

# **2010 Wildlife Program Annual Report**

**Ecosystem Conservation Department**

**Lake Tahoe Basin Management Unit**



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The Wildlife Group of the Ecosystem Conservation Department of the Lake Tahoe Basin Management Unit (LTBMU or The Basin) and its partners conducted surveys to assess presence, reproductive activity and success, and spatial distribution of several prominent species of special interest for the Lake Tahoe Basin in 2010. These included California spotted owl (*Strix occidentalis occidentalis*), northern goshawk (*Accipiter gentilis*), osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), peregrine falcon (*Falco peregrinus*), willow flycatcher (*Empidonax traillii*), and Townsend's big-eared bat (*Corynorhinus townsendii*).

## 1.0 CALIFORNIA SPOTTED OWL

### 1.1 BACKGROUND, PROTOCOL, AND SURVEY METHODS

The Lake Tahoe Basin Management Unit conducted surveys for California spotted owl (*Strix occidentalis occidentalis*) in cooperation with Nevada Department of Wildlife (NDOW), Hauge Brueck Associates (contractor for Heavenly Mountain Resort), and Insignia Environmental (contractor for Sierra Pacific Power Company) in 2010. LTBMU also normally conducts surveys in cooperation with California Department of Parks and Recreation (CDPR) but CDPR was not able to conduct spotted owl surveys this year at their locations (Sugar Pine Point State Park and Burton State Park) due to a lack of wildlife personnel. These 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).

Owl call stations were located along established routes on roads or trails, spaced approximately ¼ - ½ mile apart, and situated on the landscape to maximize acoustic coverage (e.g. located on high ground). Survey efforts within a one-mile radius of an active nest focused directly on the nest stand. Portions of any survey routes within a one-mile radius of an active spotted owl nest were not surveyed using spot calling for the remainder of the season, to prevent unnecessary harassment of the reproductive owl pair. However, nest checks were conducted.

All surveys were conducted by a team of trained biologists beginning at sunset. If an owl was detected a follow-up visit was performed within 48 hours to attempt to locate the owl and determine its status (e.g., nesting). Spotted owl surveys determined survey area occupancy, individual and pair status, nesting status, and reproductive success. Owl pairs were identified 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 if juveniles were detected outside the nest cavity.

The LTBMU and its partners surveyed 50 areas within the Lake Tahoe Basin for California spotted owl in 2010 (Appendix 1). Survey areas were established in highly suitable to marginally suitable habitats within ¼ mile of planned Forest Service project sites (Table 1). Insignia Environmental conducted surveys for spotted owls for the Sierra Pacific 625 and 650 Powerline project. The study area roughly followed FS road 73 (the "Fiberboard Freeway") from Tahoe city to Kings Beach and included 37 call stations. Hauge Brueck Associates conducted surveys at Heavenly Ski Resort at 90 call stations. NDOW conducted surveys at North Canyon within Lake Tahoe Nevada State Park at 14 call stations.



The Cold Creek male prior to a sunset nest check, 29 June 2010. Photograph by LTBMU wildlife crew.

Currently, there are 21 Protected Activity Centers (PACs) within the LTBMU; 10 of the 21 PACs were surveyed this year for spotted owl due to the proximity of LTBMU projects or as NEPA Resource Inventory (NRI) surveys. PACs surveyed in 2010 include: Twin Crags, Burton Creek, Griff Creek, Mount Pluto, Spring Creek, Hawley Grade, Lower Saxon Creek, Hellhole, Cold Creek, and Echo Lake. The Painted Rock, Round Lake, Upper Saxon Creek, Tahoe Mountain, General Creek, Blackwood Creek, Twin Peaks, Stanford Rock, Page Meadow West, Page Meadow East, and Carnelian PACs were not surveyed in 2010.

LTBMU routes were surveyed either three times, in areas under a standard two-year protocol, or six times for locations needing one-year procedures, from May 1 to August 31. The first two to four visits, respectively, occurred prior to 30 June, with remaining surveys conducted after June 30 and completed before 31 August. Spot-calling surveys were conducted by LTBMU crews from 4 May through 31 August 2010. Nest checks were conducted prior to the first survey at historic nests in the Burton FS, Cold Creek, Griff Creek, and Saxon Creek areas.

**Table 1.** Areas within the Lake Tahoe Basin surveyed for California spotted owl by the Lake Tahoe Basin Management Unit, NDOW, Hauge Brueck Associates, and Insignia Environmental in 2010. Occurrence of historic spotted owl detections near survey areas, number of visits in 2010, and LTBMU projects associated with survey area are also presented for reference.

<b>Route Name</b>	<b>Historical Detections</b>	<b>2010 visits</b>	<b>Associated USFS Projects</b>
Angora Creek	No	6	South Shore Hazardous Fuels Reduction
Angora Ridge	No	3	South Shore Hazardous Fuels Reduction
Baron Lake	No	3	South Shore Hazardous Fuels Reduction
Big Meadow	No	3	South Shore Hazardous Fuels Reduction
Bliss Creek	No	3	Spooner Hazardous Fuels Reduction
Burton FS	Yes	6	NRI
Captain Pomin	No	3	Spooner Hazardous Fuels Reduction
Carnelian Bay	Yes	3	Carnelian Hazardous Fuels Reduction
Cascade Lake	No	3	South Shore Hazardous Fuels Reduction
Cave Rock	No	3	Spooner Hazardous Fuels Reduction
Christmas Valley	No	3	South Shore Hazardous Fuels Reduction
Cold Creek Nest	Yes	6	South Shore Hazardous Fuels Reduction
Cold Creek	Yes	3	South Shore Hazardous Fuels Reduction
Cookhouse Meadow	Yes	6	South Shore Hazardous Fuels Reduction
Cowboy Hat	No	6	South Shore Hazardous Fuels Reduction
Fiberboard Freeway (Insignia Environmental)	Yes	3	Sierra Pacific 625 & 650 Power line Projects
Genoa Peak	No	3	Spooner Hazardous Fuels Reduction
Grass Lake	Yes	6	South Shore Hazardous Fuels Reduction
Grass Lake Creek	No	3	South Shore Hazardous Fuels Reduction
Griff Creek	Yes	3	Incline Hazardous Fuels Reduction
Hawley Grade	Yes	6	South Shore Hazardous Fuels Reduction
Hellhole	Yes	3	South Shore Hazardous Fuels Reduction
Heavenly Ski Resort (Hauge Brueck Assoc.)	No	3	Heavenly Mountain Resort Master Agreement
Incline Creek	No	3	Incline Hazardous Fuels Reduction
Incline Lake	No	3	Incline Hazardous Fuels Reduction
Lake Christopher	No	6	South Shore Hazardous Fuels Reduction
Logan House Creek	No	6	Spooner Hazardous Fuels Reduction

Route Name	Historical Detections	2010 visits	Associated USFS Projects
Luther Pass	No	3	South Shore Hazardous Fuels Reduction
Marlette Creek	No	6	Spooner Hazardous Fuels Reduction
Marlette Lake	No	3	Spooner Hazardous Fuels Reduction
Martis Peak	No	3	Carnelian Hazardous Fuels Reduction
Montreal Canyon	No	6	Spooner Hazardous Fuels Reduction
North Canyon (NDOW)	Yes	3	N/A
Old Meyers Grade	No	3	South Shore Hazardous Fuels Reduction
Prey Meadow	No	3	Spooner Hazardous Fuels Reduction
Round Hill	No	3	South Shore Hazardous Fuels Reduction
Sawmill Pond	No	6	South Shore Hazardous Fuels Reduction
Saxon Creek	Yes	3+	South Shore Hazardous Fuels Reduction
Second Creek	No	3	Incline Hazardous Fuels Reduction
Secret Harbor	No	6	Spooner Hazardous Fuels Reduction
Slaughterhouse Canyon	No	6	Spooner Hazardous Fuels Reduction
Spooner Summit	No	3	Spooner Hazardous Fuels Reduction
Spring Creek	Yes	3	South Shore Hazardous Fuels Reduction
Tahoe Meadow	No	3	Incline Hazardous Fuels Reduction
Tahoe Mountain	No	3	South Shore Hazardous Fuels Reduction
Tallac Creek	Yes	6	South Shore Hazardous Fuels Reduction
Tamarack Peak	No	3	Incline Hazardous Fuels Reduction
Third Creek	No	3	Incline Hazardous Fuels Reduction
Trout Creek	Yes	6	South Shore Hazardous Fuels Reduction
Tunnel Creek	No	3	Incline Hazardous Fuels Reduction
Twin Crags	Yes	3	NRI
Watson Creek	Yes	3	Carnelian Hazardous Fuels Reduction

## 1.2 SURVEY RESULTS

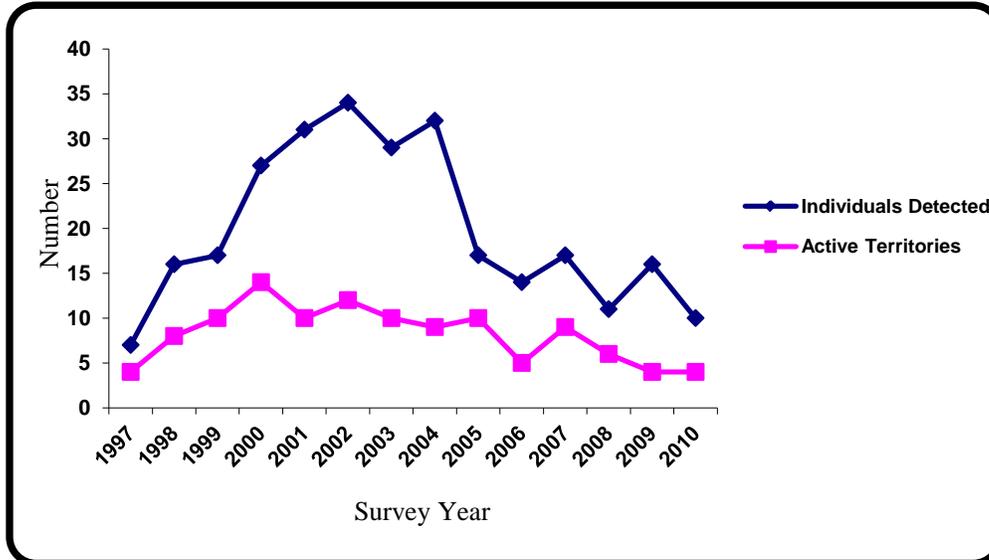
Approximately 37,019 acres (14,982 hectares) were surveyed for California spotted owl by the LTBMU and its partners in the Lake Tahoe Basin in 2010. Acreage was calculated based on the average area effectively surveyed (0.25 mile radius) from call stations during spot-calling surveys and a one mile radius around active nests. LTBMU wildlife crews surveyed 32,551 acres (13,172 hectares). Hauge Brueck Associates surveyed 3,422 acres (1,385 hectares) at Heavenly Ski Resort, Insignia Environmental surveyed 4,013 acres (1,624 hectares) along power lines north of Tahoe City and Kings Beach, and NDOW surveyed approximately 1,224 acres (496 hectares) at Lake Tahoe Nevada State Park. Ten spotted owl individuals are believed to have been found in 2010 (Figure 1, Table 2), although fourteen separate detection locations across several dates were accrued throughout the season. Spotted owls were detected at three of the PACs (Burton Creek, Cold Creek, and Lower Saxon Creek) two of which included nests (Burton Creek, Cold Creek). Though down 37% from the confirmed sixteen individual spotted owls recorded in 2009, this number makes



The Burton FS male takes a mouse, 28 July 2010. Photograph by LTBMU wildlife crew.

inferences about territory boundaries and clusters of detections within 1-2 miles to assume the same owl or pair was detected on several occasions.

**Figure 1.** Number of California spotted owls and active territories detected in the Lake Tahoe Basin, 1997-2010.



Four pairs and two juveniles (from one pair) were recorded in 2010 (Table 2), although a member of two of the pairs was detected alone on multiple occasions. Cold Creek was the only nest determined to be reproductively active, with 2 juveniles detected during the course of nest check visits. The Burton Creek pair received a nesting-confirmed designation, but reproductive status remained unknown through several nest checks, and did not ultimately appear reproductively successful. Pairs were detected together in Saxon Creek and Cookhouse Meadow, but were not found to be nesting at any point. All detections during protocol spot calling surveys received a follow-up within 48 hours to attempt to determine nesting status.

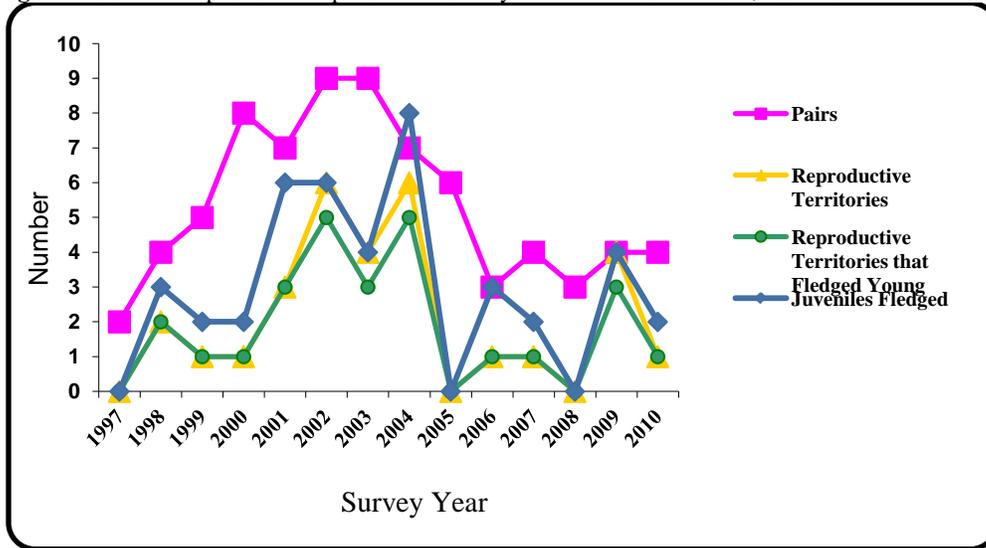
**Table 2.** Status of territories, pairs, reproductive activity and success for California spotted owl in areas surveyed by the Lake Tahoe Basin Management Unit, Hauge Brueck Associates, Insignia Environmental, and NDOW in 2010.

Survey Area	Individuals Detected	Territory Active	Pair	Territory Reproductive	Juveniles Fledged
Angora Creek	0	no	-	-	-
Angora Ridge	0	no	-	-	-
Baron Lake	0	no	-	-	-
Big Meadow	0	no	-	-	-
Bliss Creek	0	no	-	-	-
Burton FS	2	yes	yes	nesting confirmed, reproduction unknown	-
Captain Pomin	0	no	-	-	-
Carnelian Bay	0	no	-	-	-
Cascade Lake	0	no	-	-	-
Cave Rock	0	no	-	-	-
Christmas Valley	1	no	no	-	-

Survey Area	Individuals Detected	Territory Active	Pair	Territory Reproductive	Juveniles Fledged
Cold Creek	4	yes	yes	nesting confirmed, reproduction confirmed	2
Cookhouse Meadow	2	yes	yes	resident pair	-
Cowboy Hat	1	no	no	-	-
Fiberboard Freeway (Insignia Environmental)	0	no	no	-	-
Genoa Peak	0	no	-	-	-
Grass Lake	1	no	-	-	-
Grass Lake Creek	0	no	-	-	-
Griff Creek	0	no	-	-	-
Heavenly Ski Resort (Hauge Brueck Assoc.)	0	no	-	-	-
Incline Creek	0	no	-	-	-
Incline Lake	0	no	-	-	-
Lake Christopher	0	no	-	-	-
Logan House Creek	0	no	-	-	-
Luther Pass	0	no	-	-	-
Marlette Creek	0	no	-	-	-
Marlette Lake	0	no	-	-	-
Martis Peak	0	no	-	-	-
Montreal Canyon	0	no	-	-	-
North Canyon (NDOW)	1	no	-	-	-
Old Meyers Grade	0	no	-	-	-
Prey Meadow	0	no	-	-	-
Round Hill	0	no	-	-	-
Sawmill Pond	0	no	-	-	-
Saxon Creek	2	yes	yes	resident pair	-
Second Creek	0	no	-	-	-
Secret Harbor	0	no	-	-	-
Slaughterhouse Canyon	0	no	-	-	-
Spooner Summit	0	no	-	-	-
Spring Creek	0	no	-	-	-
Tahoe Meadow	0	no	-	-	-
Tahoe Mountain	0	no	-	-	-
Tallac Creek	0	no	-	-	-
Tamarack Peak	0	no	-	-	-
Third Creek	0	no	-	-	-
Trout Creek	0	no	-	-	-
Tunnel Creek	0	no	-	-	-
Twin Crags	0	no	-	-	-
Watson Creek	0	no	-	-	-
<b>Total</b>	<b>14</b>	<b>4</b>	<b>4</b>	<b>1</b>	<b>2</b>

The finding that four reproductively active territories in 2009 decreased to one in 2010 (Cold Creek), which successfully fledged 2 juveniles, represents a substantial drop in spotted owl reproduction in the Lake Tahoe Basin in 2010 (Figure 2, Table 2).

