California Cooperative Forest Management Plan (2023)

Nevada City School of the Arts
501(c)(3)

13032 Bitney Springs Rd, Nevada City, CA 95959
Raven Springs, LLC

Plan preparer: Erin Andrew, M.S., Sierra Streams Institute
Funding provided by: California Wildlife Conservation Board

Purpose of this Plan

This Multi-Agency Cooperative Forest Management Plan was developed for use in California by the California Department of Forestry and Fire Protection (CAL FIRE), the United States Forest Service (USFS) and Natural Resources Conservation Service (NRCS) using information from a national joint Forest Stewardship, American Tree Farm System (ATFS), NRCS Planning Process and the California Forest Improvement Act.

This management plan template meets management plan requirements for grant agreements and other provisions available through CAL FIRE, USFS, NRCS, and the ATFS. Signature Pages are provided to document acceptance of this management plan in meeting those requirements. Signatures are only required for that entity providing funding as requested by the landowner.

This management plan is a tool for and belongs to the landowner. This forest management plan outlines the conditions and capability of property resources, documents the landowner's objectives and decisions and identifies potential resource improvement projects. It is meant to be a flexible and educational document that considers a planning horizon of at least five years but may include objectives that require a much longer time frame.

Acknowledgements

Thank you to Forestry Technicians Annie Baker and Gary Wells for field data collection and processing, and Joshua Zupan for editing this document. Kevin Whitlock, RPF and Dr. Jeffrey Lauder provided keen insight for the development of this Plan. Funding was provided by the California Wildlife Conservation Board (WCB).

Contents

Certifications

Note to the landowner: This Forest Management Plan is provided as a guide to help you accomplish the objectives that you have for your forest. This Forest Management Plan will guide you in achieving the benefits of managing your forest and forest-related resources. With this Forest Management Plan, you are eligible to participate in the CAL FIRE's California Forest Improvement Program (CFIP), US Forest Service's Forest Stewardship Program (FSP), the American Forest Foundation's American Tree Farm System (ATFS) and the Natural Resources Conservation Service (NRCS) programs. This plan will need to be reviewed and approved by representatives for each of the programs that are providing funding.

Landowner Certification

"I have reviewed this plan and approve its content."

Name (print or type):

Signature:

Date:

Mailing Address:

Phone number:

E-mail:

USFS Forest Stewardship Program Certification

Plan Preparer

"I certify that this Forest Management Plan meets the requirements of the federal Forest Stewardship Program."

Plan Preparer Name (print or type):

Signature:

Date:

Stewardship Forester

"I certify that this Forest Management Plan meets the requirements of the federal Forest Stewardship Program."

Stewardship Forester Name (print or type):

Signature:

Date:

Forest Stewardship Tracking Number:

NRCS Cost Share Certification

Technical Service Provider

"I certify that this Forest Management Plan meets the requirements of the USDA-NRCS Programs and/or the Quality Criteria for forest activity plans in Section III of the USDA NRCS Field Office Technical Guide."

Technical Service Provider Name (print or type):

Signature:

Date:

Registered Professional Forester #:

District Conservationist

"I certify that this Forest Management Plan meets the requirements of the USDA-NRCS Programs and/or the Quality Criteria for forest activity plans in Section III of the USDA NRCS Field Office Technical Guide."

District Conservationist Name (print or type):

Signature:

Date:

ATFS Program Certification

"I certify that this Forest Management Plan meets the requirements of the American Forest Foundation's American Tree Farm System."

ATFS Inspecting Forester (print or type): Signature:

Date:

Inspector Number:

Certified Tree Farm Number (e.g. CA 1234):

Date of ATFS Certification:

CFIP Certification

Plan Preparing Registered Professional Forester

"I certify that I, or my supervised designee, personally inspected this California Forest Improvement Program (CFIP) plan area, and that the plan fully complies with the CFIP and Professional Foresters Law, and meets Federal Forest Stewardship Management Plan Standards. I further certify that this plan is based upon the best available site and landowner information, and if followed, will not be detrimental to the productivity of the natural resources associated with this property."

Name (print or type): Kevin Whitlock

Signature: Kevin Whitlock Digitally signed by Kevin Whitlock Date: 2023.05.15 17:34:19 -07'00'

Date:

Registered Professional Forester #: 2436

Organization or Company: Under the Trees, Inc.

Mailing Address: P.O. Box 363, Nevada City, CA 95959

Phone Number: 530-559-0901

CAL FIRE Unit

"I certify that I, or my supervised designee, personally inspected this California Forest Improvement Program (CFIP) plan area, and that the plan fully complies with the CFIP and Professional Foresters Law, and meets Federal Forest Stewardship Management Plan Standards."

Forestry Assistance Specialist Name (print or type):

Signature:

Date:

Unit & Mailing Address:

CAL FIRE State or Region CFIP Coordinator

"I certify that the plan fully complies with the CFIP and Professional Foresters Law and meets Federal Forest Stewardship Management Plan Standards."

CFIP Coordinator Name (print or type): Signature:

Date:

Registered Professional Forester #:

Landowner Information

Landowner(s) Name: Raven Springs, L.L.C.
Mailing Address: 13024 Bitney Springs Rd, Nevada City, CA 95959
Phone Number: (530) 273-7736

Landowner's Representative (if applicable)

Landowner's Representative Name (if applicable): Kevin Whitlock, RPF
Representative's Registered Professional Forester # (if applicable):2436
Mailing Address: P.O. Box 363, Nevada City, CA 95959
Phone Number: 530-559-0901
E-mail: underthetrees@att.net

Management Plan History

A Forest Management Plan was completed for the property in Spring 2022 by the USDA-NRCS for the application of an EQIP grant (# 749104222GU).

Property Facts

Public Land Survey System (PLSS) Description:

Parcel 1: A portion of Section 12, and a portion of the NE 1/4, Section 13, T16N, R7E., MDB&M
Parcel 2: A portion of the NE 1/4, Section 13, T16N., R7E., MDB&M.
Parcel 3: A portion of the NW1/4, Section 18, T16N., R8E., and a portion of the NE 1/4, Section 13, T16N., R7E., MDB&M

Nearest City or Town: Nevada City, California

County: Nevada

Assessor's Parcel Number(s):
Parcel 1: 052-050-031
Parcel 2: 052-050-030
Parcel 3: 052-070-071

GPS Coordinates: 39.2530427, -121.1328742

Tract and Farm Number (if applicable): N/A

Total Ownership Acreage: 155.3 acres

Total Forested Acreage: 127.0

Does the Landowner reside on the property? Yes or No: No

Describe the overall character of the topography including aspect and elevation range:

The topography overall is gentle, with the steepest slopes north of the river canyon in the southernmost part of the property. Elevation ranges from 2000 to 2400 feet.

Describe the overall slope of the property by percent of land in each of the following categories:

- Flat (grade less than 5%): 25 percent
- Gentle (grade 6% to 35%): 70 percent
- Steep (grade greater than 35%): 5 percent

Road System

Approximately 80 percent of the property is accessible by road. The total length of improved road is approximately 2 miles, and unimproved road length is approximately 1.75 miles.

Watershed Information

According to the State Water Resources Control Board, the majority of the parcel occurs within the Kentucky Ravine watershed (#5517310003), and an approximate 31 acres of the southern portion of the parcel exists within the Excelsior watershed (# 5517200204).

Property History

The property experienced the 36,343-acre 49er Fire in 1988, leaving fire scars on existing trees. Scotch broom (*Cytisus scoparius*) has replaced some dead ponderosa pine (*Pinus ponderosa*) on the north slope of the main property hill. Additionally, the 705- acre Lobo Fire (2017) burned east to west, and downslope on the southern portion of the property, then up to the Caretaker's house. Regeneration was poor for conifers after this fire, which killed many ponderosa trees. Black oak (*Quercus kelloggii*) interior live oak (*Quercus wislizeni*) and blue oak (*Quercus douglasii*) have since resprouted quickly.

After the Lobo Fire, electrical lines were repaired by PG&E, and they removed dead or damaged trees adjacent to the lines. Where conifers were removed, more Scotch broom has established. Erosion control also occurred after the fire.

The 1994 Trauner fire (536 acres) burned on far eastern corner of what is now the NCSA property, from the boundary of Lone Lobo Trail road east. Dense brush is observed around the buildings that arose post-fire.

Fuels reduction occurred between the powerline just to the west of Building 4 spanning to the powerline east of Building 8 and Bitney Springs Road. Piles of brush remain, and cut logs are stacked below the canal. Some Scotch broom removal was completed by the caretaker and Sierra Streams Institute. A bark beetle infestation occurred some years ago, killing mature Ponderosa Pine, and trees were subsequently harvested. Post-harvest, more Scotch broom invaded, unfortunately.

Within the past couple of years, land was cleared to the soil above the road going to the Caretaker's house from the main road to prepare for solar panel installation. The installation is complete, generating electricity.

Bike trailbuilding has occurred on the property, with a short loop course near the Music Building parking lot. A trail was completed by Bicyclists of Nevada County (BONC) recently.

Cost-share applications (e.g. EQIP) have been submitted in prior years. This competitive grant was not awarded in the 2022 application.

Property Infrastructure

Structures

Dwellings and outbuildings have not been improved for some time. Many of the structures were originally built for manufacturing and were since converted to use for the school and the Curious Forge (a “makers” space). Buildings are primarily made of wood.

Roads

Roads on the property are generally old, with few improvements since the early 1980s. All buildings have paved access. Use for these roads are year-round. As of October 2022, a new parking lot is under development on the east side of Building B3, with an expanded play area. Tree and brush removal occurred to accommodate this.

Road clearing has been primarily completed by the caretaker of the property.

Weed control along roads can include chemical (herbicides) or mechanical (removing by hand or machinery) means. Weeds often inhabit roadsides due to their open, sunny nature; some have tolerance for degraded soils, or poor soil quality, and are thus able to establish along roads.

See the *Invasive Species and Pests* current conditions for more information on weed control.

Electrical Improvements

Solar panels by California Solar Electric Company have been installed in 2022, and currently supply electricity to the school.

Solar panels on the NCSA property

Water Improvements

Historically there was well water on the property, but a surface water treatment facility was developed. A pumping station transports water uphill to reservoirs (including a tank for fire suppression and irrigation systems) and to a treatment plant. Wastewater is filtered and goes to a shared oxidation pond. Fire hydrants and elaborate irrigation systems exist on the property.

Underground pipes were destroyed from bulldozing suppression efforts for the Lobo Fire, and since have been repaired.

Forest Resource

The forest structure of the entire property is varied; regeneration after two fire events spanning almost thirty years has resulted in even-aged ponderosa pine stands with a high number of trees per acre, with some large legacy trees that survived the fires.

Topography and soil type lends itself to a higher blue oak and grey pine component to the southeast, above Deer Creek. Also facing into the canyon, California buckeye (*Aesculus californica*) interior oak, and whiteleaf manzanita (*Arctostaphylos viscida*) are regenerating. Rabbitbrush (*Chrysothamnus sp.*) and Coyote brush (*Baccharis pilularis*) are present in this area as well, adding shrub diversity and attracting pollinators.

Overall, regeneration is adequate where there is existing forestland. These are forests that are transitioning into oak-dominated stands, as these are the dominant recruiting genera. The high acreage of Scotch broom has limited potential forest cover on over 28 acres.

Some native grass and forb species have been identified on the property, including: native cobwebby thistle (*Cirsium occidentale*), foothill deervetch (*Acmispon brachycarpus*), Ithuriel's spear (*Tritelia laxa*), seep monkeyflower (*Erythranthe guttata*), wavy-leafed soap plant (*Chlorogalum pomeridianum*) and bristly dogtail grass (*Cynosurus echinatus*), among many others.

Maintenance has occurred to reduce ladder fuels around the buildings and infrastructure, as required by law (Public Resources Code 4291).

Primary tree species:

Ponderosa pine (*Pinus ponderosa*) exists in the western United States into southern Canada and Mexico, growing up to 10,000 feet elevation. They are attractive trees, with long trunks with brown-reddish plates developing as they age. The *p. ponderosa var. ponderosa* variety (in California) is three-needled. These trees are very fire resistant due to their thick bark and self-pruning tendency. Many animals benefit from their seeds, especially mice, chipmunks, squirrels and birds. These trees are susceptible to bark beetles; although many are native, bark beetles can have devastating consequences in stressed trees. Tree stress is much more common in today's fire-suppressed, drought-susceptible, overstocked stands.

Blue oak (*Quercus douglasii*) is so named due to the blue tinge that leaves may have, which may become deciduous in the drier months. It is endemic to California, occurring in the Coast Range

and the foothills of the Sierra Nevada. Blue oak forms woodlands, and commonly exists with grey pine and interior live oak. Nonnative annual grasses are associated species, displacing the historically native bunchgrasses. They grow at low elevations (below 3,900 feet), and are extremely drought tolerant. Native Americans used the acorns (as with other oak species) to grind and make meal.

Interior live oak (*Quercus wislizeni*) has both tree and shrub forms. It lives in California south to northern Baja California, and grows from 1,000 – 6,200 feet. They typically occupy dry, shallower soils, in valleys, canyons, and foothills. Interior live oak grow in oak woodlands, chaparral, and oak-mixed conifer habitats. Grey pine and poison-oak are common associates. Primary wood products use is as firewood. Leaves are evergreen. Sprouts readily after fire, browsing, cutting, or other disturbances.

California black oak (*Quercus kelloggii*) has a range extending from western Oregon south to northern Baja California. It grows in foothills and lower mountains at 200 – 8,000 feet. It hybridizes readily with interior live oak (*Quercus wislizeni*), called "Oracle oak". Rather than existing in black oak stands, it is most common in mixed-conifer and ponderosa pine forests as an associated species. Trees can get up to 80 feet in height, and 4 feet in diameter, though that is becoming less common. Oak are excellent wildlife trees, supporting insect, rodent, bird and small mammal life cycles—and this tree is no exception. The wood is used for making furniture, cabinets, flooring, high-grade lumber, and for fuelwood.

Douglas-fir (*Pseudotsuga menziesii*) is a wide-ranging tree in its native range occurring from Canada to Mexico, and east to Colorado. *P. menziesii* is considered the "coastal variety", and *P. glauca* as the "Rocky Mountain variety". They tolerate a variety of site conditions but thrive along creeks and streams. Their distinctive cones are up to 4 inches in length, with warm-brown to straw coloring, and 3-pointed bracts that are likened to mouse posteriors. The Sierra Nevada is the southern limit of *p. menziesii's* range, and it grows up to 7,500 feet, with moisture as its limiting factor. Bigcone Douglas-fir (*p. macrocarpa*) has cones up to 6 inches in length, and occurs in southern California. Douglas-fir has high lumber value.

