



**Long-eared Owl Nesting
Research Update
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This report summarizes our observations from five different long-eared owl territories. Four nests occurred in conifer forest, and one occurred in a shrubby draw. For known nests, we documented phenology and fate. Because of associated trapping activities at these nest sites, we limited disturbance at nests and in some cases missed stages in nest development and fledging.

For each nest location, we describe nest stand and nest characteristics, a table of owl observations, and pictures documenting nest development over time. We also summarize our observations on habitat and methodology.

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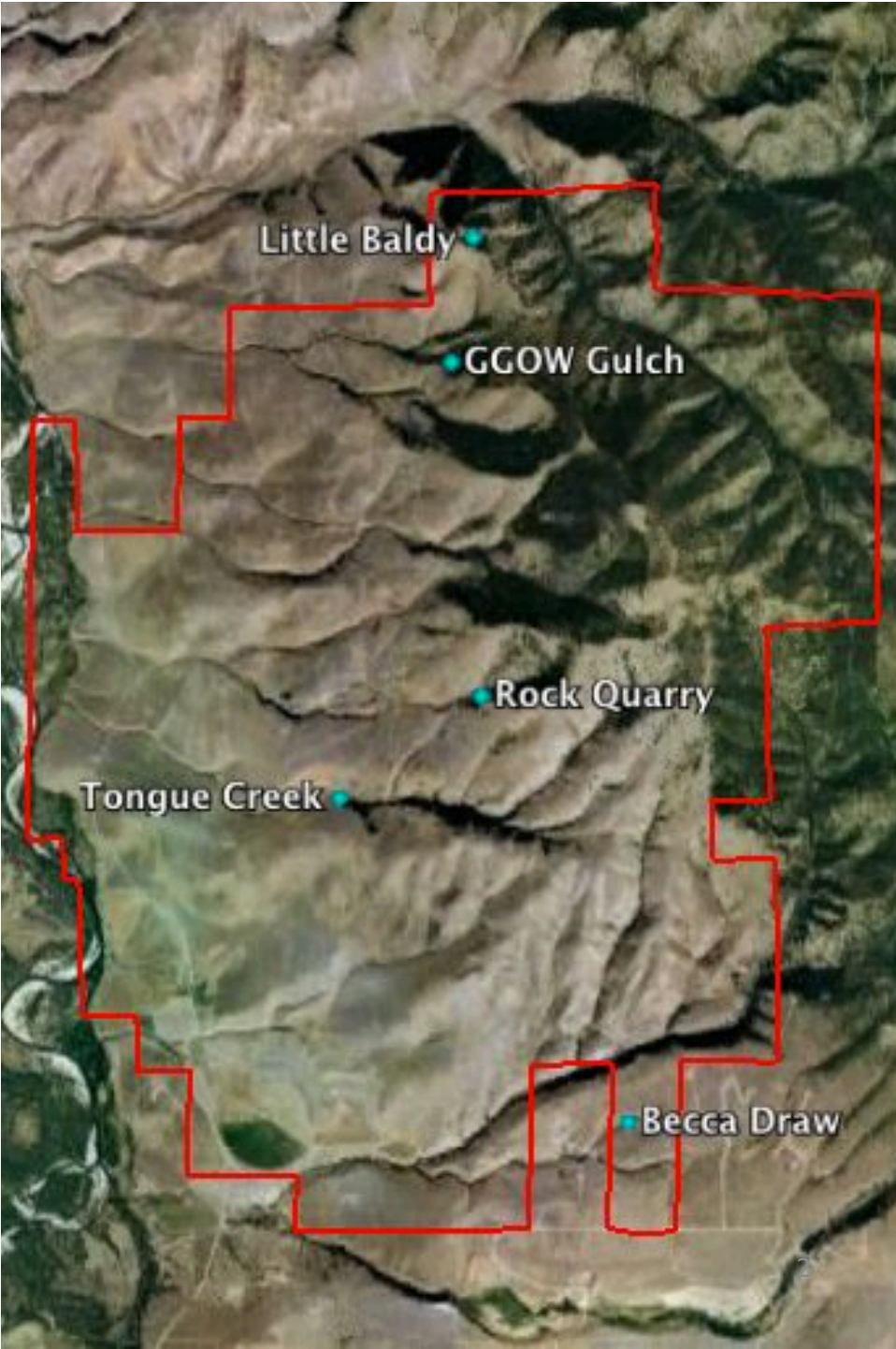
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Little Baldy Nest

We found this nest on the east-facing slope of Little Baldy, in a steeply sloped stand of dense, mistletoe-infested Douglas-fir (1366 m). The owls nested in a stick nest constructed on a mistletoe platform, approximately 18 m high. The nest tree was approximately 40 cm DBH. The nest faced northwest. Natural forest openings occurred to the north, and a large area of clearcut forest occurred to the east and south of the nest area. A pair of territorial Cooper's hawks also occupied this stand.



