Conservation Blueprint
for the
Donner Summit Royal Gorge Property

Prepared for

Sierra Watch

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CONSERVATION
BIOLOGY
INSTITUTE

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1. Introduction

The almost 3,000-acre Royal Gorge property on Donner Summit in the Sierra Nevada has long been a target of conservationists. Sitting at the cross-roads of the Sierra Nevada ecoregion−along the east-west Emigrant Trail and the north-south Pacific Crest Trail−and surrounded by protected and intact lands, this iconic property fills a significant piece of the conservation puzzle in the north-central Sierra (Figure 1). Scenery and history alone, along with opportunities for hiking and cross-country skiing, make this property a coveted target for development, as well as for conservation.

Background

The history of the entire Sierra Nevada has been one of competing uses for resource values, ranging from wilderness to rural residential, from timber harvest to hiking, from solitude to ski resorts, with high political stakes and public visibility at the core of its saga. Nowhere is this more apparent than in the central and northern Sierra, where in the 1860s the U.S. government granted alternate square miles to the Central Pacific Railroad during the building of the transcontinental railroad, thus establishing a checkerboard pattern of public-private ownership, conflicting visions and land uses, and disparate management goals.

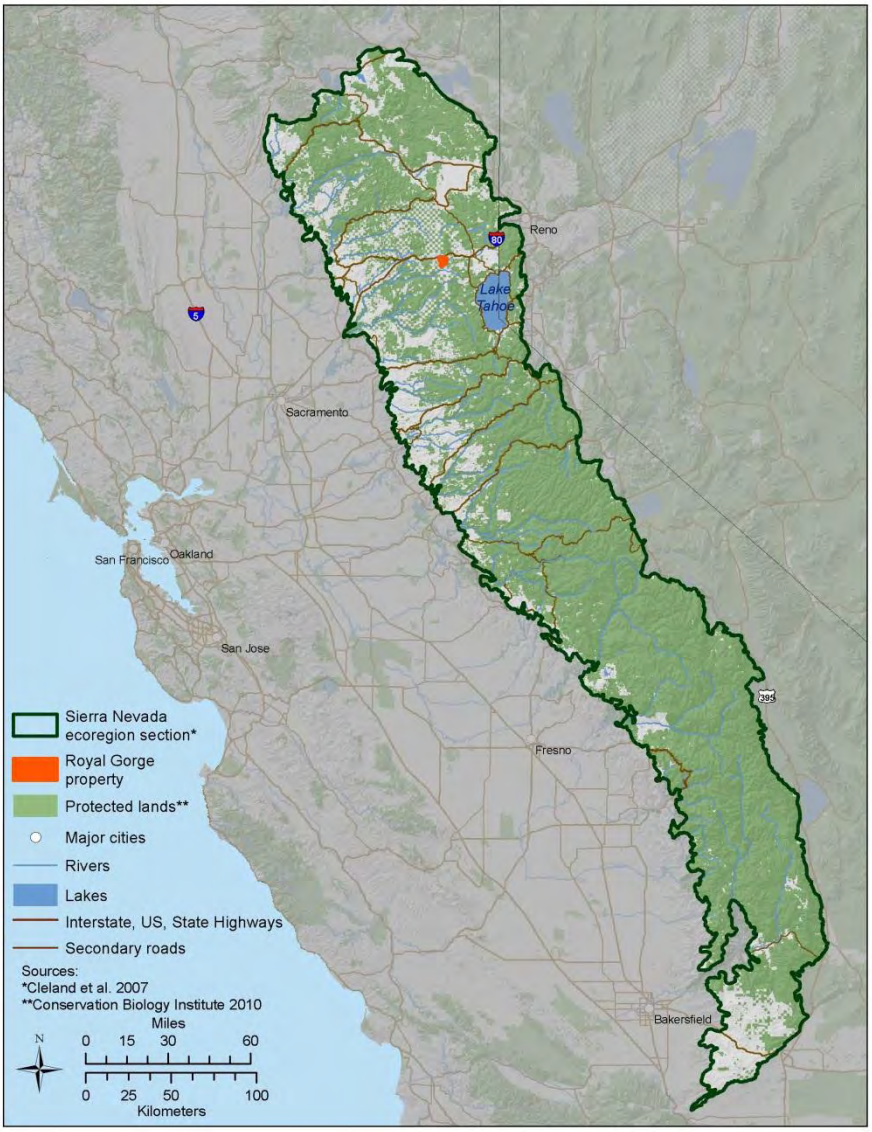

Figure 1. The Sierra Nevada Ecoregion.

The 7,200-ft Donner Pass has been the gateway to California for inhabitants and visitors worldwide−beginning as a major trade route for Native Americans, replaced by an overland wagon trail first used in 1844, a transcontinental railroad, and eventually transformed into the first transcontinental highway in 1918 (now Interstate-80), facilitating further influx of commercial, residential, and recreational land uses along its path.

Fast-forward to the 21st century, and land use battles are still being waged. The Royal Gorge property was slated for major resort development with a 950-unit subdivision and extensive other development in 2007, but after forceful opposition to the development and subsequent bank foreclosure on the loan for the project, an unparalleled partnership of conservation groups and local residents seized the opportunity to protect the land in perpetuity. Sierra Watch, in collaboration with the Northern Sierra Partnership (NSP), a cooperative initiative by five conservation groups−The Nature Conservancy, The Trust for Public Land (TPL), Truckee Donner Land Trust, Sierra Business Council, and Feather River Land Trust−are now actively pursuing funding to purchase the property to ensure that its long-term stewardship is compatible with conservation goals for the area.

This conservation effort follows in the legacy of Sierra Nevada stewardship established by the Sierra Nevada Ecosystem Project (1996), Sierra Nevada Forest Protection Campaign in 1999 (later becoming Sierra Forest Legacy in 2007), Sierra Nevada Forest Plan Amendment (2001), creation of a new state-chartered conservancy in 2004−the Sierra Nevada Conservancy, TPL's Sierra Nevada Checkerboard Initiative (2005), signing of the North Fork American River Conservation and Research Agreement in 2006, formation of the Northern Sierra Partnership in 2007, and the successful defeat of the proposed Royal Gorge resort by Sierra Watch and others. All of these efforts have had the goal of recognizing the natural heritage of the region, establishing land uses compatible with protection and sustainable management of biodiversity, protecting watershed health, and providing recreational opportunities through consolidated protection and management of public and private lands.

Goals

Sierra Watch has identified the following six principles to guide planning among conservation partners for conservation of the Royal Gorge property:

1. Natural Heritage: Ensure protection of on-site resources and support the role of Donner Summit in broader Sierra ecosystems.
2. Biological Resources: Enhance the wide array of habitat and the incredible range of biodiversity on the Royal Gorge property.
3. Water Quality and Watershed Health: Protect the wetlands and waterways of the American River and Yuba River watersheds.
4. Forests: Expand permanent protection of Donner Summit forest resources and ensure future forest health and fire safety.

5. Cultural Importance: Preserve the rich history of Donner Summit as the portal to California.
6. Sierra Recreation: Ensure opportunities for future generations to enjoy the unique, low-impact recreational opportunities on Donner Summit

This document elaborates on the conservation values inherent in these principles to support decisions on land use and management options compatible with these values. We relied on existing, publicly-available digital data from the U.S. Forest Service (USFS), CBI unpublished data, local knowledge of our science advisor T. Beedy, and other available documentation (Literature Cited and Appendix A), and we make recommendations for additional studies needed to inform development of a long-term management plan for the property.

2. Regional Conservation Values

2.1 Natural Heritage

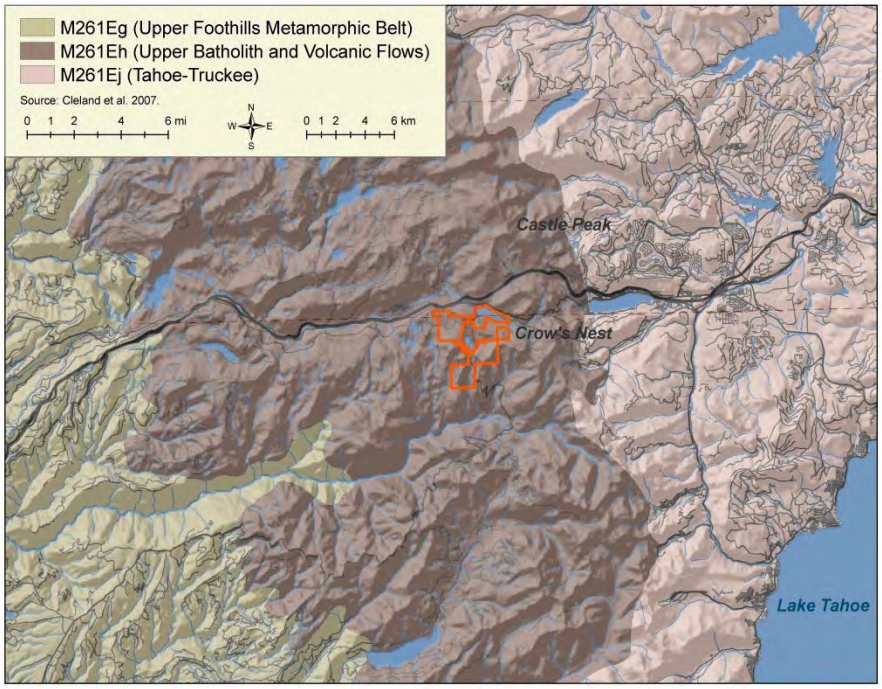

Figure 2. Ecological subsections of the Sierra Nevada.

The geologic and topographic extremes of the northern and central Sierra are the foundation for its high biodiversity, scenic beauty, and recreational values. The Donner Summit area lies at the crest of the Sierra Nevada, within the Upper Batholith and Volcanic Flows subsection of the Sierra ecoregion (Figure 2). Indeed, this subsection forms the granitic spine of the Sierra Nevada, dotted with ancient volcanoes, such as Castle Peak and Crow's Nest, and strewn with lava mud flows (McPhee 1993). Glacial sculpting has modified the valleys in the higher parts of this landscape, leaving many natural lakes and ponds. Donner Pass is one of the lowest east-west passes in the north-central Sierra, thus potentially allowing for connectivity of species populations across the crest of the Sierra, especially dispersal of plant and avian species.

The Tahoe National Forest (TNF) is the largest land manager in the Donner Summit region and, as such, is the main driver of land management, using the 2001 Sierra Nevada Forest Plan Amendment to guide stewardship. The TNF also supports large blocks of areas managed primarily for biodiversity (Table 1), as opposed to other National Forest lands managed for multiple uses, such as logging, mineral extraction, grazing, and recreation. In addition, resources on many National Forest lands are managed to protect adjacent residential development from wildfires (e.g., the Wildland-Urban Interface). Approximately 116,800 acres of National Forest lands in the Donner Summit area are managed for biodiversity, representing one of the greatest natural legacies of our country (Table 1). The Granite Chief Wilderness Area, the North Fork American River Inventoried Roadless Area (IRA), Grouse Lakes IRA, and Castle Peak IRA, as well as conservation research areas (e.g., the North Fork Headwaters Agreement Area) are all managed with a focus on biodiversity. There are also many privately conserved lands around development communities such as Serene Lakes and the Palisades west of the Royal Gorge property. However, the checkerboard ownership pattern challenges

the effectiveness of regional land management by allowing private lands to be managed differently, and at times incompatibly, with regional resource values on adjacent public lands (Figure 3).

Table 1. America's legacy of conserved lands in the Donner Summit area of the Sierra Nevada.

Designation	Rule	Definition
Inventoried Roadless Areas (IRA)	Roadless Rule of 2001	Lands without existing roads that could be suitable for wilderness conservation
Wilderness Areas	1964 Wilderness Act	Lands without roads or development, conserved to protect natural processes, watersheds, and recreation
Wild and Scenic Rivers	1968 Wild and Scenic Rivers Act	Free-flowing reaches of rivers that possess at least one outstandingly remarkable value, such as scenic, recreational, geologic, fish, wildlife, historic, cultural, etc.
Research Natural Areas	2006 Agreement between TNF, research stations, and private landowners	Lands that maintain biological diversity, support research, and provide natural history education.

The Royal Gorge property, ranging from 6,500 to 8,000 ft, sits strategically between conserved areas protected and managed for their biodiversity, adding to the landscape-scale connectivity between existing conservation. In fact, conservation of the Royal Gorge property would add to the landscape currently identified as a Natural Landscape Block by the California Essential Habitat Connectivity Project (Figure 4, Spencer et al. 2010) and contribute to carnivore connectivity in the Tahoe and Eldorado National Forests and Lake Tahoe Basin Management Unit (Britting et al. 2012). Maintaining landscape-scale connectivity, north-south and east west, as well as linking alpine communities with downslope ecosystems, is critical for maintaining functional food chains and diverse ecological communities as well as for maintaining dynamic populations, dispersal, and gene flow for neotropical migratory birds, spotted owl, and wide-ranging species such as mountain lion and other carnivores, black bear, and mule deer. Moreover, conservation in this part of the Sierra spans dramatic elevational gradients important in allowing shifts in species distributions in response to climate change (Figure 5).

