

PROGRESS REPORT

Habitat Distribution Modeling for the Sooty Grouse

CDFW Grant No. P1580059

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The stated objectives of this project are to: 1) sample locations of territorial male sooty grouse in Mendocino, Glenn, Lake, and Sonoma counties; and 2) create a habitat suitability model that predicts the locations of additional breeding sites throughout the region. All tasks required to be completed by July 31st, 2016 (tasks 1 and 2), have been completed in accordance with the timeline set forth in the grant agreement.

Field surveys of territorial male sooty grouse

Survey work began on March 18th and continued through May 30th, 2016. We began surveys in the southwestern portion of the study area and progressed northeastward, assuming hooting season would be influenced by seasonal phenology. Routes on which Sooty Grouse were actively searched totaled approximately 382 km in length, and included paved roads, dirt roads, footpaths, and cross-country treks. Dates and general locations of surveys are given in Table 1. The surveys were intended to emphasize public and “conserved” lands (sustainably managed by private owners), but opportunities also arose to survey several private ranches. The larger public/conserved parcels we surveyed included Austin Creek State Park, Fort Ross State Park, Salty Point State Park, Covelo and Upper Lake Ranger Districts (Mendocino National Forest), Buckeye and Garcia Forests (The Conservation Fund), and several parcels belonging to Mendocino Redwood Company. We detected a total of 42 male territorial grouse (Fig. 1). Many were located at sites not previously documented as Sooty Grouse breeding sites. We recorded precise locations with hand-held GPS units. A table of GPS coordinates is provided as a separate Appendix file. It should only be made available to persons with valid research or conservation needs.

Progress on additional tasks

In addition to completing tasks 1 and 2 by the required date, we have also begun analyzing satellite and aerial images of grouse territories, particularly with respect to the presence of large fir trees (task 3, habitat modeling). Figure 2 is a high-resolution Google Earth image showing details of canopy composition at an occupied territory. In such high-resolution “true color” images, canopies of large conifer trees appear scraggly, as opposed to the lumpy look of large oaks. This distinction is not always clear however, particularly in dense forest, so additional information is sometimes needed. Figure 3 is a “false color” aerial photograph of the same site. In false color images, conifers appear brown whereas oaks appear red. We are

currently testing different color band adjustments to improve this distinction. The images, acquired from USDA, also include an infrared band, which should further heighten the distinction between conifer and broadleaf species.

Preliminary conclusions

All but two of the 42 territorial males we detected were in or near a fir tree >30" d.b.h. Another was in a tight cluster of smaller firs that formed a single large canopy, and another was in a very large oak with no firs nearby. Clearly, coastal populations of Sooty Grouse are strongly associated with large fir trees in breeding season. It was also apparent that coastal populations are most closely associated with "coastal mosaic" habitats that lie between dense forests along the coast and dry inner valleys along the Russian River. All grouse we encountered were located where upper-elevation meadows were interspersed with patches of conifer and broadleaved trees. The extensive swaths of secondary forest that dominate the region appear to be largely unsuitable as breeding habitat.

We encountered very few grouse on public lands, presumably because of a paucity of large fir trees. The state parks we surveyed had all been subjected to intense commercial timber harvest prior to acquisition by the state. Forest Service lands in the region have also been subjected to intense commercial logging. Large areas owned by The Conservation Fund and Mendocino Redwood Company are primarily comprised of dense second-growth forest. Apparently, most properties acquired by these organizations are timbered throughout. The more open landscapes tend to be owned by livestock producers. The stronghold for Sooty Grouse in the region appears to be mid-sized private lands (100-1000 acres) which have historically been used for livestock production and are often managed these days as hunting preserves. The private land owners we encountered were interested in Sooty Grouse and keen to know how many grouse occurred on their land. We believe it would be feasible to follow up the current survey with a survey on private lands.