We found heavily used roost areas in dense clumps of mistletoe and/or dense stands of small-diameter Douglas-firs. We observed the male owl hunting in the clearcut area southeast of the nest on May 12 at 9 pm, in full daylight. We also flushed him from roost sites on the edge of the nest stand near the natural forest opening. He used the edge of this opening as his approach to the nest.



Roost sites



Male hunting in clearcut

We observed owls in the Little Baldy area from 2/18- 5/24. Because of the presence of territorial Cooper’s hawks in this stand throughout May, we limited our disturbance of this nest so that we did not put nestlings at risk of predation. We do not know the fate of this nest, but suspect that the nestlings may have fledged some time between 5/21 and 5/24. While trapping on the evening of 5/24, we heard screeching owl vocalizations from several areas in the stand; fledgling owls may have made these noises. The dense vegetation, presence of clumps of mistletoe, and connectivity to other large forested stands limited our ability to detect owls after the end of May.

We wondered if the Cooper’s hawks might occupy the nest after owl fledging because it looked like a nest constructed by an accipiter species. As of June 6th, the Cooper’s hawks did not occupy the nest.

Observations for Little Baldy nest	
Date	Observation
2/18	Initial audio lure response during nocturnal callback surveys.
2/20	Initial daytime exploration of area following strong night response to audio lure. Did not locate owls but saw whitewash on ground.
5/1	Elicited immediate hooting response to daytime playing of audio lure in area. Did not see owl. Cooper’s hawks cacking so left area. Snow still on ground.
5/3	Nest discovery. Female incubating with fuzzy feathers visible on nest. Flushed male from nest area. Cooper’s hawks cacking.
5/12	Female incubating with fuzzy feathers visible on nest. Male flushed from roadside roost on arrival. Cooper’s hawks cacking.
5/21	Female on nest. One fuzzy baby visible.
5/24	Nest appears to be empty of adult and young owls. Captured two adult owls. Heard odd owl vocalizations from several areas in nest stand.
6/6	No sign of owls in area. Peeper cam view of empty nest.