This network of conserved lands is part of the Sierra's essential infrastructure, providing services on which our economic, social, cultural, and political systems depend. Chan and colleagues (2006) demonstrate the overlap between protecting biodiversity and conserving ecosystem services, such as water quality and water supply, carbon sequestration, provisioning of forest products, and recreation. Biodiversity and ecosystem services are maintained by dynamic processes that function across very large landscapes, including disturbances from fire, floods, transport of organic and inorganic materials, and fluvial erosion and deposition, as well as nutrient and energy flow through food webs, population dynamics, gene flow, and species interactions such as predation and competition. Like any infrastructure, the conservation network needs continual investment in its foundation, as well as regular management and monitoring to ensure it is functioning effectively.

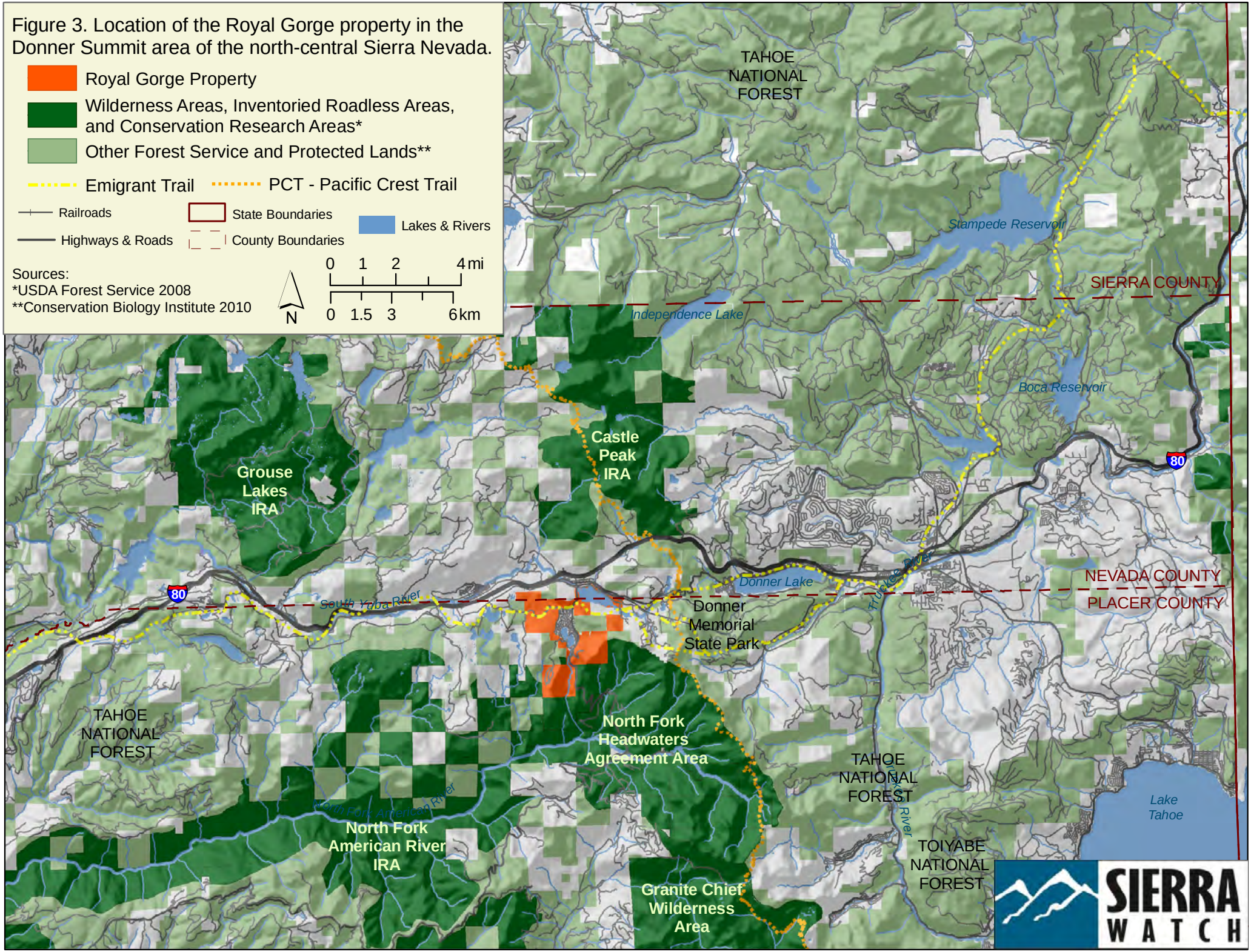
Figure 3. Location of the Royal Gorge property in the Donner Summit area of the north-central Sierra Nevada.
Royal Gorge Property
Wilderness Areas, Inventoried Roadless Areas, and Conservation Research Areas*
Other Forest Service and Protected Lands**
Emigrant Trail
PCT - Pacific Crest Trail
Railroads
Highways & Roads
State Boundaries
County Boundaries
Lakes & Rivers
Sources:
*USDA Forest Service 2008
**Conservation Biology Institute 2010
N
0 1 2 4 mi
0 1.5 3 6 km
TAHOE NATIONAL FOREST
Stampede Reservoir
SIERRA COUNTY
Independence Lake
Boca Reservoir
Castle Peak IRA
Grouse Lakes IRA
80
Donner Lake
Truckee River
NEVADA COUNTY
PLACER COUNTY
South Yuba River
Donner Memorial State Park
TAHOE NATIONAL FOREST
North Fork Headwaters Agreement Area
TAHOE NATIONAL FOREST
Lake Tahoe
North Fork American River
North Fork American River IRA
Granite Chief Wilderness Area
TOIYABE NATIONAL FOREST
SIERRA WATCH

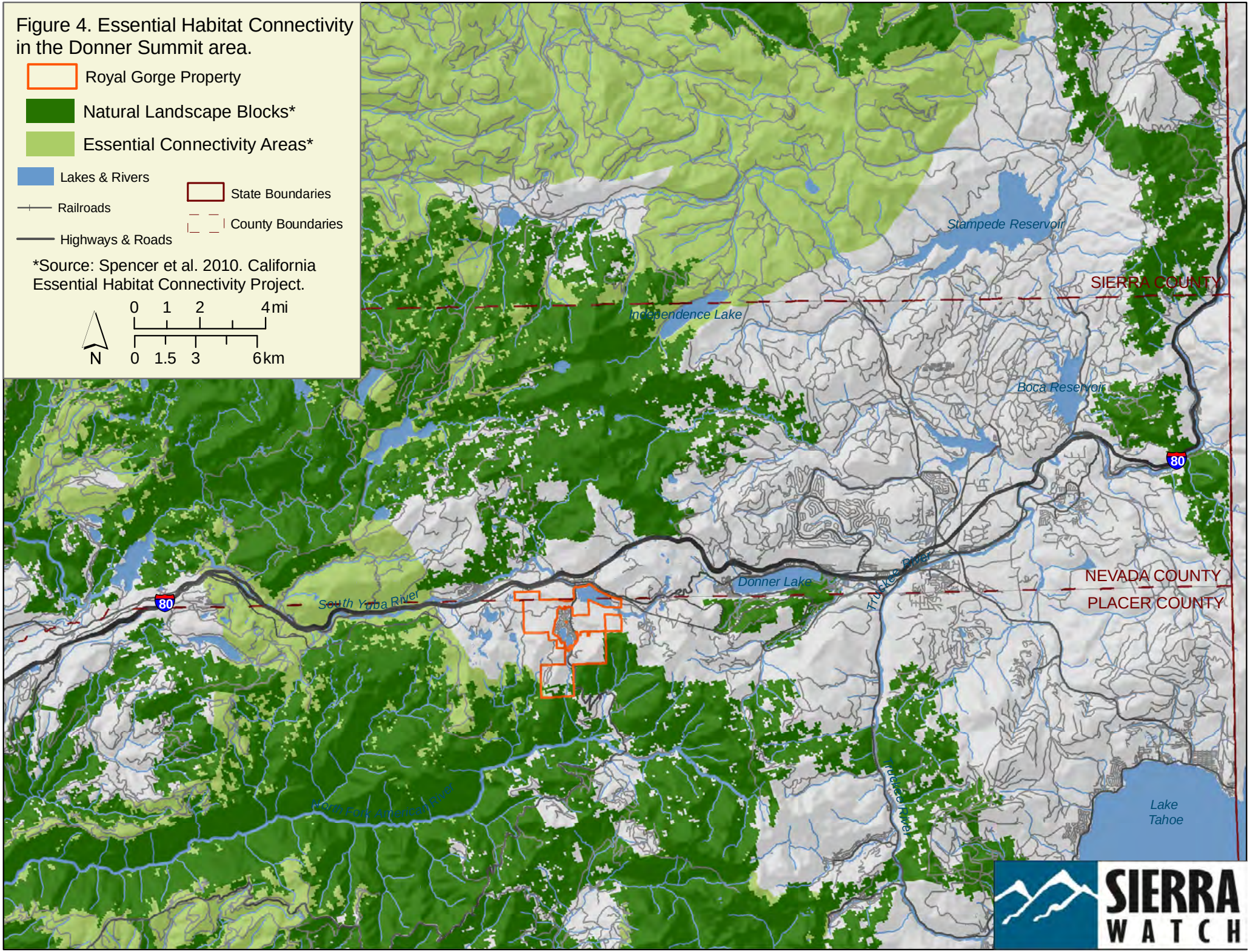
Figure 4. Essential Habitat Connectivity in the Donner Summit area.
Royal Gorge Property
Natural Landscape Blocks*
Essential Connectivity Areas*
Lakes & Rivers
Railroads
Highways & Roads
State Boundaries
County Boundaries
*Source: Spencer et al. 2010. California Essential Habitat Connectivity Project.
N
0 1 2 4 mi
0 1.5 3 6 km
Stampede Reservoir
SIERRA COUNTY
Independence Lake
Boca Reservoir
80
Donner Lake
Truckee River
NEVADA COUNTY
PLACER COUNTY
South Yuba River
North Fork American River
Lake Tahoe
SIERRA WATCH

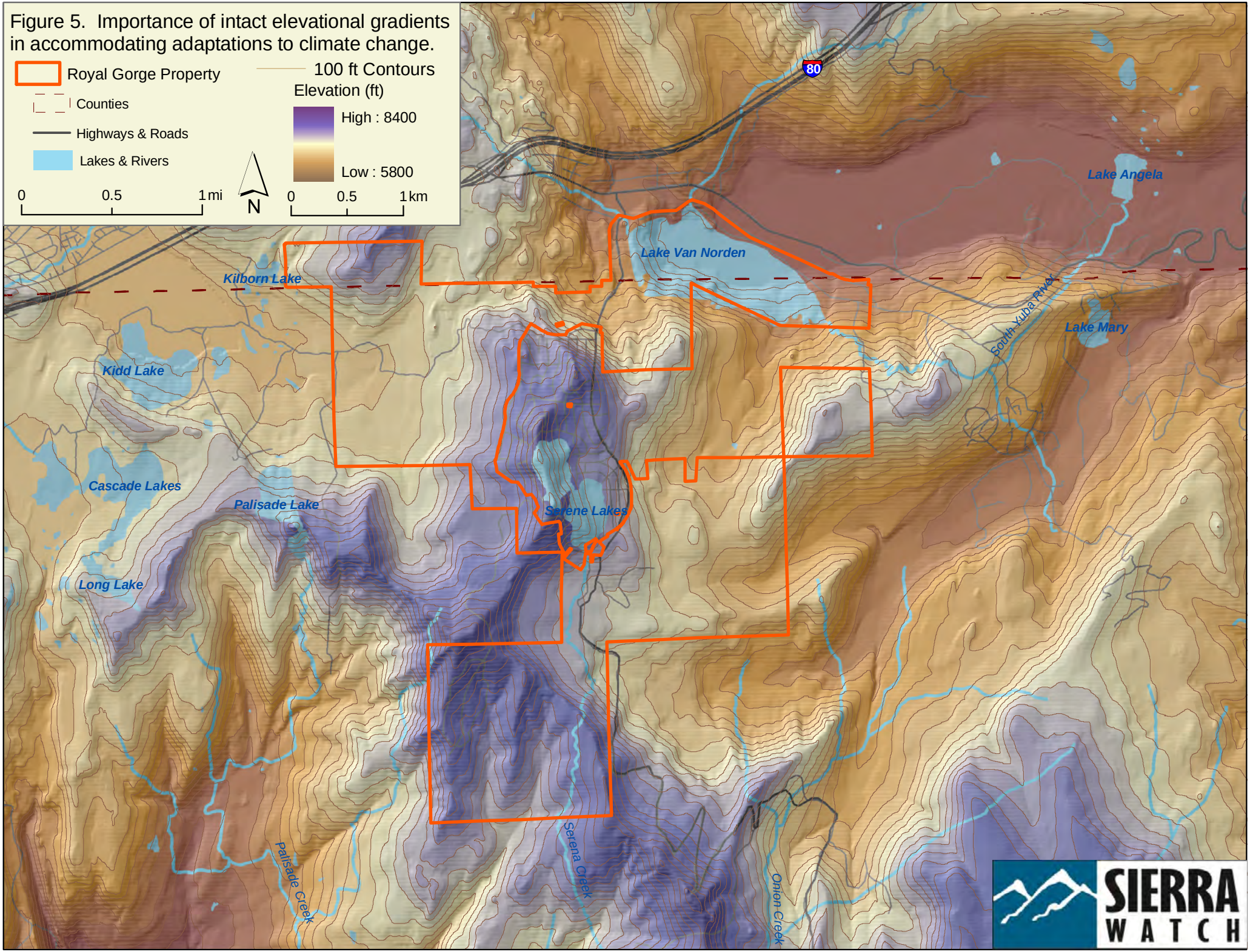
Figure 5. Importance of intact elevational gradients in accommodating adaptations to climate change.
Royal Gorge Property
Counties
Highways & Roads
Lakes & Rivers
100 ft Contours
Elevation (ft)
High : 8400
Low : 5800
0 0.5 1 mi
N
0 0.5 1 km
80
Lake Angela
Lake Van Norden
Kilborn Lake
South Yuba River
Lake Mary
Kidd Lake
Cascade Lakes
Palisade Lake
Serene Lakes
Long Lake
Palisade Creek
Serena Creek
Onion Creek
SIERRA WATCH