We were unable to detect grouse anywhere in the northern half of Mendocino County or the northwestern corners of Glenn or Lake Counties. This finding is significant, inasmuch as Mendocino Pass Road, which bisects the northern boundaries of Mendocino and Glenn Counties, was formerly the site of an annual Forest Service Sooty Grouse census (1970s). In modern times, the species has always been uncommon, and with very limited distribution, in Glenn and Lake Counties. In the areas we searched in these counties - sites reported by birdwatchers in the past - nearly all large firs had been harvested in recent decades. We hypothesize that most of the grouse observed in these areas over the past decade (very few, e.g., Pine Mtn) are not breeding birds but birds occupying post-breeding or winter range. Suitable breeding habitat - steep meadows surrounded by large firs - has largely been eliminated. These birds probably breed on private grazing lands nearby, where some large firs have been retained. Along the western portion of Mendocino Pass Road, in Mendocino County, the meadows where Sooty Grouse were formerly counted are being converted into pine plantations, on both private and public land.

There are alternate explanations for why we did not detect grouse across the northern third of the survey area, besides or in addition to habitat degradation. The area was surveyed relatively late in the hooting season. However, we had no problem locating grouse during the same time period at more southerly, lower elevation, sites that were more phenologically advanced. Furthermore, if grouse have become rare in the region, they likely hoot as solitary individuals or in small groups comprised of 2-3 males. Under these circumstances, there is less

“social facilitation” or stimulation to hoot, and birds would hoot less and for a shorter period (see Bland 2013, Estimating the number of territorial males in low-density populations of the Sooty Grouse). In any case, we believe the Sooty Grouse is significantly less abundant across the northern portion of our study area than is currently recognized, and additional survey work is needed.

Table 1. Dates and general locations of Sooty Grouse Surveys.

March 18th	Stewarts Point Road, Sonoma Co.
April 2nd	Meyers Grade, Sonoma Co.
April 2nd	Oak Ridge Road, The Conservation Fund, Sonoma Co.
April 3rd	Buckeye Forest, The Conservation Fund, Sonoma Co.
May 4th	Fort Ross State Park, Sonoma Co.
May 5th	Salt Point State Park, Sonoma Co.
May 5th	School Ridge, The Conservation Fund, Sonoma Co.
May 6th	Bear Creek, The Conservation Fund, Mendocino Co.
May 6th-7th	Fish Rock Road, Mendocino Co.
May 7th	Phelps Ridge, The Conservation Fund, Mendocino Co.
May 12th	Austin Creek State Park, Sonoma Co.
May 16th	Orr Springs Road, Mendocino Co.
May 16th	Low Gap Road, Mendocino Co.
May 17th	Elk Mountain Road, Mendocino National Forest, Lake Co.
May 17th	Middle Mountain, Mendocino Co.
May 22nd	Pine Mountain, Mendocino National Forest, Lake Co.
May 23rd	Mountain View Road, Mendocino Co.
May 23rd	Eel River Road, Mendocino National Forest, Mendocino Co.
May 24 th	Buehler Ranch, Mendocino Redwood Company, Mendocino Co.
May 24th	Peachland Road, Mendocino Co.
May 25th	Bradford Ranch (Hopland), Mendocino Co.
May 25th	Mouse Pass, Mendocino Redwood Company, Mendocino Co.
May 26th	Bradford Ranch (Boonville), Mendocino Co.
May 26th	Bell Springs Road, Mendocino Co.
May 27th-28th	Mendocino Pass Road, Mendocino National Forest, Mendocino Co.
May 28th	Mann Ranch, Mendocino Co.
May 29th	Koch Ranch, Mendocino Co.

Figure 1. The distribution of survey routes and grouse detections.

