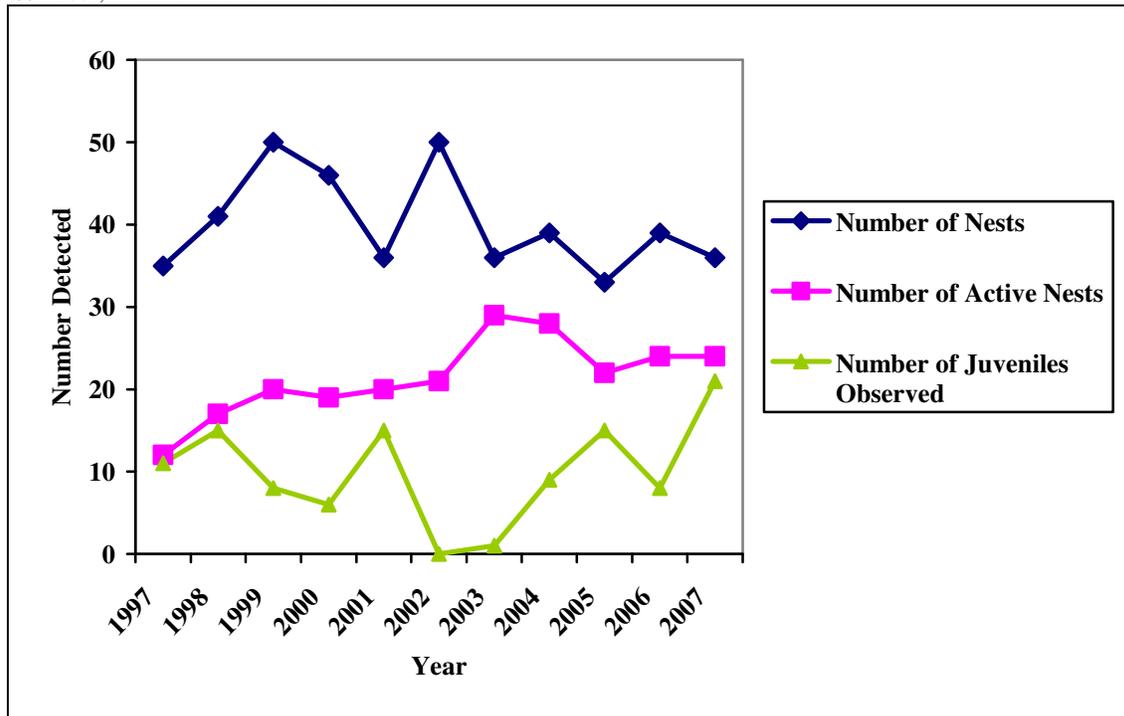
³ Nest located in Tunnel Creek drainage and not visible from lake

⁴ Nest formerly known as TUC01 - possible activity early season; no activity later on

⁵ Nest was gone on last visit after being Active

Of the 24 active osprey nests detected, juvenile osprey fledged successfully from 14 nests (58%) (Appendix 4). A total of 17 juvenile osprey were confirmed to have fledged in 2007, with 4 additional confirmed to have fledged after being observed as nestlings. In total, the LTBMU and its partners detected 36 osprey nests (down 8% from 39 in 2006), 24 active nests (equal to 24 active in 2006), and 21 juveniles (up 62% from 8 in 2006) (Figure 5).

Figure 5. The total number of osprey nests, active nests, and successfully fledged juveniles detected by LTBMU and its partners, 1997-2007, within the Lake Tahoe Basin.



Photographs were taken of all new 2007 nests and old nests whose appearance had changed. Copies of the photos were filed appropriately in the osprey photo binder continuing the photo-inventory project initiated by TRPA. The Wildlife 2000 database and GIS shape files were updated with the osprey data collected during the 2007 survey season.

DISCUSSION

The osprey survey effort, expanded in 2005 in comparison to 2004 due to increased staffing and additional survey efforts performed by California State Parks, continued in 2006 and 2007. Surveys were well distributed throughout the osprey nesting season (April-September) and additional visits to active nests were completed as necessary to determine reproductive activity and success. The final round of surveys occurred during the third week of September. The number of juveniles (21) is over twice the average (8.8) for the period 1997-2006 (Fig. 5). The reproductive output in the vicinity of Emerald Bay has also rebounded (4 fledglings confirmed with 4 additional young possibly fledged) after a poor 2006 breeding season with only 2 successful fledglings (see 2006 annual report). The 2007 fledging rate may partially be due to higher numbers of visits between the efforts of all agencies involved in osprey monitoring in 2007. Surveys occurred during the fledging period of the breeding season, therefore the number of juveniles fledged is considered to be accurate within the limitations of this type of survey protocol.

The 2007 Angora Fire did not affect any known active osprey nest sites nor have any obvious effect on Tahoe Basin individuals or population. High burn severity occurred at the FLL07 nest site; however, that nest tree fell down an undetermined number of years ago (at least four years) and no osprey activity has been observed or reported in the vicinity since.

MANAGEMENT RECOMMENDATIONS

The collaborative efforts of the LTBMU, TRPA, and CaSP have refined osprey surveys within the Lake Tahoe Basin and initiated the development of a database that will further contribute to our understanding of status and change in the local osprey population. This database should continue to be maintained and shared with NDOW. Five boat surveys were done in collaboration with TRPA starting in mid-May. Initial surveys in subsequent years should continue to be initiated in May, or even late April, in order to best detect early nesting attempts.

Bald Eagle

METHODS

The LTBMU hosted the 25th annual mid-winter bald eagle count on January 12, 2007 as part of an ongoing effort led by the UC Santa Cruz Predatory Bird Research Group (PBRG) to assess the status of bald eagle populations in California, and to contribute to the National Midwinter Bald Eagle Survey. The mid-winter count is a one-day event in which participants, arrayed at suitable sites throughout the Lake Tahoe Basin, watch for bald eagles during an pre-established three-hour time period (Appendix 5). Participants were recruited by the LTBMU from local agencies and recorded the time, direction of flight, and age-class of all bald eagles detected. The data was reviewed to determine whether multiple observers may have recorded the same bald eagle (based on time and direction of flight) before a summary report was distributed to participants and the PBRG.

The LTBMU also conducted limited bald eagle nest surveys in conjunction with the osprey nest survey program (Appendices 3 and 5). We surveyed the bald eagle nest at Emerald Point in Emerald Bay for signs of eagles or nesting activity 5 times between May and August 2007 from the TRPA boat during osprey nest surveys. California State Parks surveyed the Emerald Point nest 10 times between March and



Bald eagle perched on the east shore of Lake Tahoe.
(Photo credit unknown)

July 2007. The latter surveys were conducted from above the nest on the Vikingsholm access road. We also surveyed suitable eagle habitat within approximately ¼ mile of the shorelines of Lake Tahoe, Cascade Lake, Fallen Leaf Lake, and Lower Echo Lake, incidentally, as part of the osprey nest survey program. NDOW conducted surveys at Marlette Lake in 2007 and observed a pair of bald eagles during multiple visits. No sign of nesting activity was observed at Marlette Lake.