2.2 Biological Resources

The Sierra Nevada ecological region is one of the most floristically diverse regions in North America, with habitats ranging from alpine meadows and crystalline lakes to rare old-growth forests, mixed conifer and hardwood forests, montane chaparral, grasslands and meadows, and riparian communities along streams and in broader valleys (Figure 6). White fir, red fir, and lodgepole pine comprise half of the Royal Gorge property (Table 2, Appendix A). Lodgepole pines are the dominant trees in moist areas along meadows, as well as rocky areas, while the other conifers are typically found on deeper well-drained soils. These forest communities provide nesting and roosting sites for birds, cover and shelter, and food sources for a diversity of animals. The downed logs and woody debris support insects and smaller mammals that are a source of food for larger animals, and snags of dead trees provide nesting cavities for owls and woodpeckers.

Table 2. Vegetation communities of the Royal Gorge property.

Vegetation Community	Acres	% of site
Barren/rock outcrops	66.6	2.3%
Montane chaparral	185.0	6.5%
Sierran mixed conifer	805.7	28.4%
Lodgepole pine	363.7	12.8%
Jeffrey pine	3.2	0.1%
Red fir	952.1	33.6%
White fir	83.1	2.9%
Montane hardwood-conifer	7.6	0.3%
Montane riparian	5.2	0.2%
Grassland (dry meadow)	67.3	2.4%
Wet meadow*	246.7	8.7%
Lacustrine	48.8	1.7%
Urban	18.2	0.6%
Total	2,835.2	100%

*includes montane wetland scrub, seasonal marsh, and wetland swale.

Montane chaparral and small patches of juniper woodland are embedded within the conifer forests, particularly in the southern areas of the property on the granitic outcrops overlooking the Royal Gorge of the North Fork American River (NFA 2006a). Serena Creek flows south from Serene Lakes through a steep canyon to the American River.

This diversity of vegetation communities, wetlands and perennial water, and elevational gradients, in turn, supports a diverse flora and fauna, including more than 80 special status animals and plants (Appendices B-1 and B-2). The Royal Gorge property has the potential to support more than 200 species of vascular plants (Appendix B-3), 13 species of amphibians and reptiles, 20 species of mammals, and over 100 species of birds (Appendix B-4).

Wetlands

Montane Meadows and Riparian Conservation Areas designated by the USFS are abundant on the Royal Gorge property (Figure 7, Appendix A). North Fork Associates conducted wetland delineations over the Royal Gorge property and described seven wetland types (Table 3, NFA 2006b). These habitats comprise 9% of the Royal Gorge property, adding immensely to its overall species richness and wildlife habitat values.

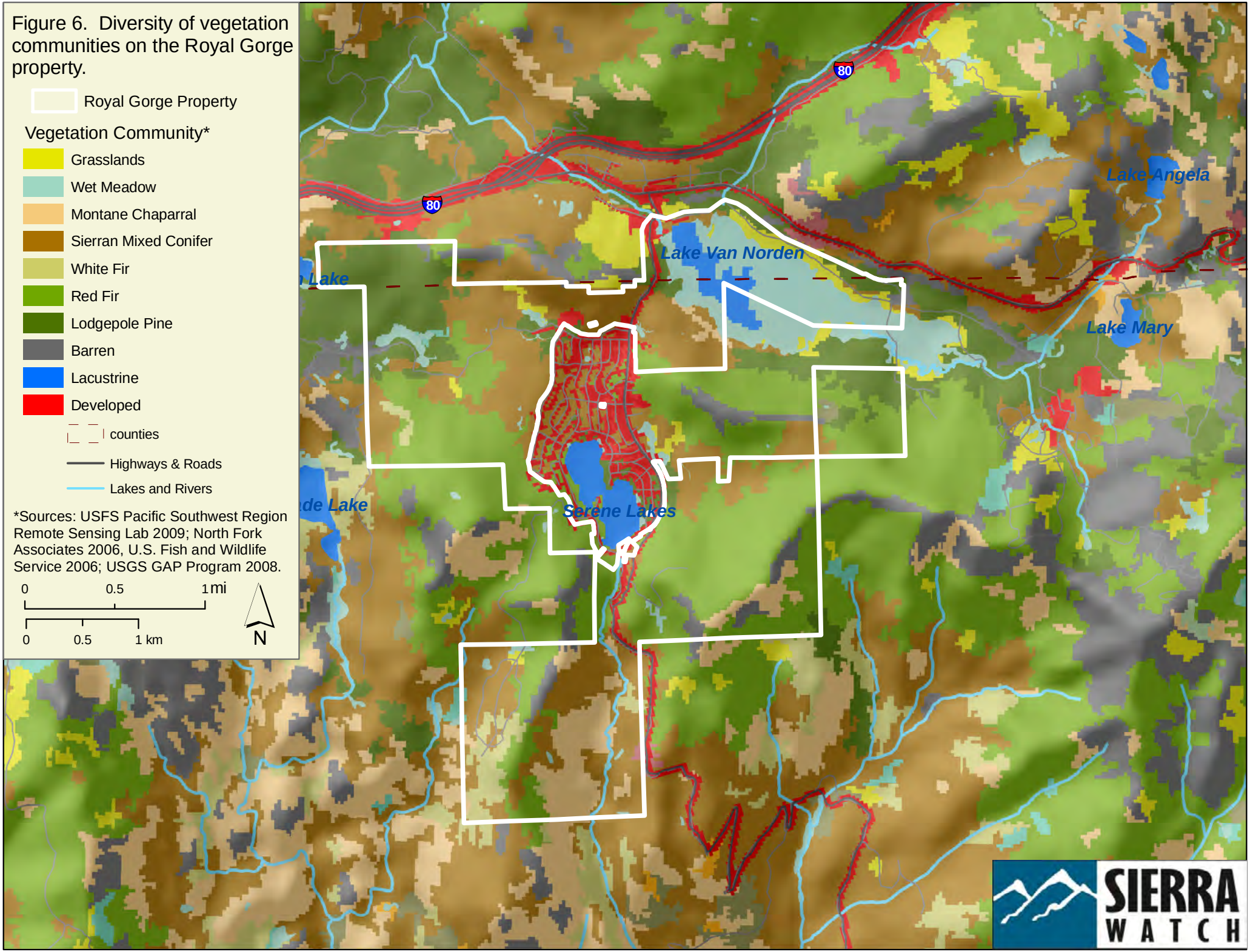
Figure 6. Diversity of vegetation communities on the Royal Gorge property.
Royal Gorge Property
Vegetation Community*
Grasslands
Wet Meadow
Montane Chaparral
Sierran Mixed Conifer
White Fir
Red Fir
Lodgepole Pine
Barren
Lacustrine
Developed
counties
Highways & Roads
Lakes and Rivers
*Sources: USFS Pacific Southwest Region Remote Sensing Lab 2009; North Fork Associates 2006, U.S. Fish and Wildlife Service 2006; USGS GAP Program 2008.
0 0.5 1 mi
0 0.5 1 km
N
80
80
Lake Van Norden
Lake Angela
Lake Mary
Serene Lakes
SIERRA WATCH

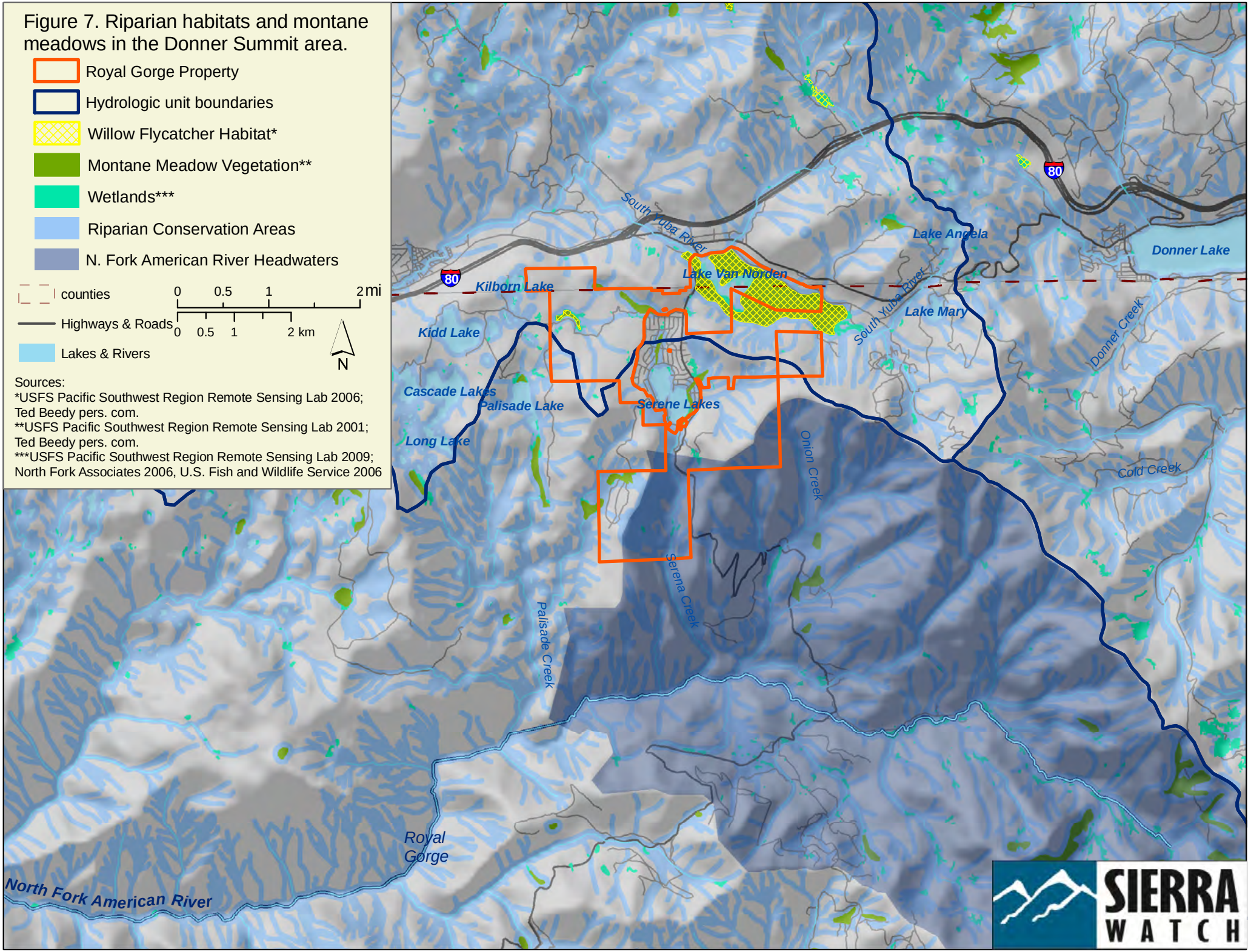
Figure 7. Riparian habitats and montane meadows in the Donner Summit area.
Royal Gorge Property
Hydrologic unit boundaries
Willow Flycatcher Habitat*
Montane Meadow Vegetation**
Wetlands***
Riparian Conservation Areas
N. Fork American River Headwaters
counties
Highways & Roads
Lakes & Rivers
0 0.5 1 2 mi
0 0.5 1 2 km
N
Sources:
*USFS Pacific Southwest Region Remote Sensing Lab 2006; Ted Beedy pers. com.
**USFS Pacific Southwest Region Remote Sensing Lab 2001; Ted Beedy pers. com.
***USFS Pacific Southwest Region Remote Sensing Lab 2009; North Fork Associates 2006, U.S. Fish and Wildlife Service 2006
80
South Yuba River
Lake Angela
Donner Lake
Lake Van Norden
Kilborn Lake
Lake Mary
Kidd Lake
Donner Creek
Cascade Lakes
Palisade Lake
Serene Lakes
Long Lake
Onion Creek
Cold Creek
Serena Creek
Palisade Creek
Royal Gorge
North Fork American River
SIERRA WATCH

Lake Van Norden was created originally by damming the headwaters of the South Yuba River about 100 years ago. The dam was breached in 1972 (Beedy and Brussard 2002, Jones & Stokes 2004), and it now consists of a notched concrete spillway that holds water in the reservoir at a depth of less than 10 ft (NFA 2006b). Also known as Summit Valley, it supports one of the largest wetlands in the Sierra, covering over 200 acres of lacustrine and wet meadow habitat, with emergent vegetation around its shores. Migratory waterfowl, songbirds, wading birds, and shore birds use the lake and its willow-lined shoreline as wintering areas or temporary stopover resting and foraging sites during migration. The lake has been stocked with a variety of nonnative fish that support recreational fishing and provide prey for predatory birds such as bald eagles and ospreys (T. Beedy pers. comm.).