**Figure 2.** California spotted owl reproductive activity in the Lake Tahoe Basin, 1997-2010.



**1.3 DISCUSSION OF SURVEY RESULTS**

No new nests or nest trees were found in 2010. The nests found at Cold Creek and Burton FS were in trees that had been used for nesting in prior years. One of two juveniles was observed out of the nest at Cold Creek, on the ground, thus qualifying as a fledgling and confirming reproductive success. The nest located at Cold Creek was confirmed to be active upon the first visit (nest check) on 2 May. This site has been inhabited by nesting owls in 2002, 2003, 2004, 2006, and 2009. On 8 June 2009, an adult northern goshawk chased away the actively nesting spotted owl pair during a nest check survey. Following this incident, nesting activity by the pair ceased at the site for the remainder of 2009 and there was some doubt that the pair would return to the same nest tree this year. However, the pair successfully nested in 2010.

An initial check for nesting activity at last year’s active Saxon Creek nest location yielded no detections. A follow-up nest check found no nest, but a pair that responded to calling surveyors confirmed resident pair status. Subsequent detections in the Saxon Creek territory were lone individuals, and most of these were probably the male. One of the pair members was detected during surveys of routes near Saxon Creek, feasibly within the active territory, but outside of the Saxon Creek drainage. Christmas Valley, Cowboy Hat, and an incidental detection near the Hawley Grade survey area are all believed to have been detections of one of the Saxon pair.



Juvenile at Cold Creek, 29 June 2010. Photograph by LTBMU wildlife crew.

A new territory was found at Cookhouse Meadow. There were detections of either the pair or an individual on seven different occasions. The roost tree was located but the pair did not seem to be reproductively active. Detections at the Grass Lake route are thought to be individuals from the Cookhouse Meadow pair.

Following a first nest check with no detection, the Burton FS historic nest tree, used in 2001, 2002, 2004, and 2009, was found occupied with a resident pair on 18 May 2010. Additional visits confirmed nesting, but reproductive status remained unknown, although since obvious incubation, brooding, or young were never observed, the possibility of reproductive success was extremely low. The single detection at Watson Creek was most likely one of the Burton FS pair.

Insignia Environmental had a total of 25 detections although it is unknown how many distinct individuals were detected. Hauge Brueck and NDOW had no detections. Of the 25 detections by Insignia Environmental, 19 detections were in the vicinity of the Carnelian PAC. Six detections were made between the Burton Creek and Twin Crag PACs and a daytime roost was located in this area. This cluster of detections and the roost may have been the individuals from the Twin Crag PAC since the owls from the Burton Creek PAC were known to be in the vicinity of the Burton Creek nest tree, and not near the Twin Crag PAC.

#### **1.4 RECOMMENDATIONS FOR SPOTTED OWL SURVEYS**

Due to very little turnover in wildlife crew membership this year from 2009, the crew was well-staffed with experienced owl surveyors. This meant that observers were generally capable of recognizing non-standard spotted owl vocalizations, familiar with local survey areas and historic territories, and cognizant of species behavioral patterns and indicators of reproductive activity. This combination of factors should lead to more certainty of detection in areas in fact containing spotted owls. For the amount of survey effort undertaken, 2010 was not a season particularly rich in spotted owl detections. Most of the surveys were necessarily conducted, due to funding restrictions, in areas slated for hazardous fuels reduction work, the majority of which were not high-grade spotted owl habitat. While the basin as a whole may not have been productive for spotted owls this year, it seems probable that survey areas with sub-optimal nesting habitat (moderate quality habitat), and not crew inexperience, may have been partially responsible for lower detection rates than in some recent years. Some areas containing active territories within the past 5 years yielded no detections this year, including Spring Creek, Carnelian Bay, and Hawley Grade, all of which contain call stations within or directly adjacent to Protected Activity Centers (PACs). While no obvious explanation of spotted owl absence is indicated, monitoring plan surveys to occur in 2011 will cover these same areas with additional call stations, which should increase the possibility of detection if owls are present.

Detecting biologically meaningful levels of change in the spotted owl population through monitoring in the LTBMU are deemed vital to the initiation of a viable conservation strategy. Although monitoring has loosely occurred via spot calling since 1981 with a standardized protocol in use since 2000, statistical analyses indicate that survey efforts in and around PACs, and thus the most high-quality habitat and active territory areas, have not been conducted consistently enough on a year to year basis to detect statistically significant population trends. In an attempt to develop and implement a meaningful monitoring program to meet a management objective that details protection of the spotted owl population throughout its contemporary distribution, the LTBMU will begin implementation of a population monitoring plan (MP) for spotted owls in 2011. Surveys will be conducted in current PACs, which have been selected based on historically active territories and available high-quality habitat. Wildlife personnel began to set up MP routes at the end of the 2010 field season so surveys can begin immediately at the onset of the 2011 field season.

In 2009 and 2010 combined, nearly all PACs in the LTBMU were surveyed via standardized protocol. The remainder will be included in the 2011 MP surveying effort, which should complete appropriate survey coverage for quality habitat in the Tahoe Basin. The 2011 round of MP surveys will include Blackwood Creek, Burton Creek, Carnelian Bay, Cold Creek, Cookhouse Meadow, Echo Lake, General Creek, Griff Creek, Hawley Grade, Hellhole,

Mount Pluto, Page Meadow (East and West), Painted Rock, Paradise Flat, Round Lake, Saxon Creek (Upper and Lower), Spooner Summit, Spring Creek, Stanford Rock, Tahoe Mountain, Twin Crags, and Twin Peaks. The remaining PACs will be surveyed in subsequent years of the MP. In addition to completing MP surveys next year, the wildlife crew will need to complete the following surveys to meet the second year of two-year protocols begun in 2010: Angora Ridge, Baron Lake, Big Meadow, Bliss Creek, Captain Pomin, Cascade Lake, Cave Rock, Christmas Valley, Cold Creek, Genoa Peak, Grass Lake Creek, Hellhole, Luther Pass, Marlette Lake, Old Meyers Grade, Prey Meadow, Saxon Creek, Spooner Summit, Spring Creek, Tahoe Mountain, and Twin Crags.

## 2.0 NORTHERN GOSHAWK

### 2.1 BACKGROUND, PROTOCOL, AND SURVEY METHODS

The LTBMU conducted northern goshawk (*Accipiter gentilis*) surveys in collaboration with Insignia Environmental (contractor for Sierra Pacific Power Company) and Hauge Brueck Associates (contractor for Heavenly Ski Resort) in 2010. Due to a staff shortage CDPR did not conduct their own goshawk surveys in 2010 however they did assist the forest service with surveys that overlapped CDPR property. NDOW conducted goshawk surveys in 2010 however survey information was not available at the time of this writing.

The Forest Service wildlife crew conducted dawn acoustic, broadcast acoustic, and stand search surveys for northern goshawks following the “Northern goshawk inventory and monitoring technical guide.” (USDA 2006). Dawn acoustic surveys were conducted 2 March through 14 April. Broadcast acoustic surveys began 1 June and all surveys ended on 31 August. Stand search surveys followed goshawk detections during broadcast acoustic surveys as necessary.

Dawn acoustic surveys for goshawk were conducted starting 45 minutes before sunrise and ending 1½ hours after sunrise, in cooperation with our partners. For each survey, observers were distributed approximately 300 meters apart around focal areas (e.g. nest stands) where, historically, goshawk activity occurred. The number of surveyors participating varied between two and five 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



Northern goshawk. Photo by LTBMU wildlife crew.

calls. Surveyors left the area if detected individuals responded to observer presence with agitation.

A total of 59 areas were surveyed in 2010 (Table 3). Survey areas were established in highly suitable to moderately suitable habitats within ¼ mile of USFS project-implementation sites and in selected areas with a history of goshawk activity. Forty-eight of the 56 survey areas in 2010 were initiated due to fuels reduction programs. The remaining eight sites were initiated based on NRI needs, restoration projects, Heavenly Master Plan requirements, power line upgrades or trail projects. Surveys were conducted to determine goshawk activity within a project area or, in the case of NRI surveys, to determine if there is continued activity within a known nesting territory. It was necessary to ascertain presence or absence of goshawks using a one-year protocol in 14 polygons; all related to fuels reduction projects. These sites were surveyed four times with three of the surveys completed before 31 July. The other 41 polygons were two-year protocols with two annual surveys. High Meadow, Martis Peak and Sierra Creek were monitored as NRI sites.

**Table 3.** Areas within the Lake Tahoe Basin surveyed for northern goshawk by the LTBMU, Hauge Brueck Associates, and Insignia Environmental in 2010.

<b>Route</b>	<b>Historic Nesting Area</b>	<b>Project</b>
Angora Creek	No	South Shores Hazardous Fuels Reduction
Baron Lake	No	South Shores Hazardous Fuels Reduction
Big Meadow	Yes	Aspen Restoration
Bliss Creek	No	Spooner Hazardous Fuels Reduction
Camp Richardson	No	South Shores Hazardous Fuels Reduction
Carnelian Bay	No	Carnelian Hazardous Fuels Reduction
Cascade Lake	Yes	South Shores Hazardous Fuels Reduction
Christmas Valley	No	South Shores Hazardous Fuels Reduction
Cold Creek	Yes	South Shores Hazardous Fuels Reduction
Cookhouse Meadow	No	South Shores Hazardous Fuels Reduction
Cowboy Hat	No	South Shores Hazardous Fuels Reduction
Deadman's Point	No	Spooner Hazardous Fuels Reduction
Echo Lake	No	South Shores Hazardous Fuels Reduction
Fiberboard Freeway (Insignia Environmental)	No	Sierra Pacific 625 & 650 Power line Projects
First Creek	No	Incline Hazardous Fuels Reduction and Lake Tahoe Ecosystem Underburn
Fountain Place	No	South Shores Hazardous Fuels Reduction
Genoa Peak	No	Spooner Hazardous Fuels Reduction
Glenbrook Creek	No	Spooner Hazardous Fuels Reduction
Grass Lake	No	South Shores Hazardous Fuels Reduction
Griff Creek	Yes	Carnelian Hazardous Fuels Reduction
Hawley Grade	No	South Shores Hazardous Fuels Reduction
Heavenly Ski Resort (Hauge Brueck Associates)	No	Heavenly Ski Resort Master Plan

<b>Route</b>	<b>Historic Nesting Area</b>	<b>Project</b>
Hellhole	Yes	South Shores Hazardous Fuels Reduction
High Meadow	Yes	NRI
Incline Creek	Yes	Incline Hazardous Fuels Reduction , Incline Management Plan
Incline Lake	No	Incline Hazardous Fuels Reduction , Incline Management Plan
King	No	Carnelian Hazardous Fuels Reduction
Logan House Creek	No	Spooner Hazardous Fuels Reduction
Marlette Creek	Yes	Spooner Hazardous Fuels Reduction
Marlette Lake	No	Spooner Hazardous Fuels Reduction
Martis Peak	Yes	NRI
Montreal Canyon	No	Spooner Hazardous Fuels Reduction
Mount Baldy	No	Incline Hazardous Fuels Reduction
Old Meyers Grade	No	South Shore Hazardous Fuels Reduction
Ormsby Point	No	Spooner Hazardous Fuels Reduction
Pomin Rock	No	Spooner Hazardous Fuels Reduction
Sawmill Pond	No	South Shore Hazardous Fuels Reduction
Saxon Creek	Yes	South Shore Hazardous Fuels Reduction
Second Creek	No	Incline Hazardous Fuels Reduction, Incline Management Plan
Secret Harbor Creek	No	Spooner Hazardous Fuels Reduction
Shakespeare Point	No	Spooner Hazardous Fuels Reduction
Sierra Creek	Yes	NRI
Skunk Harbor	No	Spooner Hazardous Fuels Reduction
Slaughterhouse Canyon	No	Spooner Hazardous Fuels Reduction
South Upper Truckee	No	South Shore Hazardous Fuels Reduction
Spooner Junction	No	Spooner Hazardous Fuels Reduction
Spooner Summit	No	Spooner Hazardous Fuels Reduction
Spring Creek	No	South Shore Hazardous Fuels Reduction
Tahoe Mountain	No	South Shore Hazardous Fuels Reduction
Tahoe Valley	No	South Shore Hazardous Fuels Reduction
Trout Creek	No	South Shore Hazardous Fuels Reduction
Tunnel Creek	No	Incline Hazardous Fuels Reduction
Ward Canyon	Yes	NRI and Aspen Restoration
Watson Creek	Yes	Carnelian Hazardous Fuels Reduction
White Hill	No	Spooner Hazardous Fuels Reduction
Zephyr Cove	No	Zephyr Cove Corral

## 2.2 SURVEY RESULTS

The LTBMU and partner agencies conducted broadcast surveys within 56 survey areas for a total of 31,889 acres (12,905 hectares) in 2010. Acreage was calculated based on the area of survey polygons plus (in the case of survey points provided by Insignia Environmental) the effective area encompassed within a 200 meter radius of call points. The LTBMU surveyed a total of 25,811 acres (10,445 hectares). Hauge Brueck Associates surveyed 902 acres (365 hectares). Insignia Environmental surveyed 5,176 acres (2094 hectares).

There were 59 detections of goshawks within or very close to the 2010 survey areas, as well as three at the Sugar Pine Point nest (which was not within a survey area) and 4 incidental detections outside of survey sites. Surveys by partner agencies resulted in 0 detections. Goshawks were detected within 47% (26 of 55) of the areas where broadcast surveys were conducted by the LTBMU and within 50% (2 of 4) of the areas where dawn acoustic surveys were conducted in 2010 (Table 4). Ten nests were discovered in the Basin this year: six new nests and four at previously detected nest sites.

**Table 4.** Survey Areas and results of northern goshawk surveys conducted by LTBMU, Hauge Brueck Associates, and Insignia Environmental in 2010.

Survey Area	Dawn Acoustic Survey	Dawn Acoustic Detection	Broadcast Survey	Broadcast Detection	Nest Found	Nest Outcome
Alpine Ridge	No	N/A	Yes	Yes	Yes	1 fledged
Angora Creek	No	N/A	Yes	Yes	No	N/A
Angora Ridge	No	N/A	Yes	Yes	No	N/A
Baron Lake	No	N/A	Yes	No	No	N/A
Big Meadow	No	N/A	Yes	Yes	No	N/A
Bliss Creek	No	N/A	Yes	No	No	N/A
Burton Creek State Park	Yes	Yes	No	No	No	N/A
Camp Richardson	No	N/A	Yes	No	No	N/A
Carnelian Bay	No	N/A	Yes	No	No	N/A
Cascade Lake	No	N/A	Yes	No	No	N/A
Christmas Valley	No	N/A	Yes	Yes	No	N/A
Cold Creek	No	N/A	Yes	Yes	No	N/A
Cookhouse Meadow	No	N/A	Yes	Yes	No	N/A
Cowboy Hat	No	N/A	Yes	Yes	No	N/A
Deadman's Point	No	N/A	Yes	No	No	N/A
Echo Lake	No	N/A	Yes	No	No	N/A
Fiberboard Freeway (Insignia Environmental)	No	N/A	Yes	No	No	N/A
First Creek	No	N/A	Yes	No	No	N/A
Fountain Place	No	N/A	Yes	No	No	N/A
Genoa Peak	No	N/A	Yes	No	No	N/A
Glenbrook Creek	No	N/A	Yes	Yes	No	N/A

Survey Area	Dawn Acoustic Survey	Dawn Acoustic Detection	Broadcast Survey	Broadcast Detection	Nest Found	Nest Outcome
Grass Lake	No	N/A	Yes	No	No	N/A
Griff Creek	No	N/A	Yes	Yes	No	N/A
Hawley Grade	No	N/A	Yes	No	No	N/A
Heavenly Ski Resort (Hauge Brueck Associates)	Yes	No	Yes	No	No	N/A
Hellhole	Yes	Yes	Yes	Yes	Yes	failed
High Meadow	No	N/A	Yes	No	Yes	2 fledged
Incline Creek	No	N/A	Yes	Yes	No	N/A
Incline Lake	No	N/A	Yes	No	No	N/A
King	No	N/A	Yes	No	No	N/A
Logan House Creek	No	N/A	Yes	No	No	N/A
Marlette Creek	No	N/A	Yes	Yes	No	N/A
Marlette Lake	No	N/A	Yes	No	No	N/A
Martis Peak	No	N/A	Yes	Yes	Yes	1 fledged
Montreal Canyon	No	N/A	Yes	No	No	N/A
Mt. Baldy	No	N/A	Yes	Yes	No	N/A
Old Meyers Grade	No	N/A	Yes	No	No	N/A
Ormsby Point	No	N/A	Yes	No	No	N/A
Pomin Rock	No	N/A	Yes	No	No	N/A
Sawmill Pond	No	N/A	Yes	Yes	Yes	failed
Saxon Creek	No	N/A	Yes	Yes	Yes	2 fledged
Second Creek	No	N/A	Yes	Yes	No	N/A
Secret Harbor Creek	No	N/A	Yes	Yes	No	N/A
Shakespeare Point	No	N/A	Yes	No	No	N/A
Sierra Creek	No	N/A	Yes	Yes	Yes	1 fledged
Skunk Harbor	No	N/A	Yes	Yes	No	N/A
Slaughterhouse Canyon	No	N/A	Yes	No	No	N/A
South Upper Truckee	No	N/A	Yes	Yes	No	N/A
Spooner Junction	No	N/A	Yes	No	No	N/A
Spooner Summit	No	N/A	Yes	No	No	N/A
Spring Creek	Yes	Yes	Yes	Yes	Yes	2 fledged
Sugar Pine Point State Park	Yes	Yes	No	No	Yes	1 fledged
Tahoe Mountain	No	N/A	Yes	Yes	No	N/A
Tahoe Valley	No	N/A	Yes	No	No	N/A
Trout Creek	Yes	No	Yes	No	No	N/A