RESULTS

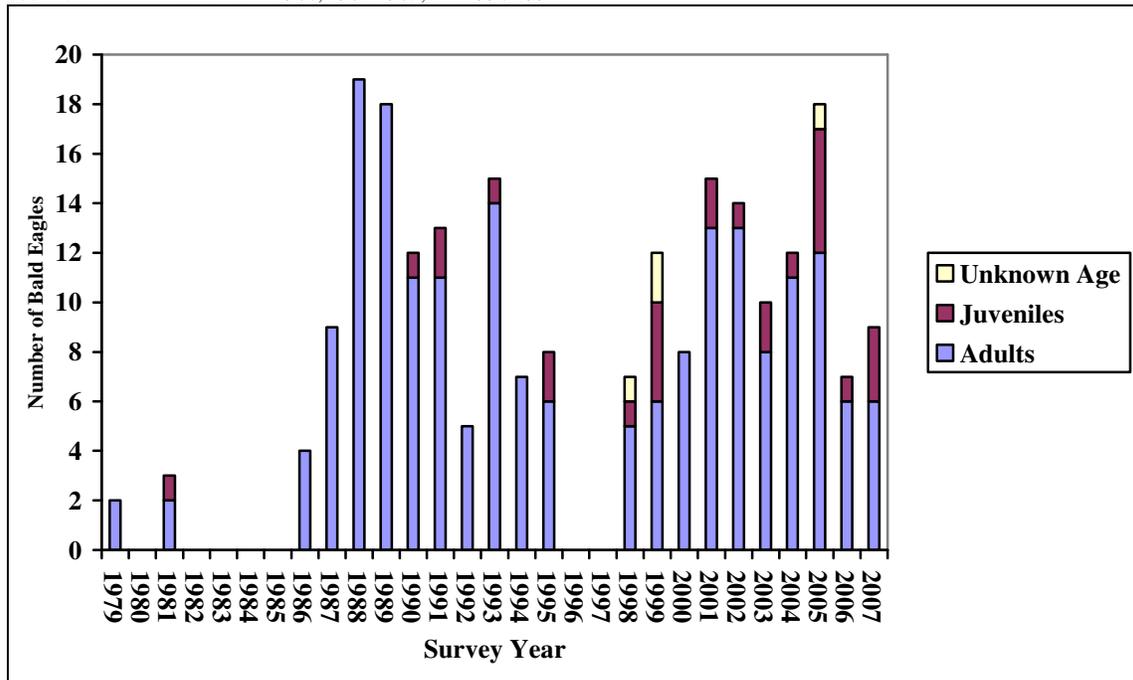
Twenty-eight participants, stationed at 26 survey points around the Basin, observed 9 bald eagles (3 juveniles and 6 adults) during the 2007 mid-winter bald eagle count (Table 7). Bald eagles were detected at 10 locations. A juvenile was detected at the Zephyr Cove site was observed twice within an hour and was thus assumed to be the same individual.

Table 7. Locations and age-classes of bald eagles detected during the mid-winter bald eagle count conducted by the Lake Tahoe Basin Management Unit and its partners, January 12, 2007.

Survey Location	Bald Eagles Detected
Baldwin Beach	1 juvenile
Cave Rock	1 juvenile
Fallen Leaf Lake (North)	1 juvenile
Meeks Bay	1 juvenile
Reagan Beach	1 adult
Sugar Pine Point State Park	1 adult, 1 juvenile
Timber Cove Pier	1 adult
Truckee Marsh	1 juvenile
Valhalla	1 juvenile
Zephyr Cove	1 adult, 1 juvenile

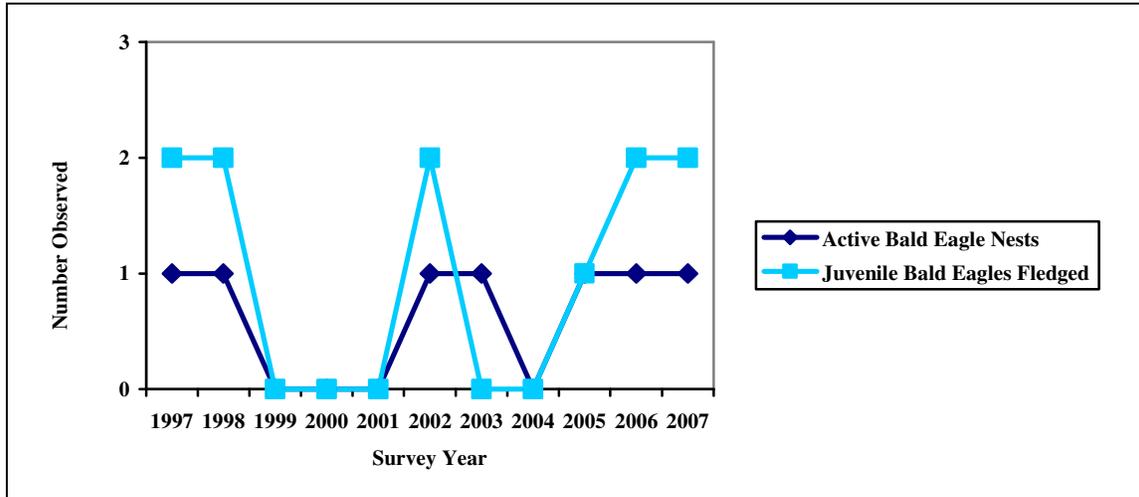
The number of bald eagles detected during the mid-winter count increased in 2007 (n= 9, up 22% from 7 in 2006) (Fig. 6).

Figure 6. Bald eagles detected during mid-winter counts in Lake Tahoe Basin, during the period: 1979, 1981, 1986-95, and 1998-2007. Count data not found for 1980, 1982-1985, and 1996-1997.



During surveys and observations conducted during the breeding season, adult bald eagles were detected in the area of the Emerald Bay nest site. The nest in Emerald Bay (BAEA01) was the only successful nest observed in the Lake Tahoe Basin, and fledged 2 juveniles. The number of active bald eagle nests detected (n=2, up from 1 in 2006) and juveniles fledged (n=2, same as 2005) are consistent with numbers recorded during the 1997-2006 period (Fig 7).

Figure 7. Number of bald eagle nests and fledged juveniles detected in Lake Tahoe Basin, 1997-2007.



DISCUSSION

In May 2000, the LTBMU submitted a bald eagle management plan to the U.S. Fish and Wildlife Service (USFWS). The key recommendations of the plan involve seasonal and/or year round closure of bald eagle habitat, increased educational signage in recreation areas, re-routing of trails away from sensitive habitat and wetland improvement projects. The plan increases protection of bald eagle habitat, and subsequently protects habitat for a wide diversity of terrestrial and aquatic taxa. Planning for or implementation of these measures continued in 2007 though the USFWS has not yet commented on the management plan. The U.S. Fish and Wildlife Service announced intent to de-list the bald eagle, formerly federally-listed as a threatened species on June 28, 2007. The bald eagle was federally de-listed on August 8, 2007, 30 days after. After the de-listing was published in the federal register on July 9, the bald eagle was designated as a Forest Service sensitive species.

The 2007 Angora Fire did not affect the Emerald Bay nest and had no obvious effect on bald eagle individuals or population in the Lake Tahoe Basin.

MANAGEMENT RECOMMENDATIONS

Our continued participation in the mid-winter bald eagle survey is important in assisting the UC Santa Cruz Predatory Bird Research Group in a long-term effort to assess population levels nationwide and should continue in the future. With the leadership of California State Parks, survey efforts at the Emerald Point bald eagle nest verified reproductive success in Emerald Bay. Continued collaboration with California State Parks and Nevada Division of Wildlife is necessary to adequately assess bald eagle fecundity in the Lake Tahoe Basin.