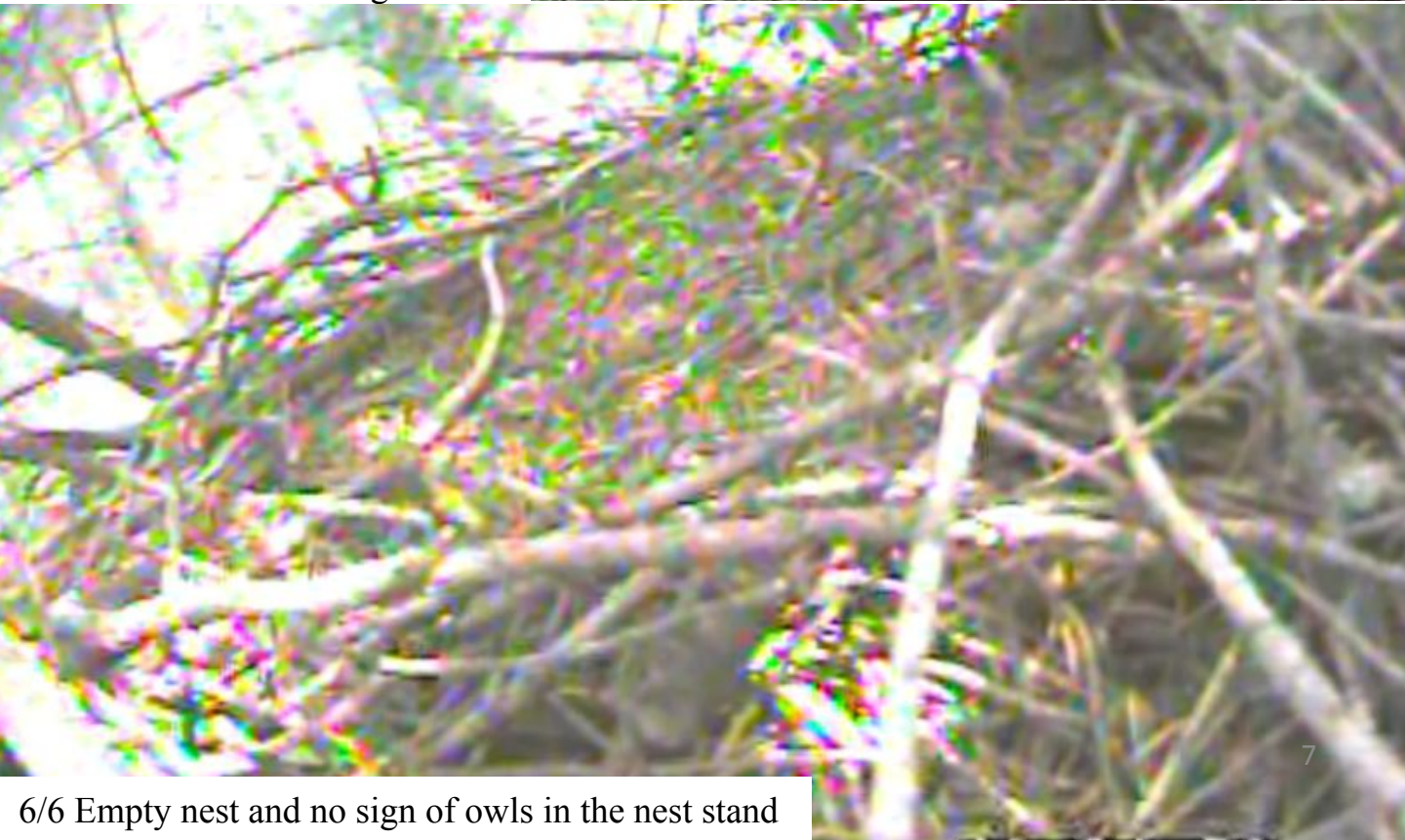
5/3 Incubation



5/12 Incubation and fuzzy feathers visible



5/21 At least one nestling visible



6/6 Empty nest and no sign of owls in the nest stand

Tongue Creek Nest

We found this nest in the lower portion of the Tongue Creek drainage, within 150 m of a main ranch road (1182 m). The owls nested in a stick nest in a 20 cm DBH Douglas-fir, approximately 6 m high. The nest faced south. The nest stand contained dense, mixed-age Douglas-fir. Open grasslands occurred to the south, a shrubby draw occurred directly to the north, and open shrublands occurred farther north. Long-eared owls roosted in this stand all fall and winter. We found nests approximately 200 m to the east last year.



We detected owls via callback surveys in early February and monitored the nest through the end of May. Because of the state of development of the nestling on 5/10 and the agitated nature of the female on 5/23, we suspect that the nest fledged at some point between these two visits. The nest destruction that occurred between the 5/23 and 5/30 visits may have resulted from scavengers at the nest or a major wind storm.

As of early June, the owls appear to have left the conifer stand but they may occupy dense vegetation in adjacent shrublands, or other conifer stands farther up the Tongue Creek drainage.

Observations for Tongue Creek nest	
Date	Observation
2/11	Initial audio lure response during nocturnal callback surveys.
4/19	Nest discovered. Female incubating.
4/25	Female incubating.
5/1	Female incubating.
5/6	Male roosting near nest. Female sitting more upright. Fuzzy feathers visible on nest edge.
5/10	Female upright with one young visible.
5/23	At 12:15, female perched on side of nest. No young visible. That evening, female extremely agitated and making yeowling and other vocalizations in several locations in nest area. Did not check nest that evening- possible young fledged at this point.
5/30	One adult flushed from near nest. Nest partially pulled apart. No sign of babies.
6/6	No sign of any owls.
6/10	No sign of any owls.
6/18	No sign of any owls or fresh sign. Searched entire nest stand and nearby winter roost sites.