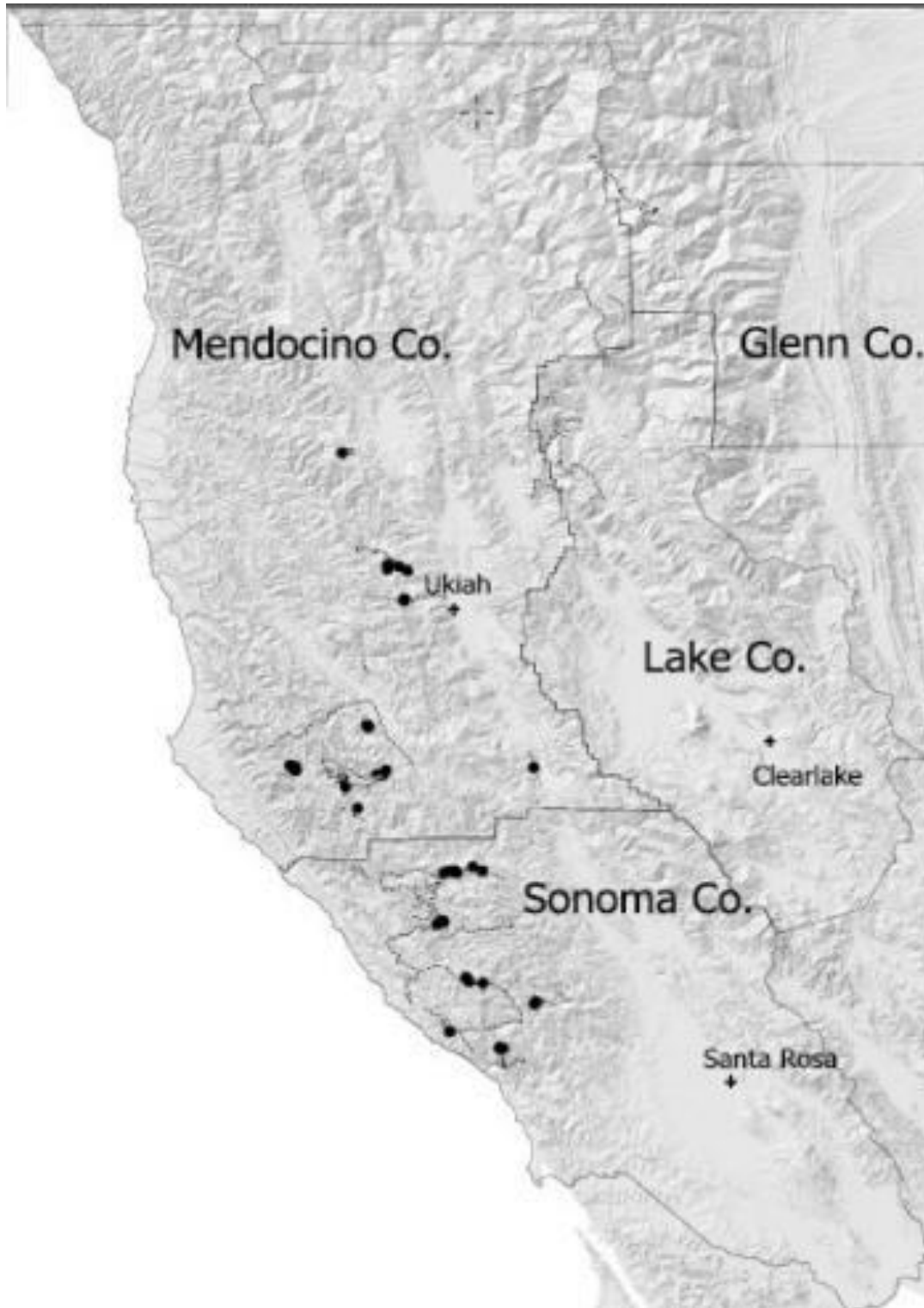


Figure 2. Google Earth high-resolution image of an occupied grouse territory. White dot is the location of the grouse, blue rings are large Douglas firs.



Figure 3. Color Infrared “false color” image of the same location. White dot is the location of the grouse, yellow rings are large Douglas firs.