Willow Flycatcher

METHODS

The LTBMU conducted surveys for willow flycatcher (*Empidonax traillii*) in coordination with the Tahoe National Forest Willow Flycatcher Demography Study. A total of 14 sites were surveyed for this species in the Basin in 2007 (Appendix 6). All surveys followed the USFS, Region 5 protocol “A Willow Flycatcher Survey Protocol for California” (Bombay et al., 2003). The purpose of these surveys was to assess presence

or probable absence, reproductive activity, and nesting success of willow flycatcher. The LTBMU conducted surveys for Willow Flycatchers during the first (June 1–14) second (June 15–25) and third (June 26–July 15) survey periods. All sites were surveyed once during the (mandatory) second survey period. A minimum of 5 days elapsed between surveys of each site. Surveys began approximately 1 hour before sunrise and ended at or by 10:00 a.m. We broadcast willow flycatcher songs approximately every 50 meters within suitable habitat.

The Tahoe National Forest Willow Flycatcher Demography Study surveyed the Blackwood Canyon, Tallac Creek, Morton Street, Grass Lake, and Uppermost Upper Truckee sites in 2007.

Survey site selection was determined according to direction given in the Sierra Nevada Forest Plan Amendment, Final Environmental Impact Statement, Record of Decision (hereafter ROD; 2004) and project work in suitable habitat (Table 8). The ROD describes willow flycatcher ‘emphasis habitat’ as meadows larger than 15 acres with standing water on June 1 and a deciduous shrub component; ‘emphasis meadows’ are meadows within 5 miles of a historically occupied site; and ‘historically occupied sites’ are those where this species is known to have occurred.



Willow flycatcher nestling banded in Blackwood Canyon, 2002. (Photo by Theresa Pope)

Table 8. Locations surveyed to assess presence or probable absence, reproductive activity, and nesting success of willow flycatcher by the Lake Tahoe Basin Management Unit and its partners within the Lake Tahoe Basin, 2007. Types of survey areas are described in Sierra Nevada Forest Plan Amendment, Final Environmental Impact Statement, Record of Decision (USFS, 2004). Associated USFS projects listed may be under consideration, proposed, underway, or completed.

Surveyor	Survey Area	Type of Survey Area	Associated Project
LTBMU	Big Meadow	Previously Occupied	Big Meadow Restoration
	Lily Lake	Previously Occupied	Recreation Residence certification: Lily Lake Tract
	Prey Meadows	Previously Occupied	Slaughterhouse Fuels Reduction
	Spring Creek	Emphasis Habitat	South Shore Healthy Forest Restoration
	South Lake Tahoe Airport	Emphasis Habitat	Upper Truckee River Restoration
	Taylor Creek	Previously Occupied	Taylor Creek Environmental Education Center, Fallen Leaf Water System Improvements - Phase 4, South Shore Healthy Forest Restoration
	Trout Creek	Previously Occupied	South Shore Healthy Forest Restoration
	Zephyr Cove	Emphasis Habitat	Roundhill Fuel Reduction
Tahoe National Forest Willow Flycatcher	Blackwood Canyon	Previously Occupied	Blackwood Creek Stream Restoration Phase III
	Grass Lake	Previously Occupied	South Shore Healthy Forest Restoration

Demography Study	Morton Street	Previously Occupied	South Shore Healthy Forest Restoration
	Tallac Creek	Previously Occupied	South Shore Healthy Forest Restoration, Tallac Creek Grazing Permit
	Uppermost Upper Truckee	Previously Occupied	South Shore Healthy Forest Restoration
California State Parks	Antone Meadows	Previously Occupied	Unknown
Wildlife Resource Consultants	Washoe SP	Previously Occupied	Golf Course Remodel

Willow flycatcher habitat assessment surveys were conducted at the Tallac Creek marsh from October 4th through October 17th, 2007. The following methods were used to assess riparian community composition: 1) vegetation cross-section composition, 2) green-line composition, 3) woody species regeneration, and 4) cover-board (see below). These survey methods were used to monitor vegetation changes taking place as a result of natural and anthropogenic activities. Cross-section transects were randomly established perpendicular to the grade in the riparian complex in order to cross the entire riparian area. End points of each of the five transects were permanently marked with stakes and UTM coordinates were recorded. Community type composition was obtained by taking the number of steps encountered for each type (i.e. willow, alder, grasses, etc.) in all five transects divided by the total number of steps taken in all five transects. The greenline measurement is designed to account for a continuous line of vegetation on each side of the stream even when this line of vegetation occurs several feet above or away from the stream's edge. The greenline transect began on the right-hand side looking downstream of the current, most active channel and proceeded down the greenline using a step-transect approach. The total number of steps of each community type encountered along the greenline on both sides of the stream was tallied and percent composition for each type computed, as described in the cross-section composition measurement. Woody species regeneration measurements were made using a 6-foot wide belt along the same transects used for the greenlines. Woody plants rooted within the 6-foot region were tallied based on the following age classes: sprout, young, mature, decadent, and dead. Measurements for vertical vegetative cover were taken using the cover board method. The cover board was divided into sections (like a chess board) and vegetative cover determined by averaging the percentage of each section of the board that was covered by vegetation. Cover board measurements were taken at randomly selected points off of the cross-section transects.

RESULTS

The LTBMU and its partners surveyed an estimated 271 acres (LTBMU 166 acres; Tahoe National Forest Willow Flycatcher Demography Study 105 acres) of suitable habitat within the Lake Tahoe Basin for willow flycatcher in 2007. We calculated the area surveyed using 50 meter buffers around each survey point within a survey area. Willow flycatchers were detected in Blackwood Canyon, Tallac Creek, along the Upper Truckee River near the South Lake Tahoe Airport, and at the Uppermost Upper Truckee site (Table 9).

The LTBMU completed surveys for willow flycatchers at 8 sites between June 1 and June 21, 2007. Male willow flycatchers were detected during surveys of Tallac Creek, Blackwood Canyon, South Lake Tahoe Airport, and Uppermost Upper Truckee. The Tahoe National Forest Willow Flycatcher Demography Study monitored Blackwood Canyon and reported 1 nesting attempt that was successful with 4 chicks fledged.