Table 3. Wetland habitats on the Royal Gorge property.

Type	Acres
Wet meadow	163.7
Montane wetland scrub*	6.7
Seasonal marsh*	1.9
Wetland swale*	2.3
Intermittent stream	13.5
Ephemeral stream	5.0
Open water	63.5
Total	256.5

Source: NFA 2006b

Wet, mesic, and dry meadow systems network throughout the Royal Gorge property (Figure 7, NFA 2006b). These montane meadows are keystones of the Sierra Nevada ecosystem. They reduce peak water flow after storms and during runoff, recharge groundwater supplies as they release water into the ground, filter sediments, and provide food and shelter for a variety of wildlife including special status species like willow flycatchers and Sierra Nevada yellow-legged frogs.

Management Indicator Species

The 2001 Sierra Nevada Framework Plan required that the U.S. Forest Service (USFS) focus management on improving habitat conditions for and develop a monitoring program for keystone and important wildlife species−Management Indicator Species−within the National Forests of the Sierra Nevada. Management Indicator Species for the Tahoe National Forest include the Sierra Nevada yellow-legged frog, bald eagle, California spotted owl, northern goshawk, willow flycatcher, Pacific marten[1], Sierra Nevada red fox, wolverine, and mule deer, included here as potential conservation targets for management planning on the Royal Gorge property.

Sierra Nevada Yellow-Legged Frog. Once the most abundant frog in the Sierra Nevada, 94% of historical populations of yellow-legged frog are now extirpated (CDFG 2011), primarily due to pesticides, disease, and predation by nonnative trout stocked in high elevation lakes that historically did not contain fish (Davidson and Knapp 2007). This amphibian is adapted to the cold temperatures of glaciated lakes above 6,000 ft; tadpoles typically require 2-3 summers before metamorphosing and thus must overwinter. The Sierra Nevada Framework Plan (USFS

[1] Taxonomic review has identified martens west of the Rocky Mountain crest as a separate species (Pacific marten, *Martes caurina*) from those to the east (*Martes americana*) (Dawson and Cook In press).

2001) includes strategies to recover this species, including prohibition of pesticides, removal of nonnative fish, removal of livestock, and prohibiting development of new recreational trails that would adversely affect its habitat. The Royal Gorge property could provide opportunities to assist with recovery of this species, which is expected to be proposed for federal listing in October 2012, but only in streams or wet meadows lacking nonnative fish.

Bald Eagle. The bald eagle is federally protected and listed as Endangered by the California Department of Fish and Game (CDFG). Nesting is restricted to higher elevations in the northern portion of the state, near large bodies of water with nearby tall trees. It probably nests near Lake Van Norden and Serene Lakes, where the species is often sighted throughout much of the year (T. Beedy pers. comm.).

California Spotted Owl. USFS has mapped home ranges and protected activity centers for this species on land directly southeast of the Royal Gorge property. Spotted owls also occur in appropriate habitat in the North Fork Headwaters Area and the Palisades property, south and west of the Royal Gorge property, respectively (T. Beedy pers. comm., Figure 8). The Royal Gorge property itself, while it probably does not support nesting habitat for spotted owls, is likely used for foraging and dispersal. Forests adjacent to these existing Protected Activity Centers should be managed with California spotted owls in mind (Britting et al. 2012).

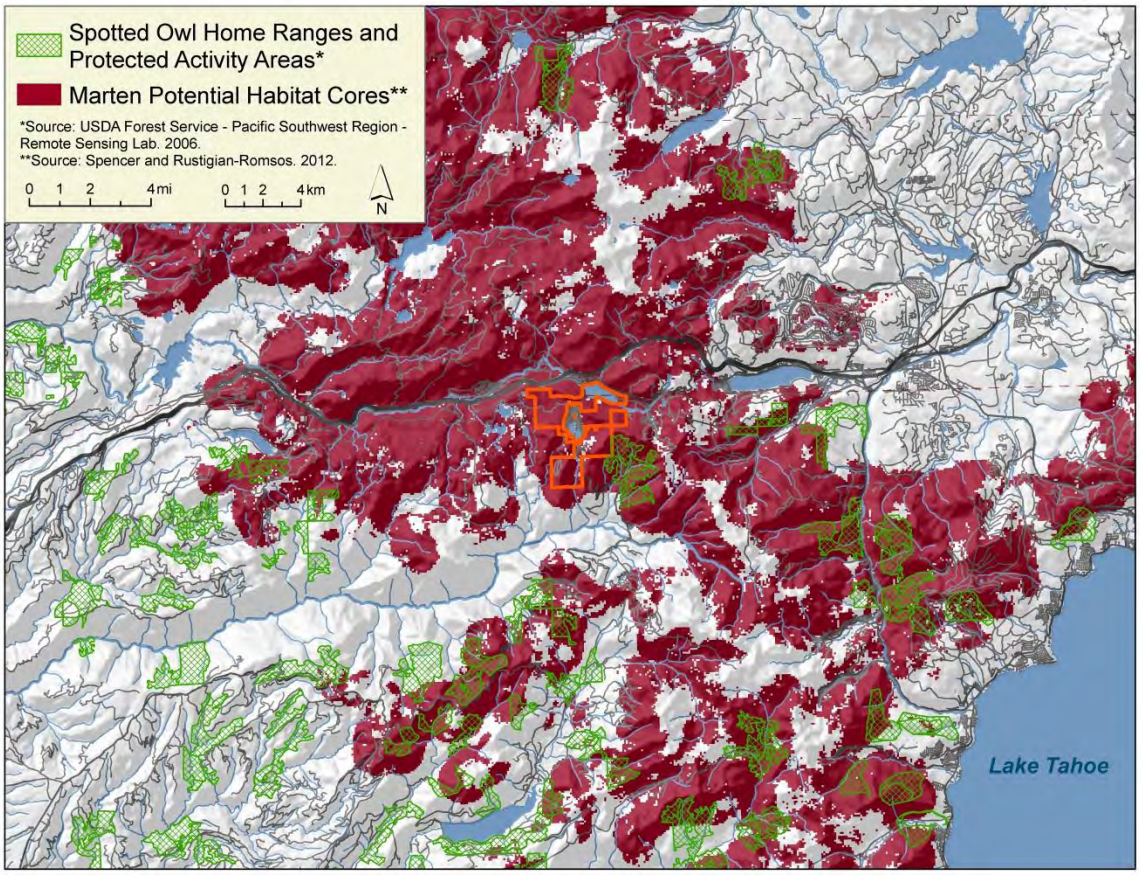

Figure 8. Potential habitat for the Pacific marten and California spotted owl.

Northern Goshawk. Like spotted owls, goshawks prefer dense, mature forests for nesting, especially those near ponds, creeks, or ephemeral streams. Northern goshawks are known from the Palisades property due west of Royal Gorge, and also use the Royal Gorge property (Beedy and Chainey-Davis 2008, Beedy pers. comm.). There is suitable nesting habitat throughout the property, particularly on north-facing slopes in the vicinity of Lake Van Norden, South Yuba River, and near Serene Lakes (NFA 2006a). According to the USFS management guidelines, the nest area for one pair is approximately 30 acres, while its foraging area ranges across 5,400 acres (Reynolds et al. 1992).

Willow Flycatcher. According to the USFS, the Sierra subspecies of the willow flycatcher has the highest priority for conservation because of its high potential for extirpation from the Sierra Nevada. Willow flycatcher populations have declined precipitously in the Sierra Nevada since the mid-20th century, largely due to habitat loss and degradation of meadow habitats and nest parasitism by brown-headed cowbirds, which are often attracted by livestock grazing. The dense stands of willows and wet meadows upstream of Lake Van Norden support a thriving breeding population of willow flycatchers, a state-listed Endangered Species (Figure 7, Beedy and Brussard 2002, Beedy and Chainey-Davis 2008, Beedy and Pandolfino in press).

Pacific Marten. Martens are strongly associated with high-elevation forests, especially unmanaged red fir forests (Spencer and Rustigian-Romsos 2012), and riparian areas near mature forests are important for foraging (Spencer et al. 1983). Therefore, maintaining and improving connectivity of mature forests is a key conservation objective for managing martens in this region. CBI has identified potential summer habitat for this species across much of the Donner Summit region (Figure 8, Appendix A), and martens have been sighted in the Headwaters of the North Fork American River, south of the Royal Gorge property, and on the Palisades property, west of the Royal Gorge property (Beedy pers. comm., Beedy and Chainey-Davis 2008). Although much of marten core habitat is within national parks and wilderness areas, significant portions are on USFS multiple-use lands subject to timber harvest and other vegetation treatments, which can fragment habitat and reduce or eliminate use by martens (Slauson and Zielinski 2008, Moriarty et al. 2011). Also, ski area development fragments marten habitat, reducing local marten populations due to avoidance of smaller fragments (especially by females) and decreased survival and reproduction within larger fragments (K. Slauson, unpublished data). Increases in housing development, roads, and ski areas could isolate martens, and extensive vegetation treatments on USFS lands, or large, severe wildfires, could potentially fragment marten populations. Thus, conserving the Royal Gorge property without these multiple land uses will contribute to marten persistence in the area. However, I-80 and Old Highway 40 are significant barriers to carnivore movement in the Donner Summit area (Spencer and Rustigian-Romsos 2012).

Sierra Nevada Red Fox. This subspecies of the red fox is listed as Threatened by the CDFG. It almost certainly occurred in the Donner Summit area historically but is considered locally extirpated. Schempf and White (1977) show 2-5 observations near the Truckee River and Sierra/Nevada County line from 1960-1974. Very recently, at least two red foxes were detected

by remote camera and scats near Sonora Pass in the southern Sierra Nevada (just northeast of Yosemite National Park on the Humboldt-Toiyabe and Stanislaus National Forests). CBI has delineated potentially suitable habitat and assessed habitat connectivity needs for the species in the Sierra Nevada (Spencer and Rustigian-Romsos 2012, Appendix A), suggesting that, with appropriate management across its range, the more undisturbed portions of the Donner Summit area could provide suitable habitat for this rare and secretive species in the future.

Wolverine. Wolverines are considered functionally extirpated from California; however, the National Park Service is seriously considering reintroducing wolverines to National Parks in the southern Sierra (D. Graber pers. comm.), and Britting and others (2012) recommend that USFS Region 5 develop a management plan for monitoring and conservation of this species. A single male wolverine recently dispersed to the northern Sierra Nevada (north of the Royal Gorge property), probably from the Sawtooth Range in Idaho (Moriarity et al. 2009). Based on numerous sightings, this individual has established a home range north from the vicinity of Sagehen Creek (Spencer and Rustigian-Romsos 2012). Although wolverines are very strong dispersers, capable of traversing hundreds of miles, human modifications such as highways and urban areas decrease the probability of a wolverine surviving as it moves across the landscape. Identifying and protecting likely dispersal routes is therefore a high conservation priority. Although the Royal Gorge property lies within the historic range of wolverines, and recent research has identified this area as potentially suitable core habitat (Appendix A, Spencer and Rustigian-Romsos 2012), the presence of highways and human recreational activity make it unlikely that the Royal Gorge property would be used by wolverines other than for dispersal.