Incense-cedar (*Calocedrus decurrens*) is not a true cedar, but is in the cypress family. They are shade-tolerant, slow-growing trees that develop large, irregular crowns that may almost reach the ground. Mature trees may have upright branches (candelabra shape), with fluted base. These trees are more susceptible to fire and have proliferated in forests with fire's absence. They occur at 2,000-6,000 feet often in mixed-conifer or hardwood-mixed conifer stands in the Sierra Nevada. Their range is from northern Oregon to Baja California. These trees are used to make wooden pencils.

For a detailed discussion of individual forest stands please see the Vegetation Unit Descriptions section of this plan.

Access and Security

The property has been surveyed, as selling of land has occurred over the years. Some old fencing runs along some of the boundary, but there are boundaries where no fencing exists. Several property corners exist, while others could not be relocated.

There are concerns about property trespass, but there have not been notable incidents reported. Precautions are taken to prevent theft.

Recreation & Aesthetics

This campus has many outdoor facilities for recreation, including gym and climbing equipment, a basketball court, grassy areas and ample designated outdoor space for students. A garden plot is on site for use.

Recreation trails exist on the campus for students and staff, including a short bike trail installed in the summer of 2022. One trail system has exercise equipment along it exclusively for staff.

Aesthetically, the property is attractive, with varied topography and vegetation, with some large, mature ponderosa pine trees. The Newtown canal winds through the property – a water resource and a visual respite during the dry months. The southern property boundary overlooks Deer Creek, and has sweeping views of the canyon, Sierra foothills, and Lake Wildwood.

View facing southwest; note Lake Wildwood in the distance

Soils

A soil "series" are a classification level developed by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) and consist of groupings based on similar soil characteristics (soil chemistry, physical properties, formation). Erosion hazard potential and productivity values were provided (as available) by the Tahoe National Forest Soil Survey (USFS, 2002) and the Nevada County Soil Survey (1975). ***Table 1 details the proportion of these soils on the property.***

The following soil series occur on the NCSA property:

Alluvial soils are generally fertile, formed by deposition from water flow. These soils are highly permeable, and consist of silt, sand, clay, gravel and organic matter.

Boomer series support ponderosa pine, Douglas-fir, California black oak, incense-cedar, sugar pine, manzanita, toyon, poison-oak, buckbrush and grasses. These soils exist on foothills and mountains (and at their transitions), with slopes of 2 to 75 percent. *Boomer is well drained soil, with slow to very rapid runoff, and permeability is moderately slow.* Elevations are from 500 to 5,000 feet. Soils formed from material weathered from metavolcanic and igneous rocks. *Erosion hazard potential is moderate to high*. Projected bole volume growth is greater than 225 ft^3/acre/year for ponderosa pine, and 165 to 225ft^3/acre/year for Douglas-fir.

Josephine series support Douglas-fir, ponderosa pine, madrone, California black oak, incense-cedar and sugar pine. This is an extensive series, ranging up to the Kamath mountains of southern Oregon to northern California, Sierra Nevada Range. These soils exist on mountains, with slopes of 2 to 75 percent. Elevations are up to 5,500 feet in California. They formed from altered sedimentary and extrusive igneous rocks. Josephine is well drained soil, with moderately slow permeability*. Erosion hazard potential is moderate to very high.*

Loam is a fertile soil, containing sand, silt, and clay.

Secca series support manzanita, sparse grey pine, some ponderosa pine, ceanothus, blue oak, grasses and forbs. Has limited grazing opportunity. There soils exist on gentle to steep mountainous terrain between 1,700 and 3,000 feet. Soils are moderately well-drained, with slow to rapid runoff. Permeability is slow. *Erosion hazard potential is slight to high.*

Shenandoah series support blue oak and grey pine with grasses, sedges and forbs. These soils are traditionally used for pasture and range. Soils formed from granitic rock, and are on gentle to steep concave formations at 1,600 – 1,800 feet. Shenandoah is poorly drained with slow runoff. Permeability is slow as well. *Erosion hazard potential is slight to moderate.*

Sites series support coniferous forest and associated hardwoods (e.g. ponderosa pine, Douglas-fir, California black oak). These soils exist on mountains, with slopes of 2 to 75 percent at elevations of 1,650 – 3,900 feet. Soils formed from metabasic and metasedimentary rocks. Soils are well-drained, with low to moderately low permeability. *Erosion hazard potential is moderate to high*. Projected bole volume growth is greater than 225 ft^3 /acre/year for Douglas-fir and 165 to 225 ft^3/acre/year for ponderosa pine.

Sobrante series support oak, grasses and forbs, and is primarily used for range activities. These soils exist on foothills, with slopes of 2 to 75 percent, at elevations of 125 to 3,500 feet. This series formed from basic igneous and metamorphic rock. These are well drained soils with low to very high runoff, and moderate permeability. *Erosion hazard potential is moderate to high.*

Removal of forest products incorrectly, road building in unsuitable areas, and poorly located skid trails can dramatically increase water erosion. It is highly advisable that an RPF or Civil Engineer be consulted before any future road building is undertaken on the property.

Table 1. Soil types on the NCSA property, according to the Natural Resources Conservation Service (NRCS).

Soil Type	NRCS Soil Symbol	Acres
Alluvial land, clayey	Ao	4.2
Boomer, hard bedrock (rock outcrop complex, 5-30 percent slopes)	BrD	28.7
Boomer, hard bedrock (rock outcrop complex, 15-60 percent slopes)	BrE	16.6
Josephine loam, 15 to 30 percent slopes	JoD	0.0
Secca-Rock outcrop complex, 2 to 50 percent slopes	ScE	27.7
Shenandoah sandy loam, 2 to 15 percent slopes	SdC	0.0
Sites very stony loam, 15 to 50 percent slopes	SmE	67.2
Sobrante-Rock outcrop complex, 30 to 50 percent slopes	SrE	10.9
Total:		**155.3**

Streams, Wetlands and Ponds

Three cement-lined reservoirs exist on the main hill of the property, with little riparian vegetation surrounding them. ***The cement lining is cracked in the reservoirs, and warrants replacement or coverage to retain water*.** A four-million-gallon pond exists on lower campus, with riparian vegetation within and surrounding it. An ephemeral pond is located to the northeast, at the intersection of Lone Lobo Trail and Bitney Springs Road. This pond is fed by water within the Kentucky Ravine that occasionally flows as a Class III watercourse along Bitney Springs Road. Gradient for this course is 5%, with a shallow bed (up to 8”). Two wastewater treatment ponds are west of this ephemeral pond and are close together (a few feet apart).

The large pond towards north campus drains downslope as a Class III watercourse into a smaller pond initially through a culvert under a road, then flows down a steep Scotch broom-shrub slope. The gradient of this watercourse is roughly 15%. Channel width is up to 1’ across, and up to 6” deep. An additional Class III watercourse drains north-northwest from upper campus, along an improved road, and into the Newtown Canal near the solar panel installation. This is a shallow drainage, up to 1’ across and 8” deep (approximately). Gravel has been observed in it, but few large rocks, and some grass.

The Newtown canal winds through the property and is the jurisdiction of Nevada Irrigation District (NID) as a Class IV watercourse. It flows east to west, transporting drinking water to the Community of Lake Wildwood.

Wildlife

Fish and Aquatic Species

The Newtown Canal on the property has been reported to occasionally have trout (subfamily *Salmoninae*). Rushes (*Juncus spp*.) and water-inundated vegetation has been observed within the canal, as have water strider insects (*Gerridae* family).

All of the ponds on the property serve as habitat for at least part of the year to supply drinking water to animals and to support aquatic organisms. The reservoirs, the large pond on lower campus and the small ponds to the northeast have smallmouth bass (*Micropterus dolomieu*) in them, which were added in the 1980s for mosquito abatement.

The large pond on campus is capable of supporting wildlife, with reeds and vegetation for perching and animals seeking cover adjacent to this water source. Canada Goose (*Branta canadensis*) and Redwing blackbird (*Agelaius phoeniceus*) were observed on and near this pond, with cattail (*Typha sp.*) and willow (*Salix spp.*) present. Climate and weather patterns will impact water volume, and maintenance of this pond will be required to keep this resource. The small ephemeral pond to the northeast was also observed to have cattails, Redwing blackbird, and Himalayan blackberry with water in April 2023.

Upland Wildlife

A wide variety of animals are known to be present in the area, including numerous bird species, mice (Peromyscus spp.), black bear (*Ursus americanus*), black-tailed Jackrabbit (*Lepus californica*), black-tailed deer (*Odocoileus hemionus columbianus*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), and rattlesnakes (*Crotalus spp*.).

Multiple habitat types exist here that can support diverse wildlife. Although Scotch Broom does inhibit growth of multiple native species, monocultures are a cover for rodents, securing them from predators, enabling population booms. Woodrat (*Neotoma fuscipes*) dens have been spotted in the forests. Oak trees in particular are highly beneficial wildlife, as their acorns are consumed by many species, and insects (particularly wasps (family *Cynipidae*)) use them to complete their life cycles. Some animals may use the trails on the property to move unencumbered (deer are known for this) and to track prey.

Standing dead ponderosa pine have been observed, serving as snag habitat for insects and woodpeckers (subfamily *Picidae*). The large pond on lower campus provides water to support higher diversity for birds, plants, amphibians, and aquatic organisms.

Threatened or Endangered Species

The California Department of Fish and Wildlife Natural Diversity Data Base (CNDDB) is a source for identifying special status flora and fauna in the state. Spatially, the extent of the search using the RareFind tool within CNDDB constituted four quads (French Corral, Nevada City, Rough

and Ready, and Grass Valley), which meets the requirements of identifying special status species at least three miles from the site. ***Table 2 details the species that may exist on the property, and Table 3 details the California Rare Plant Rank system.***

No listed species have been reported on the property, but it is possible that the listed animals here have resided or come across the property at one point. None of these species were observed during site visits from June 2022 to January 2023; however, if spotted, the RPF presiding over forest management activities should be notified so that a buffer can be established around the observation area and suitable habitat for appropriate protection measures.

The closest sighting of wildlife on this list is the coast horned lizard (*Phrynosoma blainvillii),* spotted at the intersection of Woolman Lane and Newtown Road from thirty years ago. These lizards are striking while subtle: they blend in with gravel but have spinelike projections on their bodies and are capable of squirting blood to defend themselves (California Department of Fish and Wildlife, 2019).

Phrynosoma blainvillii, USFWS, n.d.

Table 2. Status of plants and wildlife that could occur on the property

Wildlife Type	Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Animals - Amphibians	*Rana boylii pop. 3*	foothill yellow-legged frog - north Sierra DPS	None	Threatened	-	-
Animals - Birds	*Aquila chrysaetos*	golden eagle	None	None	FP ; WL	-
Animals - Birds	*Strix nebulosa*	great gray owl	None	Endangered	-	-
Animals - Birds	*Strix occidentalis occidentalis*	California Spotted Owl	None	None	SSC	-
Animals - Birds	*Haliaeetus leucocephalus*	bald eagle	Delisted	Endangered	FP	-

Animals - Birds	*Laterallus jamaicensis coturniculus*	California black rail	None	Threatened	FP	-
Animals - Birds	*Ardea herodias*	great blue heron	None	None	-	-
Animals - Insects	*Bombus occidentalis*	western bumble bee	None	None	-	-
Animals - Insects	*Desmocerus californicus dimorphus*	valley elderberry longhorn beetle	Threatened	None	-	-
Animals - Mollusks	*Margaritifera falcata*	western pearlshell	None	None	-	-
Animals - Reptiles	*Emys marmorata*	western pond turtle	None	None	SSC	-
Animals - Reptiles	*Phrynosoma blainvillii*	coast horned lizard	None	None	SSC	-
Plants - Bryophytes	*Mielichhoferia elongata*	elongate copper moss	None	None	-	4.3
Plants - Vascular	*Allium sanbornii var. sanbornii*	Sanborn's onion	None	None	-	4.2
Plants - Vascular	*Carex xerophila*	chaparral sedge	None	None	-	1B.2
Plants - Vascular	*Rhynchospora capitellata*	brownish beaked-rush	None	None	-	2B.2
Plants - Vascular	*Fritillaria eastwoodiae*	Butte County fritillary	None	None	-	3.2
Plants - Vascular	*Lilium humboldtii ssp. humboldtii*	Humboldt lily	None	None	-	4.2
Plants - Vascular	*Lewisia cantelovii*	Cantelow's lewisia	None	None	-	1B.2
Plants - Vascular	*Clarkia biloba ssp. brandegeeae*	Brandegee's clarkia	None	None	-	4.2
Plants - Vascular	*Cypripedium fasciculatum*	clustered lady's-slipper	None	None	-	4.2
Plants - Vascular	*Brodiaea sierrae*	Sierra foothills brodiaea	None	None	-	4.3
Plants - Vascular	*Viburnum ellipticum*	oval-leaved viburnum	None	None	-	2B.3
Plants - Vascular	*Lathyrus sulphureus var. argillaceus*	dubious pea	None	None	-	3
Plants - Vascular	*Clarkia mildrediae ssp. lutescens*	golden-anthered clarkia	None	None	-	4.2
Plants - Vascular	*Eriogonum tripodum*	tripod buckwheat	None	None	-	4.2

Plants - Vascular	*Calystegia stebbinsii*	Stebbins' morning-glory	Endangered	Endangered	-	1B.1
Plants - Vascular	*Azolla microphylla*	Mexican mosquito fern	None	None	-	4.2

CDFW= California Department of Fish and Wildlife Status; this status applies to animals only. For CDFW species that do not have a designated status, they are pending status evaluations. If assigned a status, there are the following descriptors: FP (fully protected, for rare species that face possible extinction), SSC (Species of Special Concern: for vertebrates with declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction), and WL (Watch List: Previously designated SSC, but no longer merit that status, need for clarification of status). CA Rare Plant Rank: this status applies to plants only. This was originally developed by the California Native Plant Society (CNPS) to categorize and define rarity in CA flora.

Table 3. California Rare Plant Rankings

CA Rare Plant Rank	Description
1A	Plants presumed extinct in California and rare/extinct elsewhere
1B.1	Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California
1B.2	Plants rare, threatened, or endangered in California and elsewhere; fairly threatened in California
1B.3	Plants rare, threatened, or endangered in California and elsewhere; not very threatened in California
2A	Plants presumed extirpated in California, but more common elsewhere
2B.1	Plants rare, threatened, or endangered in California, but more common elsewhere; seriously threatened in California
2B.2	Plants rare, threatened, or endangered in California, but more common elsewhere; fairly threatened in California
2B.3	Plants rare, threatened, or endangered in California, but more common elsewhere; not very threatened in California
3.1	Plants about which we need more information; seriously threatened in California
3.2	Plants about which we need more information; fairly threatened in California
3.3	Plants about which we need more information; not very threatened in California
4.1	Plants of limited distribution; seriously threatened in California
4.2	Plants of limited distribution; fairly threatened in California
4.3	Plants of limited distribution; not very threatened in California

Invasive Species and Pests

Several noxious weeds have been observed on the property. Scotch broom was introduced as an ornamental and also used for erosion control. It grows in sunny sites, and spreads rapidly on roadsides and borders of forests. It has a seedbank that can remain dormant for up to 80 years

and its stems are highly flammable, increasing wildfire risk. It is found in a large multi-acre patch on the property, and scattered throughout the forests.