4/19 Incubation



4/25 Incubation



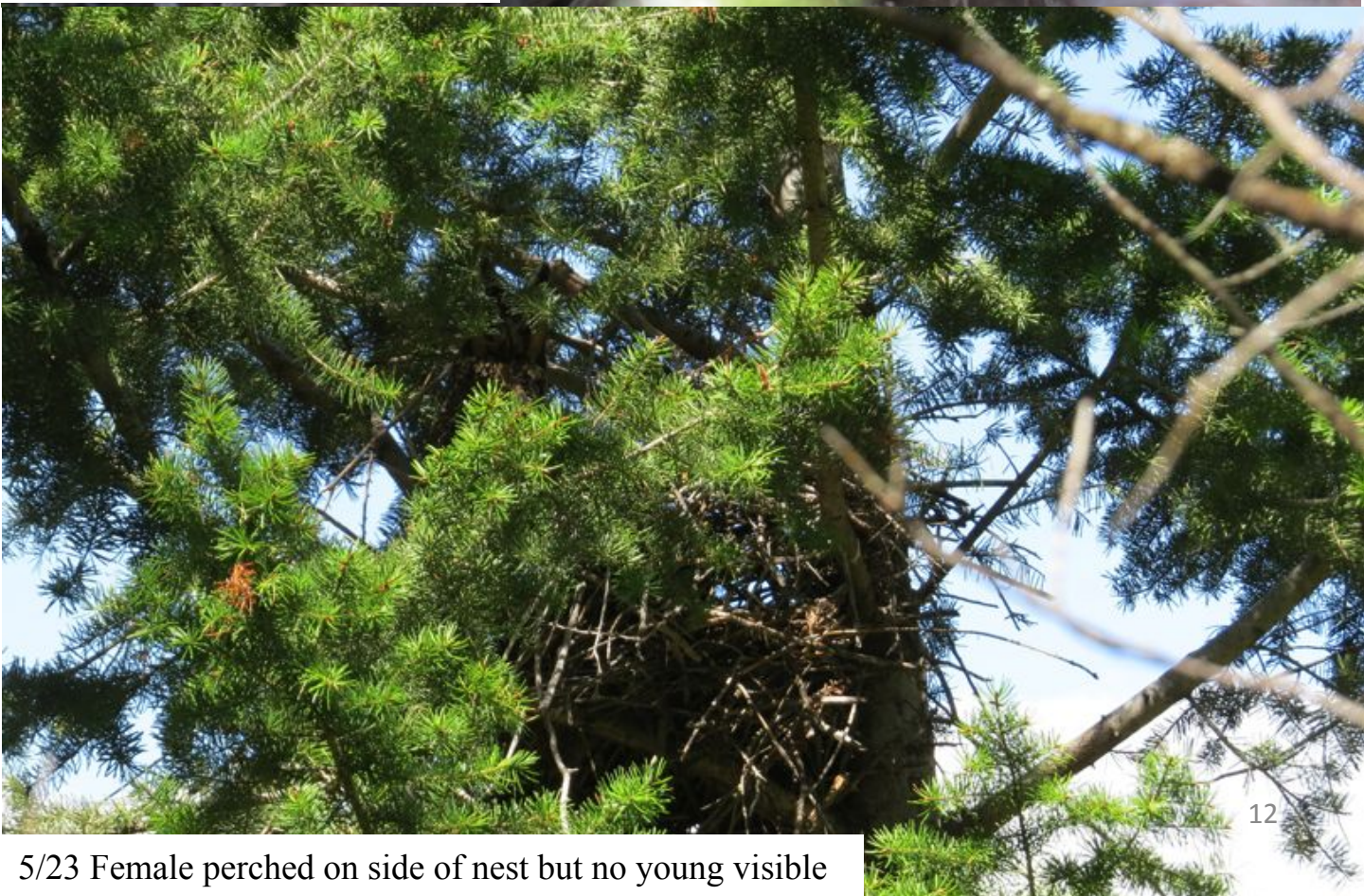
5/6 Male roosting in nearby Douglas-fir



5/6 Female incubating with fuzzy feathers visible



5/10 At least one nestling visible



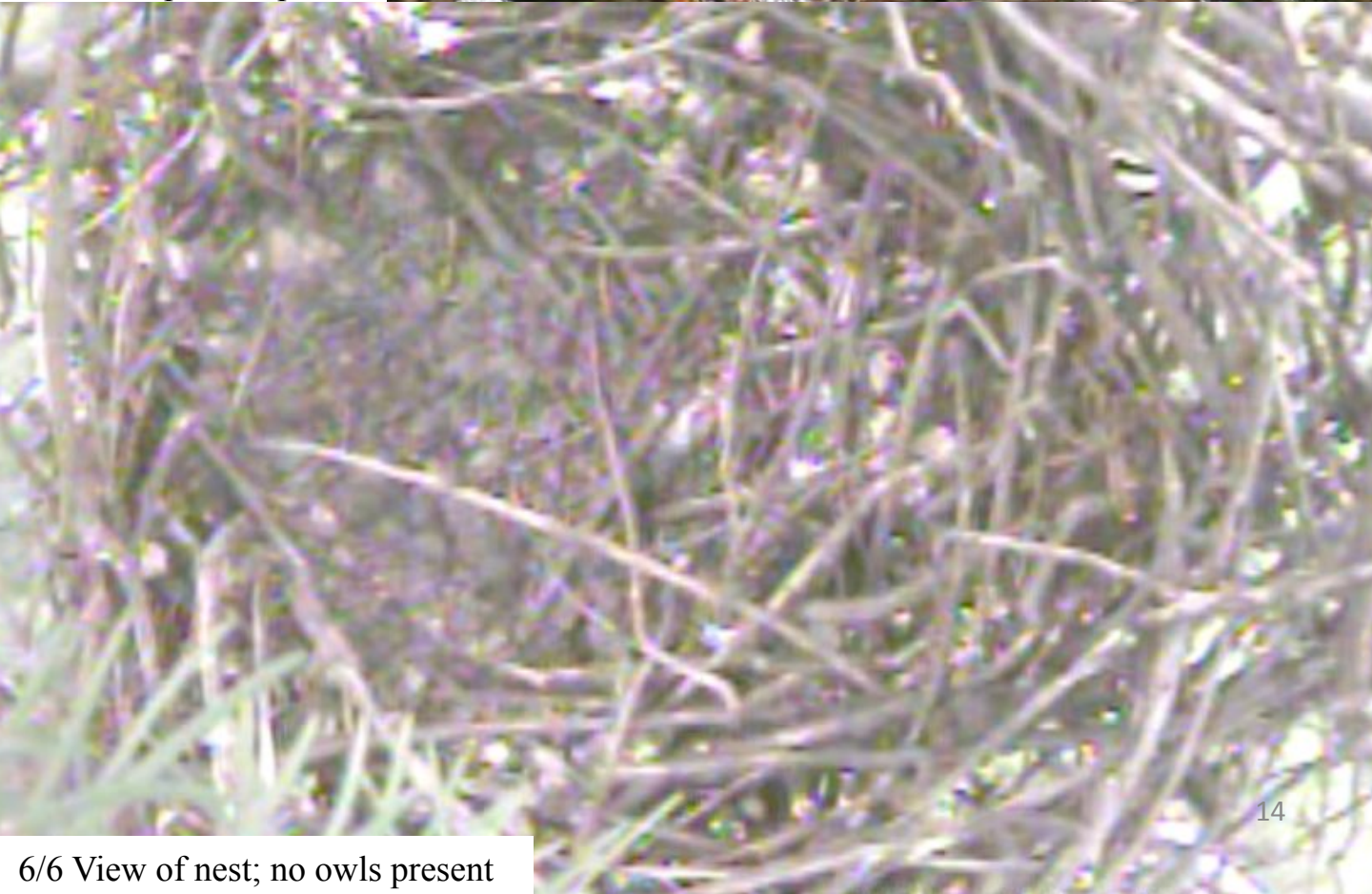
5/23 Female perched on side of nest but no young visible



5/30 One agitated adult flushed from nest area, roosting in adjacent Douglas- fir



5/30 Nest pulled apart



6/6 View of nest; no owls present

Rock Quarry Nest

We found this nest in a small Douglas-fir stand on the west side of the Rock Quarry (1369 m). The owls used a grassy nest that looked like a squirrel nest. We found the nest in a relatively large Douglas-fir, approximately 45 cm DBH. The nest faced east and was approximately 9 m high.

An opening created by the rock quarry and an access road occurred due east of the nest. Open sagebrush shrublands surrounded the nest stand on the south and west sides.





The nest stand contained dense small- and medium-sized Douglas-fir and very little understory vegetation. The stand lacked mistletoe. I took this picture near the most common roost site of the male owl, in the larger-diameter Douglas-firs present just south of the nest. One young owl we saw also roosted in this area.

We detected owls via callback surveys in late February and monitored the nest area through early July. Of the owl nests we worked with, we spent the most time at this nest attempting to trap the adults. We observed several dawn prey deliveries and vocal interactions between the male and female.