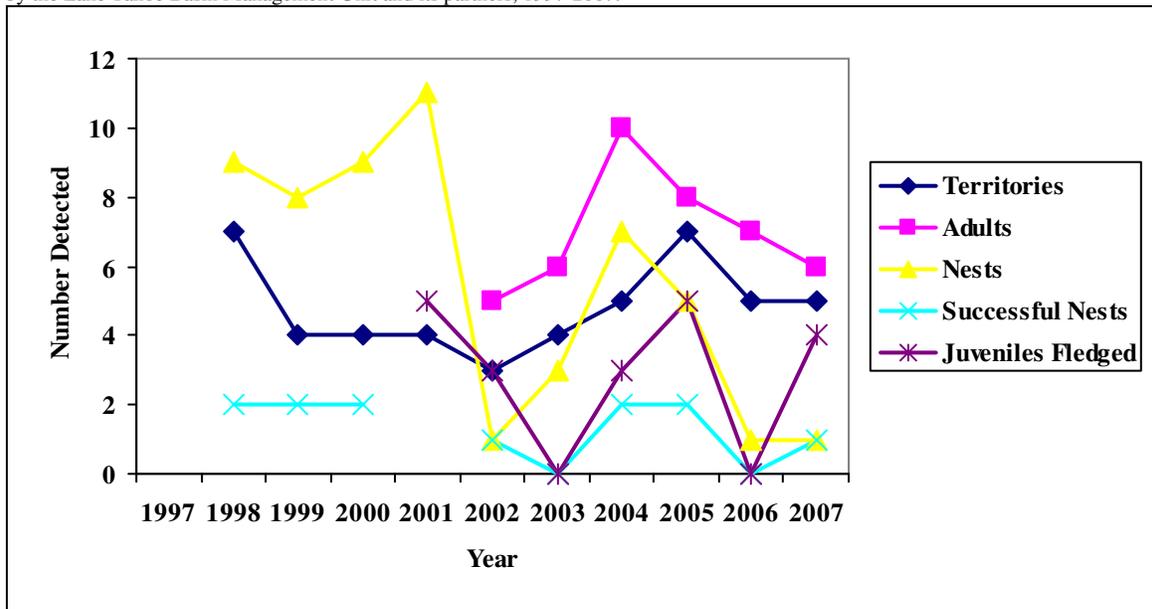
Table 9. Summary of willow flycatcher detections, nests, and recruitment in areas surveyed by the Lake Tahoe Basin Management Unit and its partners, 2007.

Survey Area	Territories	Adults	Nests	Nest Outcome	Juveniles Fledged
Antone Meadows	-	-	-	-	-
Big Meadow	-	-	-	-	-
Blackwood Canyon	1	2	1	success	4

Grass Lake	-	-	-	-	-
Lily Lake	-	-	-	-	-
Morton Street	-	-	-	-	-
Prey Meadows	-	-	-	-	-
South Lake Tahoe Airport	1	1	-	-	-
Spring Creek	-	-	-	-	-
Tallac Creek	2	2	-	-	-
Taylor Creek	-	-	-	-	-
Trout Creek	-	-	-	-	-
Uppermost Upper Truckee	1	1	-	-	-
Washoe State Park	-	-	-	-	-
Zephyr Cove	-	-	-	-	-
Totals	6	6	1	1	4

The number of willow flycatcher territories (n=6, up from 5 in 2006), adults (n=6, down from 7 in 2006), nests (n=1, equal to 1 in 2006), successful nests (n=1, up from 0 in 2006), and juveniles fledged (n=4, up from 0 in 2006) detected in 2007 are shown in comparison to those for the period 1997-2007 (Fig. 8).

Figure 8. Number of willow flycatcher territories, adults, nests (including re-nests), successful nests, and juveniles fledged detected by the Lake Tahoe Basin Management Unit and its partners, 1997-2007.



DISCUSSION

The last remaining grazing allotment on Forest Service lands in the Lake Tahoe Basin is located in Tallac creek marsh and in the adjacent uplands. The LTBMU plans to protect the suitability of the existing willow flycatcher habitat in Tallac marsh by allowing only late-season grazing (after August 20) in the meadow as described in the Sierra Nevada Forest Plan Amendment, Final Supplemental Environmental Impact Statement, Record of Decision (2004). The LTBMU conducted a willow flycatcher habitat assessment at the Tallac marsh in order to provide information on the long-term trends of vegetation communities in that complex. Disturbance activities, such as overgrazing or trampling by animals or people, result in vegetation changes to shallower, weakly rooted species. These species have a reduced ability to buffer the forces of moving water and keep the stream's hydrologic features in balance. Therefore, an evaluation of the vegetative composition can provide a valuable indication of the general health of a riparian area (successional status) as well as the current strength of the stream banks in buffering the forces of water (stream bank stability).

The Angora Fire (June 24 to July 19, 2007) burned over a newly proposed survey polygon which was to be surveyed during the second window for the first time on Monday the 25th of June. The willow flycatcher survey at Angora Creek did not take place this year. It is believed that the fire may increase the health of the meadow and provide better habitat for willow flycatchers in the future.

MANAGEMENT RECOMMENDATIONS

Willow flycatchers and their habitat would likely benefit in the long term from meadow and creek restoration projects, such as the Cookhouse Meadow, Big Meadow, Upper Truckee River, Blackwood Creek Lower Channel Restoration and High Meadows Restoration Projects. Restoration projects often raise water tables and may provide standing water when the climatic conditions are favorable for nesting and often later into the nesting season. Elevated water tables may also reduce nest and fledgling predation rates. Restoration of meadow vegetation may improve hiding and thermal cover for nesting and provide more abundant and better dispersed perches for foraging. Restored meadow vegetation and elevated water tables may increase local prey insect populations. The suitability of existing willow flycatcher habitat and probability of successful reproductive activity for this species at Tallac marsh would likely improve by stopping the grazing currently permitted and restoring the meadow.



Male willow flycatcher (*Empidonax traillii*) perched on a willow. (Photo credit unknown)

Mountain Beaver

METHODS

The LTBMU conducted surveys were done during daylight hours to get the most sunlight available when looking for detections. The protocol for mountain beavers was created by Shay Zanetti and Rena Escobedo based on literature. Mountain beaver is a presence absence survey. Presence sign includes hay piles, clipped stems, basal barking and burrows. In order to avoid over estimating the number of territories found, when sign is found, surveyors move up and/or down the drainage 100m before resuming the search based on home range figures. This will avoid the possibility of detecting two areas of sign that are part of the same home range.



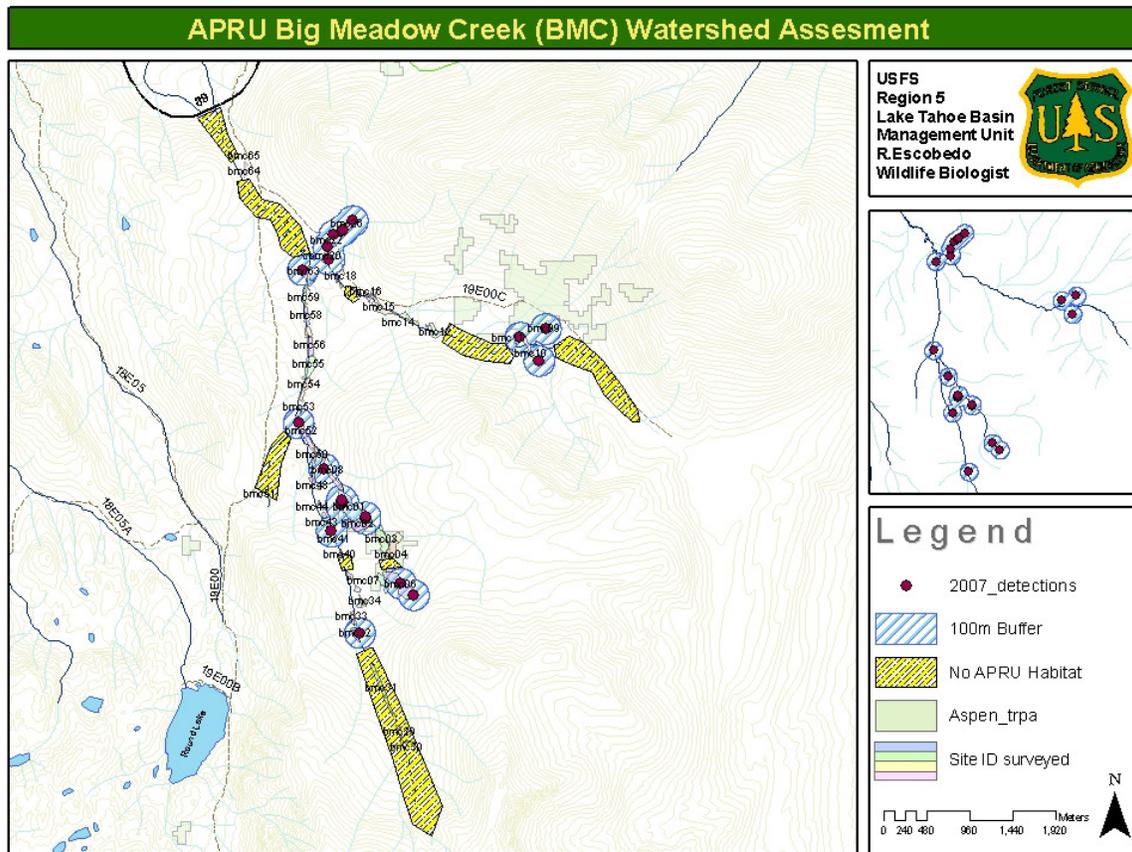
Mountain beaver (*Aplodontia rufa*) museum specimen (Photo credit unknown)