Survey Area	Dawn Acoustic Survey	Dawn Acoustic Detection	Broadcast Survey	Broadcast Detection	Nest Found	Nest Outcome
Tunnel Creek	No	N/A	Yes	No	No	N/A
Watson Creek	No	N/A	Yes	Yes	Yes	2 fledged
White Hill	No	N/A	Yes	No	No	N/A
Zephyr Cove	No	N/A	Yes	Yes	No	N/A

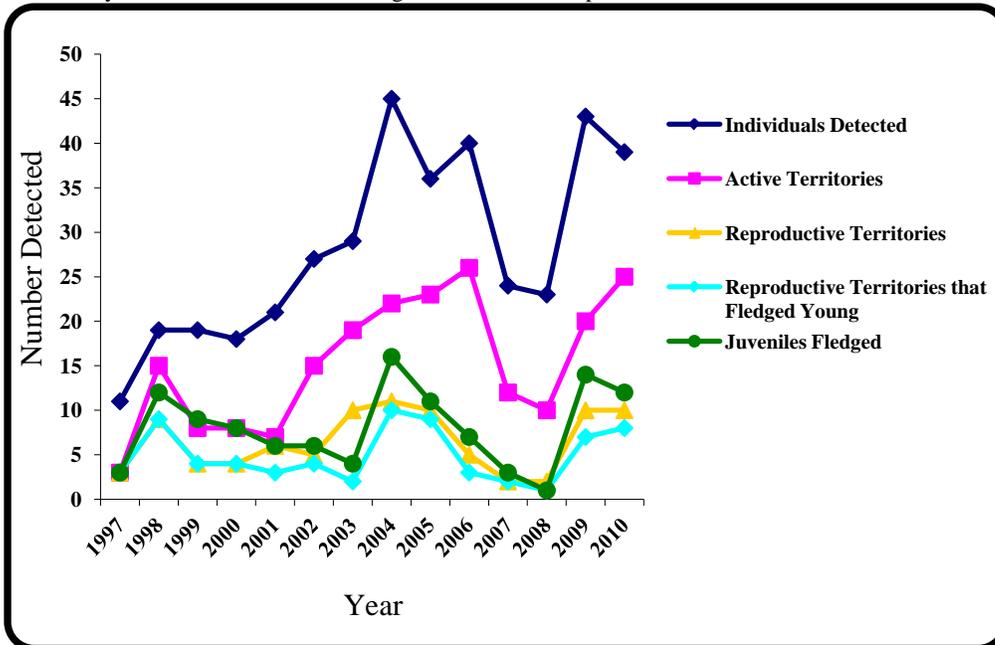
The Saxon Creek nest was located during a California Spotted Owl survey on 3 May. Four nests were discovered at or near previous nesting sites on 1 June when broadcast surveys began, these were the Watson Creek, Sierra Creek, Sugar Pine Point State Park and Hellhole nests. The Sawmill Pond nest was found incidentally during a point count survey on 17 June. The Spring Creek nest was found on 24 June during a second check of the 2009 nest site. The three other nests were discovered during routine broadcast surveys. These were Alpine Ridge (28 June), Martis Peak (6 July) and High Meadow (12 July).

One juvenile downy chick was found dead below the Saxon Creek nest (Nest ID = 2010a) yet two other chicks fledged from this nest. The Hellhole nest (2010b) was discovered on 1 June with scattered fresh goshawk eggshells and feathers below a partially collapsed nest, it was deemed a failure. The Watson Creek (2004j), Sierra Creek (2002g) and Sugar Pine Point (2006a) nests were all discovered on June 1; these nests fledged 2, 1, and 1 juvenile, respectively. The Sugar Pine Point nest (2006a) was located on CDPR property and in an arrangement with CDPR, LTBMU biologists performed all surveys. This nest fledged one juvenile. On 28 June a routine check of the Sawmill Pond nest (2010c) found no adults in attendance and a dead downy chick, roughly one week old, 20m from the nest tree; this nest failed. The Spring Creek nest (2010d) was found during a stand search following the discovery of a plucking post; it fledged two juveniles. The Alpine Ridge nest (2001d) was found at a site previously used in 2001 and 2004; it fledged 1 juvenile. The Martis Peak nest (2010e) fledged 1 juvenile. The High Meadow nest (2010f) was located late in the season with at least two large juveniles still in the nest; two fledged juveniles were seen later on 27 July.

The LTBMU and its partners recorded 66 goshawk detections (up 16% from 57 in 2009), 25 occupied territories (up 25% from 20 in 2009), and 10 reproductively active territories (equal with 10 in 2009), eight known reproductively active territories that fledged young (up 14% from 7 in 2009), and 12 known juveniles fledged (down 16% from 14 in 2009) (Figure 3). Note that the 2009 annual report cited 11 nests found during that year. Upon further investigation and consideration it was decided that the Trout Creek nest (2009c) was not clearly a goshawk nest. It was discovered abandoned with some whitewash, a pellet and a feather, but may have been the nest of a Cooper's hawk or Red-tailed hawk. This nest has been removed from the 2009 nest database.

Individual goshawks detected totaled 39, down 9% from 43 goshawks found in 2009. In terms of area surveyed during broadcast surveys, goshawk search effort by LTBMU field crews also decreased 43% in 2010 from the previous field season. However, goshawk detections continued on an upward trend in 2010 (66 versus 57 in 2009, an increase of 16%).

**Figure 3.** The number of northern goshawk individuals, active territories, and reproductive success detected by the Lake Tahoe Basin Management Unit and its partners from 1997 to 2010.



### 2.3 DISCUSSION OF SURVEY RESULTS

The nest at Watson Creek was found at the same location used for nesting in 2004, less than 200 meters from the 2009 nest. On 27 July one juvenile was seen flying near this nest site. The Sierra Creek goshawks utilized the same nest as 2009 and successfully fledged one juvenile. At Sugar Pine Point surveyors heard kakking and discovered a nest 400 meters from the 2009 nest in an aspen stand at a historic nesting site from 2006. This nest fledged one juvenile. These nests were all discovered on 1 June by LTBMU biologists checking historic nesting sites.

The new nest at Spring Creek was found on 24 June almost 300 meters from the 2009 nest and less than 100 meters from a nest site utilized in 2004. The dawn acoustic survey on 13 April had found two adults in this area. Two partially feathered chicks were in the nest. Both chicks fledged. A plucking post and feathers lead surveyors to an adult female sitting quietly on a nest with two juveniles at Alpine Ridge on 29 June. A later nest check found one fledged juvenile. On 6 July surveyors found the Martis Peak nest with one adult and one juvenile already fledged nearby. This marks the second consecutive year that the Martis Creek territory has been outside the current PAC. The High Meadow nest was found during a broadcast survey with 2 large chicks perched on the edge and one adult in attendance. The nest was over 250 meters from the 2009 nest site. Both fledged juveniles were seen again on 27 July 20 meters from the nest.

Twenty-four goshawk polygons were located on the southern end of the Basin. Five nests were located there and 41 other detections were recorded during broadcast surveys. Fourteen of these detections were associated with known nests. On 29 June at Cookhouse Meadow observers had two aural and visual encounters with a goshawk yet no definite signs of nesting could be found nearby. This may have been the same goshawk heard by surveyors on 28 June at the nearest edge of the Big Meadow polygon. At the Cowboy Hat polygon a plucking post containing Clark’s nutcracker remains and a possible goshawk pellet were found.

There were five detections of goshawk at Angora Creek in 2010 during each of the 4 surveys there. Three plucking posts were found with feathers from Steller's jay, northern flicker and pileated woodpecker: all large birds, not likely prey for other bird-eating raptors. On 19 July a probable goshawk was seen flying into thick forest on the edge of the burned section of the Angora area and on 26 August a faint wail call was heard. The Angora Creek polygon contains suitable habitat for goshawk and it is possible that one or two goshawks that were displaced by the 2007 Angora fire to the north have moved into the area. At Angora Ridge a plucking post was found with over 30 Stellar's jay feathers and a goshawk was seen flying overhead.

An old goshawk nest was discovered near the Spring Creek polygon. The nest showed no signs of recent attention however whitewash and a large eggshell fragment were discovered in the vicinity. Nearby was a plucking post with Stellar's Jay remains. This nest was recorded as an inactive nest, not necessarily initiated in 2010.

In the Christmas valley polygon surveyors discovered several sites of heavy whitewash during broadcast surveys. The Cold Creek polygon yielded several detections: surveyors found two plucking posts of Stellar's jay and feathers from a sapsucker, also eggshells, whitewash and a pellet. Later they found a dead chick that was possibly identified as a Cooper's hawk chick. All three sections of the South Upper Truckee polygons yielded plucking posts with Stellar's jay remains. Another plucking post was found at Tahoe Mountain with remains of a juvenile Stellar's jay.

The east shore of Lake Tahoe is not known for plentiful goshawk habitat as it is often steeper and drier than the western shores. However there are historic nesting sites there. Nineteen goshawk survey polygons were located on the east shore due to fuels reduction projects and one new horseback riding trail. These sites yielded nine detections and no nests. Surveyors found a plucking post and pellet at Marlette Creek, the same was found at Skunk Harbor. A juvenile goshawk flew over during a broadcast survey at Secret Harbor Creek. At Zephyr Cove two plucking posts were found with small mammal, raven and sapsucker remains. Two goshawks were seen at Glenbrook Creek, a probable adult and a juvenile.

Ten polygons were located on the north shore; two nests were located within them and 16 detections, seven of these were associated with known nests. Four plucking posts (Sooty Grouse, Stellar's jay and rodents), whitewash and a possible visual sighting of a goshawk flying by were detected at Second Creek. At Watson Creek another promising plucking post was discovered at the far end of this large polygon from the known nest. A plucking post containing Sooty Grouse, Clark's Nutcracker and Stellar's Jay feathers was found at Mount Baldy. Whitewash and a partial rodent were discovered at Incline Creek. Surveyors saw an adult goshawk soaring over Griff Creek, they also found a plucking post with Clarks' nutcracker and rodent remains.

Only two survey polygons were located on the west shore of the lake, both containing nests (Ward Creek and Sierra Creek). The Sugar Pine Point nest was also located on the west shore, outside of designated survey polygons. It was located within CDPR and monitored by LTBMU staff in co-operation with CDPR.

A CDPR employee reported seeing a goshawk incidentally from his home in Tahoe Vista, 3 times in late May. This goshawk was carrying prey on one occasion but no nest was discovered. On 2 June, Dr. Will Richardson spotted a goshawk in Blackwood Canyon and on 11 December he saw a large female goshawk predate a female mallard at Cove East. Garth Alling heard goshawk kakking in the forest west of Castle Rock on 13 June. A follow-up visit by LTBMU biologists did not find any goshawks present.

The 2010 wildlife crew was highly qualified. Every person on the crew had at least one previous year of goshawk experience. This may account for the significant increase in

occupied territories identified despite the fact that in 2009 goshawk surveys focused on the best habitat located in the basin per the monitoring plan. Nine out of ten nests found in 2010 were in historic nesting territories. Eight of the ten nests were in close proximity to 2009 nesting sites, averaging 395 meters from the previous year's nest. These figures compare favorably with active territories discovered in 2009. This is particularly remarkable because 2009 was the inaugural year of the goshawk monitoring plan; an inventory of 28 sites known for historic goshawk activity. The majority of sites monitored in 2010 were not chosen based on their suitability of habitat for goshawks; the majority of the polygons were selected because of Forest Service projects.

In 2010, crews surveyed project sites that involved thinning which should move the existing forest structure toward more sustainable and resilient forest conditions, reducing the likelihood of stand replacing wildland fires, and contributing to the long-term suitability of goshawk habitats where possible. Other projects included aspen restoration and a new horseback riding trail. Three sites were surveyed as NRI survey areas, all yielding active nests.

The reason for this downward fluctuation in the goshawk population in the Lake Tahoe Basin in 2010 is uncertain. One possible cause of goshawk decline since 2009 could be predation. A dawn acoustic survey on 13 April found two adults active in the Hellhole area and a survey of the area on 1 June discovered a new goshawk nest site within 400 meters of the 2009 nest. The nest itself looked somewhat dilapidated; almost worn through. Directly below the nest were fresh goshawk eggshells and an adult flight feather. Downy feathers were visible at the nest's edge probably indicating a recent depredation or that the nest had simply collapsed and released the eggs to the ground. Unfortunately, we have no data on predation rates in 2009 and 2010 to make a clear comparison.

Another potential cause of the decline in goshawk individuals could be related to disturbance by humans. The Saxon Creek nest was discovered near to a trail on 3 May during a California spotted owl survey. Surveyors trained in both species noticed prey remains in the snow and located what looked like a fresh nest. Subsequent surveys confirmed nesting and despite its proximity to a popular hiking and biking trail adult goshawks were present at each visit. Unfortunately, on 3 July one chick, roughly 3-4 weeks old, fell from the nest and perished. This event was witnessed by two members of the wildlife crew and the trail crew supervisor during off hours. As previously noted, the nest was in close proximity to a popular mountain bike trail. As the trio descended the trail, the male goshawk delivered a prey item to the nest. He offered it to one of the young. As the nestling took the prey, the mountain bikers passed the nest location, unaware of the adult's presence. The adult male was startled and flushed from the nest. Neither he nor the nestling released the prey item. The nestling was flung from the nest and killed. This chick was collected and has been made into a study skin for future reference. Ultimately, the nest fledged 2 chicks.

A second example of possible nest failure from human disturbance is the nest at Sawmill Pond. This area is located in an island of habitat virtually surrounded by the city of South Lake Tahoe. It is a popular hiking and off-road vehicle area. Therefore it was surprising on 17 June when a LTBMU wildlife biologist, while conducting a passerine point-count, heard a food delivery call. He found an adult goshawk in the nest tree and two recently used plucking posts. Unfortunately, the subsequent next check found a downy goshawk chick 20 meters from the nest tree and no other activity. The nest site was surrounded by a PSW small mammal trapping grid that would have brought researchers into the area several times daily. It is possible that human disturbance in this area caused this nest to fail. As with predation rates, this evidence is anecdotal and we have no data to compare among years.

## 2.4 RECOMENDATIONS FOR NORTHERN GOSHAWK SURVEYS

Efforts should be made to visit Protected Activity Centers that have not been surveyed or have only been partially surveyed in the past two years. The following sites are recommended for goshawk surveys in 2011: West Blackwood PAC, East Blackwood, and Upper Saxon PAC. A portion of the West Blackwood PAC was surveyed in 2009, with no detections. However, surveys in 2007 and 2008 had both aural and visual sightings of goshawk in this area and there is record of a historical nest site. East Blackwood has not been surveyed since 2008. This site has had few detections and a historic nest. A portion of the Upper Saxon PAC was surveyed in 2009 without goshawk detection. This polygon was the site of three known nests in the past.



Juvenile goshawk at nest. Photo by LTBMU wildlife crew.

The following sites require a second year of monitoring in 2011 to complete two-year protocol requirements for USFS projects: Baron Lake, Big Meadow, Cascade Lake, Christmas Valley, Cold Creek, Deadman's Point, Fountain Place, Genoa Peak, Glenbrook Creek, Grass Lake, Hawley Grade, High Meadow, Logan House Creek, Marlette Lake, Montreal Canyon, Old Meyers Grade, Ormsby Point, Pomin Rock, Saxon Creek, Secret Harbor Creek, Spooner Summit, Spring Creek, Tahoe Mountain, Trout Creek and White Hill.

The increase in detections was likely partially attributable to the experienced crew members available during the 2010. Rehiring as many as possible of this team would be an effective way to continue this trend. Also emphasis of skills in finding plucking posts, feathers and pellets should be featured as part of training for any new biologists new to the forest in 2011. Surveys of historic nesting sites yielded nine of the ten nests discovered in 2010. Continued attention should be paid to historic nest sites during dawn acoustic surveys and early in the broadcast survey season.