Yellow starthistle (*Centaurea solstitialis*) is in the aster family and is native to Eurasia, introduced to the United States in 1850. It occurs on open hills, grasslands, roadsides, and fields, and is a major rangeland weed. It is found in patches on the property to the northeast, close to Bitney Springs road.

Himalayan blackberry (*Rubus armeniacus*) is native to Armenia and Northern Iran and is a sprawling shrub that outcompetes native vegetation due to the thickets they form. They often develop in natural gaps or human-disturbed areas. It is found throughout the property.

Tree-of-heaven (*Ailanthus altissima*) is a very fast-growing tree that thrives in disturbed, semi-natural habitats. It has pinnately compound leaves. When broken, twigs may smell akin to peanut butter. It is found close to Bitney Springs Road, north and east of building eight.

Efforts towards Scotch broom removal have been reported. Prior to the solar panel installation, broom was removed – *R. armeniacus* has since developed around the panels. Broom has been cut in spots along the southernmost trail on the property. A small experimental plot utilizing biosolarization (trapping heat; in this case, with a tarp) is ongoing across from B3.

Invasive Scotch Broom along both sides of trail

Yellow starthistle on the property to the north

Air Resources

Nevada City School of the Arts has treated unwanted vegetation over the years. A Conservation Corps crew came out to remove brush and understory trees north of the canal on lower campus. Piles remain, but charred material on the ground suggests that piles have been burned previously. Logging occurred after the Lobo fire to remove the standing dead pine trees. Previous prescribed burning on the property has not been reported.

See the Future Property Conditions: Air Resources Section for more information

Objectives

The following goals for the property have been expressed by the NCSA Action Committee and NID:

1. *Improve defensible space from wildfire and manage to reduce the potential for high-severity wildfire.*
2. *Improve forest health using informed, site-specific information.*
3. *Reforest after removal of Scotch broom.*
4. *Incorporate student involvement in the restoration process.*
5. *Thin vegetation along the Newtown Canal.*

Cultivating a low-severity fire after forest thinning when wildfire occurs is a goal of the Committee. It is not a matter of *if*, but *when* fire will burn in the area, and preparedness via forest thinning and defensible space improvements can buy time for fire personnel, students and staff for ingress and egress. Additionally, low-severity fire is better aligned with the land historically and could result in ecological benefits.

Removal of the Scotch broom monoculture is another objective. Planting native seedlings coupled with natural regeneration will restore the forest component, improving land health and aesthetic value. These tasks will offer excellent hands-on learning opportunities for students as they steward their school's property and can observe and measure changes in the Our Forests program plots and for NCSA classroom learning beyond the term of the partner program.

The Newtown Canal winds east to west through the property, carrying water to the community of Lake Wildwood. NID is responsible for ensuring high quality water for its constituents. Keeping debris and material (particularly post-fire) from entering the canal is a preventative measure to avoid more consequences downstream. This necessitates maintenance of vegetation along NID canals.

Family legacy and income from wood products were not discussed as objectives from NCSA, however it is understandable that maintenance of an aesthetically pleasing, healthy forest resilient to wildfire would please future generations and be beneficial in the event of a parcel sale.

Concern has been expressed over potential trespass on the property, but no recent events have been observed.

Management for livestock is not applicable for this property.

Constraints and Proposed Alternatives

The following is an explanation of options that the landowner has (in no order of importance) regarding forest management:

1. The landowners may continue with the management practices recommended in this Forest Management Plan, which align with their objectives.
2. Some land use alternatives to current use and landowner objectives include expanding farming acreage, adding more trails for recreation and managing the remaining timber resources for potential harvesting.
3. Opting to not pursue this project is an option for the landowner, but there are risks involved. Wildfire will occur in the future on the forestland of the project area, and with the same or increased contiguous, dense fuel loading, fire has the potential to carry quickly and at high severity. Non-native invasive species will continue to reduce biodiversity on the land, inhibiting growth of native trees, shrubs and understory species, ultimately reducing habitat and carbon sequestration potential. Hands-on educational opportunities within our community on the benefits of prescribed fire and other fuels treatments and stewardship learning with children would be missed.
4. The timing of the proposed project in this Plan can be delayed, but with potential risk (see above paragraph), particularly in regard to wildfire outbreak potential.
5. Another option is for the landowner to sell the property; however, this is not feasible as the landowners are not willing sellers at this time.

Economic Sustainability

This property derives income from educational activities. Should the landowners request a cost benefit analysis for the property, the confidential analysis will include timber management and carbon sequestration as income streams.

Smaller-scale planning of periodic timber harvests can provide increased economic benefit. This Forest Management Plan also provides for an assessment of resources and presentation of management opportunities

Timber Yield Tax is required when landowners harvest their trees, or timber. It is based on values of local market transactions. For more information, consult the California Department of Tax and Fee Administration at https://www.cdtfa.ca.gov/taxes-and-fees/timber-tax.htm.

After a wildfire, a portion of the forest stand loss on your property can be claimed on your federal income tax statement. Seeking tax advice from an agent is encouraged.

Roads

NCSA has two access roads from Bitney Springs Road. Evacuation plans have been written for the property. To decrease the potential for "bottlenecking" during egress, widening of the far west old service one-lane road to make a two-lane road could be considered.

Improvements to paved roads have not been made for some time, as some stretches are rutted and sagging. Replacing the asphalt in these locations and re-grading in the areas where the road dips significantly is suggested.

Culverts are capable of handling 100-year storm events, as evidenced by the recent spring 2023 storms.

For the reduction of soil erosion on roads, ensure that the roads are well constructed, and on ridgetops rather than slopes where possible. Ensuring that drainage structures have been properly sized and installed is important to prevent water erosion from the wet season. Checking culverts annually and clearing debris as needed before the rains is a good preventive measure. Properly constructed water bars are effective at limiting erosion. Rocking the road with 1 ½" gravel is an improvement to limit erosion and dust.

Noxious weeds often develop in disturbed areas, such as roadsides. On and off-road vehicles (OHVs) can transport the seeds from roads to other areas. Targeting weeds on and along roadsides is a relatively manageable process opposed to trekking through the backcountry, and is encouraged to limit spread as soon as they are identified. Washing of vehicle tires and undercarriages, particularly with OHVs and land-altering machinery prior to any construction or fuel treatment activities is a best management practice.

Trail construction and maintenance should follow the same guidelines as for roads, except that high use trails will be built with a maximum slope of 6%. Mulching of trails with fir needles, forest litter, or some other suitable material will help reduce erosion.

Rolling dips or water bars should be maintained on all traveled roads within the property. They should also be installed on older roads and trails, which have evidence of erosion occurring. Water breaks should not exceed the following standards (based on a moderate Erosion Hazard Rating):

- <11% Gradient – 200'
- 11-25% Gradient – 150'
- 26-50% Gradient – 100'
- >50% Gradient – 75'

Water breaks should be located to allow water to be discharged into some form of vegetative cover, rocks or other non-erodible material and should be constructed to provide for unrestricted discharge at the lowest end of the water break so that water will be discharged and spread in such a manner that erosion will be minimized.

Water breaks should be cut diagonally a minimum of six inches into the firm roadbed or skid trail

and should have a continuous firm embankment of at least six inches in height at the lower edge of the water break cut.

Avoid using roads during wet periods if such use would likely damage the road drainage features. Consider gates, barricades, or signs to limit use of roads during the winter period (Nov. 15th - April 15th) or other wet periods.

Culvert & Ditches:

Culverts and ditches must be kept free of debris and obstructions. Ditches on newly constructed and/or graded roads may require frequent cleaning and checking after each major storm until re-vegetation has occurred. While clearing ditches, follow these guidelines:

• Leave grass in the ditch unless it has filled with sediment and is no longer functioning.

• Avoid undercutting the road shoulders and banks.

• Check culverts for blockage by debris.

• Do not leave a berm on the side of the road; berms will channel water down the road.

Existing Road Practices:

Identify and prioritize mitigation measures for existing roads that cause resource or watershed impacts. Mitigation measures may include any of the following:

a) Relocating road segments that adversely impact soil or water resources.

b) Reconstructing road segments to modify, improve, or restore road drainage.

c) Improving roads with deferred maintenance needs to current standards.

d) Improving stream crossings to accommodate bedload and debris and provide for aquatic habitat and passage.

e) Hardening road surfaces (that is, running surface or inside ditches) to prevent the generation of fine-grained surface material and/or armor portions of the road prism subject to concentrated runoff.

f) Putting roads in storage, while maintaining hydrologic and geomorphic functionality of drainage features.

g) Closing roads seasonally to protect water resources.

h) Restoring surface and subsurface hydrologic properties by removing roads from sensitive environments including riparian areas and meadows. May include relocation or decommissioning.

i) Permanently closing roads that cause significant adverse impacts to soil or water resources.

j) Decommissioning or converting unnecessary roads to other uses, such as trails. Assess risk of impact to water quality by decommissioning, placing road in storage, or converting to other use, and various treatments for each option.

k) The road system should be inspected prior to the summer season; problem areas should be identified and corrected.

l) Maintain road surfaces to dissipate intercepted water in a uniform manner along the road by out-sloping with rolling dips, in-sloping with drains, or crowning with drains. Where feasible and consistent with protecting public safety, utilize out-sloping and rolling the grade (rolling dips) as the primary drainage technique.

m) Adjust surface drainage structures to minimize hydrologic connectivity by:

a. Discharging road runoff to areas of high infiltration and high surface roughness.

b. Armoring drainage facility outlet as energy dissipater and to prevent gully initiation.

n) Clean ditches and drainage structure inlets only as often as needed to keep them functioning. Prevent unnecessary or excessive vegetation disturbance and removal on features such as swales, ditches, shoulders, and cut and fill slopes.

o) Minimize diversion potential by installing diversion prevention dips that can accommodate overtopping runoff.

a. Place diversion prevention dips downslope of crossing, rather than directly over the crossing fill, and in a location that minimizes fill loss in the event of overtopping.

b. Armor diversion prevention dips when the expected volume of fill loss is significant.

p) Maintain road surface drainage by removing berms, unless specifically designated otherwise.

q) Install and preserve markers to identify and protect drainage structures that can be damaged during maintenance activities (that is, culverts, subdrains, and so forth).

r) When grading roads or cleaning drainage structure inlets and ditches, avoid undercutting the toe of the cut slope.

s) Grade road surfaces in accordance with road management objectives and assigned maintenance level. Grade only as needed to maintain a stable running surface and adequate surface drainage.

t) Accompany grading of hydrologically connected road surfaces and inside ditches with erosion and sediment control installation.

u) Enforce pre-haul maintenance, maintenance during haul, and post haul maintenance (putting the road back in storage). Require the commercial operator to leave roads in a satisfactory condition when project is completed.

v) Restrict or prohibit road use during periods when such use would likely damage the roadway surface or road drainage features.

Fire Protection

Wildfire in our area is typically human-caused. Developing defensible space around our homes and applying appropriate forest management practices can limit or shape the impact that wildfire has. Maintaining defensible space around infrastructure is required by law (Public Resources Code 4291).

Understory thinning and burning.

There are also forested areas where the crowns of the overstory trees are touching and/or intermingled. If understory ladder fuels were to carry fire into the canopies of these trees, under the right circumstances a crown fire would result. Such fires are difficult to control and could move rapidly through dense canopies, pushed by the winds that are common during the summer. Most crown fires require surface fires to maintain the heat necessary to advance. If understory vegetation is adequately thinned or burned with a controlled, low-intensity flame, the likelihood of a crown fire developing or advancing will be reduced.

Management practices:

- All dead and dying vegetation should also be removed from the thinning zones.

- Undesirable plant species should be removed from the thinning zones due to their susceptibility to wildland fire.

- All burning shall be in compliance with CAL FIRE and the Northern Sierra Air Management District laws and regulations. *See the Air Resources section for more information.*

Fuel modification along roads and trails

In addition to providing travel routes, roads and trails can act as firebreaks for certain types of fire providing control points for fire suppression. But roads and trails are also a common location for fire ignitions. Fuel modification along roads and trails can reduce the availability of fuels for such ignitions as well as slow the rate of spread and reduce fire intensity once fuels are ignited. This increases the time before fires build up enough energy to become difficult to control and increases the effective response time for fire control resources. Working with neighbors to accomplish vegetation management along roads can be an excellent way to pool resources and efficiently complete the work.

Management practices:

- Remove and treat limbs, residual slash, windfalls, live roadside brush, and small trees within, or obtruding into, the designated brushing limits (minimum 10 feet along the shoulder on both sides of the road).

Pile Burning Requirements

- Only dry, natural vegetative material such as leaves, pine needles and tree trimmings may be burned.
- The burning of trash, painted wood or other debris is not allowed.
- Do NOT burn on windy days.

- Piles must be no larger than four (4) feet in diameter and in height. Vegetative slash be can added to the pile as it burns down. Small piles burn with less danger of scorching the crowns of the residual leave trees.
- Clear a 10-foot diameter down to bare soil around all piles.
- Have a shovel and a water source nearby.
- An adult is required to be in attendance of the fire(s) at all times.
- Cover piles with waterproof tarp /paper prior to winter
- Take all preventative measures to reduce/eliminate scorching of nearby green trees.
- Burn permits - Prior to burning the Landowner shall acquire all necessary burn permits. The Northern Sierra Air Quality Management District may also have permitting requirements, such as a smoke management plan prior to burning.

Forest Resource

The transition of forests over time is known as forest succession, and the species that regenerate after the fire or some other major disturbance event are known as "pioneer" species. The shrubs, grasses, forbs and stump sprouts are present as part of this natural succession process, as the stand begins the reinitiation phase.

A large area on NCSA could benefit from planting—at least 23 acres. After the Scotch broom field is managed, planting of native, climate-smart species could restore the forest component, improving wildlife habitat and controlling the rodent populations that have extensive cover from predation. Seeds and seedlings should be sourced with care. ***See the Climate Considerations and Carbon Sequestration section***. Regenerating Rangeland Oaks in California is a great resource on oak planting from UCANR (2016): https://anrcatalog.ucanr.edu/pdf/21601e.pdf

Monitoring and addressing resource needs after planting is very important to ensure success. Thinning competing vegetation and irrigation are common practices that address the needs of plantings. On a large planting site both of these practices may not be feasible or cost effective, but pulling, cutting, or spraying encroaching vegetation with a targeted herbicide is encouraged. Herbicide use should be followed according to label instructions. Tree tubing or wire cages can be placed around the seedlings for protection from browsing.

Thinning ladder fuels near infrastructure is warranted for NCSA. Maintaining defensible space is crucial for limiting wildfire spread before it hits infrastructure.