We initially thought that this nest failed due to the destruction of the nest less than a week after our first detection of a nestling. After discovering a fledged young flying around the stand on 6/13, we realized that the nestling must have left the nest soon after our 5/30 visit, when it lacked any real ability to fly. Unfortunately, we found a pile of feathers from one young owl on 7/3. Because we only ever saw one young owl on or near the nest, we do not know if any young survived.

Observations for Rock Quarry nest

Date	Observation
2/26	Initial audio lure response during nocturnal callback surveys.
3/31	Two adults flushed in area. Nest found.
4/11	Female incubating. Male flushed from roost.
4/18	Female incubating. No male seen.
4/25	Female incubating. No male seen.
5/1	Female incubating. No male seen. Heard light hooting from female as I left nest area.
5/6	Female incubating. No male seen.
5/11	Female incubating. No male seen.
5/17	Female incubating. Fuzzy feathers on edge of nest but no young visible. No male seen.
5/19	Both male and female hunting at our BC traps in the evening.
5/23	Female upright on nest. Fuzzy feathers on edge of nest but no young visible.
5/30	Female upright on nest with one fuzzy, upright young next to her.
6/6	Nest pulled apart and partially on ground. No sign of baby. Both adults flushed from nest area.
6/13	Nest pulled apart even more. One adult flushed from roost south of nest. One young flushed from area near nest. Fully capable of short flights.
7/3	Pile of feathers from young owl found on ground just south of nest, including some partially sheathed. Tips of feathers chewed. No sign of other owls. Nest totally destroyed.