Mule Deer. The Royal Gorge property lies roughly at the intersection of three mule deer herds: the Loyalton-Truckee herd east of the property, the Nevada City herd in Nevada County on the north edge of the property, and the Blue Canyon herd of both migratory and resident deer that remains south of I-80 in eastern

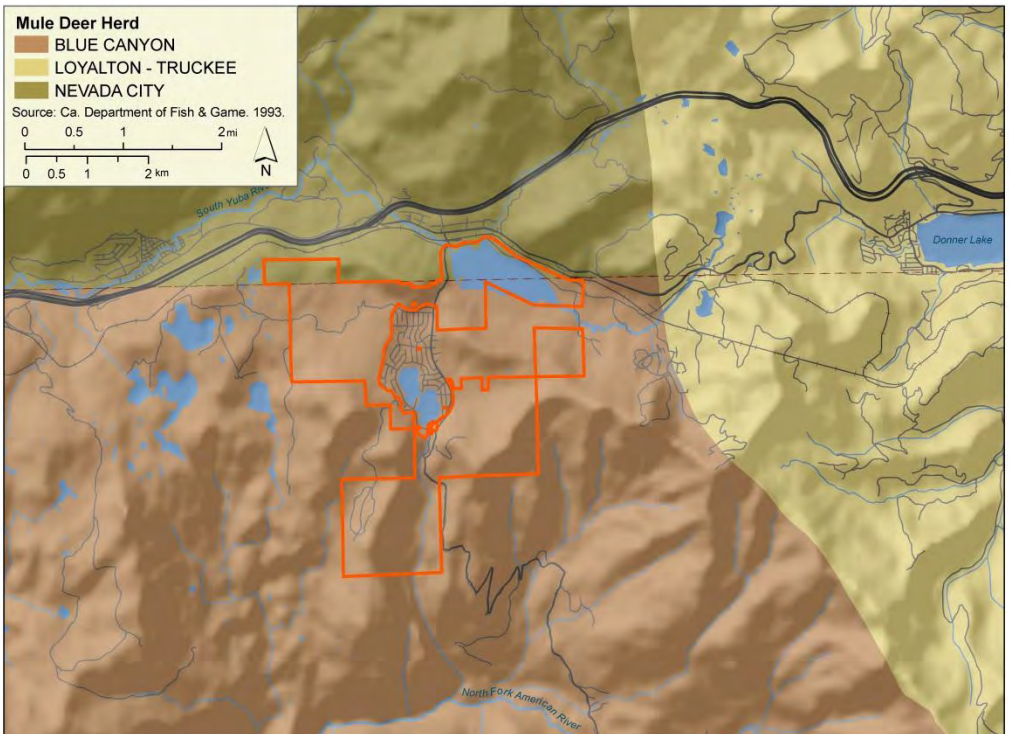

Figure 9. Sierra Nevada mule deer herds in the Donner Summit area.

Placer County (CDFG Region 2, Figure 9). The Blue Canyon herd includes three sub-species: the Columbian black-tailed deer, California mule deer, and Rocky Mountain mule deer (Fowler and Wagner 1982). The first heavy snows typically trigger fall migration, with major seasonal movement corridors documented to the north of Foresthill Divide and to the south along the Middle Fork of the American River. The Royal Gorge property occurs within the known summer range, and wet meadows on the property could support fawning areas for mule deer. The Blue Canyon deer herd plan (Fowler and Wagner 1982), although dated, cites the checkerboard pattern of land ownership over much of its range as a challenge to consistent habitat management. One of the cited objectives of the plan is for the CDFG to work cooperatively with the USFS and private land owners to fund and perform habitat alterations at selected sites, concentrating on key winter ranges and fawning habitats, while limiting residential development and roads, which are not compatible with forage and cover requirements for deer. Royal Gorge could qualify as one of these deer management sites.

2.3 Water Quality and Watershed Health

The Donner Summit area forms the headwaters of the South Yuba River and the North Fork American River (Figure 10)−which along with the Feather River supply water and hydropower to 65% of the state's residents. The majority of the water from these watersheds is derived from snow melt. Dams and reservoirs on these rivers are part of local, state, and federal facilities that provide flood protection for residents in the greater Sacramento region and water and

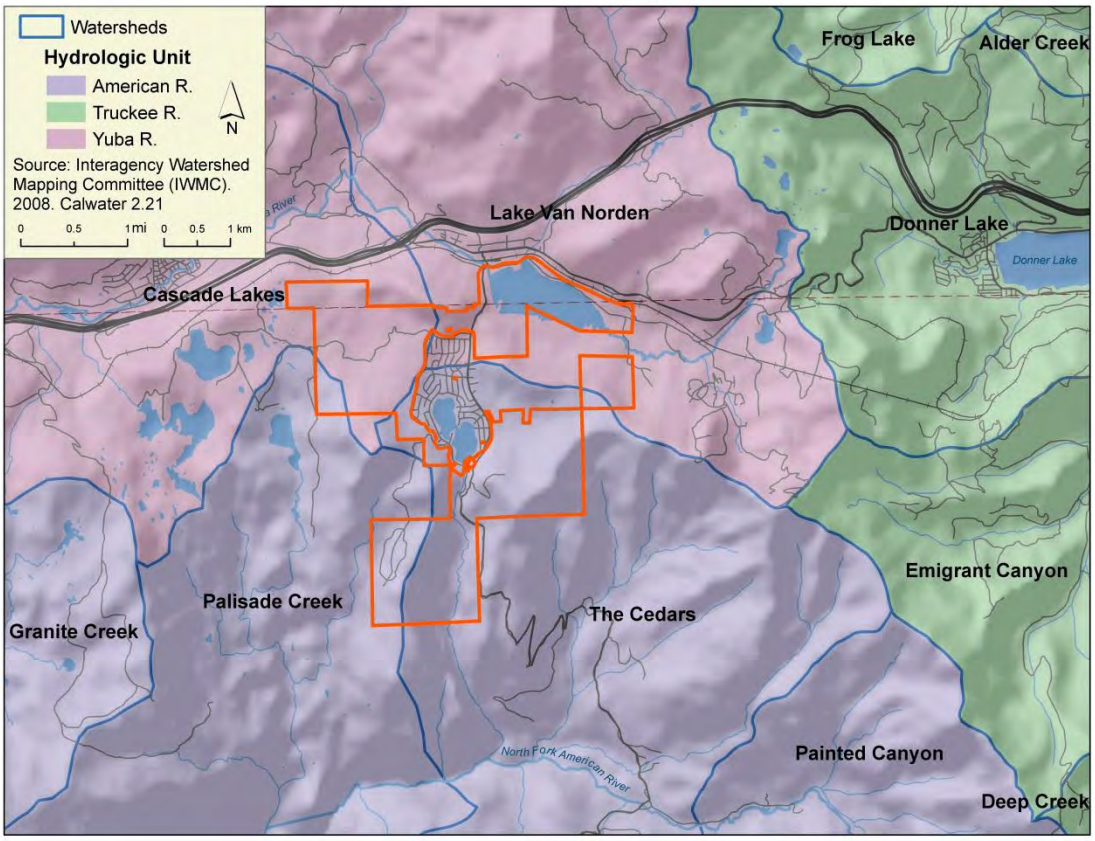

Figure 10. Watersheds of the American, Truckee, and Yuba River hydrologic units.

power for urban and agricultural users throughout the Central Valley. Intact watersheds are important for maintaining adequate supplies of clean runoff and for providing land managers with greater flexibility to optimize watershed management actions and reservoir operations, thus achieving biological objectives, securing water supplies, and maintaining power generation capacity. These river systems also sustain diverse aquatic and terrestrial flora and fauna (e.g., Wright et al. 2004), which depend on natural hydrological cycles to replenish nutrients, create openings, and recruit individuals into riparian vegetation communities.

Approximately 54% of the Royal Gorge property is in the American River watershed, with 46% in the Yuba River watershed. The ridge between Lake Van Norden and Serene Lakes forms the divide between these watersheds. South of this divide water flows into Onion Creek, Serena Creek, and Palisade Creek, which are tributaries of the North Fork of the American River.

These river systems are also focal points for human recreation. TPL's Sierra Nevada Checkerboard Initiative targets the upper watershed of the North Fork American River as the largest of five high quality resource areas (White et al. 2005, 2009). The North Fork has been federally designated as Wild and Scenic and supports a USFS Inventoried Roadless Area that has been proposed as a Wilderness Area. The Checkerboard Initiative targets the South Yuba River as one of five river corridors that support human recreation, scenic beauty, and human water supplies. Reaches of the South Yuba River are designated as Wild and Scenic and associated with hiking on the South Yuba Trail, water rafting, and fishing.

The Checkerboard Initiative proposes conservation objectives for these resource areas that are complementary to protecting recreational and visual resources as well as buffering and connecting existing and proposed Wilderness Areas, with an emphasis on maintaining natural ecosystem processes by preventing new development, road-building, and large-scale timber plantations.

Watershed basins are good units for conservation analyses because they integrate conditions over relatively large areas and support geographically distinct ecological processes, dependent on their position in the landscape. Because individual watershed basins have varying topography and geology, they support mosaics of forest community composition and structure and thus can serve as useful units for framing landscape-scale forest conservation objectives (White et al. 2005, 2009). Loss of natural vegetative cover and attendant increases in impervious surface cover, as a result of development, can adversely affect natural flow regimes, sediment dynamics, and riparian habitat quality. We measured watershed integrity in the Donner Summit area, using watershed sub-basins (hydrologic subareas) as the analytical unit. In this analysis, we calculated and ranked the area of land cover change for each watershed sub-basin, with higher integrity basins having lower levels of land cover change. Figure 11 shows how watershed integrity has been compromised along I-80 and in areas supporting housing and associated roads. Areas without roads, such as the southern portions of the Royal Gorge property, have the highest watershed integrity, and new roads or development activities should be prohibited in this part of the property.

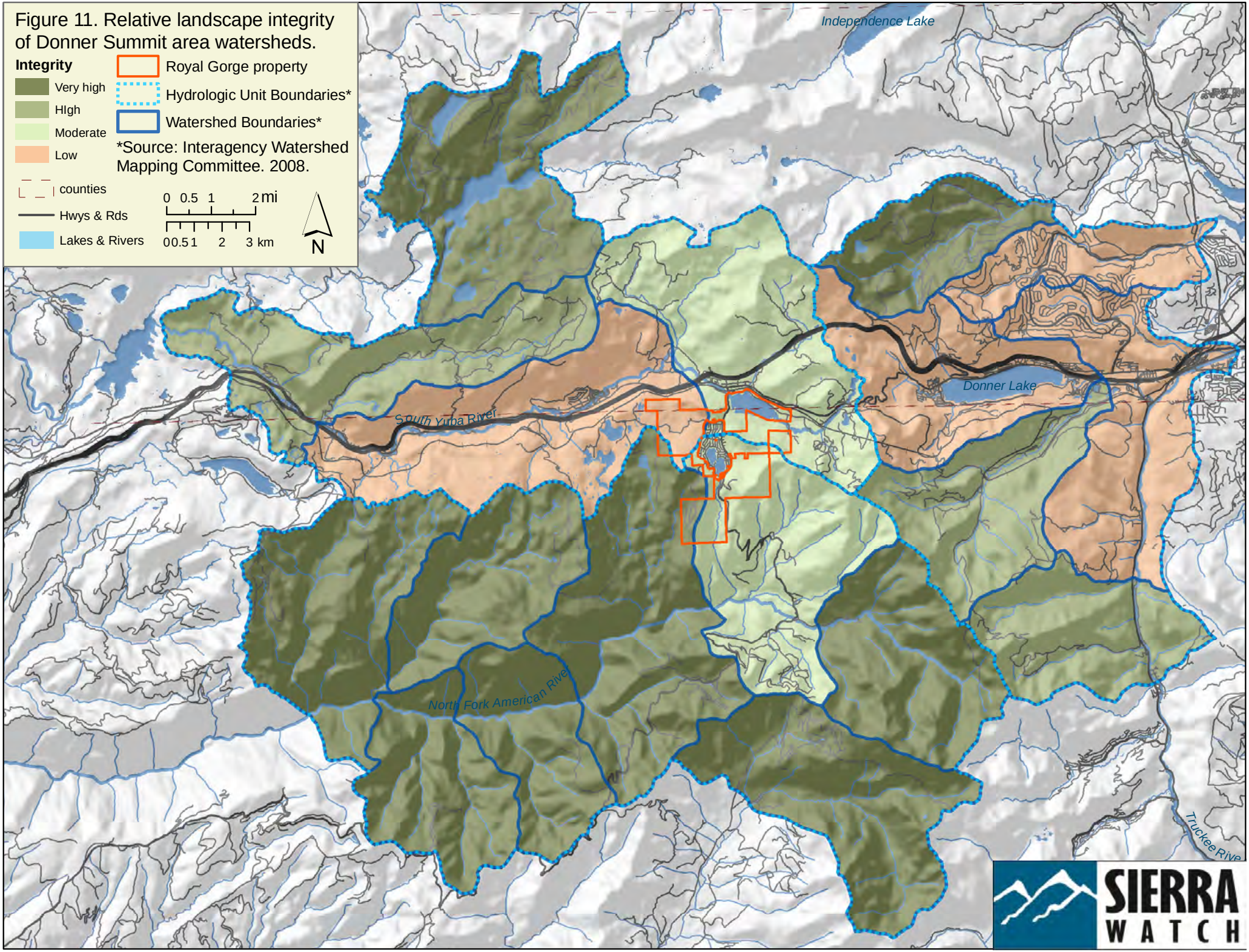
Figure 11. Relative landscape integrity of Donner Summit area watersheds.
Integrity
Very high
HIgh
Moderate
Low
Royal Gorge property
Hydrologic Unit Boundaries*
Watershed Boundaries*
*Source: Interagency Watershed Mapping Committee. 2008.
counties
Hwys & Rds
Lakes & Rivers
0 0.5 1 2 mi
0 0.5 1 2 3 km
N
Independence Lake
Donner Lake
South Yuba River
North Fork American River
Truckee River
SIERRA WATCH

2.4 Forests

Table 4. USFS rankings.