Access and Security

The best way to prevent timber theft, vandalism, and trespass is to protect your property with the following simple steps: Mark forest boundaries. Most property boundaries in forests are obscure, giving timber thieves a good excuse for removing trees through unauthorized logging. Your forest boundaries should be clearly marked with a combination of ownership signs, paint marks, posted signs, flagging, and fencing, where appropriate. Posted signs should be placed

conspicuously, without creating a visual nuisance.

Posting property marks a boundary and provides an added measure of protection through state law providing a landowner's right to prohibit trespassing for any purpose. Any signs you post must be properly placed and maintained. Signs must be at least 11 inches square, include the owner's name and address, and be placed not more than 660 feet apart.

At least one sign must be set on each side of the protected area and on each side of each corner. Ideally, extra signs are placed so that one is visible wherever the boundary is crossed. Landowners must replace illegible signs within a year. If forest property boundaries are made clear, the crime of timber theft is both more pronounced and easier to prosecute.

1. Know who the adjacent property owners are. Invite neighboring property owners to double check and agree to property line. If any areas are in question, hire a professional survey crew to set the property line. Mark the line with flagging or paint only after agreed upon or professional survey. Too often, adjacent property owners play boundary tag, removing, and posting boundary limits when the other is not around. This may actually encourage timber theft activities. Discuss boundary markers, your views toward hunters, and any plans either of you may have for cutting firewood and/or cutting timber. Trees on the property line belong to both landowners, whether or not the line is marked as a boundary. Accordingly, removal of a tree on or near a boundary line could be construed as theft. If differences with adjoining landowners cannot be resolved, agree to a “buffer” zone in which neither landowner will harvest without further discussion and/or establish a tree-by-tree agreement.

2. Patrol your property. Forest owners should make a habit of actively patrolling the boundaries of their forestland. If there is logging activity in the vicinity, the patrols should be increased.

3. Keep in touch with neighbors about activities on their properties. Let each other know when you may plan to have any outsiders working on your property.

4. Mow and trim the grass and brush along the roadways on your property, to demonstrate a presence. Neglected or "abandoned" properties may be more tempting to a timber thief.

5. Install a chain or gate across any roads entering your property. Such a deterrent will help keep honest people honest, and dishonest people out.

Recreation & Aesthetics

This property has much to offer in terms of recreation and aesthetics. However, noxious weeds do limit the potential for forest development and flowering understory plants and can be unsightly. Monitoring and prompt removal will limit spread. Planting with a native grass and forb mix can enhance vegetative beauty. ***Regular trail maintenance should continue for the property, to remove fallen limbs and debris.***

Post-fire, standing dead trees, fallen limbs, and scorched bare earth can be unappealing for some. But fire is part of a natural process with these forests, and succession will occur. Removing standing dead trees and planting are measures that can be taken to visually “clean up” the forest and reduce future fuel

Soils

As most of the organic nutrients of the soil are found in the surface leaf litter and in the top few inches of soil, disturbance to this zone should be kept at a minimum to ensure continued productivity of the soil. It is important to provide for replenishment of the nutrients in this zone, especially following removal of vegetation. This can be done by retaining a mixture of conifers and hardwoods as this enhances leaf litter decomposition and by allowing foliage and limbs of trees and shrubs that are cut to rot into the ground as these portions of the plants contain the majority of the nutrients in the plants.

The most obvious cause of soil degradation and consequent loss of soil productivity is from soil erosion. Soil erosion is a constantly occurring natural event which can be greatly aggravated by human disturbance. In mountainous areas road building, vegetation removal, and fire are the main causes of accelerated erosion. Whenever soil is exposed to rainfall impact and/or water is concentrated on bare soil, erosion will increase. For these reasons, it is best to maintain a continuous vegetative cover or at least minimize disturbance to the ground cover (leaf and twig cover).

In general, roads are known to be the main contributors of sediment to stream systems. Sediment is eroded primarily because of drainage structures which have been improperly sized, installed, constructed, and/or maintained. Drainage structure failures are more often caused by high rainfall from summer thunderstorms which overload or plug them than from winter rainfall. This can be alleviated to a degree by installing culverts of adequate size, installing trash racks on culverts, keeping culvert inlets free of debris, constructing waterbars and rolling dips of a sufficient depth so they will not fill up with sediment or debris, and keeping them cleaned out.

Another source of sediment is from rill or gully erosion from road surfaces. Gully erosion most often occurs because of improper sloping of roads which concentrates water on the road surface or in inboard ditches, inadequate water barring for the road gradient and soil type, inadequate maintenance of water-bars which allows water to broach them, and/or rutting of the road surface (and broaching of water bars) by driving on it when it is wet. Rill erosion occurs for the above reasons plus inadequate vegetation on cut banks and fill slopes.

Most of the above causes of erosion can be minimized through regular maintenance of roads. Drainage structures should be checked periodically during the summer but especially after severe thunderstorms. Before the winter rain period all drainage structures should be inspected, cleaned out, and repaired. Ideally these should be inspected periodically during the winter. It will soon be evident where the problem spots are and corrective measures can then be taken.

Soil disturbance from fuels management activities, including mastication, could result in the introduction and spread of noxious weeds into areas that are currently not infested, as well as the potential spread of existing infestations into new areas. Invasive weeds can increase fire hazards and have adverse effects on native plant communities and the wildlife that depend on them, and on the value of agricultural lands. The most aggressive exotic plants degrade natural areas because they can exclude native species, displace natural communities, promote faunal change, reduce biological diversity, disrupt ecosystem processes, alter fire frequencies, reduce

recreational values, threaten endangered species, and fundamentally alter the unique character of California.

The tires or undercarriage of vehicles and equipment working in infested areas can inadvertently pick up and transport noxious weed seed and/or stolons. Erosion control measures such as use of contaminated straw bales and seed can also result in the inadvertent introduction of new invasive plants to the project area, which can in turn spread into adjacent undisturbed woodlands or adjacent agricultural lands or residences.

Forest landowners who wish to practice good stewardship on their lands need to assess the potential negative impact of their management activities on soil and water resources both on and off their property. Soil and water conservation is focused on the prevention of erosion and off-site movement of sediments, nutrients, and pesticides, the maintenance of normal water levels in wetlands, and the reduction of flood flows into estuaries.

It is necessary to monitor soil productivity to detect significant changes caused by management actions. Maintaining soil productivity also requires restoring or improving soils in areas where they have been degraded. Controlling soil erosion, compaction, and maintaining the nutrient balance during timber harvest, reforestation, and vegetative manipulation is vital to long-term soil productivity and protection of down-stream water quality. Practices include maintaining ground cover to reduce soil loss and limiting heavy equipment use on soils during wet weather.

If practices are not performed properly, they have the potential for significant topsoil and nutrient loss. This often results in reduced productivity and increased off-site water pollution. Additionally, the cumulative effects of drainage projects in a region often result in reduced water storage capacity and increased downstream flooding, as well as reduced fish/wildlife habitat and species diversity.

Soils are an important environmental variable in that they reflect many of the processes that shape the natural landscape. They are good indicators of the parent geologic formations beneath them and thus can aid in defining geologic strata. Soils are also the products of topography, hydrology, climate and flora, which allow them to be used as general environmental indicators.

To minimize soil compaction, rutting, and gullying with resultant sediment production and loss of soil productivity, tractor operations should be limited to periods when the soil moisture content is sufficiently low that excessive rutting or other soil damage does not occur.

Mechanical slash treatment involves the use of heavy equipment to clear an area of unwanted vegetation or planting obstructions. This may be as simple as masticating brush and small trees, or as major as completely clearing a site of undesirable trees and brush with a dozer. When mechanical treatment is necessary, consider these guidelines:

- Avoid removing the forest's litter layer as much as possible on slopes. This can be done by hand clearing, mastication, or using a raised dozer blade to move only woody material and avoid soil gouging. Do not expose more than 50% of the soil surface.
- Do not operate under wet soil conditions.
- Stabilize bare soil areas on cleared sites with a temporary cover crop.

Streams, Wetlands and Ponds

Forest management activities have the potential to affect the hydrologic, soil, and aquatic resources by causing soil disturbance, altering vegetative cover, and changing local drainage patterns. The effects of the proposed management activities are most closely related to the harvesting and reforestation techniques used. Ground-based mechanical systems have the highest potential impacts. Applying effective Best Management Practices (BMPs) is necessary to reduce the magnitude of the effects to soil, water, and aquatic resources. In addition, management requirements were developed to avoid sensitive watershed areas or minimize soil/water/aquatic concerns. The primary concern to water quality is the impairment of beneficial uses due to an increase of fine sediment caused by accelerated erosion from the proposed projects. In this case, the risk of direct effects to forest soils, water quality, and aquatic species is expected to be low in the projects proposed because project design minimizes activities that might otherwise have an impact to these resources.

Best Management Practices (BMPs) to be used:

Effectiveness of the BMPs in mitigating direct and indirect effects is largely related to proper implementation and the magnitude of climatic events the first several seasons after project completion. There is a risk that heavy precipitation or rain or accumulations of snow could overwhelm erosion control structures and render them ineffective. The increased sediment delivery to channels would occur only during rare events and for short periods of time where overland flow from disturbed areas occurs. BMPs have been selected below using specific information regarding soil, slope, geology, and climate conditions typically found in the project area.

To ensure recognition and protection of areas related to water-quality protection, delineate on a sale-area map or a project map any of the following: 1. Location of stream courses and riparian zones to be protected, including the width of the protection zone required for each stream. 2. Wetlands (meadows, lakes, springs, and so forth) to be protected. 3. Boundaries of harvest units. 4. Specified roads. 5. Roads where log hauling is prohibited, or restricted. 6. Structural improvement. 7. Area of different skidding and/or yarding method application. 8. Sources of rock for road work, riprapping, and borrow materials. 9. Water sources that are available for purchasers' use. 10. Other features that are required by contract provisions. 11. Site preparation/fuel treatment. The watercourses throughout the property are classified as Class III and IV. To protect the quality of water in these creeks care needs to be taken to prevent sediment and debris from entering them. A buffer of undisturbed vegetation, leaf litter, and soil needs to be maintained on either side of the creeks to act as a sediment filter strip and to protect stream banks from erosion.

- Class III buffers should be a minimum of 25 feet wide on slopes up to 30%, 50 feet wide on slopes greater than 30%.

- ***Class IV buffers should be determined from on-site inspection by an RPF. Nevada Irrigation District (NID) should be contacted for vegetation management along class IV watercourses.***

Management activities proposed in vicinity of a watercourse will require appropriate buffering and protection measures per the California Forest Practice rules. These are based on the size, seasonality, habitat, and other conditions of the watercourses The buffer zone include Equipment Limitation Zones (ELZ) where heavy machinery may only be operated under very specific provisions, or Watercourse and Lake Protection Zones (WLPZ), where only hand-work may be done.

In general, conservation practices for riparian habitat and wetlands include promoting the growth of native vegetation and refraining from the use of vehicles or other equipment in the area. Even wetland areas or fens can be damaged by foot traffic and should be kept to a minimum. Road crossings should be inspected on a regular basis especially after large storm events (once they dry out); appropriate steps should be taken to repair or maintain their function as costs for repair can quickly escalate and more damage can happen downstream, especially with increase sedimentation from a washed-out road.

Use of heavy equipment for release and follow-up operations shall be restricted as follows:

a) No operations on excessively wet or saturated soil conditions as defined in the California Forest Practice Rules;

b) No equipment shall be used within 50' of any stream or lake transition line without approval from a responsible agency. Streams and watercourses shall be flagged prior to the start of operations; and

c) No equipment shall cross watercourses except Class III watercourses that are entirely dry at the time of operations without an approved CDF&W Lake & Stream Alteration agreement.

Hand cutting within 50' of a watercourse shall follow the following guidelines:

a) Watercourse protection measures for shade canopy retention and soil stability shall be followed as described in the Forest Practice Rules;

b) All riparian vegetation found along streams and lakes, and within marshes, wet meadows, and other wet areas shall be retained and protected;

c) Other vegetation shall be left as necessary to maintain stream temperatures;

d) All snags within the stream and lake protection zone and all live trees and snags with visible evidence of use as nesting and roosting by rare, threatened, or endangered bird species shall be left undisturbed; and

e) All areas below the stream and lake transition line of watercourses shall be kept free of slash and debris. Accidental deposits shall be immediately removed, consistent with the requirements found in the Forest Practice Rules.

Wildlife

Managed forests promote biodiversity. Thinning ladder fuels and reducing overall forest density will not only improve forest health and resilience to stressors but develop habitat for wildlife. Forest stands on this property are overstocked with small-diameter biomass; with maintenance, this ensures protection of the forest component, and therefore, habitat and biodiversity protection. Additional measures that can be taken to improve habitat include:

- *Incorporate brush piles*. Brush piles offer perches for birds and cover for small animals. Brush piles should have the largest materials at the bottom, with the smallest-diameter brush at the top. Piles that are close to water are appealing to wildlife, and in openings where there is otherwise not much forest cover.
- *Retain snags.* "Snags" are trees that are dead or dying. Snags are excellent for wildlife, as they offer cavities for nesting, limbs for perching, and numerous insects. "choice" snags are trees that have cavities, loose bark, limbs, and signs of insect presence (holes, sawdust-like frass, galleries under bark). Leaving 9-12 snags/acre with preference for at least 18" diameter trees greater than 20' in height is a good rule of thumb.
- *Put up nest boxes.* Nest boxes encourage nest sites for wildlife where they may otherwise not be present.
- *Exclude livestock from riparian areas*. Using fencing to prevent browsing and trampling of soils and streams can restore vegetation, which provides cover and food for wildlife. Streams with shaded water are cooler and reduce evaporation which benefits aquatic species.
- *Promote habitat connectivity.* Habitat connectivity refers to two or more areas of undeveloped habitat that are connected to each other in an otherwise isolated area. These areas are also referred to as "wildlife corridors". These strips or patches of connectivity can attract wildlife and enable them to travel or dwell with a sense of safety.
- *Add water sources where feasible and protect pools.* Incorporating bird baths or above/in-ground holding ponds are activities that support wildlife needs. Allow water to naturally pool and protect those pools from vehicles and heavy recreational use. This limits erosion, maintains water quality, and serves as a source for drinking, dwelling or breeding- even if pools are temporary.
- *Plant grasses, forbs, and trees.* Herbaceous cover benefits many animals, including when the cover is in forest openings. Snakes, raptors, turkey, sparrows and foxes are some of the many animals that use these openings for hunting, feeding, and cover (Brittingham, 2016). Planting native bunchgrass is also beneficial. For example, deergrass (*Muhlenbergia rigens*) is easy to grow, and does well in almost any soil (California Native Plant Society, n.d.). Native trees offer seed sources and cover that animals in the foothills are adapted to, and cultivated fruit trees attract numerous animals, including deer and bear (Brittingham, 2016).