## 3.0 OSPREY

### 3.1 BACKGROUND, PROTOCOL, AND SURVEY METHODS

The LTBMU led collaborative surveys with TRPA to assess the spatial location and reproductive activity of osprey (*Pandion haliaetus*) nesting in the Lake Tahoe Basin in 2010. TRPA led osprey monitoring efforts prior to 2004 and provided records of osprey nesting activity collected from 1976-2003. In 2004, the USFS began taking the lead for the osprey surveys and data management in the Lake Tahoe Basin. In 2010, surveys were conducted for osprey and osprey nests within approximately 0.25 mile of the shorelines of Lake Tahoe, Fallen Leaf Lake, and Cascade Lake, and at the following sites located further inland: CAB01, CAB03, CRB01, CRB02, CRB03, CRB04, MMP04, MMP09, SKH08, SKH11, DMP09, DMP10, GLB03, CVR03, CVR04, SCH08, SLT08, FLL02 and FLL18 (Appendix 3; see Appendix 4 for code definitions). California Department of Parks and Recreation was unable to conduct surveys in 2010 on state park lands due to a budgetary staff shortage.

NDOW monitored Marlette Lake, Tunnel Creek, Bonpland Creek, Slaughterhouse Canyon, and Memorial Point for osprey activity during the 2010 breeding season.

Protocol surveys were conducted from May through September 2010 and followed the “TRPA Osprey Boat/Walk-In Protocol”. Surveyors visited all known osprey nest sites during the initial visiting period in May, except those designated “tree gone” with certainty during prior field seasons. Once a month between June and September 2010, LTBMU biologists visited all historic sites for which the nest tree was confirmed to be still 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 20 May, 15 June, 8 July, 12 August, and 16 September 2010. 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. Surveyors spent several minutes per visit at each active nest site to assess nesting activity and conducted additional visits as necessary through 16 September 2010 to determine nest fate and reproductive success. As in 2009, this report will not represent the number of juveniles fledged in 2010 since juveniles cannot be reliably aged once they have fledged. Nests were considered active if nesting activity was observed on any visit. 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 4) and with a numerical suffix to indicate order of discovery for that area. For example, the fourth recorded nest in the Crystal Bay area, a new initiation this field season, was labeled CRB04.

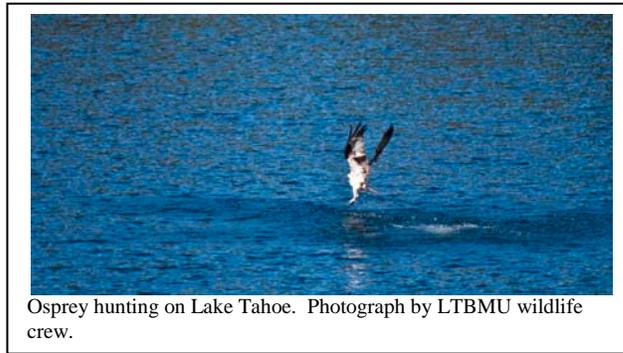
We collected digital photographs of new nests to facilitate nest tree identification as part of a photo-inventory project begun by TRPA in 2000. We also tried to photograph old nests not previously included in the inventory and those which had changed in character substantially (e.g. half of the nest tree had fallen) since the last photograph was taken.

### 3.2 SURVEY RESULTS

The LTBMU and NDOW surveyed 17,033 acres (6,893 hectares) of suitable osprey habitat and made initial visits to 86 historic nest sites. Several nest trees had fallen or broken off near the base and were subsequently re-assigned ‘tree gone’ status and not re-visited. Over the course of the 2010 field season, six additional trees were observed to contain new osprey nests or initiations, to which visits continued for the remainder of the summer.

In total, the LTBMU and NDOW surveyed 92 nest sites and detected 43 intact nests, 26 (60%) of which were active (Table 5). However, there were five nests that had activity

early in the season but later were inactive (likely failed or no reproductive effort). All of these nests were still classified as active, to be consistent with analysis methods in previous years. The total intact nests decreased 4% from 45 observed in 2009, while active nest detections were up 8% from 24 in 2009 (Figure 4).



**Table 5.** The total number of osprey nests and active nests detected by LTBMU and its partners, 1997-2010, within the Lake Tahoe Basin. The “Nest Active” classification refers to 2010 only.

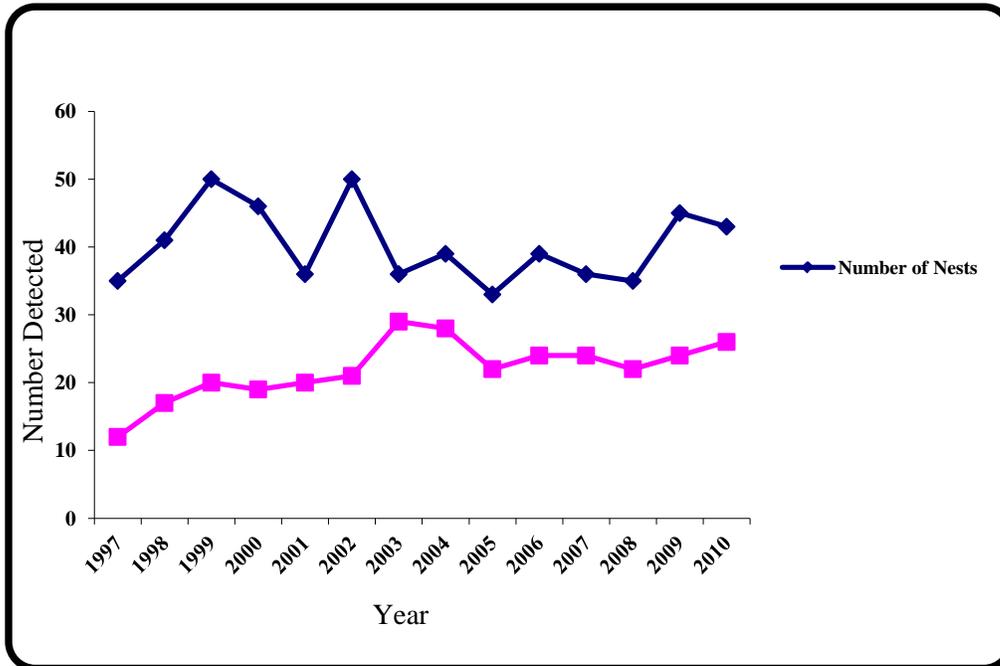
<b>Nest Site</b>	<b>Nest Present</b>	<b>Nest Active</b>	<b>Nest Site</b>	<b>Nest Present</b>	<b>Nest Active</b>	<b>Nest Site</b>	<b>Nest Present</b>	<b>Nest Active</b>
CAB01	Y	N	EMB25*	Y	N	RUP15	Y	N
CSL04	N	N	EMB26*	Y	Y	RUP16	Y	N
CSL06	N	N	EMB27*	Y	Y	RUP20	N	N
CSL07	N	N	EMB28*	Y	N	RUP22	N	N
CSL08	N	N	FLL04	Y	Y	RUP23	N	N
CSL09	Y	Y	FLL06+	Y	Y	RUP24	N	N
CRB01	N	N	FLL14	Y	Y	RUP25	N	N
CRB02	N	N	FLL15 <sup>1</sup>	Y	N	RUP26	Y	Y
CRB03	Y	Y	FLL16	Y	N	RUP27	N	N
CRB04*	Y	Y	FLL17	N	N	RUP28	N	N
CVR03	Y	N	FLL18	Y	Y	SAH02	N	N
CVR05	Y	N	FLP02	N	N	SAH06	N	N
DMP03	N	N	GLB01	N	N	SAH07	Y	N
DMP09	N	N	GLB02	N	N	SAH08	Y	Y
DMP11*	Y	Y	GLB03	N	N	SCH02	Y	N
EMB02	N	N	MEB01	Y	N	SCH06	N	N
EMB05	Y	N	MMP04	N	N	SCH07+	Y	Y
EMB09	N	N	MMP05	Y	Y	SKH07	N	N
EMB11	Y	Y	MMP07	UNK	UNK	SKH10	N	N
EMB14	Y	Y	MMP08	Y	Y	SKH11	N	N
EMB 15	N	N	RUP01	Y	N	SLT02	Y	N
EMB17	N	N	RUP03	Y	Y	SLT03	N	N
EMB18	N	N	RUP04	Y	Y	SLT05	N	N
EMB20+	Y	Y	RUP07	Y	Y	SLT06	Y	N
EMB21	N	N	RUP09	Y	N	SLT07	N	N
EMB22	Y	Y	RUP11	N	N	SLT08	Y	Y
EMB23	Y	Y	RUP13	N	N	SPP02	Y	Y
EMB24	Y	Y						
<b>Subtotal</b>	<b>14</b>	<b>10</b>	<b>Subtotal</b>	<b>18</b>	<b>11</b>	<b>Subtotal</b>	<b>11</b>	<b>5</b>
						<b>Grand Total</b>	<b>43</b>	<b>26</b>

\* Indicates new nest detected during 2010 surveys.

+ Active in early season and later likely abandoned with failed reproductive effort.

<sup>1</sup>Reported active by Tahoe Baikal staff prior to first survey; never observed as active by LTBMU staff, and dilapidated/gone by late season.

**Figure 4.** The total number of osprey nests and active nests detected by LTBMU and its partners, 1997-2010, within the Lake Tahoe Basin.



Photographs were taken of new 2010 nests and old nests whose appearance had changed. Copies of the photos were filed in the osprey photo binder continuing the photo-inventory project initiated by TRPA. The Wildlife 2000 database and GIS shape files have been updated with the osprey data collected during the 2010 survey season.

### 3.3 DISCUSSION OF SURVEY RESULTS

The osprey survey effort, expanded in 2005 in comparison to 2004 due to increased staffing and additional survey efforts performed by CDPR, continued through 2009. However, CDPR conducted no osprey surveys in 2010 due to budget-induced staff shortages. As a result, Emerald Bay and Rubicon Point osprey nests received substantially less monitoring effort this summer than in previous recent field seasons. This led to less certainty about ultimate nest determination as well as the chronological events occurring at nests in these productive areas throughout the season. Generally, CDPR biologists have been able to spend more time observing each individual nest than LTBMU personnel, leading to a level of richness in monitoring data that has often proven useful. Without CDPR monitoring efforts, the 2010 survey effort, especially in terms of total hours of observation, dropped substantially.

Without long periods of observation to allow biologists to record complete behavioral data and make inferences about nesting activity and success, brief observational opportunities generally available on lake-wide boat surveys cannot reach the same level of accuracy with respect to final nest determinations. Without long behavioral surveys to indicate the age of birds at any particular nest, and since juveniles cannot reliably be visually aged, fledging success was unknown in the case of most nests. Only one nest, EMB05, was designated with certainty as containing at least one juvenile, with two observed, although several more nests were thought to contain young. Unfortunately, high quality data were not collected on fledging success due to the lack of lengthy nest observation opportunity and the month separation of surveys.

### **3.4 RECOMENDATIONS FOR OSPREY SURVEYS**

The collaborative efforts of the LTBMU, TRPA, NDOW, and CDPR 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 partner agencies. All agencies involved should check to ensure consistency between ArcMap shapefiles for osprey nest data, a project initiated between the LTBMU and CDPR. Sharing existing nest tree photos between agencies would also be useful. Lack of surveys by CDPR likely hurt the thoroughness of 2010 survey data, ideally a trend that will not continue. Monetary restrictions aside, long behavior observation surveys would prove useful in providing life history data and certainty over reproductive success.

Initial surveys in subsequent years should continue to be initiated in May, in order to best detect early nesting attempts. September surveys may also reveal late-season nest activity and indicate trees that individuals will return to early during the next breeding season and continue to build. If funding were available, October monitoring could provide information on migration chronology.

## **4.0 PEREGRINE FALCON**

### **4.1 BACKGROUND, PROTOCOL, AND SURVEY METHODS**

LTBMU biologists continued peregrine falcon surveys initiated in 2008. The Luther Rock, South Maggie's Peak and Angora Peak sites were surveyed in accordance with "Protocol for Observing Known and Potential Peregrine Falcon Eyries in the Pacific Northwest" (J. E. Pagel, USFS internal document). Each site was slated to be visited once a month from April through September, for a minimum of four consecutive hours per visit and a minimum of 14 days between surveys. If a site was visited twice with no detections, surveys at that site were suspended for the year. In the event that a nest was found, each survey only needed to continue for the amount of time necessary to determine the current status of the nest. Observations were conducted by two biologists at a location suitable for observing the whole area for activity.

In 2008 and 2009, it was determined that a large hack box installed in 1985 by the Santa Cruz Predatory Bird Research Group atop the cliff was not in use. Three juvenile birds were released at the hack box in 1985 and successfully fledged later that breeding season (Drager et. al., 1985). The procedure was repeated in 1986 and 1987. It is not known if any breeding pairs used the structure in subsequent years as a nesting site.

Although an active nest in close proximity to rock climbing areas was detected in 2009, the area was never closed to recreational use. Practical concerns over the logistics of closure slowed the process, by which time the juveniles had fledged, making human disturbance less of a concern.

### **4.2 SURVEY RESULTS**

Luther Rock was visited a total of five times during 2010, four of which were official four-hour surveys. The additional non-protocol visit was made by one wildlife biological technician to attempt to sketch of the existing rock climbing routes. This effort was conducted to assess and determine whether any areas of the cliff needed to be closed to public access during the breeding season. During this survey, an observed copulation and possible new nest site was found.

Luther Rock was the only site determined to have an active peregrine territory in 2010 (Appendix 5). Two adults were extremely active and vocal during visits; the pair was observed copulating, making food exchanges and prey deliveries to the new nest site. One juvenile was observed through a spotting scope near the edge of the cliff; however fledging success was undetermined. The 2010 nest is approximately 200m south and 50m higher on the rock than the 2009 nest; this is outside any known active climbing routes and should remain undisturbed.

There were no detections at the Angora Peak or South Maggie's Peak sites. Following two visits at South Maggie's Peak, surveys were discontinued per protocol. An extra visit was conducted at Angora Peak due to nest-building activity during early season, though nesting attempts did not continue as the season progressed. Incidental peregrine falcon detections were made near Castle Rock and Angora Creek above Osgood Swamp.

#### **4.3 DISCUSSION OF RESULTS**

Although peregrine falcons have been occasionally observed in the Lake Tahoe Basin during surveys and incidentally in previous years, a nest with productivity had not been confirmed between 1985 and 2008. Due to a copulation sighting early in the 2010 season, and visual food delivery to a female tucked into the rock face, a positive nest location could be determined at Luther Rock.

#### **4.4 RECOMMENDATIONS FOR PEREGRINE FALCON SURVEYS**

Initial visits to Luther Rock in 2010 recorded nesting activity at a site well away from established or potential climbing routes. While discussion of closure was therefore not necessary in 2010, it is not always possible to locate nests early enough to preclude the possibility of human disturbance. Since Luther Rock is becoming a more popular rock climbing destination, it is recommended that an official closure to rock climbing be put in place where recreational activities would be likely to disrupt reproductive success at this nest site. It is recommended that the closure remain in place between the months of March and August (breeding season) if the nest site is located within climbing areas in a current year.

Education signage and outreach efforts are recommended for 2011 to provide interpretive information to rock climbing groups and individuals. South Maggie's Peak and Angora Peak are sites located far enough above popular hiking and sightseeing areas to sufficiently limit potential disturbance without need for an area closure. Survey efforts at sites could be expanded to check for nesting from the top of the cliff areas, but only if the vantage point was positioned far enough away (using a spotting scope) to avoid disturbing falcon reproduction. Additionally, areas in the Basin with tall cliffs and ledges (i.e. Castle Rock) that have not been historically surveyed for peregrine falcons should be scouted and potentially surveyed in future years.

### **5.0 GOLDEN EAGLE**

#### **5.1 BACKGROUND, PROTOCOL, AND SURVEY METHODS**

Golden eagles (*Aquila chrysaetos*) were originally monitored by the TRPA as a Special Interest Species (SIS) for the Lake Tahoe Basin. Because of their SIS status, TRPA aims to maintain a minimum ¼ mile 'disturbance zone' around population sites (a.k.a. 'threshold sites') for golden eagle. The locations of these sites are identified on TRPA adopted Special Interest Species map overlays (1987) and in the Environmental Impact Statement for the establishment of Environment Threshold Carrying Capacities (TRPA, 1982). The intent of TRPA SIS threshold standards is to protect and enhance critical habitat that this species uses

for significant periods of their life history and discourage harmful activities at current and future population sites. The SIS management goals for golden eagle have not been attained since their inception in 1982, in spite of available and relatively undisturbed nesting and roosting habitat as interpreted based on known golden eagle habitat preferences and survey protocol documents. LTBMU golden eagle surveys have been conducted during the past several years loosely following “Protocol for Observing Known and Potential Peregrine Falcon Eyries in the Pacific Northwest” (J. E. Pagel, USFS internal document).



Golden eagles were detected during April-May 2009 at Angora Peak during the first two peregrine falcon surveys of the year.

Therefore, this site was surveyed again in 2010 along with peregrine falcon surveys in May-July. The historic golden eagle nest located on a bluff above Round Lake was surveyed once in August 2010 by LTBMU staff.