1. Structurally simple forests, such as young plantations, areas recently burned and salvaged
2. Maturing even-aged forests lacking large-diameter trees, snags, and logs
3. Selectively logged or burned areas that retained significant numbers of large trees and snags or second-growth forests approaching maturity
4. Old growth mixed conifer forests with open, park-like structures often produced by frequent low-intensity fire
5. Forests with the highest levels of structural complexity, including many large trees

(Source: USFS 1996 Table 115 - Sierra Nevada Old Growth Significance)

Due to historic forest management practices, mature forests are under-represented in the Sierra Nevada (Franklin and Fites-Kaufmann 1996). Thus, conservation and management for mature forest values has become a regional conservation priority. TPL's Sierra Checkerboard Initiative identifies the Yuba and American rivers as two of four resource areas emphasizing mature forests, and the Sierra Nevada Ecosystem Project (SNEP) (Franklin and Fites-Kaufmann 1996) also ranked the Donner Summit region as contributing to mature forest functions. Logging in this area dates back to the railroad era (1860s). Kevin Whitlock, a registered forester, conducted an inventory of the Royal Gorge property in 2006 (Figure 12), showing that most of the accessible areas were last harvested in the 1990s, resulting in maturing, even-aged forests (category 2, Table 4). While the Royal Gorge property itself does not support significant stands of mature forests, surrounding areas such as the Onion Creek Experimental Forest and the North Fork Headwaters Area lie within a USFS-designated Area of Late Successional Emphasis. Therefore, long-term stewardship goals for the property should include management for mature forest characteristics (i.e., a mosaic of stands with large-diameter trees, snags, and down logs), particularly in areas adjacent to Onion Creek Experimental Forest and the North Fork Headwaters Area. The desired condition for future management should be to achieve stands with rankings 4 and 5 (K. Whitlock pers. comm.).

2.5 Cultural Importance

The history of the Donner Summit area is synonymous with that of California and colonization of the West. The 88-mile Emigrant Trail, dating from 1841, opened up California not only to Americans from the rest of the U.S., but also to people from abroad. This overland wagon trail, which crossed the historic Donner Pass, at 7,085 ft, is one of the lowest elevation passes in the Sierra Nevada. This route across the Royal Gorge property was a major pre-historic trade route for Native Americans. The Donner Summit area was the summer home of the Martis tribe, hunter-gatherers named after arrow points found in the Martis Valley near Truckee. They have left their imprints behind in the form of petroglyphs and bedrock mortars throughout the Donner Summit area (Powell 2003).

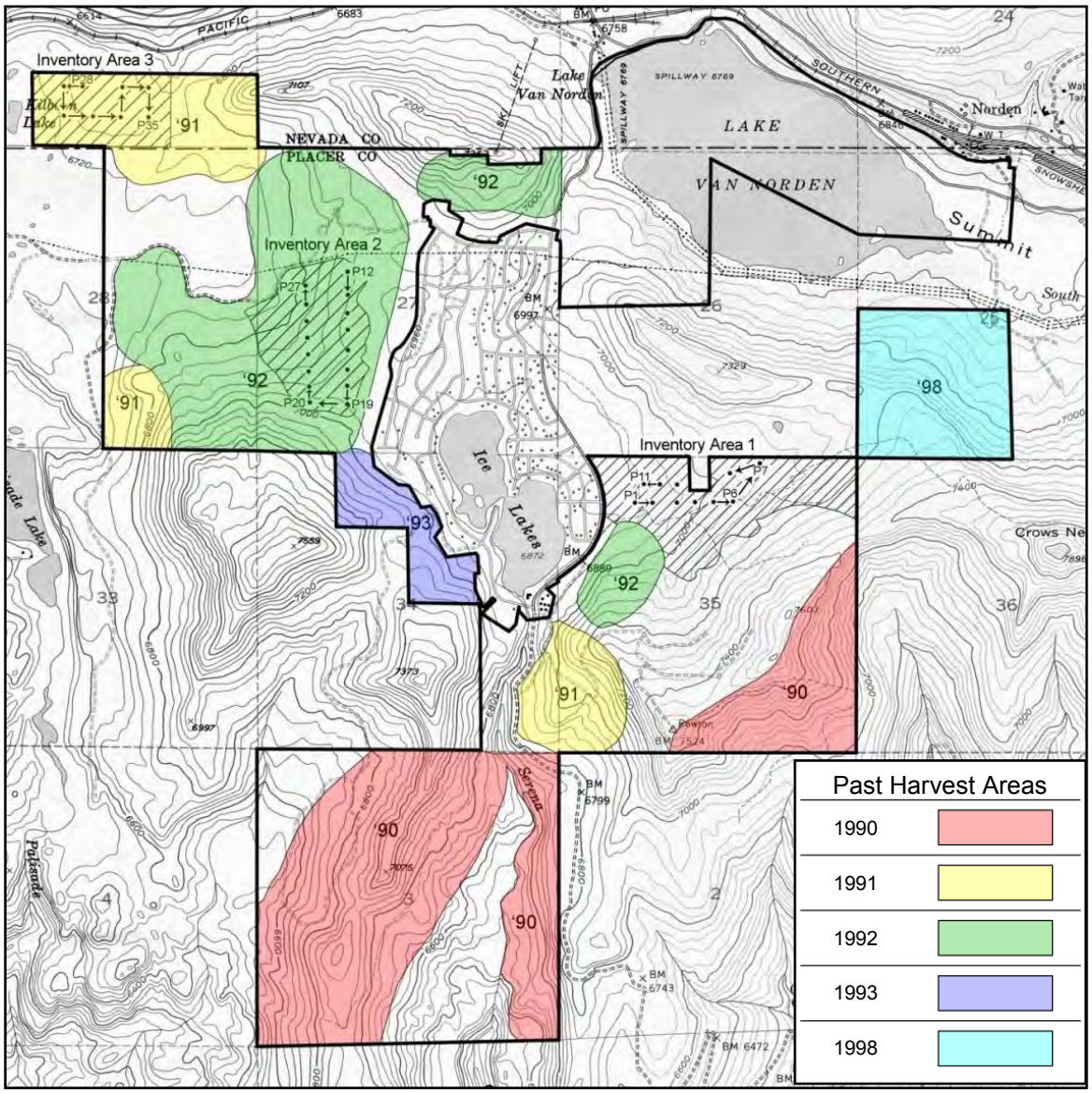

Figure 12. Royal Gorge forest inventory map (source: Whitlock 2006).

[Portions of Sections 21, 23, 25, 26, 27, 28, 34, and 35, T17N, R14E and Section 3, T16N, R14E USGS 7.5-min. quadrangles Soda Springs 1955 and Norden 1955]

The Emigrant Trail came into heavy use after the discovery of gold in 1848, at Sutter's Mill south of the Donner Summit area (Figure 13). The Gold Rush produced so much development to provide services to those mining the gold that California became a state in 1850. The most famous use of the Emigrant Trail was by George Donner and his party of American pioneers who set out in a wagon train from Missouri in 1846, headed west for California. They had planned to be in California by September, but found themselves trapped by snow in the Sierra Nevada in early November at Donner Pass and Alder Creek to the northeast. Less than half of the trapped invidivuals lived, and history will remember them as resorting to cannabalism to survive.

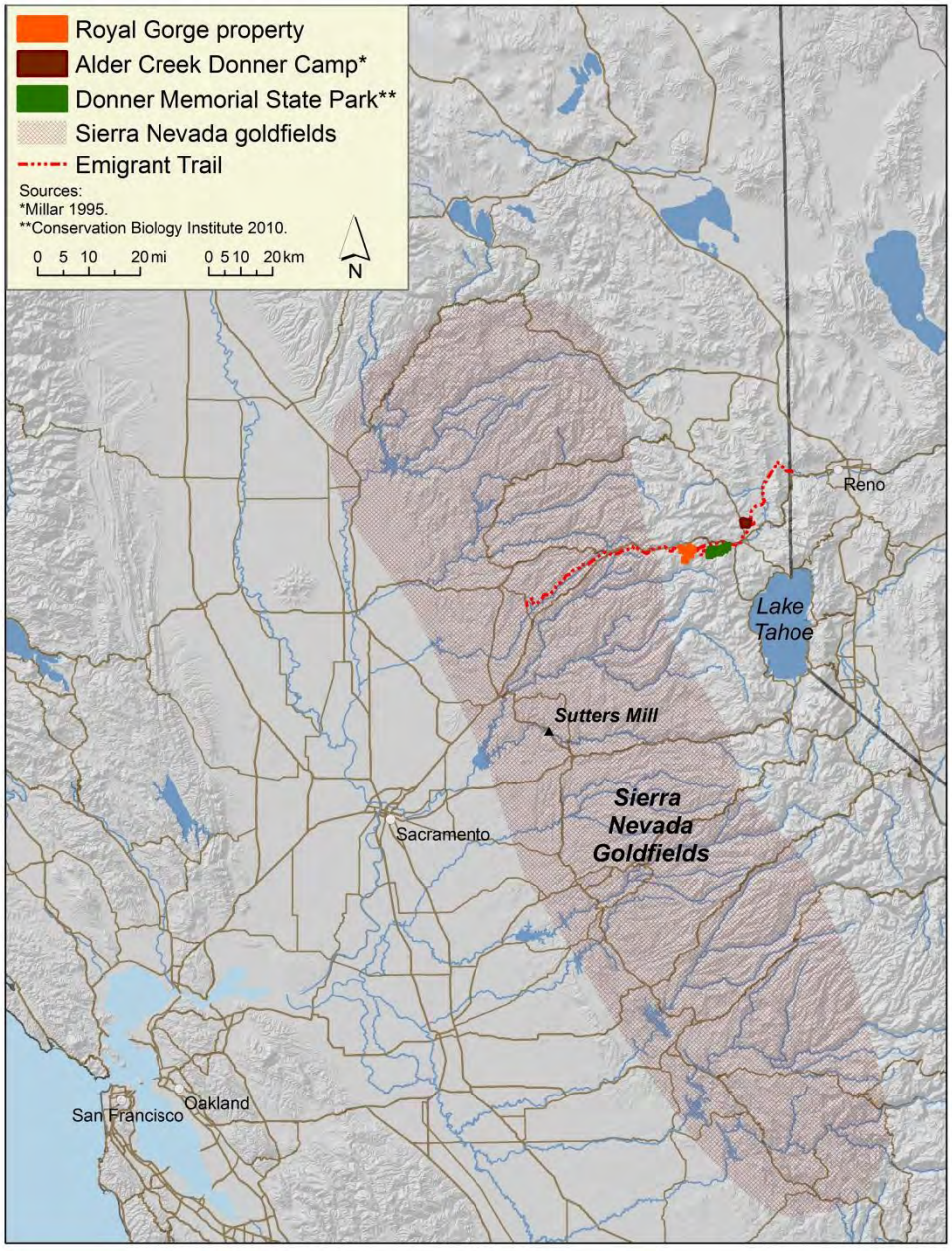

Figure 13. Cultural importance of the Donner Summit area.

Eventually, easier passes both north and south of Donner were opened, and Donner Pass was virtually abandoned until 1864, when the railroad opened the Dutch Flat-Donner Lake Road as a supply artery for improved travel by covered wagons, stagecoaches, and pack trains carrying goods, people, and construction supplies over the Sierra for the Central Pacific Railroad (later called the Union-Pacific, Powell 2003). This route was also used to herd cattle, sheep, and horses to and from Sacramento Valley. In 1869 the transcontinental railroad opened, with San Francisco as its western terminus; it was built on the backs of Irish and Chinese laborers and facilitated by the use of the newly

discovered explosive nitroglycerine. Eventually, this trade route became the location of the first continental roadway−Highway 40−also called the Lincoln Highway, eventually becoming part of the interstate highway system (I-80) in 1960.

The Donner Memorial State Park, Emigrant Trail Museum, Pioneer Monument, and the new High Sierra Crossing Museum were established to commemorate the site of the ill-fated Donner Party, and the history of the Donner Pass itself, as well as to showcase the extraordinary geologic history of the Sierra, its natural resources, Native American history, and the history of railroad development through Donner Pass. The Alder Creek Donner Camp northeast of the Royal Gorge property is a National Historic Landmark (Figure 13).

2.6 Sierra Recreation

The topographic extremes in the Donner Summit area produce some of the most dramatic views in the Sierra, ranging from peaks over 9,000 ft elevation down to river gorges below 4,000 ft. This most iconic of California landscapes is a readily accessible recreation destination for millions of Californians. Recreational opportunities include hiking, camping, fishing, skiing, biking, equestrian activities, and nature study. The extensive trail system traversing this part of the Sierra includes the well-known Pacific Crest and Emigrant trails, as well as the Rubicon Trail, South Yuba Trail, Tevis Cup/Western States Trail, Palisades Creek Trail, Cascade Lake OHV, Mt. Judah Loop, Summit Lake Trail, the Truckee Donner Land Trust's Donner Rim Trail, and others (selected trails shown on Figure 14). Conservation of the Royal Gorge property will allow consolidated management of recreational trail use, compatible with resource protection goals.