Invasive Species and Pests

Tree diseases are common, varied, and often occur concomitantly. Diseases may be caused by biotic pathogens, including fungi. The mistletoe plant is a defoliator of trees (commonly oak), and insects can cause injury and potentially death. Drought, wind, smog, frost, flooding, high temperatures, fire and lightning cause tree damage, and the stress from these events can prompt attack by bark beetles.

Bark beetles

Many bark beetles are native species, fulfilling ecological roles- thinning forests, facilitating decomposition, and serving as a food source for wildlife. However, dense stands coupled with drought can snowball into extensive bark beetle outbreaks. Generally, trees that are more spaced out are not competing as much for water and sunlight and are less stressed. ***Forest thinning, tree watering, and removing dead trees around your property are preemptive management tools that can limit bark beetle outbreak severity and the range of the beetles.*** There are hundreds of species of bark beetles found in the conifer forests of the West particular to different tree parts, from cones to tiny branches to the main stems of their hosts (US Forest Service CA Forest Insect and Disease Training Manual, 2015).

Common beetles in forests of the Sierra Nevada include the pine engraver beetle (*Ips pini*), mountain pine beetle (*Dendroctonus ponderosae*), red turpentine beetle (*Dendroctonus valens*), and Douglas-fir beetle (*Dendroctonus pseudotsuae*). If it is suspected that trees are impacted by beetles (pitch tubes, small holes through the bark, or boring dust and/or frass), a Registered Professional Forester (RPF) or the Nevada County Department of Agriculture can be consulted for further assistance. *For more information, see the attached factsheet from the US Forest Service.*

Bark beetle infestation is evident on ponderosa pine trees on the property, but not at a large scale. Preventive measures are addressed via the thinning practices recommended in this Plan.

Invasive plants

Monitoring for aggressive noxious weeds is necessary for action to occur as soon as they are spotted. Weed prevention also includes washing equipment and vehicles before entering the property (particularly if returning from areas where weeds were identified) and after use. ***To address the invasive plant species identified on the property, see Table 4.***

There are many methods of weed control, and the following are common.

- *Mechanical control* is generally the physical action of pulling, cutting or burning the plants.
- *Chemical control* is the killing or injury of plants through application of herbicides or other chemicals. Some chemicals are available for public use at garden stores or nurseries, whereas others have restricted uses and should only be applied by a certified applicator.
- *Controlled grazing* (commonly via goats, sheep and cattle)
- *Biological control* (the application of naturally-occurring host-specific insects, mites of

pathogens (CAL IPC, 2023)).

- *Competitive planting* (seeding and planting native plants before, during or after invasion)
- *Physical barriers* (tarps, mulch to suppress growth)

For more weed removal options, consult the California Invasive Plant Council's Weed Control User Tool: https://weedcut.ipm.ucanr.edu/#gsc.tab=0

Monitor for at least a year and re-treat as needed. To monitor, visit the site and look for new sprouts, leaves, or flowers. Develop the treatment schedule accordingly, depending on time of year, herbicide instructions (if using chemical means), and stage of the plant. The label on herbicides must be consulted before application.

Table 4. Guidelines for treatment of invasives plant species on the property.

Species	Proposed Initial Treatment Options	Follow-up Treatment Options
Yellow star-thistle *(Centaurea solstitialis)*	Aminopyralid, Triclopyr, or Clopyalid, select or directed spray. Goat herbivory is an alternative.	Maintain the chemical treatment options; dig out widely scatted plants after infestation is greatly reduced, before flowering occurs
Scotch broom *(Cytisus scoparius)*	Hand pull in winter or spring and/or cut at the base in the months of May-October. Treat cut stumps with Triclopyr.	Maintain the chemical treatment options or continue pulling plants.
Tree-of-heaven *(Ailanthus altissima)*	Hand pull seedlings. For saplings and small trees, a weed wrench can be used, but it is key that the entire root gets removed. Triclopyr, or Aminopyralid + Tricloypr, may be applied foliarly or to the stem.	Continue hand pulling and chemical treatments as needed.
Himalayan blackberry *(Rubus armeniacus)*	Hand pull in spring or late fall, when soil is moist. May apply Triclopyr or Glyphosate.	Re-treat when new, sprouting leaves are fully expanded.

Air Resources

According to the California Air Resources Board (2022), particulate matter (PM) at 2.5 microns or less can be inhaled into the deepest parts of the lung, as they are very small. Smoke from wildfires are mostly of this sized particle, and can aggravate existing health problems and increase the risk of heart attack or stroke. Carbon monoxide is also produced from wildfires, and in highest concentrations with smoldering material.

Residential landscape debris burning of vegetation is allowed during certain times of the year. Debris burning is limited to dry, woody, natural vegetation that can be burned within the permissible burn day and with limited smoke production.

The Air Quality Management Districts issue burn permits for the purposes of regulating particulate matter release amounts All burning must be in compliance with CAL FIRE and the Northern Sierra Air Management District (Nevada County) laws and regulations in order to mitigate as many negative impacts on air quality as possible. Consult CAL FIRE for the current burn day status AND the Northern Sierra Air Management District (Nevada County).

- CAL FIRE Burn Permits: https://burnpermit.fire.ca.gov/current-burn-status/
- Northern Sierra Air Management District: https://myairdistrict.com/index.php/burning-info/burn-day-status/

Check to see if burn permits are required. The burning must occur on the property where the vegetation grew.

Alternatives to burning biomass include cutting up and scattering the material by hand, or using mechanical means to chip or masticate it. This is not actually removing the materials from the site, but rather reconfiguring it. Composting, if on a small scale, is a feasible option. Waste Management of Nevada County has a greenwaste pickup program. They can be contacted at: (530) 274-3090.

The Nevada County Fire Safe Council has a chipping and shredding program. You can submit a request at https://clienthub.getjobber.com/client_hubs/0ea7b196-f50e-4e4b-9a3a-f2f6486280f3/public/work_request/new?source=social_media

Climate Considerations and Carbon Sequestration

Thinning to increase carbon storage

Thinning of ladder fuels and smaller trees has been shown to lead to a net carbon gain due to decreased competition for larger trees (which are known to accumulate more carbon per growth year than smaller trees) and reduced likelihood of catastrophic wildfire that fully consumes and volatilizes all carbon back into the atmosphere (Hurteau et al., 2011; Hurteau and North, 2010). Thinning on this property may have a similar effect, particularly if follow-up treatments are done over the years. There is a carbon cost to implementation, however, including emissions from heavy equipment and from burning of any fuels that are not chipped or removed in some other way. There are many carbon calculators on the internet that can help give landowners a sense for carbon impact. This tool is from the US Forest Service, the CarbonPlus Calculator: http://www.itreetools.org/forestcarboncalculator/

Reforestation with climate-smart species

Planting trees can add carbon storage potential to the property. Areas where large patches of invasive species are removed can be planted with native species. Sourcing plants grown with seed locally or within one's seed zone has been a standard recommendation, to give the plants adapted to your area a better chance of success. Our seed zone is 525, as depicted in this Seed Zone Map: https://forestrychallenge.org/wp-content/uploads/TREE-SEED-ZONE-MAP.pdf.

However, there are additional considerations for the success of your plantings based on projected drought and drier conditions with climate change. An approach to consider:

1. Planting using seeds adapted to drier, hotter conditions originating from lower elevation may have greater success in respect to climate change (Young et al. 2020, North et al. 2018), *and*:
2. Having different seed sources for a given species will promote genetic variation, which may benefit your future trees and forest to be more resilient to stressors.

Additional research supports planting not in the traditional rows, or "pines in lines", format when we traditionally think about plantations, but rather, in clumps with openings between them, emulating historic patterns and reducing potential fire severity (Larson and Churchill 2012, North et al. 2018).

In sum, different seed sources from further south or downslope could be a climate-smart choice. Variation is key! And, as always, forestry professionals are available to discuss these kinds of questions. They can also recommend species to plant that are appropriate for your soils, elevation, topography, and projected climate conditions.

You may be eligible for financial assistance with procuring seedlings and planting labor through the nonprofit One Tree Planted at https://onetreeplanted.org/.

Family Legacy

Conservation easements are voluntary agreements with a nonprofit, land trust or government agency determining what activities can and cannot be performed on a landowner's property for conservation purposes, into perpetuity.

Finding a local land trust organization could be a next step for those wishing to explore this option further to see what the details and requirements are.

Forest Legacy Program

A conservation program called the California Forest Legacy Program helps to protect and manage, for future generations, environmentally important forest areas that are threatened by conversion to non-forest uses. The program may only purchase a conservation easement from a landowner that is willing to sell their development rights for their forested property. Another program is the Federal Forest Legacy Program, which has the same overall objectives but differs based on the source of funding, property requirements, and application timeline.

Livestock

There are no known livestock plans or related issues on NCSA.

Part of the responsibility of owning or leasing animals is to ensure that they do not cause environmental degradation (e.g., contribute significantly to erosion, denude landscapes, and contaminate water bodies). Consult the NRCS Conservation Practice Standards page, where you can look up a specific activity regarding farming and livestock and find best management practices: https://www.nrcs.usda.gov/resources/guides-and-instructions/conservation-practice-standards

Forest Stands

Forest stands were delineated using aerial photos, topography, and forest type. Five stands were identified on the NCSA property. Aspect varies quite a bit for these stands, as the terrain is hilly. Data was collected using a modified Forest Inventory and Analysis (FIA) protocol developed by the US Forest Service, using variable-radius plots. The Forest Vegetation Simulator (FVS) is a US Forest Service software that calculates stand-level data and can simulate different forest management scenarios. FVS was used to determine tree species ratios per stand and stocking levels. ***See Table 5 for 2022 stocking information and Figure 6, which includes diameter distribution per species for the property.***

Site index is based on measuring the height and deriving the age of dominant and co-dominant trees in the forest stand, and relating this to a standard base age, for example fifty (50) years. Site class, usually numbered in Roman numerals from I (best) to V (worst) is a grouping of site indexes used when the California Forest Practice Rules apply to commercial timber-harvesting operations. Site Index is determined by measuring tree heights and using increment borings of dominant trees to determine tree age, and then using Dunning (1942) Site Classifications for the Sierra Nevada. The estimated growth rates for the stands were obtained by calculating the differences in merchantable board feet per acre per year over a 10-year span.

Stand 1 consists of 29 acres of oak woodland with open areas consisting of Scotch broom, manzanita, rabbitbrush, and toyon (*Heteromeles arbutifolia*). California buckeye (*Aesculus californica*) was found on the unit, but not within our plots. Tree species include 42.9% blue oak, 28.6% black oak 14.3% ponderosa pine, and 14.3% interior oak based on inventory data. Site information suggests Site Class V (Dunning, 1942).

The unit is on the southernmost portion of the property, facing generally south, and has a steep slope along the southern edge of the property overlooking Deer Creek. Elevation reaches 2400 feet. Slope was averaged in our plots to 11 percent, but directly facing the Deer Creek canyon the slope exceeds 30 percent. Boomer hard bedrock, Sobrante-Rock outcrop complex, Secca-Rock outcrop complex, and Sites with very stony loam are the soil types. The southwest portion of the stand tends to be rockier, with shallower soil. ***For detailed soil descriptions, see the preceding soil section and Table 1.***

After the 2017 Lobo Fire, Scotch broom took over, which exists in patches ranging in size in open areas. There is some oak regeneration, but levels are generally low.

The general objective for this stand is to remove Scotch broom where feasible (e.g. along the walking trail) to improve ecological health and restore native vegetation. Erosion potential is higher after removal of Scotch broom, but regeneration of native species will help to mitigate this. Seed with a native forb and grass mix after Scotch broom removal along the trail where needed.

See Table 6 for recommended practices.

Stand 2 consists of 22 acres of conifer-hardwood forest. Large-diameter ponderosa pines exist here (some of which are dying). Species composition is 50% ponderosa pine, 34.4% interior live oak, 12.5% grey pine, and 3% incense cedar based on inventory data. The projected growth rate for the stand is 595 board feet/acre/year. Site information suggests Site Class II (Dunning, 1942).

Manzanita, poison oak (*Toxicodendron diversilobum*), Himalayan blackberry and Scotch broom are in the understory. Regeneration is adequate, primarily consisting of oak. Grassy open areas occur here, with large rocks. Yellow starthistle is found in patches in these open areas.

The unit is on the northeastern portion of the property, facing north. Elevation reaches 2100 feet. The stand abuts Bitney Springs road and includes administrative buildings and the Curious Forge business. Slope was averaged in our plots to 10 percent. Soils are Secca-Rock outcrop complex, Boomer, hard bedrock, and alluvial. This stand was not impacted by the 49er Fire nor the Lobo Fire.

The general objective for this stand is to remove the dying ponderosa pine near the parking lot that are hazard trees. Erosion potential is generally low post-removal.

Stand 3 consists of 21 acres of ponderosa pine forest. Species composition is 91% ponderosa pine, 6% black oak, 3% interior oak based on inventory data, with manzanita, poison oak and occasionally Scotch broom and Himalayan blackberry in the understory. The stand is relatively immature, with many small-diameter ponderosa pine approximately 30 years in age. Some very large legacy ponderosa pine trees remained after the 49er Fire of 1988. The projected growth rate is 313 board feet/acre/year. Site information suggests Site Class III (Dunning, 1942). Natural regeneration and planting of these trees likely occurred after the fire, and current regeneration levels are generally low. The duff layer is thick with needles here, suppressing undergrowth.

The unit is on the northwest corner of the property. Elevation reaches up to 2200 feet, and the slope is generally east-facing, towards the pond. Slopes were averaged to 9 percent for this stand. The Newtown Canal cuts through it. The soil type is Sites very stony loam.

The general objective for this stand is to monitor it for hazard trees, and to thin vegetation along the canal. Thinning by hand will reduce the potential for erosion.

Stand 4 consists of 40 acres of ponderosa pine forest. Species composition is 73% ponderosa pine, 13% incense-cedar, 6% black oak, 2.5% interior oak, 2.5% Douglas-fir and 2.5% white fir based on inventory data, with a varied understory of toyon, poison oak, Scotch broom and manzanita, to having a sparse understory component. The non-native species tree-of-heaven has been identified here. This stand has some large legacy ponderosa pine trees. The oldest cored tree is a dominant ponderosa pine at 148 years. Regeneration is adequate, primarily interior live oak and ponderosa pine. The projected growth rate is 1,127 board feet/acre/year. Site information suggests Site Class I (Dunning, 1942).

The unit is on the north-central portion of the property. Elevation reaches approximately 2200 feet, and the slope is averaged at 7 percent and north-facing. The Newtown Canal runs through this stand, and several school buildings are included, as well as the main pond. The stand was burned in the 49er fire, which contributed to the development of blackberry on the hill, north of the pond. The soils are Sites very stony loam, Boomer hard bedrock, and Secca-Rock outcrop complex.

The general objective for this stand is to thin along the canal and into brush extending from the canal towards infrastructure and chip existing wood piles. Removal of the tree-of-heaven will take place. Thinning by hand will reduce the need for heavy equipment, reducing erosion potential.