RESULTS

Please see end of season report: Mountain Beaver Distribution in the Lake Tahoe Basin, Mountain Beaver Habitat Assessment Report.

The number of sites surveyed and detections found in 2007 (Fig. 9).

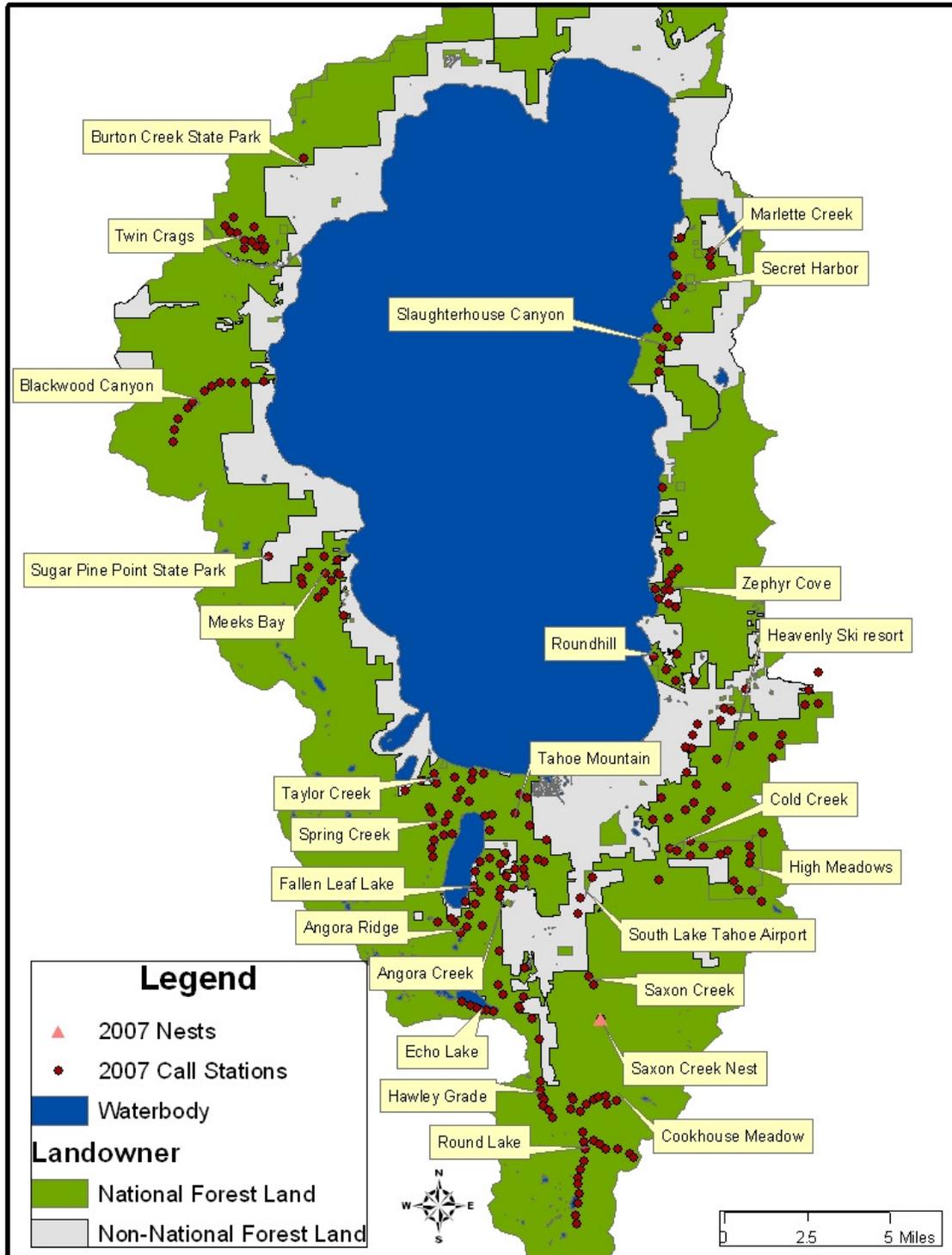
Figure 9. Mountain beaver presence detections found in the Big Meadow watershed in 2007