## 5.2 SURVEY RESULTS

During the first peregrine falcon visit at Angora Peak, an unknown eagle (possibly carrying nest material) was spotted flying overhead from the observation point, during the later part of the survey. The eagle was spotted perched on a cliff face south of the possible 2009 nest. This nest appeared to have green fir branches in it. The eagle observed during the first Angora Peak survey was originally identified as a golden eagle. After consulting a field guide, it was unclear whether the bird was a golden eagle or juvenile bald eagle. Therefore, we were unable to positively identify golden eagle at that site. This golden eagle territory continued to be monitored under the same protocol, survey time periods and vantage points as for peregrine falcon. However, no activity was witnessed for the remaining two surveys in June and July. There was no sign of golden eagle inhabiting the Round Lake area.

## 5.3 DISCUSSION OF SURVEY RESULTS

Golden eagle has probably always been present in the Basin in low numbers (Orr and Moffitt, 1971), although the habitat is generally considered sub-par for this species (TRPA, 2006). A pair was known to inhabit the Angora Peak area in the early 1930's (as cited in Orr and Moffitt 1971). In the Basin, golden eagle is most frequently detected during the annual mid-winter bald eagle count. Prior to 2009, the most recent record of golden eagle nesting activity within the LTBMU occurred in 2000, when a nesting pair was observed at the Round Lake site, though no young were fledged. The detections from the last few years may indicate an unexpected increase in golden eagle nesting in the basin.

## 5.4 RECOMMENDATIONS FOR GOLDEN EAGLE SURVEYS

Recommendations for future surveys include reinstating the protocol surveys that were last conducted by TRPA in 1999 and 2000. Funding permitting, known current and historic nesting sites in the basin (Angora Peak and Round Lake) as well as other potential sites should be surveyed, particularly in areas where incidental sightings have been made.

## 6.0 BALD EAGLE

### 6.1 BACKGROUND, PROTOCOL, AND SURVEY METHODS

The LTBMU hosted the 28<sup>th</sup> annual mid-winter bald eagle (*Haliaeetus leucocephalus*) count on 8 January 2010 as part of an ongoing effort led by the UC Santa Cruz Predatory Bird Research Group (SCPBRG) 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 an event in which participants, arrayed at suitable sites throughout the Lake Tahoe Basin, watch for bald eagles during a pre-established three-hour time period (Appendix 7). Participants were recruited by the LTBMU from local agencies and the community. Volunteers 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 SCPBRG.

The LTBMU also conducted limited bald eagle nest surveys in conjunction with the osprey nest survey program (Appendices 3, 4 and 7). The only recently active bald eagle nest in the basin, at Emerald Point in Emerald Bay, was monitored for signs of presence or nesting activity five times between May and September 2010 from the TRPA boat during osprey nest surveys. C DPR surveyed the Emerald Point nest multiple times between March and July 2010. The latter surveys were conducted from above the nest on the Vikingsholm access road. Suitable eagle habitat within approximately 0.25 mile of the shorelines of Lake Tahoe,

Cascade Lake and Fallen Leaf Lake were also incidentally surveyed as part of the osprey nest survey program.



### 6.2 SURVEY RESULTS

Sixty-one participants, stationed at 26 survey points around the Basin, observed 9 bald eagles (8 adults and 1 immature) at 12 locations during the official mid-winter bald eagle count (Table 6).

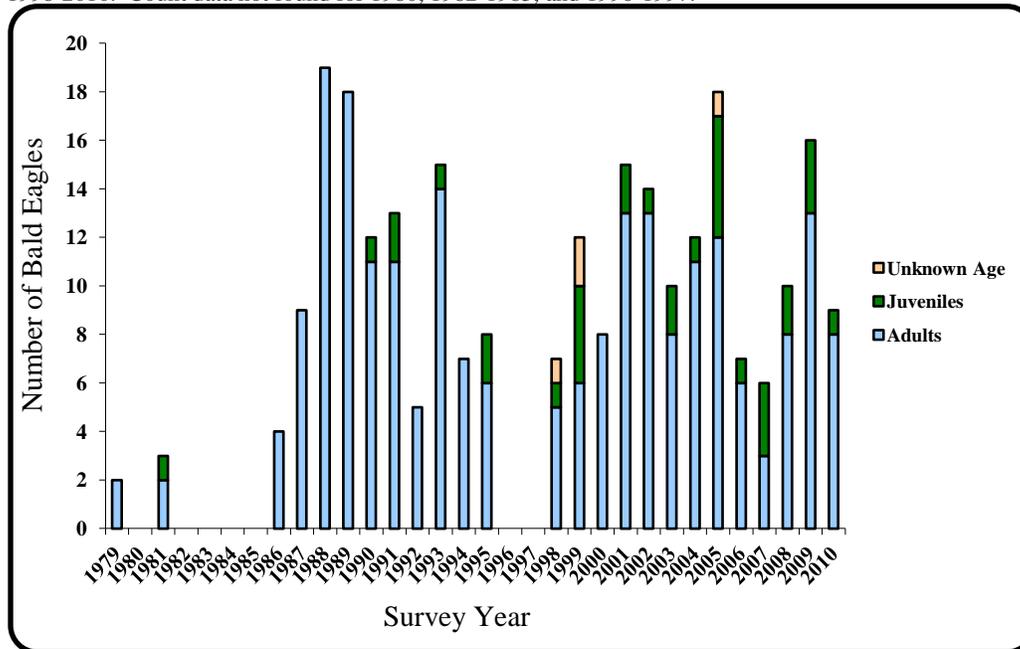
**Table 6.** Locations and age-classes of bald eagles detected during the mid-winter bald eagle counts conducted by the Lake Tahoe Basin Management Unit, C DPR, NDOW, and community volunteers, January 8, 2010.

Survey Location	Detections
64 Acres	-
Baldwin Beach	-
Cave Rock	1 adult
DL Bliss State Park	-
Eagle Falls	1 adult
Eagle Point	1 adult
Fallen Leaf Lake North	-
Fallen Leaf Lake South	1 adult
Flick Point	1 juvenile
Glenbrook	-

Survey Location	Detections
Kaspian Picnic Area	-
Kings Beach	-
Lake Forest	1 adult
Meeks Bay	-
Nevada Beach	2 adults
Pope Marsh	-
Regan Beach	-
Round Hill Resort	2 adults
Sand Harbor	1 adult
Secret Harbor	-
Stateline Lookout	-
Sugar Pine State Park	1 adult
Timber Cove Pier	1 adult
Valhalla Pier	-
Zephyr Cove	1 adult
<b>TOTAL</b> <b>(minus redundant detections)</b>	<b>12</b> <b>(8 adults, 1 juvenile)</b>

The number of bald eagles detected during the mid-winter count decreased in 2010 (n= 9), down 56% from 2009 (n= 16) (Figure 5).

**Figure 5.** Bald eagles detected during mid-winter counts in Lake Tahoe Basin in 1979, 1981, 1986-95, and 1998-2010. Count data not found for 1980, 1982-1985, and 1996-1997.



The nest in Emerald Bay (BAEA01/EMB16) was the only active nest observed in the Lake Tahoe Basin in 2010 and successfully fledged two young. This bald eagle nest location has been the only consistently active nest in the Tahoe Basin since 1997, and typically fledges young in years where reproductive attempts are observed (Table 7).

**Table 7.** Number of bald eagle nests and fledged juveniles detected in Lake Tahoe Basin, 1997-2010.

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Active Nests	1	1	0	0	0	1	1	0	1	1	1	1	1	1
Juveniles Fledged	2	2	0	0	0	2	0	0	1	2	2	2	0	2

### 6.3 DISCUSSION OF SURVEY RESULTS

Bald eagle detections during a single mid-winter survey decreased in 2010 compared to the previous year’s count, but is consistent with 2006-2009 survey data, as are observations of a single active nest that fledged two young. Fewer juveniles were observed during January’s survey effort than typical in past years, which remains unexplained. Variation in survey results in 2010 compared to the past several years are not sufficient to warrant any concern over local eagle population demographics, as a once per year survey offers a limited precision in estimating population size.

### 6.4 RECOMMENDATIONS FOR BALD EAGLE SURVEYS

Our continued participation in the mid-winter bald eagle count is important in assisting the UC Santa Cruz Predatory Bird Research Group in their long-term effort to assess population levels nationwide. This participation should continue in the future. Future efforts should also explore possibilities for a logistically achievable standardized winter population survey by conducting multiple bald-eagle counts within a single month of time in order to assess the statistical validity of the count.

## 7.0 WILLOW FLYCATCHER

### 7.1 BACKGROUND, PROTOCOL, AND SURVEY METHODS

The LTBMU conducted surveys for willow flycatcher (*Empidonax traillii*) in coordination with the Tahoe National Forest Willow Flycatcher Demography Study (Demography Study) and California Department of Fish and Game (CDFG). 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, 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 with the exception of one site due to high snow levels. A minimum of 5 days was required to elapse between surveys of each site. Surveys began approximately 1 hour before sunrise and ended at or by 10:00 a.m. Willow flycatcher songs were broadcast approximately every 50 meters within suitable habitat or 30 meters apart in areas of dense vegetation.

A total of twelve sites were surveyed for this species in the Basin in 2010 (Appendix 8). The LTBMU surveyed Morton Street, Meiss Meadows, Incline Lake, and Montreal Creek. The Demography Study was able to survey Tallac Creek, Taylor Creek, Uppermost Upper



Willow Flycatcher (*Empidonax traillii*)  
Photo courtesy of Dave Herr, USFS.

Truckee, Blackwood Canyon, Grass Lake, and Washoe State Park. CDFG surveyed Round Lake and Lost Lake.

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; and ‘historically occupied sites’ are those where this species is known to have occurred.

The LTBMU 2010 willow flycatcher surveys were delayed due to high snow levels. Montreal Creek was the only site surveyed during the period one survey window of June 1-14, although it was noted that the vegetation in the area was not leafed out. Incline Lake was still scattered with small snow drifts on June 23, vegetation was not leafed out, but the area was possible to navigate. Due to the required second survey period, the wildlife crew completed the survey. Meiss Meadow was heavily under snow during the required second survey period and as a result was skipped. Meiss Meadow was possible to navigate during the recommended third survey period, therefore the wildlife staff surveyed twice within this window in an attempt to make up for the survey skipped during the required window.

**Table 8.** Locations surveyed to assess presence, reproductive activity, and nesting success of willow flycatcher by the Lake Tahoe Basin Management Unit and its partners within the Lake Tahoe Basin, 2010. Associated USFS projects listed may be under consideration, proposed, underway, or completed.

Survey Area	Type of Survey Area	Associated Project	Surveyor
Incline Lake	Newly Acquired FS land / Suitable Habitat	Incline Lakes Management Plan	LTBMU
Morton Street	Historically Occupied	NRI	
Meiss Meadow	Suitable Habitat	NRI / Meiss Cabin BMP	
Montreal Creek	Suitable Habitat	Spooner Fuels	
Grass Lake	Historically Occupied	Demography Study	Tahoe National Forest Willow Flycatcher Demography Study
Washoe SP	Historically Occupied	Demography Study	
Blackwood Canyon	Historically Occupied	Demography Study	
Taylor Creek	Historically Occupied	Demography Study	
Tallac Creek	Historically Occupied	Demography Study	
Uppermost Upper Truckee	Historically Occupied	Demography Study	
Round Lake	Suitable Habitat	Unknown	CA Department of Fish and Game
Lost Lake	Suitable Habitat	Unknown	

## 7.2 SURVEY RESULTS

The LTBMU and its partners surveyed an estimated 296 acres (119 hectares). The LTBMU surveyed 92 acres (37 hectares). The Demography Study surveyed 203 acres (82 hectares). CDFG surveyed 30 acres (8.5 hectares) not including Lost Lake because it was dropped as a survey location due to lack of habitat. The surveyed acres were calculated using 50 meter buffers around each survey point. Willow flycatchers were detected at Mattole Road, Meeks Meadow, Lake Forest, Pomin Park, Uppermost Upper Truckee, Taylor Creek, and Tallac Creek (Table 9). The Mattole Road, Meeks Meadow, Lake Forest, and Pomin Park detections were incidental rather than during surveys.

The LTBMU completed surveys for willow flycatchers at four sites between June 14 and July 8, 2010. Due to high snow levels one survey was conducted outside of the survey window on July 8, 2010 while all other surveys were conducted within the established survey periods. No individuals were detected at any of these sites. However the LTBMU followed up on an incidental detection in the Spring Creek cabin tract off Mattole Road and found one singing male. This detection was later followed up by The Demography Study and a pair was located with a nest. The nest outcome was unknown but the territory is new for the Lake Tahoe basin. The Demography Study surveyed and monitored Tallac Creek and Taylor Creek reporting 2 nesting attempts with both nests successfully fledging 7 total birds. CDFG completed surveys at Round Lake, detecting an unknown flycatcher (unable to confirm the species identity). CDFG arrived at Lost Lake on June 22<sup>nd</sup> and completed one survey. While surveying Lost Lake, CDFG determined there were not enough willow components for nesting willow flycatchers. Due to the lack of habitat, this site was removed from the study as a potential nesting location.

The LTBMU and its partners received reports of incidental willow flycatcher detections around the basin. These locations include Mattole Road, Lake Forest Beach, Pomin Park, and Meeks Meadow. The Tahoe Institute for Natural Sciences (TINS) confirmed incidental detections of one singing male each at Taylor Creek Marsh (in addition to the detections made by the Demography Study), Lake Forest Beach, Pomin Park, and Meeks Meadow. Other detections at Meeks Meadow include one singing male found at two separate locations by Point Reyes Bird Observatory Conservation Science (PRBO).

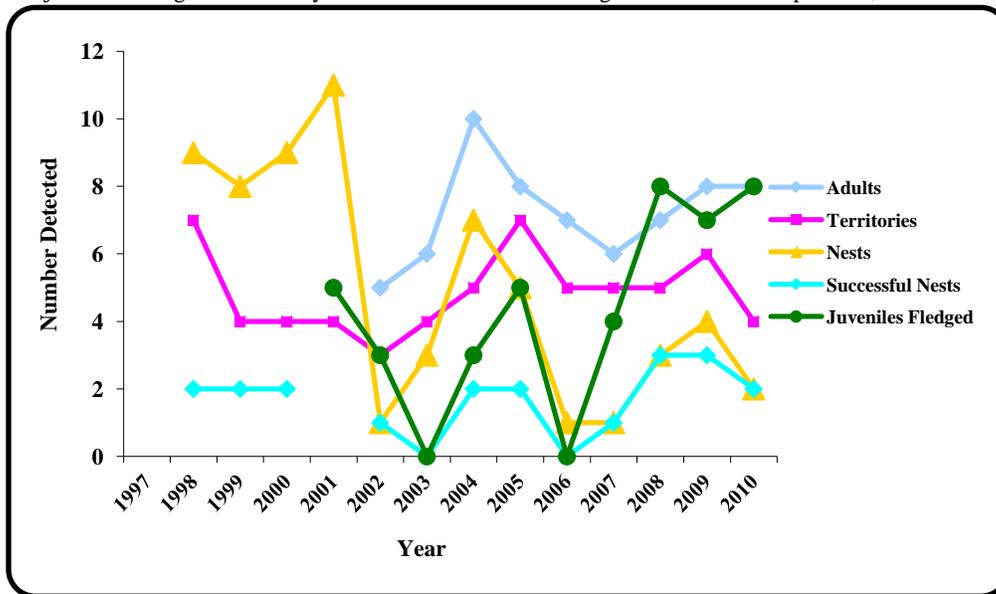
**Table 9.** Summary of willow flycatcher detections, nests, and recruitment in areas surveyed by the Lake Tahoe Basin Management Unit, Tahoe National Forest Willow Flycatcher Demography Study, and California Department of Fish and Game in 2010. Incidental sighting that were not followed up with additional surveys are not included because it is impossible to know if those detections were of one individual or many, the number of territories, if any, or the nesting status.

Survey Area	Territories	Adults	Successful Nests	Failed Nests	Juveniles Fledged
Mattole Road	1	2	Unk.	Unk.	Unk.
Meiss Meadow	0	0	0	0	0
Incline Lake	0	0	0	0	0
Montreal Creek	0	0	0	0	0
Morton Street	0	0	0	0	0
Taylor Creek	2	3	1	0	4
Uppermost Upper Truckee	1	2	Unk.	Unk.	1
Tallac Creek	1	1	1	0	3
Blackwood	0	0	0	0	0
Grass Lake	0	0	0	0	0

Survey Area	Territories	Adults	Successful Nests	Failed Nests	Juveniles Fledged
Washoe State Park	0	0	0	0	0
Round Lake	0	0	0	0	0
<b>Totals</b>	<b>4</b>	<b>8</b>	<b>2</b>	<b>-</b>	<b>8</b>

The number of willow flycatcher territories is down from 6 in 2009. The number of adults is equal to 2009. The number of nests is down from 4 in 2009. The number of successful nests is down from 3 in 2009. The number of juveniles fledged is up from 7 in 2009 (Figure 6).