Stand 5 consists of 15 acres of hardwood-conifer forest. Species composition is 33% ponderosa pine, 30% black oak, 22% blue oak and 15% grey pine based on inventory data, with dense whiteleaf manzanita in the understory, poison oak, some hollyleaf redberry (*Rhamnus ilicifolia*), and occasional grass. Tree regeneration is low in this stand, primarily consisting of oak species. Thick needle duff coupled with dense manzanita has reduced tree recruitment, so regeneration is low overall. The average cored age is 40 years. The projected growth rate is 151 board feet/acre/year. Site information suggests Site Class IV (Dunning, 1942).

The unit is in the south-central part of the property. The elevation reaches approximately 2400 feet, and the slope is averaged at 5 percent and is generally southeast. Both the 49er and Lobo fires occurred here. Soils are Sites very stony loam and Boomer hard bedrock.

The general objective for this stand is to remove the Scotch broom along the trail and replace with native seedlings. This will address any erosion concerns after removal. Seed with a native forb and grass mix after Scotch broom removal along the trail.

The broom monoculture area consists primarily of Scotch broom, and has mature ponderosa pine, grey pine, and oak, which are generally few. The unit is 19 acres in size, located south of the canal in the center of the parcel. Regeneration of native species is low in this stand, which is outcompeted by the broom. The unit is northeast-facing and reaches 2300 feet in elevation. Soils are Sites very stony loam and Boomer hard bedrock. Stocking information, growth rates and site class are not available for this stand. The western half of this stand experienced both the 49er Fire and the Lobo Fire, and the eastern half was burned in the Lobo Fire alone.

The general objective for this area is to remove the Scotch broom and plant a mix of seedlings of trees and shrubs, and a native grass and forb mix where appropriate. This will address any erosion concerns after removal.

Table 5. 2022 stand stocking information for the NCSA property. IC= incense-cedar, PP= ponderosa pine, GP= gray pine, IO= interior live oak, BL= blue oak, BO= black oak DF= Douglas-fir. QMD= quadratic mean diameter, a measure of central tendency for stand diameter.

Stand	Acres	% Slope	Species	Basal Area (ft^2)	Gross Bf/Ac	Stems/acre	QMD (in.)
1	29	19.5	PP, BL, BO, IO	13.3	379	29	9.2
2	22	10.5	GP, IO, PP, IC	100.8	10556	473	6.3
3	21	14	PP, BO, IO	135.8	11603	364	8.3
4	40	12	PP, BO, IO, DF, IC, WF	125.3	15882	246	9.7
5	15	12.5	BL, GP, BO, PP	85.7	3720	476	5.7
Broom monoculture	19	14	PP, GP, IO, BL, BO	--	---	--	--

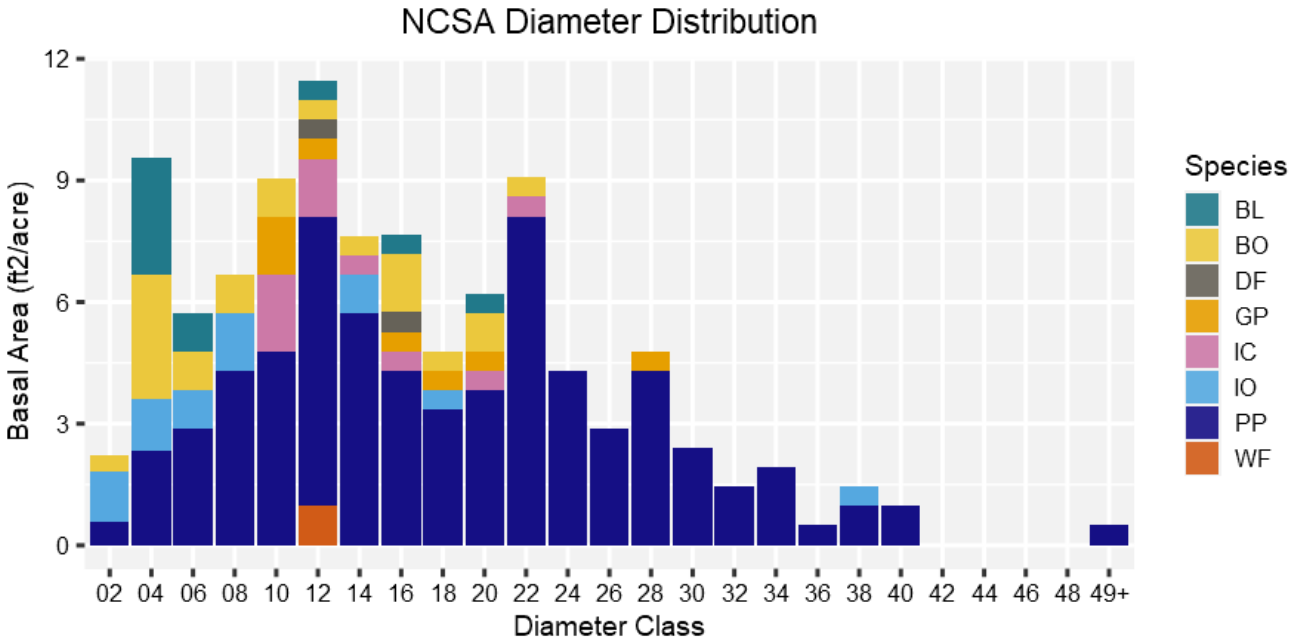


Figure 6. Distribution of species at Nevada City School of the Arts in 2022 based on 2-inch diameter classes. IC= incense-cedar, PP= ponderosa pine, GP= gray pine, IO= interior live oak, BL= blue oak, BO= black oak DF= Douglas-fir, WF= white fir.

Basal Area (BA) is the area of a cross-section of a tree at 4.5 feet above the ground, and can be summed per species by diameter groupings, or classes, to highlight trends in the forest structure. For all of the stands, BA was highest in the 12" diameter class, which is comprised mostly of ponderosa pine. Blue and black oak made up the majority of the BA in the 4" diameter class, and oaks are the primary species regenerating, as shown in the first two diameter classes (*Figure 6*).

To address the high density of Scotch broom, a targeted foliar herbicide spray is recommended, followed by mastication. This will prepare the site for planting of native seedlings and a grass and forb seed mix. The herbicide (Triclopyr is a good option) should be applied when staff and students are not around, and with the oversight of a licensed applicator to ensure the health and quality of surrounding natural resources. For planting, drought-resistant species with seeds sourced from lower elevations could reforest the property with trees more resilient to climate change (Young et al. 2020, North et al. 2018). Monitoring after removal of broom and planting will be crucial to address sprouts and competing vegetation and further project success. NCSA could use the property for student learning opportunities through monitoring, planting, and broom removal.

Removal of dead and dying ponderosa pine north of the Curious Forge parking lot will prevent these trees from causing potential damage and building up fuels. Removal of hazard trees along the canal and near trails and other infrastructure is also recommended.

Thinning of vegetation along the canal and near buildings (Stand 4) will widen the break of fuels produced by the canal and reduce ladder fuels that could increase wildfire severity. Target Scotch broom, Himalayan blackberry and tree-of-heaven here. Treating along the canal could also prevent detrimental impacts downstream from debris on water quality for the community of Lake Wildwood.

Consistent, long-term monitoring is the first step to ensure that management is continued for the property. Ongoing management activities include the need for continued fuel abatement. Due to the tendency for oaks to sprout after thinning, spraying the stumps with herbicide is recommended to reduce the rapid development of ladder fuels. Prompt removal of Scotch broom, tree-of-heaven and Himalayan blackberry is necessary also. Continue to monitor the property for noxious weeds.

These activities are unlikely to generate any income from forest products.

Table 6. Recommended practices for the NCSA property.

Date	Recommended Practice(s) Description	Location	Desired Future Conditions
2023	Hazard tree removal	Stands 2 and 4 (1 acre)	Improved safety for people and infrastructure
2023-2026	Vegetation removal; existing piles chipped or burned, ladder fuels thinned south of the canal near buildings up to 6" DBH.	Stand 4 (8 acres)	Reduced ladder fuels
2023-2026	Thinning on both sides of the Newtown Canal, 25' buffer	Stands 2, 3 and 4 (10,037 linear feet or 6 acres)	Reduced potential for high severity wildfire; Clean drinking water maintained for communities downstream; Improved forest health
	Continued on next page →		

2023-2033	Targeted foliar spray of Triclopyr on Scotch Broom and Himalayan blackberry (where spotted). Follow up with manual and mechanical removal. Monitor each year with prompt removal.	Stands 1, 5, Broom monoculture (23 acres)	Removed Scotch broom monoculture and blackberry
2023-2026	Seeding and planting of native species where broom is removed, using climate-smart seed sources	Stands 1, 5, Broom monoculture area (23 acres)	Increased carbon storage capacity with a climate-forward approach; Enhanced wildlife habitat; Expanded recreation and learning opportunities for students
2023-2033	Monitor for any new noxious weeds on the property. Clean boots and equipment to avoid transporting seeds	Entire Property	Maintain native grass and forb cover in forest understory

Required Permits and Monitoring

A burn permit from the Northern Sierra Air Quality Management District (NSAQMD) is required for any burn over 1 acre. Additional information on the specific fees and conditions of permitting is available by calling the NSAQMD at 530.274.9360 and requesting 'the outdoor burning specialist'. Rules and conditions are complex, and changeable, and calls to the AQMD in advance of a planned burn day are highly suggested to get clear and current information. Placer County RCD may offer financial assistance to cover part of the smoke permit or smoke management plan. You do not have to live in Placer County to be eligible.

If grant funds are awarded from the Wildlife Conservation Board (WCB) for the implementation of these recommendations, monitoring is required. A Landowner Access Agreement will be developed and signed by NCSA and Sierra Streams Institute (SSI), the grant applicant. This agreement essentially requires the landowner to uphold the outcome that has been met on the property, and to not drastically change the property to undo the goals of this project. SSI and the landowner will acknowledge that if the parcels are selected for monitoring by WCB and are not found to have upheld a degree of forest maintenance, SSI would be held financially responsible to WCB. The landowner would have an obligation to inform the new landowner of the Access Agreement if the home is sold. This agreement is not on file with the County Assessor's office.

If funds are not awarded, ***monitoring is still highly encouraged***. Monitoring can inform on the effectiveness of treatments and if follow-up if warranted. Monitoring can vary from informal, with general observations, to more thorough (e.g., the development of a complete report).

Forest management activities including conservation practices may impact special environmental and/or cultural values such as threatened or endangered species and archaeological sites. Landowners need to know their locations and what they can do to protect them. Environmental and cultural reviews by regulatory agencies are required when a ground practice is proposed, and a permit and/or government assistance becomes part of the project.

The Title 14 CCR § 1038 *Forest Fire Prevention Exemption* document is an option for the NCSA Property. An RPF would need to be the signatory on this form, as required by the Lead Agency, CAL FIRE. This exemption is valid for one year and would need to be renewed annually from the date signed by CAL FIRE.

Section 21080 of the Public Resources Code exempts from the application of CEQA those projects over which public agencies exercise only ministerial authority. Therefore, the State Clearinghouse would not need the documentation.

Additional CEQA/NEPA Notification for Ground Practices

Any future ground practice to implement this plan using public entity reimbursement funds requires a signed CAL FIRE CFIP Environmental Checklist, to comply with CEQA, or an NRCS CPA-52 Checklist, to comply with NEPA. The checklist must be filled out by an RPF or Certified Planner.

Along with this checklist a process of "discovery" or survey for unknown values along with a discussion of possible mitigations is required. The site specific environmental/cultural documentation will need to be completed with the schedule of activities, project map and project specifications.

As part of the above process, project notification must be provided to the following Agencies:

- County Planner
- CA Department of Fish and Wildlife
- Regional Water Quality Control Board
- If the project adjoins public land (for example, the US Forest Service, US Fish and Wildlife Service, BLM, National, State, or local parks, etc.) notify that agency
- If the project adjoins a State Highway, notify CALTRANS
- If the project is in the Coastal Zone, notify the Coastal Commission

If the project will cause ground-disturbance, notification must also be provided to:

- Native American Heritage Commission
- Tribal contacts
- Local Historical Society

Contacts

CAL FIRE Forestry Assistance Specialist (FAS)
David Ahmadi - david.ahmadi@fire.ca.gov (El Dorado, Nevada, Placer, Sacramento, Sierra, Sutter, Tahoe Basin, Yuba Counties)

Nevada County Resource Conservation District - https://www.ncrcd.org/
Phone: (530) 272-3417, ext. 5529 or 5530
Monday-Friday 7:30am-4pm
113 Presley Way, Suite 1, Grass Valley, CA 95945

Placer County Resource Conservation District - https://placerrcd.org/
Phone: 530-390-6680
Email: info@placerrcd.org
Mailing Address: 11641 Blocker Dr. #120, Auburn, CA 95603

University of California Division of Agriculture and Natural Resources - https://ucanr.edu/

UC Cooperative Extension Forest Advisors
Ricky Satomi (Sutter, Yuba, Butte, Nevada Counties)
Phone: (530) 822-6213
Email: rpsatomi@ucanr.edu

Rob York (Statewide)
(530) 333-4475
Email: ryork@berkeley.edu

Kristen Shive (Statewide)
Email: kshive@berkeley.edu

UC Cooperative Extension Placer and Nevada Counties - https://ceplacer.ucanr.edu/
Phone: (530) 273-4563, Email: cenevada@ucdavis.edu
Tuesday and Thursday, 8am-12pm and 12:30pm-4:30pm
255 South Auburn Street (Veterans Memorial Hall), Grass Valley, CA 95945

Toolkit

Sierra Streams Institute (SSI) is currently working up a Jones Bar Area Toolkit binder and link on their website for private landowners, which includes forest health information, factsheets, contractors, and grant information (listed below). If you do not receive this from SSI, please reach out to them to access it at info@sierrastreamsinstitute.org.

Yuba Bear Burn Cooperative

Working with Nevada County's Prescribed Burn Association, Yuba Bear Burn Cooperative (YBBC) is a great resource to learn about prescribed fire and to gather volunteers to apply fire. To sign up on their listserv, go to https://calpba.org/yuba-bear-burn-cooperative.YBBC planning resources are also available: https://calpba.org/rx-burn-planning.

Grants

The following grants may be available and are worth exploring for implementation:

1. **Environmental Quality Incentives Program (EQIP)**
   This USDA-run program applies to landowners (or renters) who manage land for agriculture or non-industrial private forest land.
   - Minimum acreage: no
   - Cost share: yes*
   - Prescribed burning covered: yes

Factsheet: https://www.nrcs.usda.gov/sites/default/files/2022-06/EQIP-Factsheet%20%282%29.pdf
Local NRCS contacts: Evan Smith, Forester at Evan.t.smith@usda.gov
Valerie Bullard, Soil Conservationist at valerie.bullard@usda.gov.

*Landowners must often pay up front, then will get reimbursed after the work is done. To apply, reach out to the local NRCS office and let them know you are interested. You will work with them to determine your eligibility.