4/11 Incubation



4/25 Incubation



5/23 Female upright but no young visible



5/30 Female and one upright nestling



6/6 Nest destroyed, with half on the ground and half still in the tree. Both adult owls flushed²⁰ from nearby trees but I saw no sign of the nestling.



6/13 One adult and one fledged owl flushed from roost area south of nest. If the owls had not²¹ flushed, we would not have detected them in the dense vegetation.



7/3 A pile of chewed feathers from a young owl

Becca Draw Nest

We found this nest in the shrubby draws located in the subdivision at the south end of the property. Two pairs of owls nested in this draw last year; they nested farther east in the draw this year. The draw contains a mixture of deciduous shrubs and varies in width and shrub density. The owl nest occurred in a clump of black hawthorns, with several clumps of shrubs located nearby that served as consistent roost sites.

A mixture of sagebrush and grasslands surround the shrubby draw on both sides.

1211 m





The owls used an old magpie nest in a black hawthorn. The nest was 3 m high and faced south. This nest was practically invisible once leaves emerged on the shrubs. Magpies nested within 10 m of this nest in an adjacent hawthorn and their babies fledged at roughly the same time as the owls.

We checked this draw throughout the winter and did not detect any owls. We first detected them in early March in response to nocturnal callback surveys. Because the female readily flushed from the nest when approached, we tried to limit our observations of this nest to when we attempted adult capture. After flushing the female vocalized with hoots, hissing, and bill clacks more than any other owl we observed. We believe this nest successfully fledged three young, based on our observations from 6/5 and 6/13. The density of the vegetation, using a single observer, and the presence of potential predators prevented confirmation of fledgling and adult presence towards the end of the nesting period.

Observations for Becca Draw nest

Date	Observation
3/25	Initial audio lure response during nocturnal callback surveys.
4/15	Nest discovered. Female incubating.
5/6	Female incubating but jumped from nest. 4 eggs seen via peeper cam. Male flushed from nearby shrubbery.
5/12	Female flushed from nest and captured. 3 young, 1 egg via peeper cam. Male flushed but not captured.
5/24	Male flushed from shrubbery and captured. Did not approach nest.
5/30	Female flushed from nest area. Three young seen via peeper cam.
6/5	No adults seen. Three young in nest area; one in nest and two perched on either side of nest.
6/10	One adult flushed from nest area. No young seen, but could have easily been missed if perched in vegetation.
6/13	One young seen 5 m from nest. One agitated adult flushed from same area. Ravens flying overhead so left area.
6/18	No owls detected.
7/3	No owls detected but fresh whitewash found down the draw from nest.





5/12 Female flushed from nest; appeared to be incubating with 3 nestlings and one egg



5/30 Female flushed from nest; three upright young



6/5 Two nestlings have branched while one remains in nest



6/5 The oldest owlet has the most developed feathers and moved the farthest from the nest,²⁹ but it clearly lacks the ability to fly.



6/13 Only one owl seen, roosting in a clump of shrubs 5 m northeast of the nest. Based on³⁰ how similar it looks to the oldest nestling seen on 6/5, this may be the youngest of the owls.

GGOW Gulch Nest

We found this nest in a stand of multi-aged Douglas-fir with dense clumps of mistletoe-infested trees. The nest was approximately 90 m from open shrublands/grassland on the south side. Otherwise, continuous conifer forest surrounded the nest.

The owls used a stick nest placed on a mistletoe platform. The nest was approximately 15 m high and faced south. The nest tree was approximately 25 cm DBH.



We initially flushed a long-eared owl and found several pellets near this mistletoe roost site. We also found great horned owl- and/or great gray owl-sized pellets at this roost. We found several other roost sites in mistletoe clumps surrounding the nest.



We found this nest in early May while doing a comprehensive, three-person search in a stand where we suspected owl activity. After flushing the owl, we found a promising stick nest with visible loose feathers on its side, but we could not see into the nest. Extending the peeper camera towards the nest confirmed occupancy on 5/16, but the nest failed at some point between 5/16 and 6/6.

Observations for GGOW gulch nest

Date	Observation
5/3	Flushed adult long-eared owl in area; discovered nest but could not view owl occupation.
5/16	Female flushed from nest with use of peeper cam. 3 eggs visible.
6/6	No owls seen. Nest empty except for eggshell. Part of one eggshell found on ground under nest.