**Figure 6.** 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, 1997-2010.



### 7.3 DISCUSSION OF SURVEY RESULTS

Weather plays an important role in willow flycatcher presence in suitable habitat and subsequent nesting probability within that area (Bombay et al. 1999). High snow levels late in the season as well as the delayed leafing out of vegetation such as willow (*Salix ssp.*) and mountain alder (*Alnus incana ssp.*) could have been the cause of willow flycatcher absence in our survey areas.

The LTBMU received reports of several incidental detections in 2010. These detections were scattered around the basin. The incidental detection for the beaver pond off Mattole Road provided the LTBMU a new pair and the basin's first new reproductive territory in many years. It is unknown whether the male was banded but it was confirmed that the female willow flycatcher was unbanded, indicating the possibility of new migrants into the basin. Unfortunately this new pair was only checked twice this season, once to find the nest and once to check for a band resight for the female. Due to lack of funding, neither the Demography Study nor the LTBMU monitored the nest beyond the first two visits and the nest success is unknown.

The Meeks Meadow incidental detections also provided significant results. Meeks Meadow was surveyed in 2003, 2004, and 2005 with no detections of willow flycatchers throughout all

three years. The high snow levels for 2010 provided a very wet year for area meadows not only late into the season but also in areas that aren't typically wet. Weather can play an important role in willow flycatcher occupation of suitable habitat and the presence of three separate detections in Meeks Meadow could be due to the unusually high water table.

#### **7.4 RECOMMENDATIONS FOR WILLOW FLYCATCHER SURVEYS**

Continuation of willow flycatcher monitoring for post-restoration activities will aid in the determination of management recommendations for the species. Funding permitting, surveys should continue as outlined in the Sierra Nevada Forest Plan Amendment – Final Supplemental Environmental Impact Statement (FEIS), Record of Decision (ROD) (USDA 2004). For occupied and historically occupied willow flycatcher sites a four year cycle should be initiated and completed. Surveys are then conducted according to protocol at all sites the first year, with second year follow-up surveys only at sites with no initial detections. Surveys would not be conducted during years three and four. The four year cycle is then repeated. It is recommended that new territories such as Mattole Road and Meeks Meadow should be worked into the four year survey cycle. CDFG recommends that Round Lake be added to the list of survey locations due to suitable habitat surrounding the south side of the lake.

The Tahoe National Forest Willow Flycatcher Demography Study will not continue after 2010. Beginning in 2011 the sites that the demography crew typically surveyed will need to be worked into the survey schedule of the LTBMU and other partners.

### **8.0 BATS**

#### **8.1 BACKGROUND, PROTOCOL, AND SURVEY METHODS**

Following detections of Townsend's Big-eared bat (*Corynorhinus townsendii*) in 2007, the Forest Service initiated an assessment of possible roosts for bat habitat suitability. The Townsend's Big-eared bat is considered a LTBMU sensitive species. Townsends's Big-eared bats are generally in decline in most areas; possibly due to decreasing habitat and because this species is particularly susceptible to disturbances at the roost (Pierson and Rainey, 1998). Bat surveys continued in 2008, 2009 and 2010 to gain further knowledge of bat roosts and species composition previously unknown in the basin. In 2009 Townsend's big-eared bat were identified in proximity to three roosts, Tahoe Treasure I, Tahoe Treasure II, and Newhall House.

The 2009 data was not able to be analyzed until the winter of 2009, after the annual report was completed. Two trained biologists inspected each record and identified recordings they felt they could distinguish to species with a high degree of confidence. Sonograms considered to be attributable to Townsend's Big-eared bat were verified by a bat expert. Recordings revealed the presence of Townsend's Big-eared bat at the Newhall House and Tahoe Treasure Mine I and II sites.

In 2010, monthly surveys were scheduled at Tahoe Treasure I and II mines and at the Newhall House at Skunk Harbor in June, July and August. Surveys at these sites attempted to determine the number of individual bats at each roost. Surveys seeking to find the quantity of bats present were conducted using Bushnell Night Vision Binoculars with enhanced visibility provided at the roost exit by an infrared light from Wildlife Engineering. Two biologists tallied exiting and entering bats and made aural recordings at the roost site for 2 – 2.5 hours. Only one survey was permitted at the Tahoe Treasure II mine due to noisy water runoff at the mine entrance that discouraged bats from entering and distorted audio files. Mountain Top Mine which was surveyed in 2009 was not surveyed in 2010. It was determined in 2009 that a few bats did roost there and that sealing of the mine should be prohibited. However, 2010

visits determined that the mine had collapsed further and there was no longer any cave surrogate habitat. The mine was sealed in October 2010 by the LTBMU lands department.

Additional surveys were scheduled when Forest Service employees at the Taylor Creek Visitor Center and at the Valhalla Boat House reported to wildlife personnel that significant bat assemblages had been observed exiting from each building during the previous summer. Both of these facilities are used by humans; the Taylor Creek building is an active Forest Service visitor center and the Valhalla Boat House is used as a community theater. These sites were scheduled for 10 four-hour audio recording sessions in June, July and August to assure an accurate depiction of roosting bat species throughout the summer. In July, three surveys began at the Old Lake Mill at Fallen Leaf Lake after an informal visual survey at dusk revealed the possibility of bats roosting in this structure.

All 2010 bat surveys collected audio data to determine bat species diversity. Acoustic bat surveys used Pettersson ultrasonic detectors (model D240X) and a small digital recorder (Samson Zoom H2) to collect bat vocalizations to be assessed later for bat species composition. Recordings were parsed into individual detection files, scrubbed of illegible files and saved to a disk. Analysis was performed using Sonobat, which translates digital recordings into interpretable sonograms (visual pictures of the frequency, time and amplitude components of a sound). The program enhances harmonic elements of bat calls so they can be examined and compared to known species calls for identification. These visualizations of echolocation recordings (sonograms) can be compared to reference sonograms of bats known to exist in the western United States. Many species of bat are difficult to differentiate; consequently calls are often attributed to multiple possible species, genera, or labeled as unidentifiable.

At each site, the recorders were placed at the structure's exit or outside the mine openings and angled away from rock walls, shrubberies and trees to lessen distortion of the call recording caused by echo. Due to the subjective nature of bat call analysis, collected data was independently analyzed by two biologists. Only those calls of species identified by both biologists were considered to be reliable.

## **8.2 RESULTS OF SURVEYS**

The microphone and digital recorder audio equipment functioned much more efficiently than the microphone and tape recording equipment set-up used in 2009 which captured more distortion and was prone to malfunction. In the office, digital recordings made by the ZOOM recorder were easier to download onto data files for analysis. High quality recordings were made during all surveys.

Audio recordings of bats were made in the vicinity of the mine opening at Tahoe Treasure I on all three sampling occasions. Small trees at the front of the mine obscured a full view of the mine entrance by researchers using night vision equipment. Few bats were visually monitored emerging from the mine with a high count of four on the first survey in June. Audio recordings from each survey recorded an average of 7.3 detections which is much lower than the number of recordings made in 2009 (225). Species identified at the mine in 2010 included: California myotis, long-eared myotis, little brown bat and Mexican free-tailed bat.

Due to seasonal water flow over the entrance of the Tahoe Treasure II mine opening surveys could not be conducted until the mid-August. On 17 August, audio and visual monitoring began at Tahoe Treasure II. Audio recordings included the sound of dripping water as well as some vocalizations of bats that either came from the mine itself or were bats foraging for insects in the lush dampness around the mine opening. The visual survey conducted on that date only counted five bats that appeared to originate from the mine opening. The sole

species of bat identified from recordings was the little brown bat. The data do not indicate that Townsend's big-eared bats were present at either of the Tahoe Treasure mines.

In the vicinity of the Tahoe Treasure mines a partially boarded-over vertical hole was discovered near the foundation of an old structure. It was assumed that the hole could be the location of a well or an outhouse and it might attract roosting bats. Upon further examination it was discovered that the hole was partially filled with water and not deep enough to be suitable cave surrogate habitat. This hole was filled in by the LTBMU lands department in October 2010.

The Newhall House at Skunk Harbor was visited for both audio and visual monitoring on three occasions. On the first visit on 7 June only five bats were counted using night-vision binoculars although many more bats were noticed in the vicinity. The Newhall House has multiple openings and is easily accessible to bats on all sides. Bats roosting within could be using a different exit than the space above the front door that was used in 2009. Five biologists surrounded the structure at dusk to determine the primary exit for roosting bats. It was discovered that bats were exiting from the rear doors and windows of the building. The next two surveys on 8 July and 5 August were set up at the rear of the building and visually detected 236 bats and 217 bats, respectively. Audio recordings at Newhall House noted 19, 94, and 277 individual detections, for each survey period respectively. There were seven species identified at Newhall house: big brown bat (*Eptesicus fuscus*), little brown bat, long-eared myotis, fringed bat, and Yuma myotis (*myotis yumanensis*). No 2010 recordings were made of Townsend's big-eared bat. Analysis of the calls found the majority of bats recorded at Newhall House in June and July were Yuma myotis and little brown bats. The Newhall house was visited in October to search for signs that the roost was being used by maternal females. Unfortunately, the house is also inhabited by a large rat population. Any signs that may have been left have been eaten by the rats.

There were signs that humans had gained entry to the Newhall House between the final surveys in 2009 and beginning of surveys in 2010. This building was sealed for security purposes but the interior is now accessible to humans via heavy wood shutters that have come loose or been vandalized. On 11 July, Nevada law enforcement entered the building to look for evidence of persons living there and found no one in residence. Although there was no apparent damage, the bat colony roosting at the apex of the main room could have been disturbed.

Taylor Creek Visitor Center is a conical-shaped building which has bats living in the upper attic area during the summer. Naked-eye observations made at dusk by crew biologists counted over 70 individuals issuing from openings around the peak of the building. In July and August, evening Forest Service nature walks assembled in the area at 8:30PM. The walk began promptly and leaders encouraged the public to avoid the recording devices. The disruption from this activity lasted no longer than ten minutes however the effect on bat activities is difficult to assess.



Taylor Creek Visitor Center. Bats are roosting in the top tier of the cone. Photo by LTBMU wildlife staff.

Taylor Creek exhibited the highest average numbers of bat recordings per visit of any site monitored in 2010. On 13 July, 339 individual bat detections were made. Identified species

include: silver-haired bat (*Lasionycteris noctivagans*), California myotis (*Myotis californicus*), little brown bat, fringed bat, hairy-winged myotis (*Myotis volans*), Yuma myotis, and Mexican free-tailed bat. The majority of the bats identified at Taylor Creek were little brown bats.

In mid-July Forest Service personnel at the Taylor Creek facility found a dead bat in an upstairs office. Two other bats were subsequently discovered and given to the LTBMU for analysis. All bat mortalities were identified as little brown bats. The cause of death was not determined but given the size of the colony roosting in the building incidental mortality of 3 individuals is not alarming. On 13 August, bats at Taylor Creek vacated the building and surveys were discontinued at 8 sessions.

The Boathouse Theater is on the grounds of Tallac Estate historic site adjacent to Lake Tahoe. Built in 1924, it has been renovated and is used as a community theater. The structure is covered in shingles that create gaps at the eaves that allow bats to enter and exit a narrow space under the roof. This facility was busy much of the summer and theater rehearsals occasionally occurred during monitoring. These activities did not seem to deter bats from issuing from the building. The prescribed 10 audio monitoring sessions were executed at this site. The Boathouse Theater averaged 58 individual bat detections per visit. Identified species include: big brown bat, silver-haired bat, hoary bat (*Lasiurus cinereus*), California myotis (*Myotis californicus*), small-footed myotis (*Myotis ciliolabrum*), long-eared myotis, little brown bat, fringed bat (*Myotis thysanodes*), hairy-winged bat (*Myotis volans*), Yuma myotis, and Mexican free-tailed bat. Five recordings also included possible detections of a Pallid bat but these identifications could not be confirmed by both biologists. The boathouse theater had the greatest diversity of species of any site surveyed in the basin to date.

The Old Mill site at Fallen Leaf Lake is comprised of 2 buildings which have been abandoned for many years. These structures are considered a hazard and are slated for either BMP upgrades or destruction in the future. A team of researchers surrounded this site at dusk to verify if any bats were roosting and observed a single bat that could have exited from the main building. However, this individual may have marked the presence of other overlooked bats and it was considered prudent to carry out surveys to determine species composition and abundance. One acoustic survey was done in early July; the next two surveys in August included both audio and visual surveys. The maximum number of bats exiting from the building was 5, on August 19, however this number could be low due to a failure in the lighting system for the infrared light. Species identified at Old Mill include: silver-haired bat, California myotis, and little brown bat.

**Table 10.** Site, date, type of survey, and results collected on all bat surveys in 2010.

Site	Visit	Date	Survey Type	# of acoustic Bat detections	# of visual bat detections
Old Mill	1	7/8/2010	Acoustic	23	N/A
Old Mill	2	8/19/2010	Roost Count/Acoustic	14	5
Old Mill	3	8/31/2010	Roost Count/Acoustic	28	2
Newell House	1	6/7/2010	Roost Count/Acoustic	19	1
Newell House	2	7/8/2010	Roost Count/Acoustic	94	236
Newell House	3	8/5/2010	Roost Count/Acoustic	277	217
Tahoe Treasure #1	1	6/8/2010	Roost Count/Acoustic	6	4
Tahoe Treasure #1	2	7/15/2010	Roost Count/Acoustic	1	2
Tahoe Treasure #1	3	8/11/2010	Roost Count/Acoustic	15	3
Tahoe Treasure #2	1	8/17/2010	Roost Count/Acoustic	35	5
Taylor Creek Visitor Center	1	6/2/2010	Acoustic	52	N/A
Taylor Creek Visitor Center	2	6/9/2010	Acoustic	98	N/A

Site	Visit	Date	Survey Type	# of acoustic Bat detections	# of visual bat detections
Taylor Creek Visitor Center	3	6/22/2010	Acoustic	53	N/A
Taylor Creek Visitor Center	4	7/6/2010	Acoustic	274	N/A
Taylor Creek Visitor Center	5	7/13/2010	Acoustic	339	N/A
Taylor Creek Visitor Center	6	7/27/2010	Acoustic	72	N/A
Taylor Creek Visitor Center	7	8/3/2010	Acoustic	246	N/A
Taylor Creek Visitor Center	8	8/10/2010	Acoustic	60	N/A
Valhalla Boat House	1	6/10/2010	Acoustic	73	N/A
Valhalla Boat House	2	6/16/2010	Acoustic	28	N/A
Valhalla Boat House	3	6/28/2010	Acoustic	95	N/A
Valhalla Boat House	4	7/12/2010	Acoustic	72	N/A
Valhalla Boat House	5	7/19/2010	Acoustic	28	N/A
Valhalla Boat House	6	7/26/2010	Acoustic	72	N/A
Valhalla Boat House	7	8/2/2010	Acoustic	88	N/A
Valhalla Boat House	8	8/9/2010	Acoustic	85	N/A
Valhalla Boat House	9	8/23/2010	Acoustic	26	N/A
Valhalla Boat House	10	8/30/2010	Acoustic	15	N/A

### 8.3 DISCUSSION OF RESULTS

The number of files collected of individual bat detections per survey was uniformly less in 2010 than 2009 at sites that were surveyed in both years. This may have been attributable to a late cool spring.

Species composition has also differed at both Tahoe Treasure mines and the Newhall House. In 2009 big brown bat, silver-haired bat, hoary bat, Townsend's big-eared bat and Mexican free-tailed bat were much more frequently detected than in 2010. Bats most commonly found in 2010 were silver-haired bat, California myotis, long-eared myotis, little brown bat, and Yuma myotis. The Basin experienced snow far into the spring in 2010 with the last lake-level snowfall on 27 May. The effect of this unusual weather pattern may have discouraged some migrating bat species from entering the Basin and selecting their normal roosts.

The adit at Tahoe Treasure I is approximately 20 feet deep and dry. Tahoe Treasure II is believed to be much deeper and is protected by a metal grate to prevent would-be spelunkers from accessing it. It is possible bats are using the shallow mine, Tahoe Treasure I, early in the season and transferring to the deeper adit at Tahoe Treasure II when the water has dried sufficiently to make it accessible. In October of 2010 the Tahoe Treasure I adit was gated with a bat accessible gate.

Both Taylor Creek Visitor Center and the Boathouse Theater were subject to human disturbance on a regular basis, both from inside the building and outside. Despite these issues high numbers of bat recordings were collected at these sites, averaging 149 detections during eight surveys at Taylor Creek and averaging 58 detections at the Boathouse Theater during each of ten surveys. The fact that these sites have been used by humans while roosting bat colonies appear to thrive would indicate that bats are not disturbed by human activities. Yet the species composition of regularly roosting bats at this site may not include sensitive species that may otherwise utilize these spaces.

## **8.4 RECOMMENDATIONS FOR BAT SURVEYS**

Three new structures were added to bat surveys in 2010, each yielded additional information regarding bats in the Tahoe Basin. Every structure was inhabited by bats indicating that all future forest service projects involving structures should consider the presence of bats before initiating changes. If possible, resources and flexibility should be incorporated into 2011 bat monitoring efforts to allow for the addition of study sites as needed.