2. California Forest Improvement Program (CFIP)
This program aims to improve forest resources, including animal habitat, and soil and water quality. Cost share is to hire a Registered Professional Forester to write a Forest Management Plan, and to oversee reforestation, stand improvement, and conservation practices/habitat improvement.

- Minimum acreage: 20 to 5,000 acres
- Cost share: yes*
- Prescribed burning covered: no

CFIP user guide: https://www.fire.ca.gov/media/jgmlf1j3/cfip-user-s-guide-october-2022.pdf
Local contact: David Ahmadi, Forestry Assistance Specialist at David.Ahmadi@fire.ca.gov.
Located at 143 B Spring Street, Grass Valley, CA 95945
*Funds get reimbursed after the work is completed. CFIP provides reimbursement at 75% or 90% cost share rates. Before filling out an application, consult with the Forestry Assistant Specialist, currently David Ahmadi (above).

3. Community Wildfire Defense Grant

This USDA Forest Service grant helps at-risk local communities and Tribes plan and reduce the risk against wildfire. The Act prioritizes at-risk communities in an area identified as having high or very high wildfire hazard potential, are low-income, and/or have been impacted by a severe disaster. Communities may develop the plans for project implementation. *For more information:* https://www.fs.usda.gov/managing-land/fire/grants.

4. Partners for Fish and Wildlife Program

This U.S. Fish and Wildlife Service program aims to restore habitats on working landscapes (e.g. forests, farms, ranches). This could involve improving water resources, planting native species, or oak woodland restoration. Their conservation priorities are wet meadows, streams and riparian habitats.

- Minimum acreage: No
- Cost share: 1:1 match, either cash and/or in-kind services
- Prescribed burning covered: In some instances; check with contact

Website: https://www.fws.gov/program/partners-fish-and-wildlife
Local contact: Matt Hamman at matt_hamman@fws.gov. (530) 889-2301.
Located at 11641 Blocker Drive, Suite 110, Auburn, CA 95603

5. California Vegetation Management Program (VMP)

This CAL FIRE program aims to reduce fuel loading to prevent catastrophic wildfire in California, with prescribed fire as a focus. The project area must be on State Responsibility Lands: SRA viewer.

- Cost share: yes

Note that as of early 2023, this funding is not being offered. However, check their website for future opportunities. Search "Cal Vegetation Management Program".

6. Emergency Forest Restoration Program (EFRP)

This USDA-run program helps landowners of private forestland restore forest health that has been damaged by natural disasters. Drought or insect infestation do not apply. Debris removal, planting, fire lanes, fencing, wildlife enhancement are examples of work scopes.

- Minimum acreage: no
- Cost share: yes, up to 75% of the cost to implement practices can be provided.
- Prescribed burning covered: check with contact

Local contact: NRCS Grass Valley at (530) 798-5527. Grass Valley Service Center
Located at 113 Presley Way Ste 1, Grass Valley, CA 95945.
Factsheet: https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/FactSheets/emergency_forest_restoration_program-fact_sheet.pdf

7. California Fire Safe Council Grants

This grant program emphasizes fire risk reduction activities by landowners and residents in at-risk communities to restore and maintain resilient landscapes and create fire-adapted communities. Individual landowners cannot apply–must have a legal fiscal sponsor. Check the website for current grant opportunities.

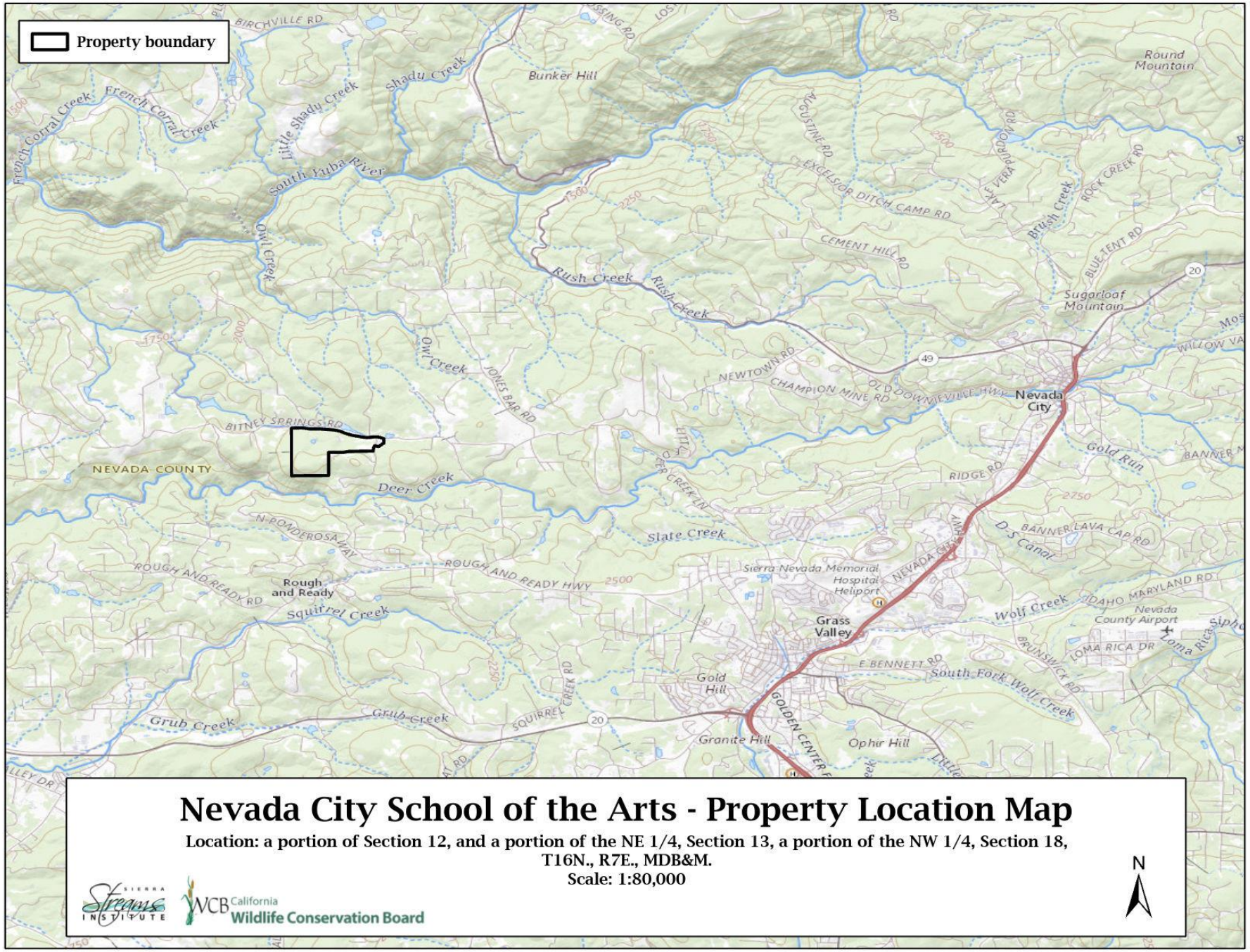
- Minimum acreage: may vary
- Cost share: 50/50 match required; cash, good, or in-kind services.
- Prescribed burning covered: yes

Website: https://cafiresafecouncil.org/grants-and-funding/apply-for-a-grant/.
Contact: https://cafiresafecouncil.org/contact/

Other Potential Grant Source

Nevada County Office of Emergency Services may offer FireWise Community grants on occasion. Check their website for information: https://nevadacountyca.gov/3595/Firewise-Community-Grants.

Maps



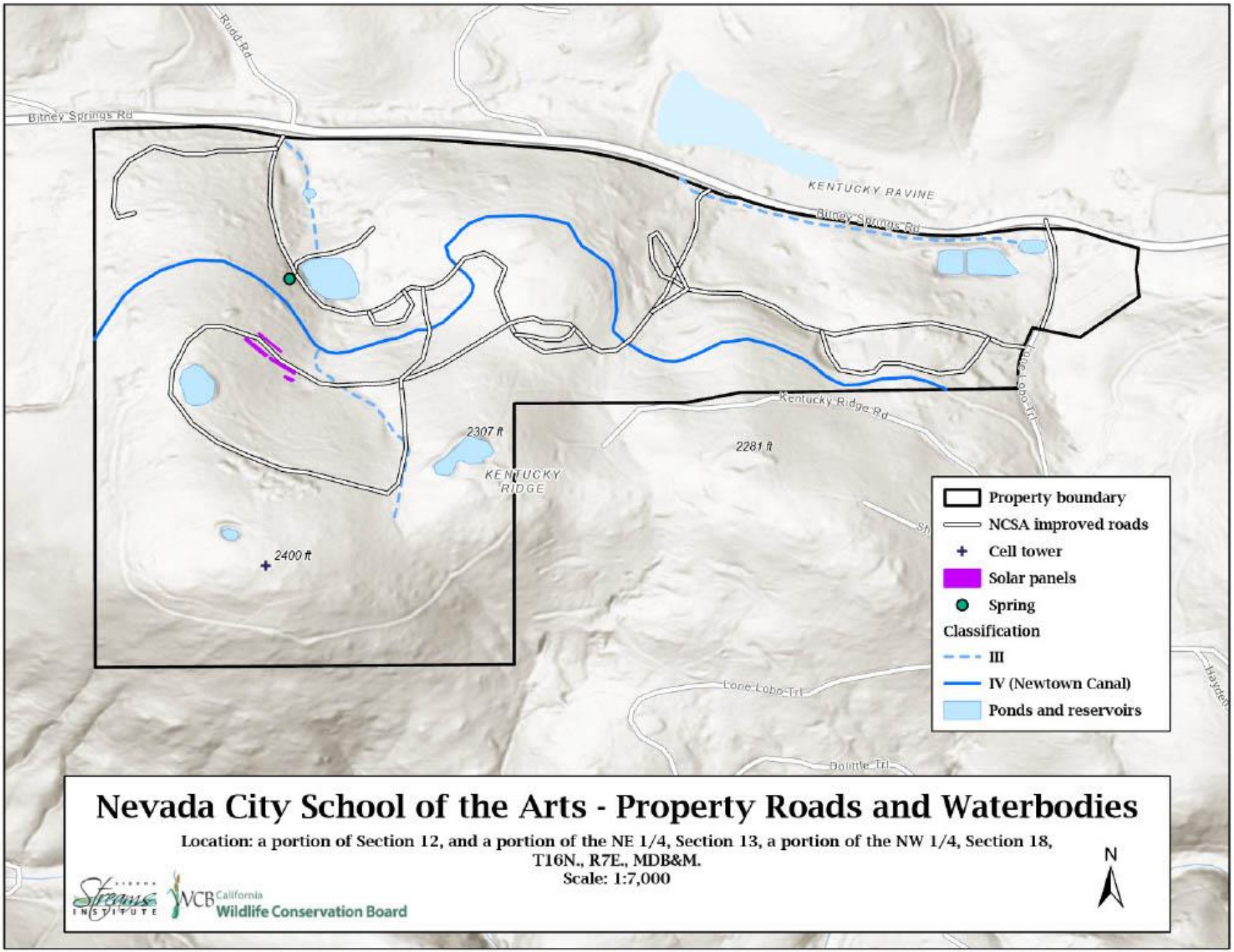
Nevada City School of the Arts - Property Location Map

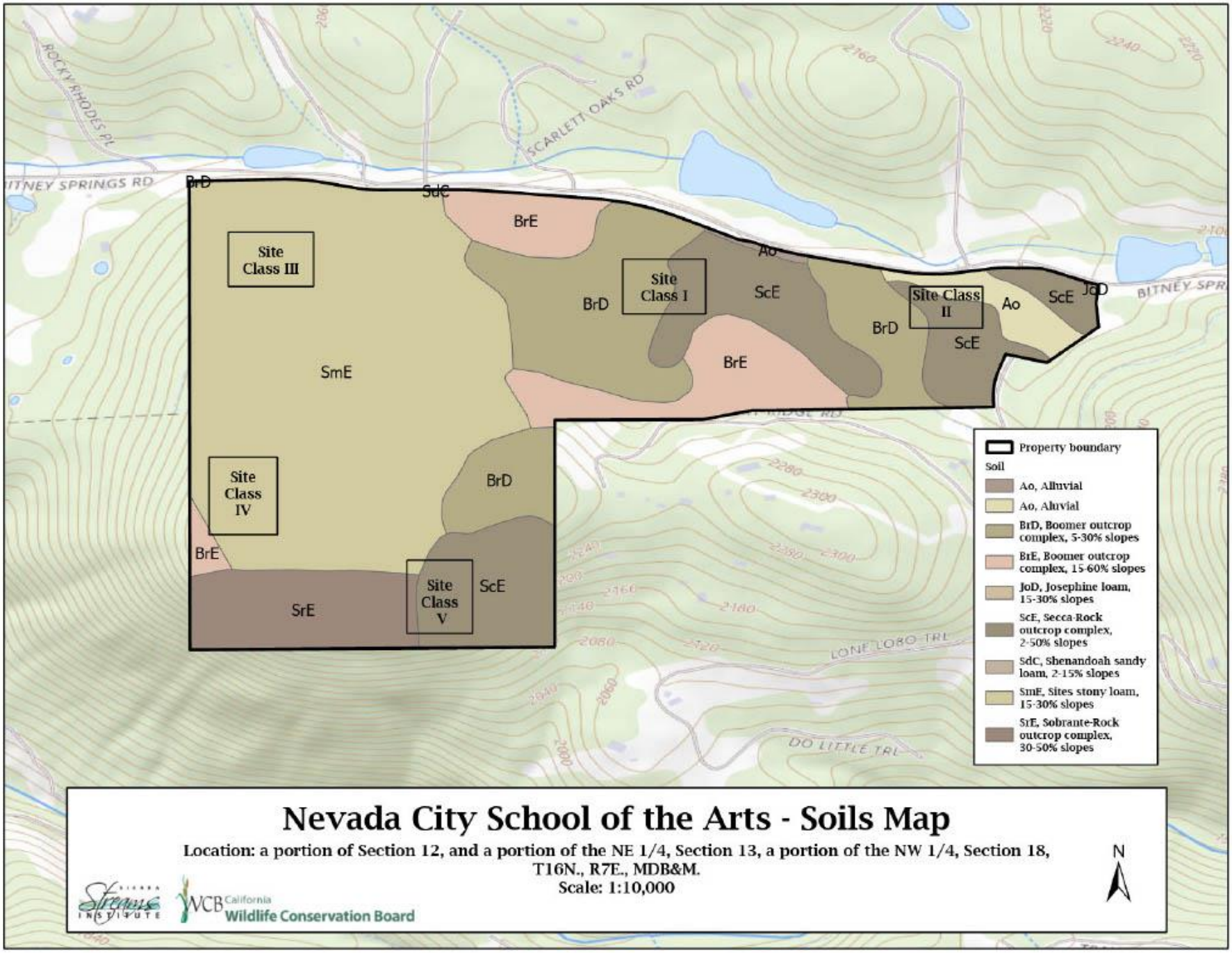
Location: a portion of Section 12, and a portion of the NE 1/4, Section 13, a portion of the NW 1/4, Section 18, T16N., R7E., MDB&M.