5/16 Incubation



6/6 Eggshell in nest and on ground below nest

Breeding habitat

Though we found fewer nests this year than last year, we fulfilled one of the objectives of this study: to detect owls nesting in conifer forests. Owls often made use of mistletoe, both as a platform for nesting and a structure for roosting. From a forest health perspective, mistletoe infestations may not represent a desirable stand condition. We found long-eared owls, grouse, passerines, and other owls using mistletoe for roosts. We also often found owls roosting in dense stands of small-diameter Douglas-fir. Like mistletoe, these dense stands may pose a fuels hazard. We will have to strike a balance between removing these structures and retaining habitat for long-eared owls and other wildlife species.

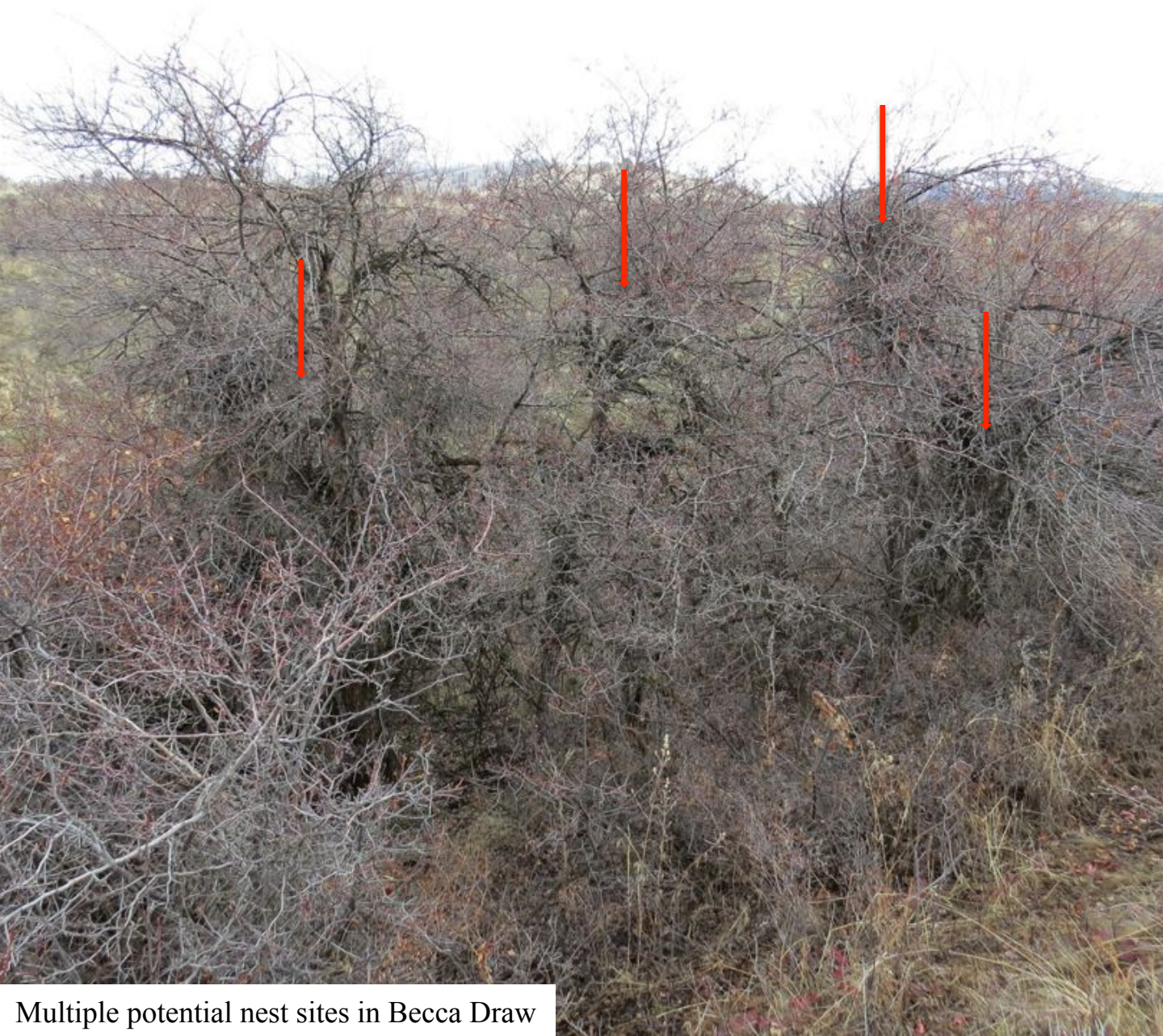


In many ways, the habitat used by long-eared owls in conifer forests mirrored my expectations for suitable accipiter habitat. They nested in stands with relatively large conifers, some clumps of small conifers, and little understory. We found evidence of accipiter hunting (e.g., plucking perches, whitewash, loose pellets) in several of the stands where owls nested. We surmise there is competition for nest sites because owls need an existing nest structure, used accipiter stick nests in three instances, and in one instance, nested adjacent to territorial Cooper's hawks.. Long-eared owls may have an advantage in that they set up territories and commence breeding earlier.