The Taylor Creek Visitor Center and Valhalla Boat House can continue summer activities without disrupting the existing bat roosts. However new, sensitive species may not choose these sites due to human activities. It is not necessary for the LTBMU wildlife crew to continue monitoring these sites in 2011 unless future information warrants the collection of additional data. Forest Service personnel employed at both sites should be asked to verify the presence of bats in future years to track the continued presence of these colonies.

A comprehensive protocol should be created to standardize bat surveys. This protocol should detail the number and type of surveys required at existing and newly found sites to obtain consistent data. Instructions need to be created outlining data management procedures and how to analyze bat vocalizations using Sonobat. It should include the currently used equipment set-up instructions as well as data sheets for roost counts, acoustic surveys and data analysis.

The perplexing variance in numbers and sizes of bats at the same sites during two consecutive years will require additional data to look for trends, although this mystery may never be solved. Continued audio surveys are necessary to search for more evidence of Townsend's big-eared bats as well as pallid and red bats. Visual surveys can be continued to chart fluctuations in numbers of bats utilizing roosts in a given summer. Aural and visual surveys should continue at both Tahoe Treasure mines and Newhall House in 2011. If other possible bat roosts are discovered they should be monitored and assessed as to whether they merit further attention.

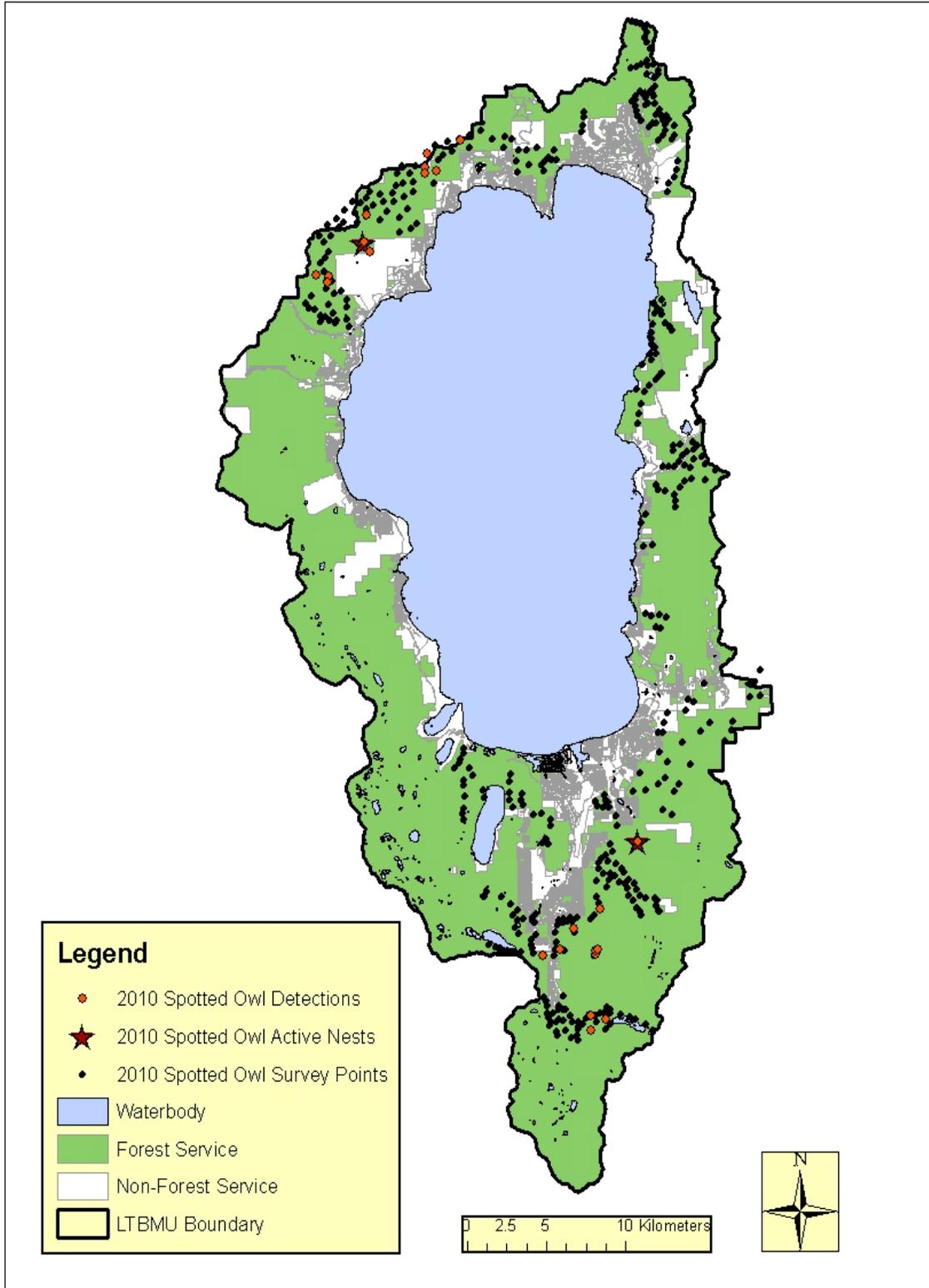
## **9.0 ACKNOWLEDGEMENTS**

Wildlife biologists and biological science technicians from the USFS, TRPA, NDOW, Hauge Brueck Associates, and Insignia Environmental, resource ecologists from California Department of Parks and Recreation, and volunteers conducted the wildlife surveys described in this report. For their assistance in conducting the surveys, we thank: Garth Alling, D.J. Allison, Abbie Alterman, Cate Brown, David Catalano, Kevin Duggan, Holly Eddinger, Rena Escobedo, Leslie Farnham, Lisa Fields, Dan Gaube, Sandra Harvill, Kevin Kilpatrick and Tonja Chi (and the Insignia Environmental crew), Stan Kot, Ashli Lewis, Victor Lyon, Hannah Pruett, Michelle Rambo, Cecilia Reed, Michael Robison, Raul Sanchez, Debra Scolnick, Ellen Sherrill, Desirae Weyland, Sylvia Copeland (and the Tahoe National Forest Willow Flycatcher Demography Study crew), Shay Zanetti, and all of our volunteers who helped.

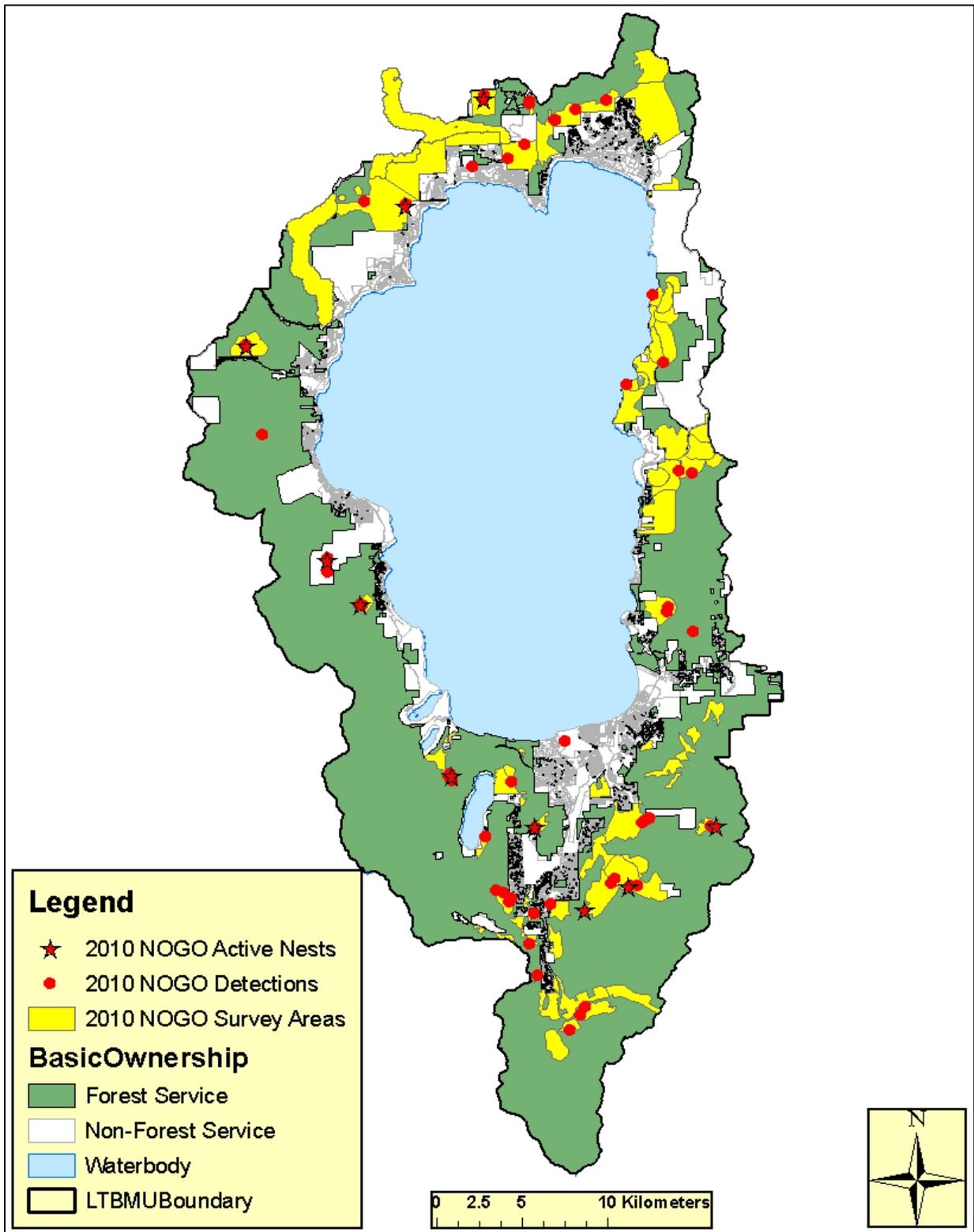
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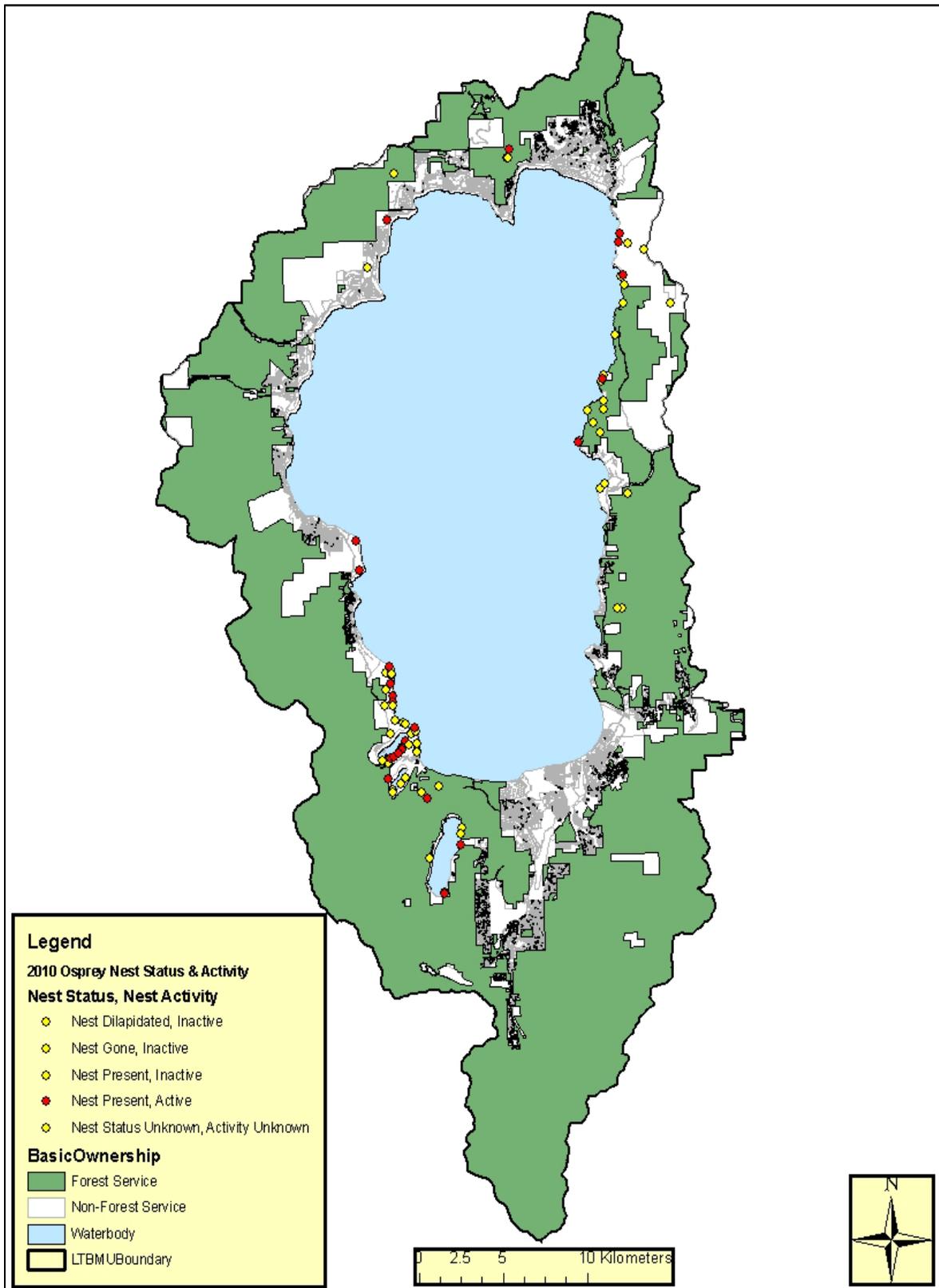
**Appendix 1.** Locations of California spotted owl survey call stations, detections, and active nests within the Lake Tahoe Basin, 2010. Surveys conducted by LTBMU and its partners.



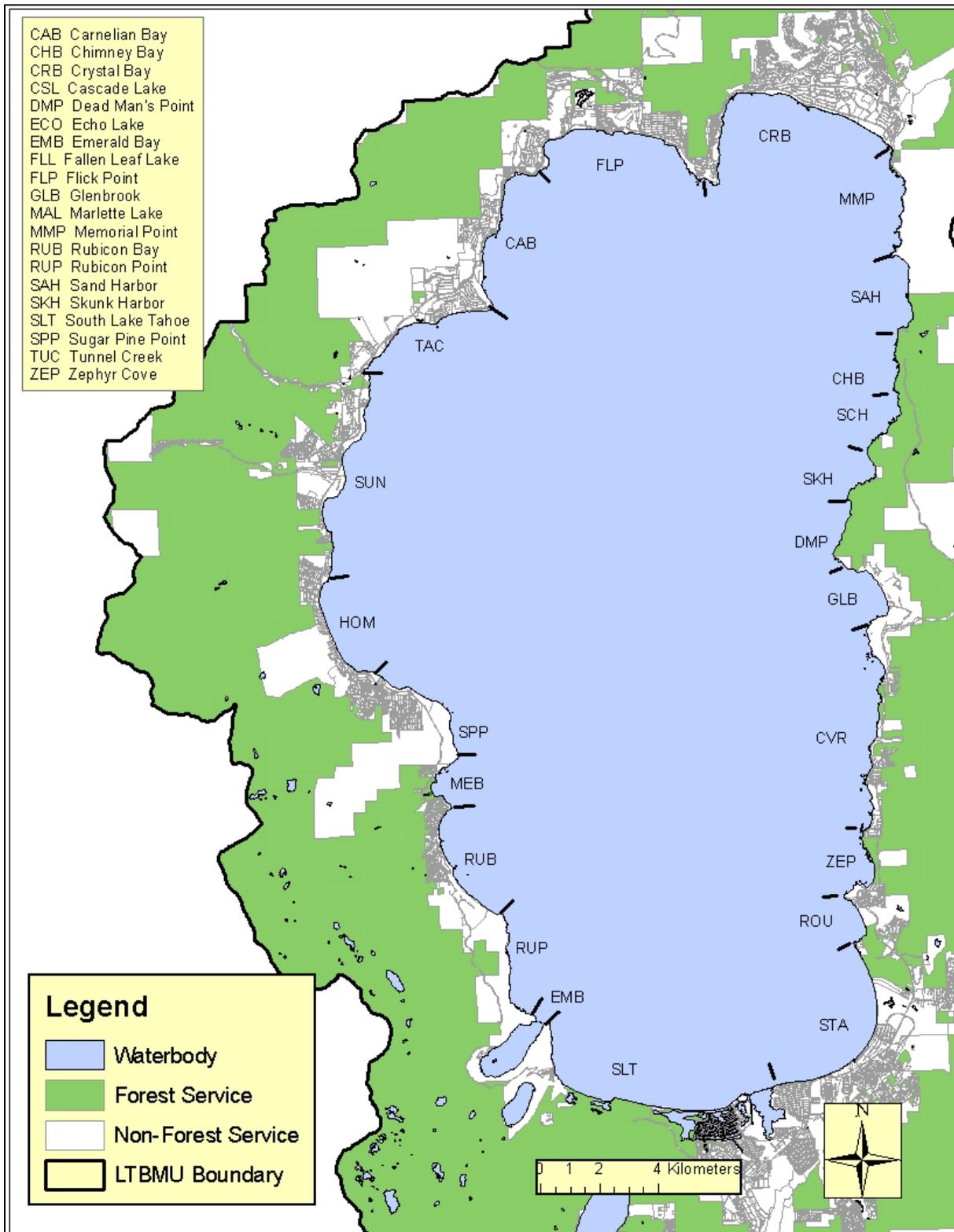
**Appendix 2.** Locations of northern goshawk survey polygons, active nests, and detections within the Lake Tahoe Basin, 2010. Surveys conducted by Lake Tahoe Basin Management Unit and its partners.