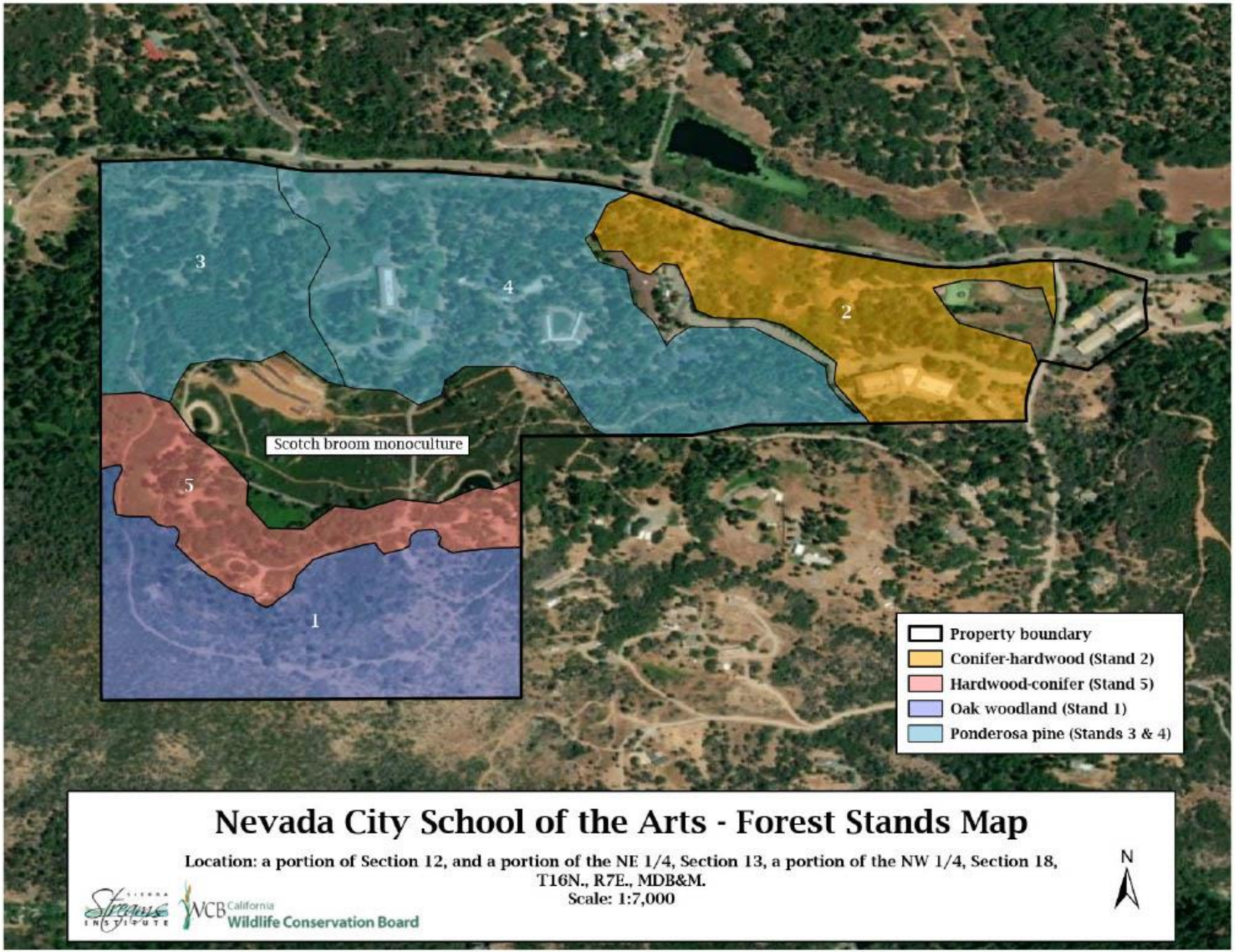
Scale: 1:80,000

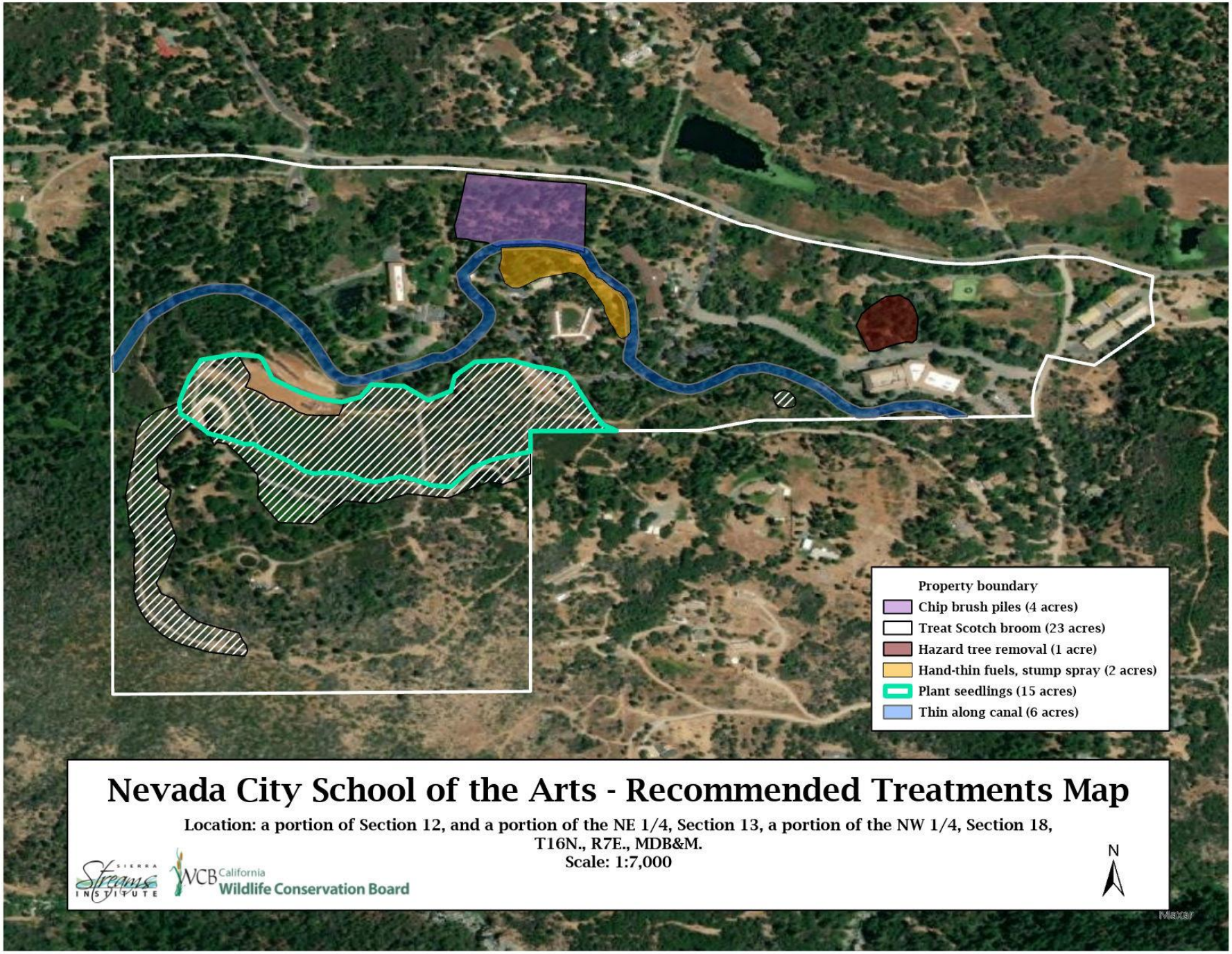
Sierra Streams Institute

WCB California Wildlife Conservation Board


Rudd Rd
Bitney Springs Rd
KENTUCKY RAVINE
Bitney Springs Rd
Lone Lobo Trl
Kentucky Ridge Rd
2307 ft
2281 ft
KENTUCKY RIDGE
2400 ft
Property boundary
NCSA improved roads
Cell tower
Solar panels
Spring
Classification
III
IV (Newtown Canal)
Ponds and reservoirs
Lone Lobo Trl
Doolittle Trl
Hayden
Nevada City School of the Arts - Property Roads and Waterbodies
Location: a portion of Section 12, and a portion of the NE 1/4, Section 13, a portion of the NW 1/4, Section 18, T16N., R7E., MDB&M.
Scale: 1:7,000
N
Streams Institute
WCB California Wildlife Conservation Board


ROCKY RHODES PL
SCARLETT OAKS RD
BITNEY SPRINGS RD
BITNEY SPR
LONE LOBO TRL
DO LITTLE TRL
BrD
SdC
BrE
Site Class III
Site Class I
Ao
ScE
BrD
JoD
Site Class II
Ao
ScE
BrD
ScE
BrE
SmE
Site Class IV
BrD
BrE
Site Class V
ScE
SrE
Property boundary
Soil
Ao, Alluvial
Ao, Aluvial
BrD, Boomer outcrop complex, 5-30% slopes
BrE, Boomer outcrop complex, 15-60% slopes
JoD, Josephine loam, 15-30% slopes
ScE, Secca-Rock outcrop complex, 2-50% slopes
SdC, Shenandoah sandy loam, 2-15% slopes
SmE, Sites stony loam, 15-30% slopes
SrE, Sobrante-Rock outcrop complex, 30-50% slopes
Nevada City School of the Arts - Soils Map
Location: a portion of Section 12, and a portion of the NE 1/4, Section 13, a portion of the NW 1/4, Section 18, T16N., R7E., MDB&M.
Scale: 1:10,000
N
Sierra Streams Institute
WCB California Wildlife Conservation Board


3
4
2
Scotch broom monoculture
5
1
Property boundary
Conifer-hardwood (Stand 2)
Hardwood-conifer (Stand 5)
Oak woodland (Stand 1)
Ponderosa pine (Stands 3 & 4)
Nevada City School of the Arts - Forest Stands Map
Location: a portion of Section 12, and a portion of the NE 1/4, Section 13, a portion of the NW 1/4, Section 18, T16N., R7E., MDB&M.
Scale: 1:7,000
N
Sierra Streams Institute
WCB California Wildlife Conservation Board


Property boundary
Chip brush piles (4 acres)
Treat Scotch broom (23 acres)
Hazard tree removal (1 acre)
Hand-thin fuels, stump spray (2 acres)
Plant seedlings (15 acres)
Thin along canal (6 acres)
Nevada City School of the Arts - Recommended Treatments Map
Location: a portion of Section 12, and a portion of the NE 1/4, Section 13, a portion of the NW 1/4, Section 18, T16N., R7E., MDB&M.
Scale: 1:7,000
Sierra Streams Institute
WCB California Wildlife Conservation Board
N

Appendix 1 – Standards and Specifications

NRCS Standards are in the NRCS Field Office Technical Guide (FOTG) at: https://efotg.sc.egov.usda.gov/#/

CFIP Standards are in the CFIP User's Guide, posted on the right-hand side of the CAL FIRE CFIP webpage at: https://www.fire.ca.gov/grants/california-forest-improvement- program-cfip/

Property Tax

The property has 501(c)(3) status as a non-profit.

Income Tax

This property is not subject to income tax. Timber harvest and other revenue generating activates generally produce a federal and state income tax liability. Tax credits may be available for some management activities.

Estate Tax

Good estate planning can help to lessen tax liability when passing land to heirs. Landowners should seek good planning and tax advice.

Record Keeping

Good record keeping can help landowners manage their assets; increase their revenues; and minimize their tax liability. The landowner is responsible for maintaining a copy of this Management Plan.

Land Use

The zoning and land use classifications from the County land use plan is not applicable for this property.

Appendix 3 – Past Plans and Updates

A Forest Management Plan was completed for the property in Spring 2022 by the USDA-NRCS for the application of an EQIP grant (# 749104222GU).

Appendix 4 – Supporting Data

Stand 1 inventory results for 2022

Species	Stems/acre	BA ft²/acre	Bf/acre	QMD (in.)
BL	4.3	3.3	237.8	9.2
BO	22.7	6.7	0.0	
IO	2.0	3.3	141.4	
Total	29.1	13.3	379.2	
Std Dev.			358.8	
95% CL			0.0 - 1270.4	

Stand 2 inventory results for 2022

Species	Stems/acre	BA ft²/acre	Bf/acre	QMD (in.)
IC	1.3	3.3	211.6	6.3
PP	36.5	50.0	8105.6	
GP	6.4	13.3	1589.1	
IO	428.7	34.1	650.1	
Total	472.9	100.8	10556.5	
Std Dev.			7685.7	
95% CL			0.0 - 29648.8	

Stand 3 inventory results for 2022

Species	Stems/acre	BA ft²/acre	Bf/acre	QMD (in.)
PP	291.6	125.8	10538.2	8.3
BO	4.6	8.0	1065.0	
IO	67.5	2.0	0.0	
Total	363.7	135.8	11603.2	
Std Dev.			7882.5	
95% CL			1812.4 – 21394.0	

Stand 4 inventory results for 2022

Species	Stems/acre	BA ft²/acre	Bf/acre	QMD (in.)
DF	3.3	3.3	228.8	9.7
WF	3.7	3.7	403.1	
IC	21.7	16.7	652.8	
PP	191.9	90.4	14048.6	
BO	8.6	8.3	549.1	
IO	17.0	3.3	0.0	
Total	246.1	125.4	15882.4	
Std Dev.			10321.7	
95% CL			5046.9 – 26717.8	

Appendix 4 – Supporting Data

Stand 5 inventory results for 2022

Species	Stems/acre	BA ft²/acre	Bf/acre	QMD (in.)
PP	22.2	22.5	2730.9	5.7
GP	17.9	10.0	142.0	
BL	184.0	25.1	434.7	
BO	251.7	28.1	412.5	
Total	475.8	85.7	3720.2	
Std Dev.			4050.6	
95% CL			0.0 – 10165.5	

IC= incense-cedar, DF= Douglas-fir, WF= white fir, PP= ponderosa pine, GP= grey pine, IO= interior live oak, BL= blue oak, CY= canyon live oak, BO= black oak. QMD= quadratic mean diameter, a measure of central tendency for stand diameter.

Appendix 5 – Archaeology Statement

The purpose of the Cultural Resources section is the identification and, to the extent possible, preservation of archaeological and historical resources on the Property.

An archaeological records check MUST BE conducted by Northeast Information Center (NEIC) prior to any on-site activities utilizing public funding.

Archaeology is confidential. A confidential archaeological records search was conducted for the entire property. The report is on file with the landowner (Northeast Center of California Historical Resources Information System (I.C. File # NEV-23-11).

Appendix 6 – References

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