Plucked northern flicker feathers in the Rock Quarry area

In four of the five areas that we found owls nesting, we found another available stick nest, a grassy squirrel nest, a mistletoe clump with a platform of vegetation, or an old magpie nest. At the Rock Quarry nest site, we failed to detect more than one nest structure. Since areas appear to get repeated use from year to year, experimenting with an artificial nesting structure near the Rock Quarry site may encourage owls to continue to nest there.



Multiple potential nest sites in Becca Draw

Nest searching methodology

Multiple observers greatly enhanced our ability to flush owls and perform comprehensive searches for owl sign, particularly in conifer forest settings. Observations of “no owl detections” often resulted when just one observer performed searches. We attribute the absence of detections to a single person’s inability to both flush and see owls when moving through dense or continuous vegetation.

Nest searching based on visual cues was easier earlier in the breeding season, prior to spring green-up. Once leaves on deciduous shrubs emerged in shrubby draws, detecting owl nests or observing owls became increasingly difficult. The emergence of understory grasses and forbs obscured owl whitewash and pellets in all vegetation types. Even areas consistently occupied by owls throughout the breeding season, groundcover often obscured whitewash and pellets.

We failed to find nests in several areas with consistent owl sightings or responses to callback surveys. Most of these areas consisted of continuous forest and/or had dense mistletoe clumps. The forest limited visibility, and many potential nests were above the scope of the peeper camera. Based on our observations while trapping owls, visiting some of these areas just prior to sunrise when males deliver prey and the owls often vocalize may help us find nests in the future.

We believe the settling of one territory was disrupted by fuels reduction treatments. The treatments included noise disturbances from chainsaws and heavy machinery. We elicited strong hooting responses just prior to the removal. Long-eared owls nested in this stand in 2010.



Prior to leaf emergence, William crashes through the shrubs while Kate observes.

Nest phenology

Though we witnessed some variation in nest phenology, the four nests that hatched young likely all fledged in the last week of May and the first week of June. We were surprised at how undeveloped the flight feathers were when fledging occurred. This behavior may help them avoid predation; even with intense searching, in most cases we could not locate fledged owls. The ability to fly may be less important than the ability to remain cryptic in dense vegetation. Though we do not know what destroyed two of the nests, their destruction soon after fledging may also support the need for early nest departure.

Nest site and territory fidelity

We checked all known nest sites from previous years. Owls occupied none of them in 2013. We did find owls in some of the same general areas using different nests. We also detected owls via callback surveys in several territories used in 2012, though we were not able to locate nests this year.

Owl occupancy of some areas was continuous from early winter into the breeding season. Continued banding efforts may clarify if the same owls occupy territories throughout the year. We question whether they breed in the same general area year to year, even if they do not use the same nest.



In 2012, owls used a magpie nest in a dead maple shrub in Tongue Creek. The nest in the area this year was approximately 200 m west in a Douglas-fir. Long-eared owls occupy this general area throughout the year.

Conclusions

We observed nest and nest site characteristics at five long-eared owl nests. We documented long-eared owl breeding in upland conifer forests, a habitat type with limited documented use in Montana. We suspect that long-eared owls breed in this cover type elsewhere in the state, but their cryptic behavior may limit their detection by casual observation.

Owls made use of mistletoe structures for nesting and roosting. They also often used dense stands of Douglas-fir. Both of these structural conditions may pose a fuels hazard, and we will have to balance forest health and wildlife habitat management goals in these forests.

We elicited callback responses easily in late winter. Actually finding the nests proved difficult. We recommend multiple-person searching and conducting most search efforts prior to spring growth of deciduous shrubs and understory vegetation. We also suggest the use of early dawn observations in areas of callback detections to target prey delivery and pair vocalization at the nest.

Of the five nests we observed, we know that one failed in the incubation stage and four succeeded to at least the nestling stage. Based on observations of fledged owls or adult behavior during trapping efforts, we think that nestlings at four nests fledged prior to flight feather development. We documented one mortality of a fledgling with partially developed flight feathers near the nest site.



Tongue Creek nest