Downhill skiing in North America began in the gold fields of the Sierra in the early 1850s, and construction of the railroad played an important role in development of the ski industry on Donner Summit (Powell 2003). The Sugar Bowl Corporation was founded in 1938, and the second chair lift in the country, to the top of Mt. Disney, was installed at Sugar Bowl in 1939. Walt Disney was one of Sugar Bowl's original investors. The Royal Gorge cross-country ski trails were opened in 1971 and today represent the largest cross-country ski area in the U.S., with over 200 miles of maintained trails (Powell 2003).

The Sierra Checkerboard initiative emphasizes conservation of recreational and visual resources in the Donner Summit area, with a focus on areas bordering the Grouse Lakes proposed wilderness area, the Granite Chief Wilderness Area, and Independence Lake.

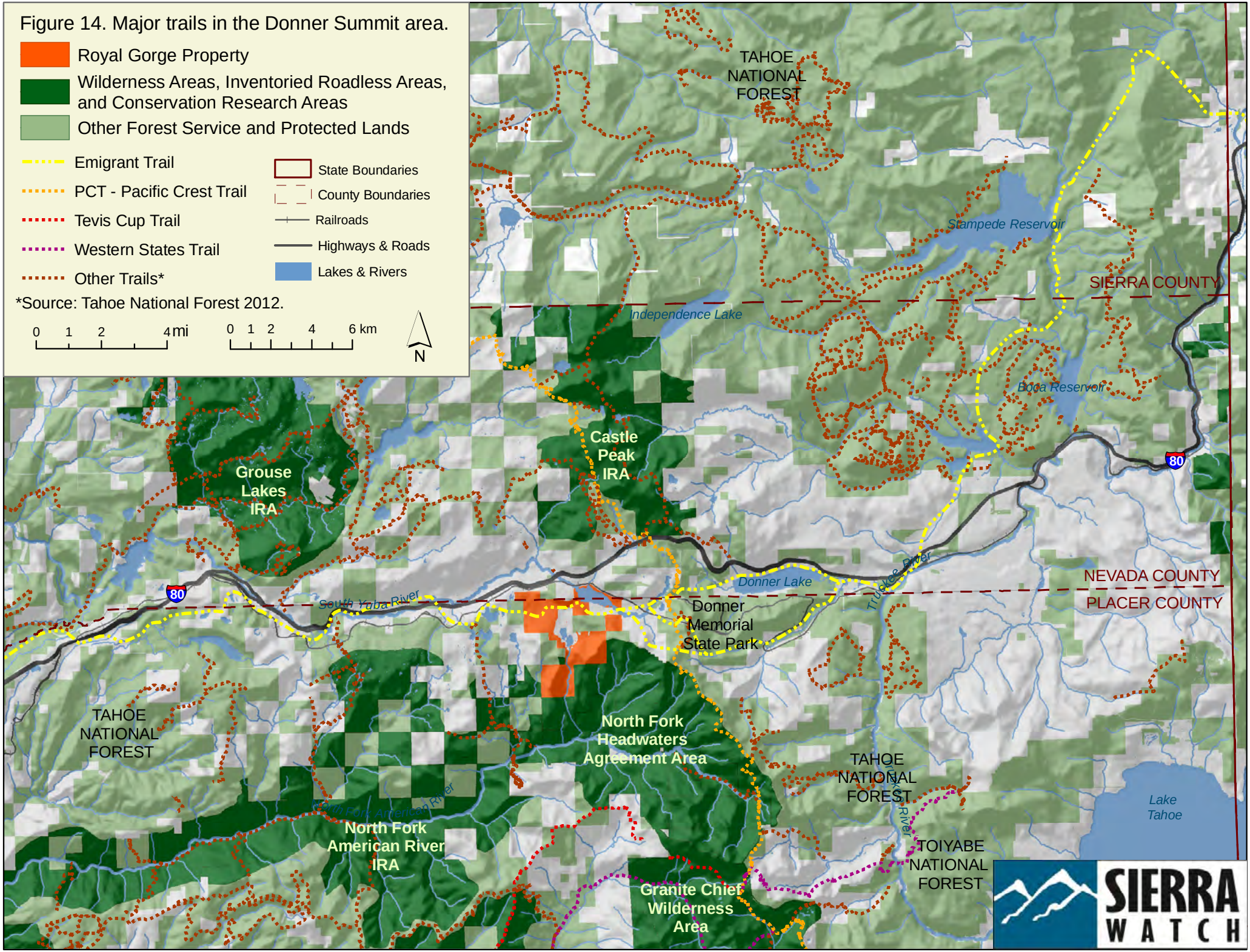
Figure 14. Major trails in the Donner Summit area.
Royal Gorge Property
Wilderness Areas, Inventoried Roadless Areas, and Conservation Research Areas
Other Forest Service and Protected Lands
Emigrant Trail
PCT - Pacific Crest Trail
Tevis Cup Trail
Western States Trail
Other Trails*
State Boundaries
County Boundaries
Railroads
Highways & Roads
Lakes & Rivers
*Source: Tahoe National Forest 2012.
0 1 2 4 mi
0 1 2 4 6 km
N
TAHOE NATIONAL FOREST
Stampede Reservoir
SIERRA COUNTY
Independence Lake
Boca Reservoir
Castle Peak IRA
Grouse Lakes IRA
80
Donner Lake
Truckee River
NEVADA COUNTY
PLACER COUNTY
South Yuba River
Donner Memorial State Park
TAHOE NATIONAL FOREST
North Fork Headwaters Agreement Area
TAHOE NATIONAL FOREST
Lake Tahoe
North Fork American River
North Fork American River IRA
Granite Chief Wilderness Area
TOIYABE NATIONAL FOREST
SIERRA WATCH

3. Threats and Vulnerability

In 2005 developers purchased Royal Gorge's almost 3,000 acres and proposed a massive development comprising 950 new residential units, new ski lifts, equestrian facilities, and over 85,000 square ft of various commercial buildings. Such a large development would have brought thousands of new residents and recreational visitors to the Donner Summit area. Removing the threat of inappropriate development from the Royal Gorge property will ensure that habitat on the property remains intact, management for biodiversity can be coordinated among conservation partners, ecosystem processes remain intact so that the area is more resilient to changes in climate, and water quality and water supply are managed as an ecosystem service. This section emphasizes the threats that remain and the importance of regional management and vigilance in abating and mitigating these threats. Because the conservation values are so inextricably linked, any impacts to one of them will have cascading effects on the others.

3.1 Habitat Loss and Fragmentation

The principal causes of species endangerment are the loss and degradation of habitat, fragmentation of remaining habitat areas into smaller, more isolated blocks, and *edge effects* that permeate the remaining habitat. Roads and increased residential densities put more pressure on native habitat as a recreational resource, often leading to inappropriate uses. Fragmentation also disrupts interactions among species, for example, between plants and their pollinators, plants and their dispersers, plants and their herbivores, predators and their prey. Fragments are more susceptible to invasive plant and animal species, including pathogens and their hosts. A break in the food web or a change in population dynamics can have cascading and compounding consequences that result in ecological collapse of the community.

Although fire has always been an important ecological process in the Sierra Nevada, catastrophic fires can burn larger contiguous areas at higher intensities than is typical under historic fire regimes, and they release large amounts of carbon into the atmosphere. Catastrophic wildfires can cause severe ecological damage by consuming larger trees, sterilizing and mineralizing soils, and prolonging normal recovery time. Conversely, development in and adjacent to wildlands forces fire managers to be more aggressive in protecting human lives and property than would otherwise be required by allowing more natural fire regimes.

3.2 Climate Change

The Sierra Nevada has been identified as one of ten ecosystems in the U.S. where climate change impacts could have the greatest effects on Threatened, Endangered, and other special status species, and where intervention can have the most impact if we restore resilience to these ecosystems (Endangered Species Coalition 2011). Climate change will likely produce ecosystem-level changes in the Sierra Nevada, with significant implications to water supply and

power generation systems dependent on Sierra rivers, as well as to species adapted to historic hydrologic regimes. There is already evidence of hydrologic alterations of river systems associated with warming. The loss of snowpack during warmer climates will further alter runoff patterns in streams and rivers, with a relatively greater proportion of stream flow likely to occur as a result of rain, rather than snow, in fall and winter, and relatively less rain in spring and summer than currently occurs. A shift in winter precipitation from snowfall to rainfall could also produce more flood events associated with individual winter storms rather than spring floods associated with snow melt.

Nonetheless, there are several actions that can ameliorate the effects of climate change, and conservation and sustainable management of the Royal Gorge property can contribute to some of these by restoring structure and process to forest systems, including:

- Reducing habitat fragmentation.
- Limiting the disruption of ecological processes (e.g., hydrologic cycles) and allowing natural disturbance processes (e.g., fire).
- Reducing human-induced habitat degradation.
- Integrating science into management.

3.3 Effects of Regional Land Use Changes

Population growth brings with it the corresponding need for open space and recreation areas, a larger strain on land management resources due to unauthorized uses (e.g., vandalism, arson, off-road vehicle use, and dumping), greater consumption of surface and groundwater in the region (e.g., by homes and golf courses), and the ever dwindling supply of land for siting housing and infrastructure for a growing population. Unauthorized uses of public and private lands have damaged property (e.g., gates and signs), eliminated habitat for rare species, caused erosion that eventually leads to sedimentation in drinking water, and introduced nonnative species that displace and destroy habitat of native species.

Subdivision and rural residential development continue to expand in the region, particularly along major transportation corridors, such as I-80 and on privately-owned lands in larger, well-watered valleys (Figure 15). Private developments and land use changes in otherwise contiguous public lands pose conflicts in public access, land use, and management and limit the ability of public land managers to achieve natural resource conservation objectives that require landscape-scale management actions. For example, fire suppression in the Wildland-Urban Interface has had profound effects on conserved lands.

The increasing demand for water resources by California's cities, agriculture, and hydroelectric facilities also threatens the resource values of aquatic and wetland habitats of the Sierra. Land use changes, impoundments, and diversions alter riverine flow regimes and water quality. These, in turn, affect the structure of aquatic and riparian communities. Inappropriate

management of forests, groundwater overdraft, and overgrazing of meadows are incompatible with biodiversity conservation objectives. Inappropriate development also constrains natural resources management options for the region. Conservation and socioeconomic challenges can be addressed only through a comprehensive, ecosystem-wide approach that integrates management of environmental resources with a sustainable tourism industry.

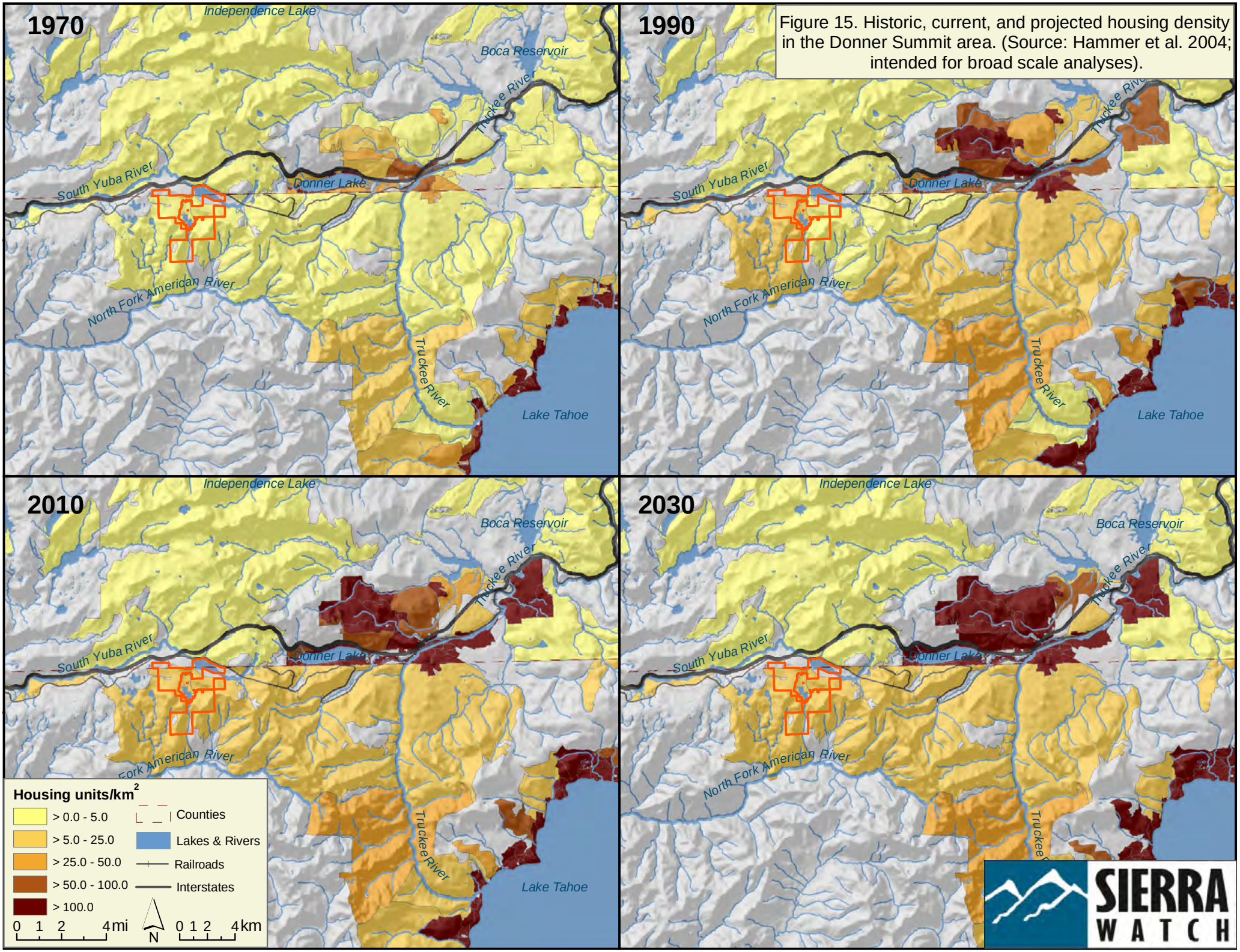

Figure 15. Historic, current, and projected housing density in the Donner Summit area. (Source: Hammer et al. 2004; intended for broad scale analyses).