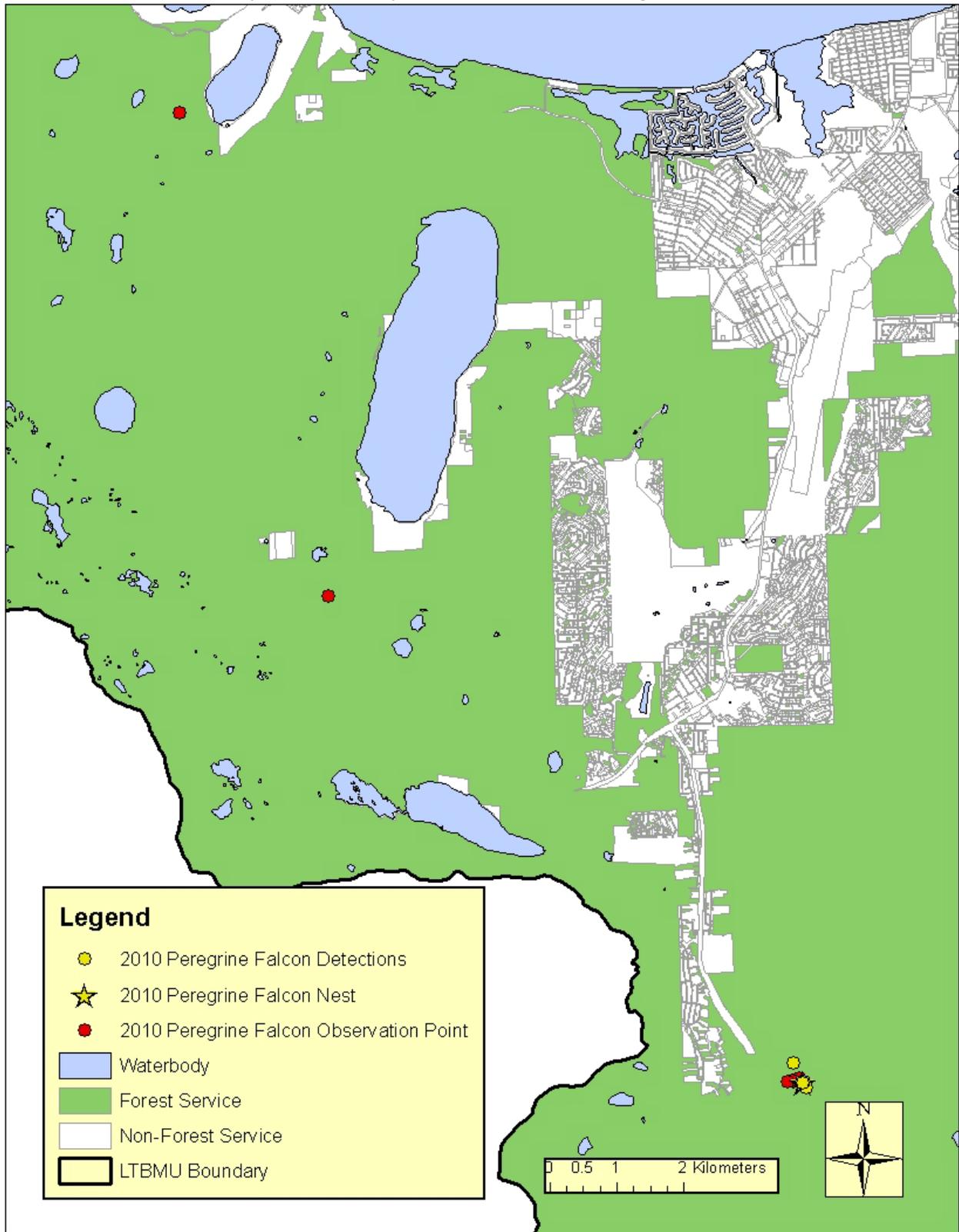
**Appendix 3.** Locations of all known osprey nests, active and inactive, in the Lake Tahoe Basin, 2010. Surveys conducted by LTBMU and its partners.



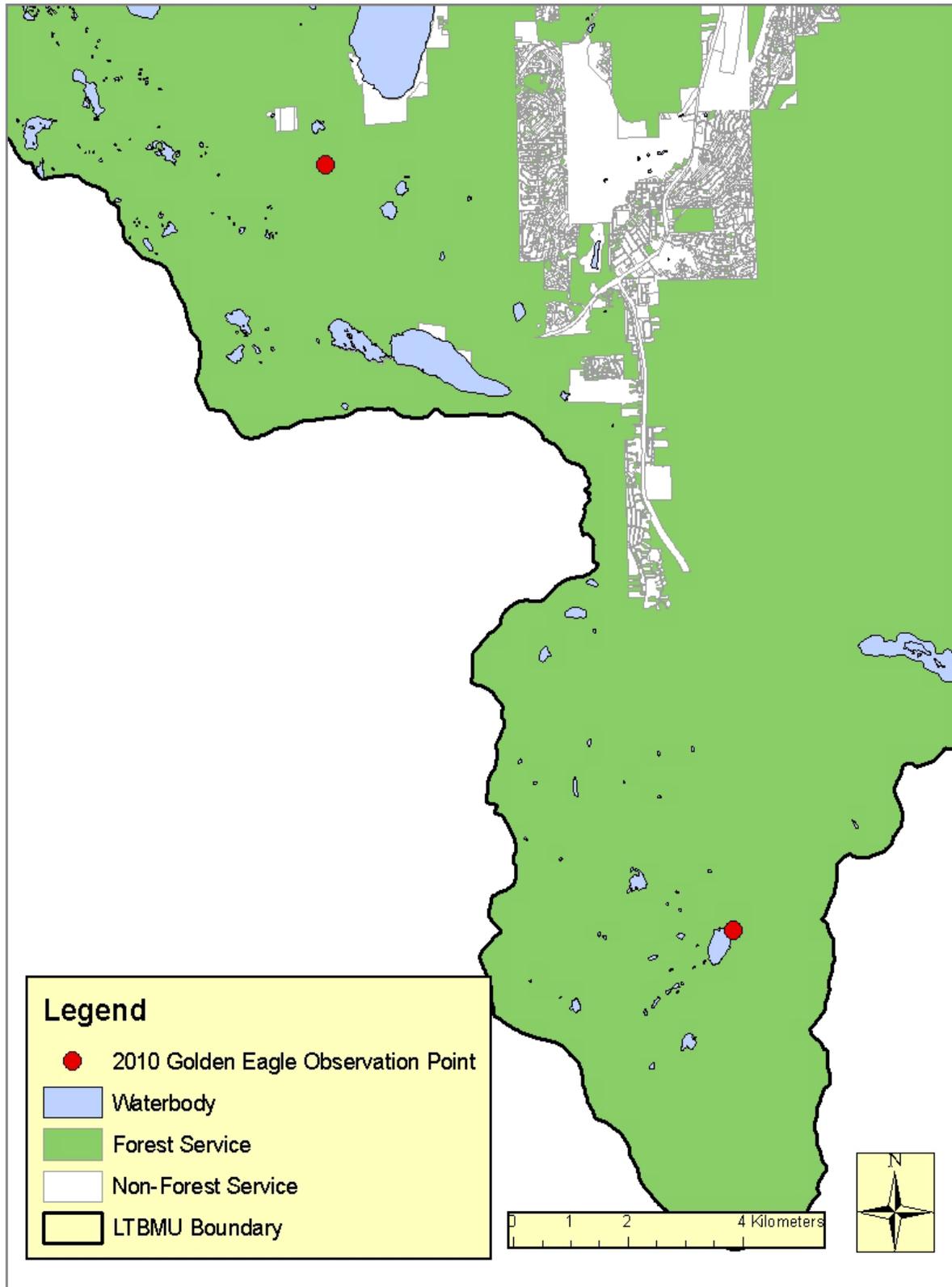
**Appendix 4.** Area surveyed by LTBMU and its partners to assess the spatial location of osprey in the Lake Tahoe Basin, 2010.



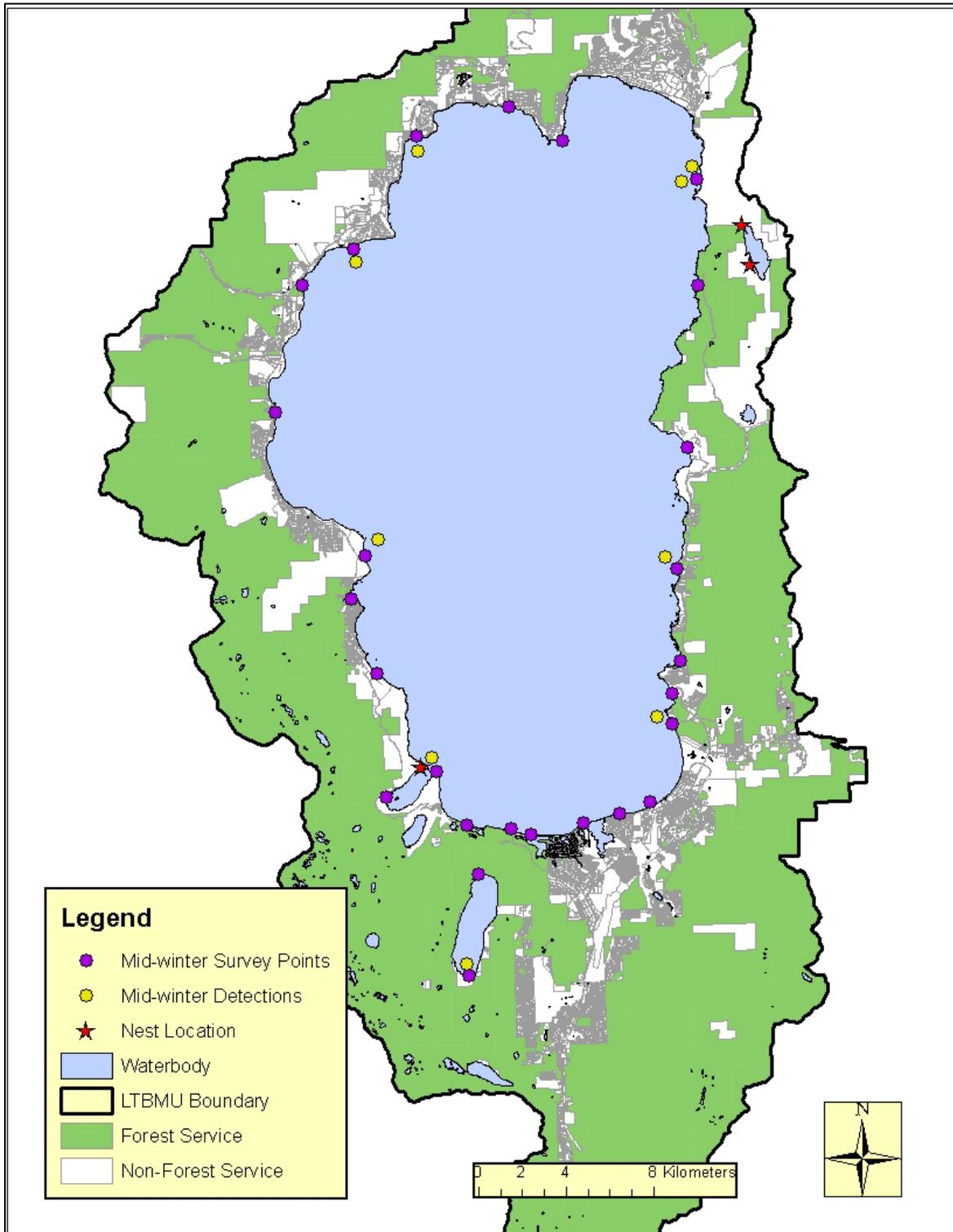
**Appendix 5.** Locations of peregrine falcon survey points, nests, and detections within the Lake Tahoe Basin, 2010. Surveys conducted by Lake Tahoe Basin Management Unit.



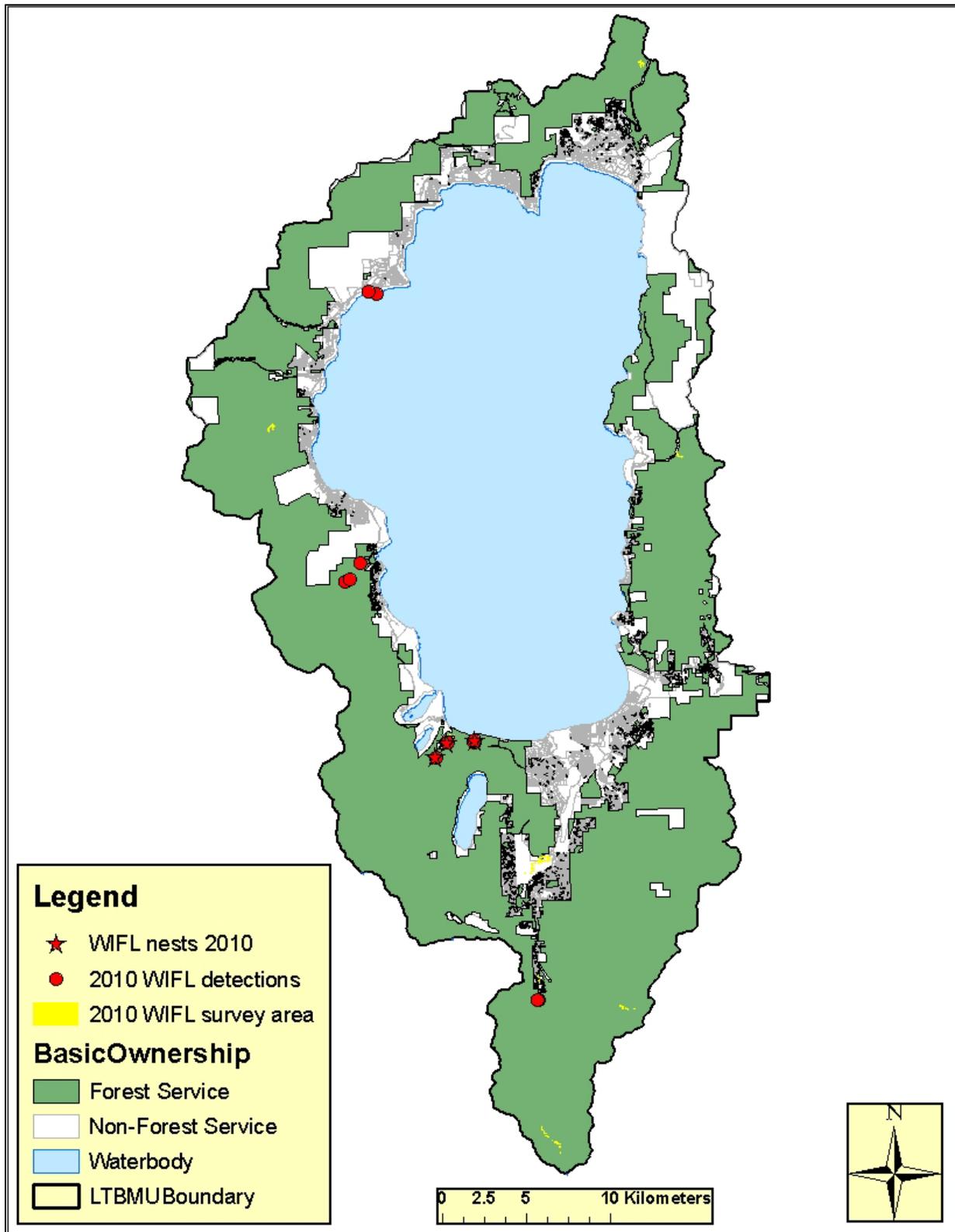
**Appendix 6.** Location of golden eagle survey points within the Lake Tahoe Basin, 2010. Surveys conducted by LTBMU.



**Appendix 7.** Location of bald eagle nests, mid-winter eagle count observation points, and detections during the mid-winter count, 2010. 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 8.** Locations of willow flycatcher survey locations, nests, and detections, 2010. Surveys for willow flycatcher were conducted by the Lake Tahoe Basin Management Unit and its partners.



**Appendix 9.** Bat roosts surveyed by the LTBMU in 2010.