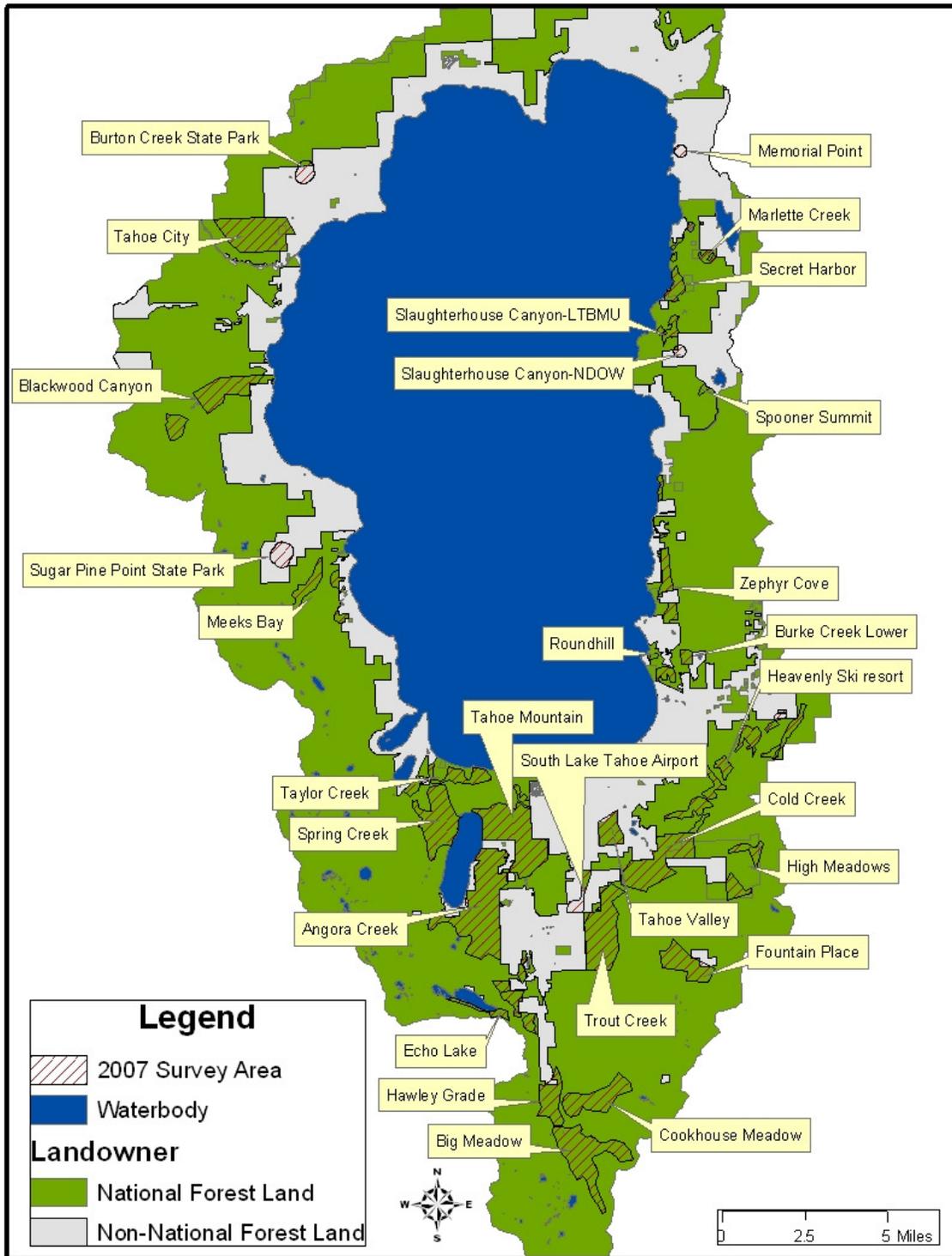
DISCUSSION

The Lake Tahoe Basin Management Unit is in the process of developing a basin wide monitoring plan for mountain beaver as part of the Forest Plan Revision. A mountain beaver assessment was completed in the Big Meadow watershed. Burrow networks of these species were identified in separate drainages within aspen stands and riparian areas in the tributaries along the drainages of the creeks in the watershed.

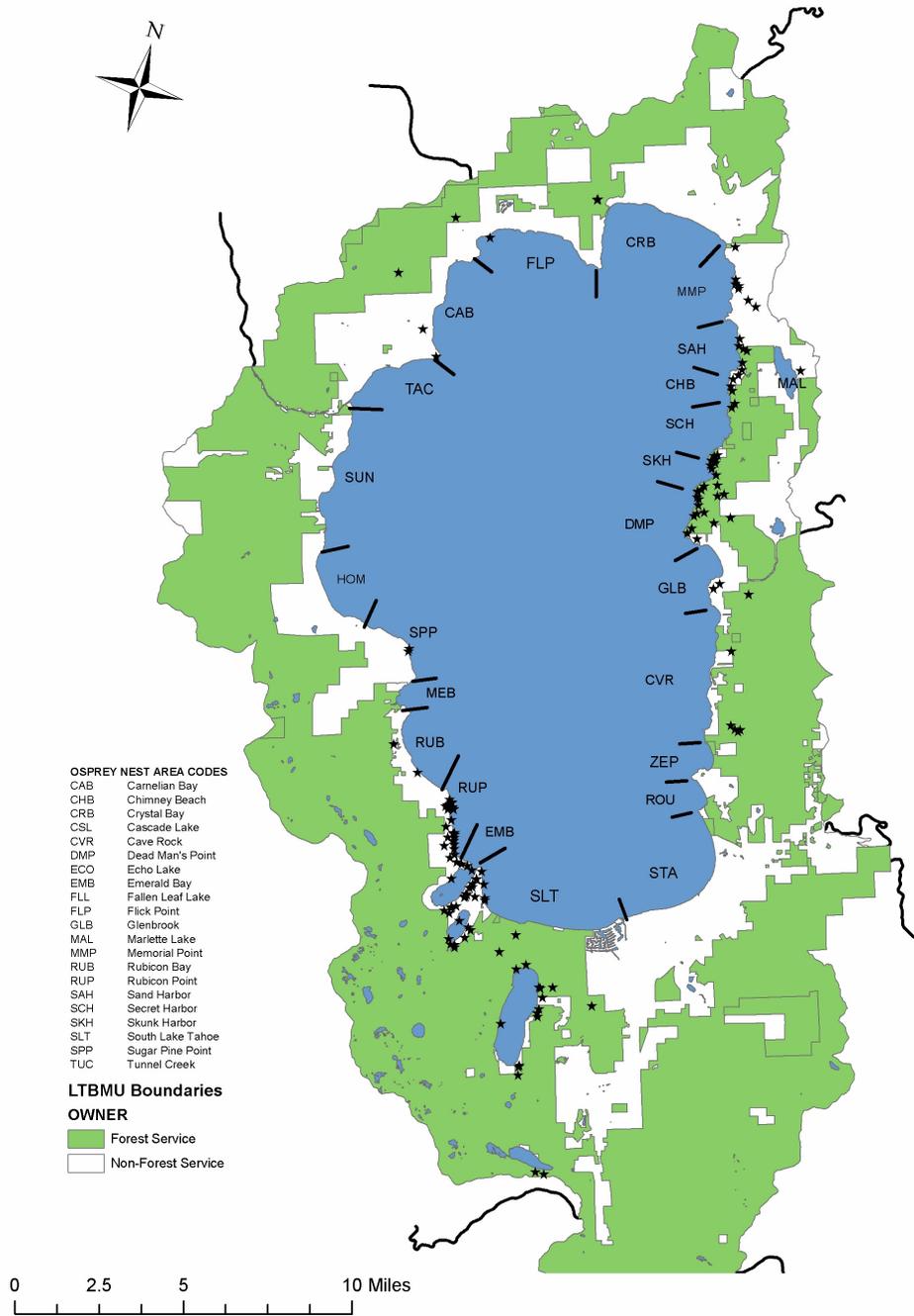
Appendix 1. Locations of California spotted owl survey call stations and nest stand habitat surveys within the Lake Tahoe Basin, 2007. Surveys conducted by Lake Tahoe Basin Management Unit, California State Parks, Nevada Department of Wildlife, and Hauge Brueck Associates (contractor for Heavenly Mountain Resort).



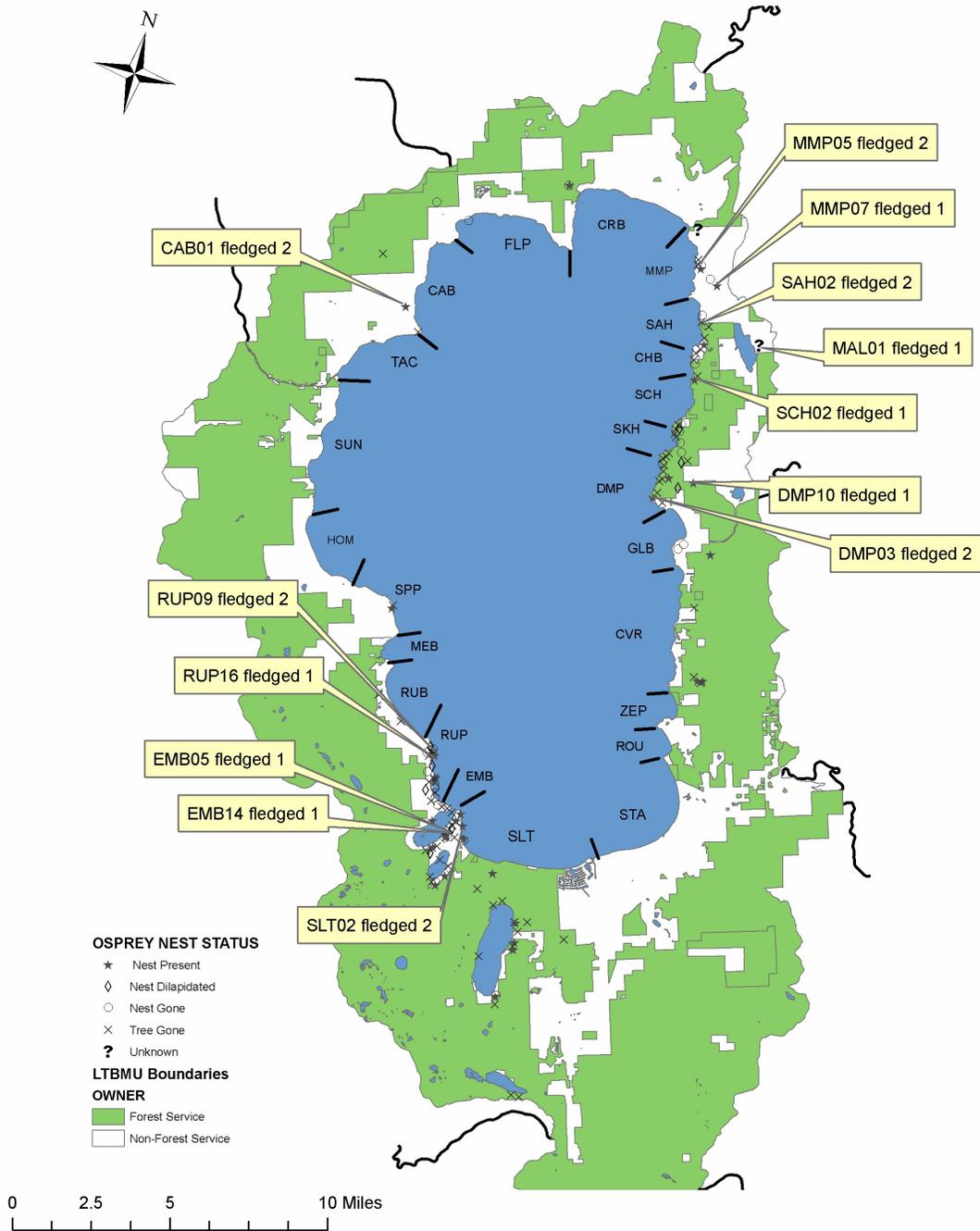
Appendix 2. Locations of northern goshawk survey polygons within the Lake Tahoe Basin, 2007. Surveys conducted by Lake Tahoe Basin Management Unit, California State Parks, Nevada Department of Wildlife, and Hauge Brueck Associates (contractor for Heavenly Mountain Resort).



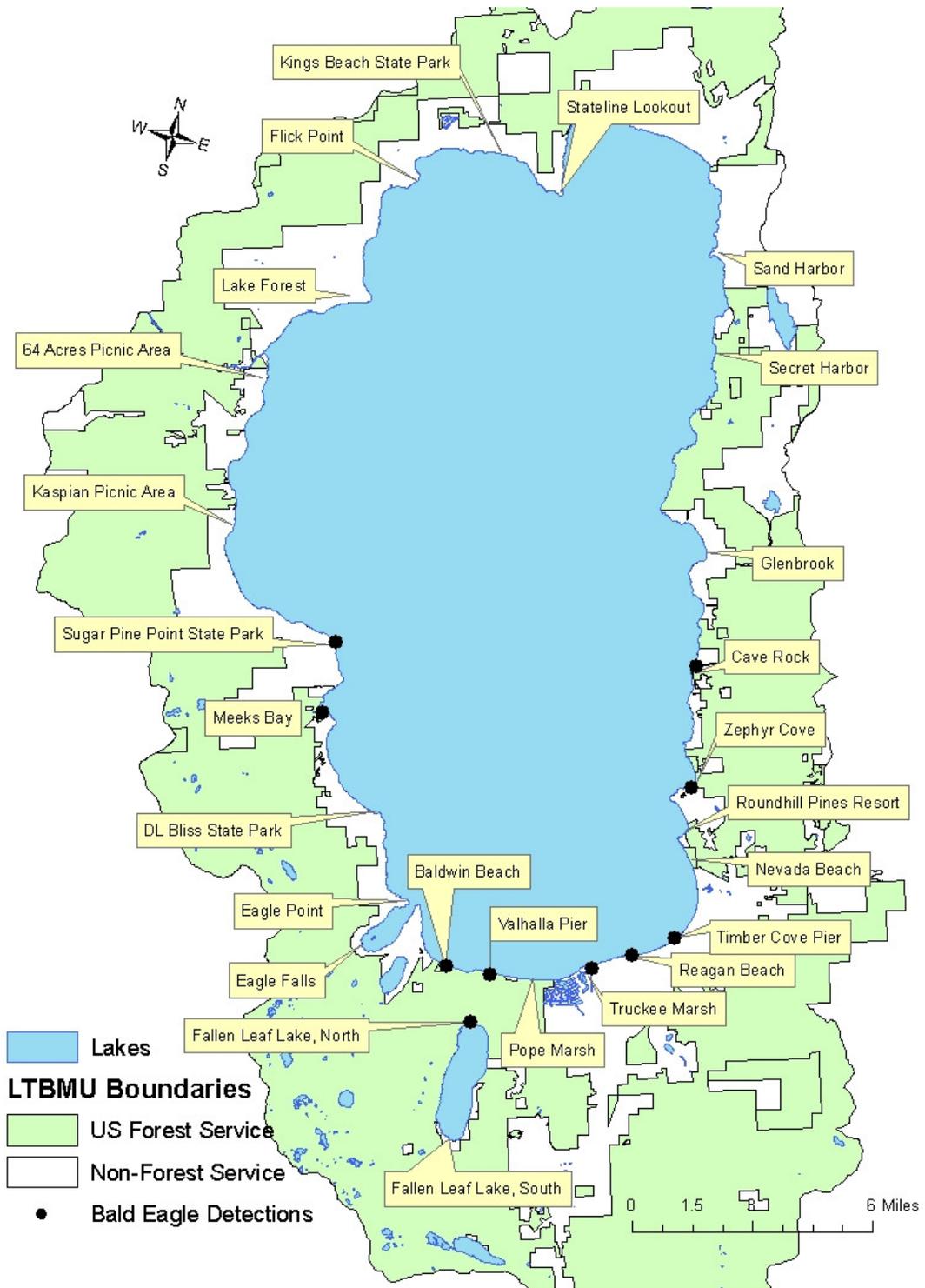
Appendix 3. Area surveyed by the Lake Tahoe Basin Management Unit, Tahoe Regional Planning Agency, Nevada Department of Wildlife, and California State Parks to assess the spatial location and reproductive activity of osprey in the Lake Tahoe Basin, 2007.



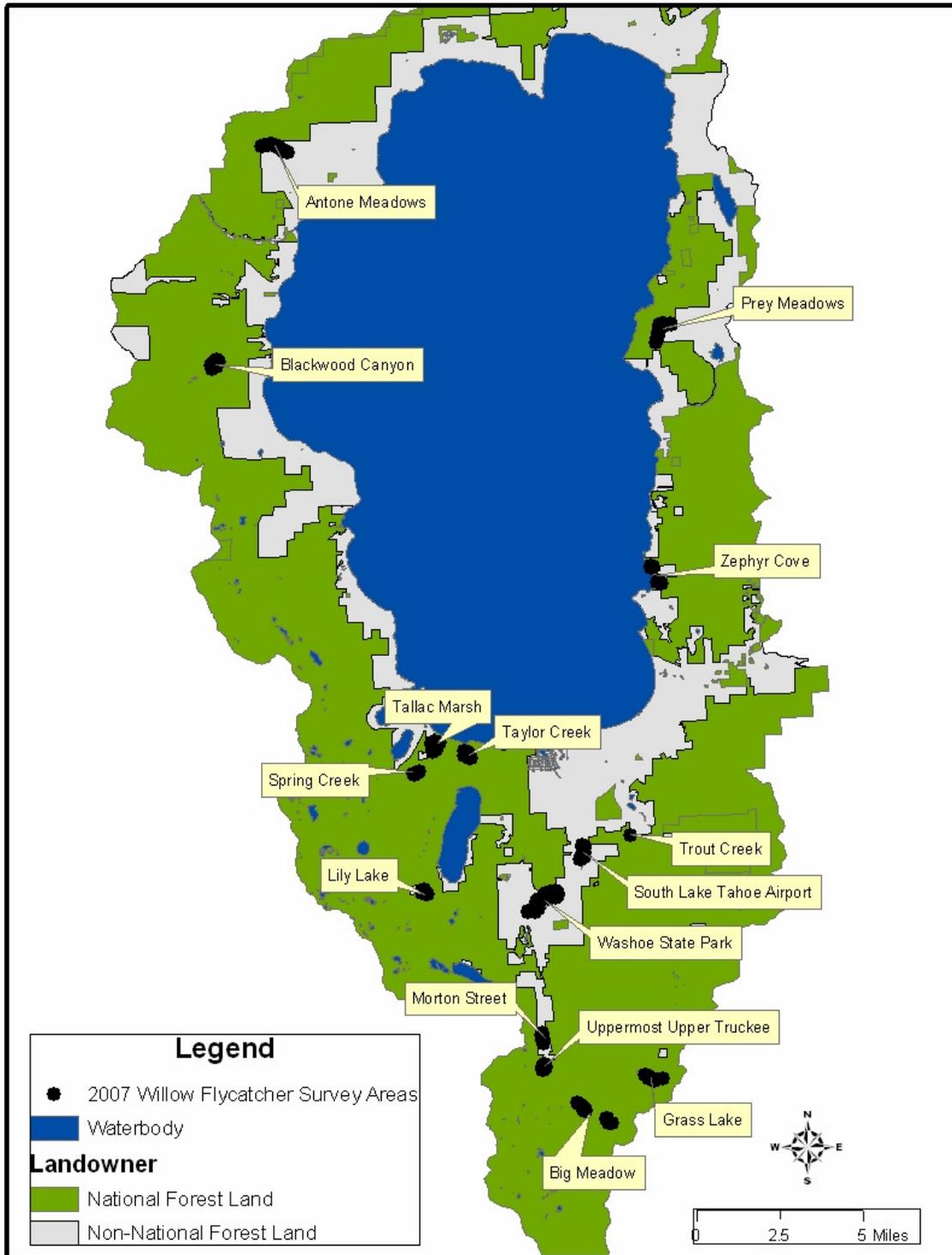
Appendix 4. Osprey nest activity and reproductive success detected in the Lake Tahoe Basin by the Lake Tahoe Basin Management Unit, Tahoe Regional Planning Agency, Nevada Department of Wildlife, and California State Parks in 2007.



Appendix 5. Area surveyed for bald eagle nests, locations of mid-winter bald eagle count observers, and locations of bald eagles detected during the mid-winter count, 2007. Surveys for bald eagle nests and the mid-winter bald eagle count were conducted by the Lake Tahoe Basin Management Unit and its partners.



Appendix 6. Locations surveyed to determine willow flycatcher presence or probable absence and reproductive activity by the Lake Tahoe Basin Management Unit and its partners, 2007.



COST

We roughly estimated the cost (for LTBMU surveys only) of surveys for each species based solely on the wages of the surveyors for time spent in the field (not in the office or at trainings) and vehicle expenses (Table 10). We calculated the costs of the surveyors based on the following general schedule (GS) wages: GS- 4 (\$12.72/hr.), GS-5 (\$15.20/hr.), GS-7 (\$18.69/hr.), and GS-9 (\$29.32/hr.). Surveys for California spotted owl and northern goshawk were conducted by 2 person crews; typically a GS-5 and a GS-7 biologist. We used 4 vehicles to conduct the surveys: a 4-wheel drive fleet vehicle (#0282) leased from General Services Administration (GSA) (\$300/month and \$0.35/mile) and 3 four-wheel drive vehicles FS holdover vehicles (\$320/month and \$0.42/mile). We used #0282 primarily for osprey, eagle, willow flycatcher, and goshawk (springtime dawn acoustic) surveys and occasionally to assist with goshawk and spotted owl surveys. The 3 holdover vehicles were primarily used for spotted owl, goshawk, and willow flycatcher surveys.

Table 10. Roughly estimated cost of surveys (wages and vehicle expenses only) by species for surveys conducted by the Lake Tahoe Basin Management Unit, 2007.

Species	Acres Surveyed	Total Hours	Wages	Vehicles			Total Estimated Cost
				Lease or Rental Expenses	Total Miles	Mileage Expenses	
California Spotted Owl	18,312	653	\$10,790	\$1,544	2,390	\$907	\$13,241
Northern Goshawk	16,824	850	\$14,450	\$2,560	2,870	\$1,039	\$18,049
Osprey	15,807	133	\$2,592	\$316	510	\$214	\$3,122
Bald Eagle	15,807	80	\$2,000	\$93	160	\$68	\$2,161
Willow Flycatcher	166	70	\$1,278	\$349	480	\$236	\$1,863
Mountain Beaver	136	968	\$21,525	\$166	292	\$113	\$279
Total (excluding APRU)	66,916	1,714	\$31,110	\$4,859	6,410	\$2,464	\$38,436
Total	67,052	2,682	\$45,100	\$5,025	6,702	\$2,577	\$38,715

SUMMARY

- ❖ **California Spotted Owl:** 26 survey areas, 17 spotted owls (15 adults and 2 juveniles), 10 territories, and 1 nest.
- ❖ **Northern goshawk:** 32 survey areas, 24 goshawks (21 adults and 3 juveniles), 12 territories, 2 territories with reproductive activity, and 2 nests (that fledged 3 juveniles).
- ❖ **Osprey:** 139 nest sites, 26 active nests, 10 nests that fledged young, and 15 fledglings.
- ❖ **Bald eagle:** 9 bald eagles (6 adults and 3 juvenile) during the mid-winter survey; one active nest, and 2 fledglings.
- ❖ **Willow flycatcher:** 15 sites, 6 adult flycatchers, 6 territories, 1 nest, and 4 fledglings.
- ❖ **Mountain beaver:** 65 sites, 21 presence detections

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