4. Protecting Our Investments

Californians have the privilege to enjoy and appreciate the conservation vision of our predecessors—our federal, state, locally, and privately protected lands. These privileges, however, are accompanied by very real obligations. We have the responsibility to sustain and enhance those investments in the face of recreational pressures and land use change.

Existing public conservation investments—Wilderness Areas, Wild and Scenic Rivers, and Inventoried Roadless Areas—form the cornerstone for conserving north-south and east-west cross-sections of the north-central Sierra landscape. The integrity of the Donner Summit area is important also to ensure landscape connectivity between conserved lands in the northern Sierra (e.g., Lassen National Park, Feather River Land Trust) and conserved areas to the south (e.g., Yosemite National Park). Without additional conservation investment, this landscape is at risk of degradation from incompatible land uses. The stakeholders of the Donner Summit area have the potential to enhance core resource values through conservation and management of the Royal Gorge property and thereby further the return on investment in land acquisition, management, monitoring, and research previously established, as described below.

The Onion Creek Experimental Forest, bordering the southeast portion of the Royal Gorge property (Figure 16), was established in 1958 to develop techniques for increasing water yields from forested lands in the Sierra Nevada snow zone. The facility is now managed by the University of California at Berkeley. Long-term climatic data have been monitored since 1976, and continuous stream discharge has been recorded from five hydrologic sub-basins. The Central Sierra Snow Lab at Norden and Sagehen Creek Field Station also conduct long-term studies in the area to inform resource management.

Private conservation has also been important in the region. TPL has conserved almost 10,000 acres of private checkerboard lands in the Donner Summit area, as part of its Sierra Checkerboard Initiative. The Truckee Donner Land Trust, in partnership with TPL, has acquired over 2,100 acres of private lands adjacent to Donner Memorial State Park since 1995, making it one of the largest state parks in the Sierra. The Serene Lakes Property Owners Association (420 acres) and the 878-acre Palisades community (Figure 16) are invested in maintaining the intactness of the Donner Summit landscape, and the resorts in the area are interested in maintaining natural open space for cross-country skiing and other recreation.

The 2006 Conservation and Research Agreement among the TNF, Pacific Southwest Research Station, University of California, North Fork Association, and the Chickering Partnership establishes a public-private partnership to (1) preserve the character of the North Fork American River headwaters basin, (2) facilitate coordinated research and management efforts on the lands subject to the agreement (19,670 acres), and (3) facilitate communication among the parties. The goals of the agreement are consistent with the TNF Plan and represent an excellent example of collaborative landscape-scale management and monitoring.

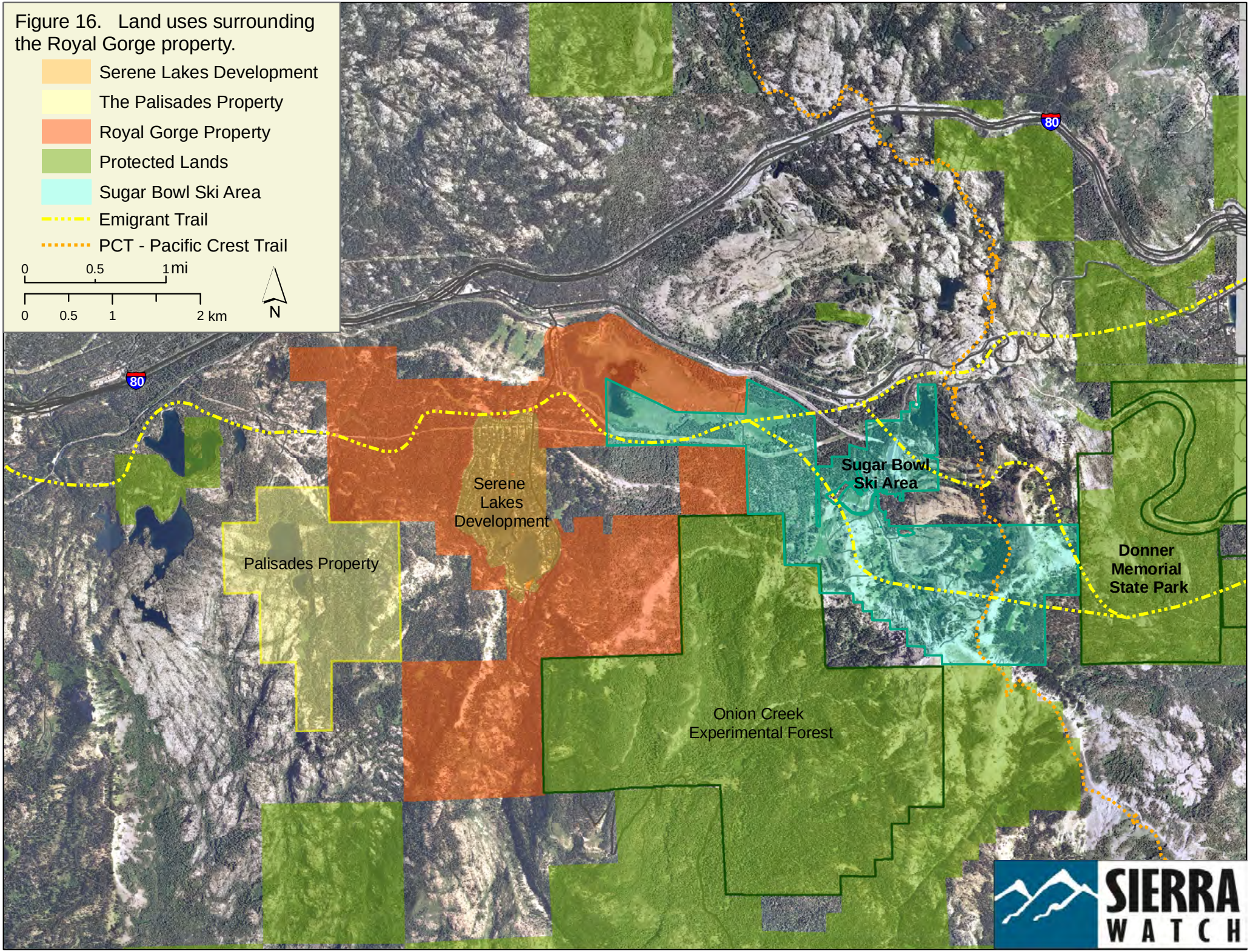
Figure 16. Land uses surrounding the Royal Gorge property.
Serene Lakes Development
The Palisades Property
Royal Gorge Property
Protected Lands
Sugar Bowl Ski Area
Emigrant Trail
PCT - Pacific Crest Trail
0 0.5 1 mi
0 0.5 1 2 km
N
80
80
Serene Lakes Development
Palisades Property
Sugar Bowl Ski Area
Donner Memorial State Park
Onion Creek Experimental Forest
SIERRA WATCH

Vision for the Royal Gorge Property on Donner Summit

Conservation and management of the Donner Summit area, and the Royal Gorge property in particular, should consider a range of issues across multiple spatial and temporal scales to achieve future desired conservation values for the broader landscape. The USFS (2011) National Report on Sustainable Forests identifies 64 indicators of forest sustainability and related policy recommendations, reflecting environmental, social, and economic concerns. The Sierra Forest Legacy has identified high priority issues to be addressed during the process of revising forest plans (Britting et al. 2012), and land managers for the Donner Summit area in general and the Royal Gorge property specifically should engage in this process for revision of the Tahoe National Forest plan.

Planning for disposition and stewardship of the Royal Gorge property should include the following science-informed actions, implemented within a regional framework of ecological sustainability−meeting human needs without compromising the health of ecosystems (Callicott and Mumford 1997). Management in the northeast quadrant of the Royal Gorge property (sections 23, 24, 25, and 26) should focus on management of wetland habitats around Lake Van Norden. The southeast and southern quadrants (sections 25, 35, and 3) should focus on management for characteristics of old growth forests, consistent with management in the Onion Creek Experimental Forest and conservation of montane meadows. Management priorities in the northeastern quadrant (sections 27, 28, and 21), where watershed integrity is lowest, should focus on management of montane meadows, old growth forest characteristics, and riparian conservation areas.

- Prevent further subdivision and exurban development of private lands outside of existing development clusters, and limit building of new roads, thus reducing the threat of fire.
- Develop a resource management framework that identifies the specific investigations, including mapping of vegetation communities, assessment of forest stand heterogeneity (North 2012), mapping of topographic and microclimate variables (North et al. 2009), and surveys for conservation target species, needed to inform preparation of an adaptive management and monitoring plan for the Donner Summit region that accommodates natural ecological succession across a dynamic landscape and that produces forest structure heterogeneity based on differences in aspect and slope shape and position.
- Develop goals for maintaining a landscape mosaic of structural diversity, with patches of forests in appropriate areas managed to promote old-growth characteristics in the future, including large-diameter trees, a complex understory, down logs, snags, and open canopy. A greater diversity of habitat structure and complexity will support greater species diversity and abundance and will enhance ecosystem resilience (North 2012).

- Manage for mature forest species at a landscape-scale (i.e., considering adjacent properties), including providing foraging habitat and habitat critical to the movement of mature forest species between forests surrounding the Royal Gorge property, e.g., primarily in southern areas of the property (Britting et al. 2012).
- Identify and develop special protection guidelines for forest stands supporting nesting areas of northern goshawks, including limiting disturbance during breeding and maintaining post-fledgling areas of 420 acres around goshawk nest stands (Britting et al. 2012). A technical review of northern goshawk in California is expected to be issued by the U.S. Fish and Wildlife Service in September 2012.
- Identify potential barriers to landscape connectivity and enhance habitat important to dispersal–from the North Yuba River watershed and its tributaries, south to the South Fork American River–among roadless areas and patches of mature forests that are part of the USFS carnivore network, to facilitate species' movements and demographic and genetic processes (see recommendations in Appendix A of Britting et al. 2012).
- Develop a plan to minimize the potential introduction of invasive plant and animal species, including conducting a risk assessment for potential invasive species (Cal-IPC 2006), establishing an Early Detection Network (Cal-IPC 2003), and implementing Best Management Practices (Cal-IPC 2012a,b) for maintaining powerline easements and use of boating and land vehicles free of invasive species from other areas. Prevent use of rodenticides that are getting into the food chain and killing predatory birds and mammals.
- Investigate the opportunities and constraints of decommissioning selected forest roads and trails, especially those that have the potential to impact wet meadows.
- Investigate the opportunities and constraints of managing and enhancing the system of wet meadows, USFS-designated Riparian Conservation Areas, and Willow Flycatcher Occupied and Emphasis Areas, including Lake Van Norden. This may include removing the concrete spillway on Lake Van Norden to restore natural ecosystem processes downstream, maintaining 300-ft buffers around streams and wet meadows (USFS 2001), and limiting human uses during the breeding season for neotropical avian migrants and the Sierra Nevada yellow-legged frog. Note that any plans to breach the existing spillway on the lake would eliminate much of the habitat for waterfowl and fish-eating predators such as the bald eagle, and could eliminate habitat around the lake for willow flycatchers and other neotropical migrants, as well as eliminate recreational fishery opportunities (Beedy pers.comm.).
- Identify meadows that are candidates for restoration within willow flycatcher dispersal distance. Meadows with willow coverage and structure and restored hydrological regimes may provide greater soil saturation later in the summer season (Green et al. 2003).
- Consider opportunities and constraints for restoring habitat for the Sierra Nevada yellow-legged frog habitat, including maintaining connectivity among meadow habitats

and Lake Van Norden. Depending on recreational objectives for the lake, removing non-native fish from Lake Van Norden, to support potential yellow-legged frog conservation, may not be realistic. Identify other places in the region occupied by yellow-legged frogs that could naturally recolonize meadow and stream habitat on the Royal Gorge property.

- Work with the Tahoe National Forest to develop a fire management plan that addresses the unnatural accumulation of fuels from fire suppression, focusing on small diameter trees, brush and surface fuels (USFS 2001), and that reduces the threat of catastrophic fire by maintaining adequate distances between ladder fuels and crown fuels, as well as adequate distances between crown fuels. A Wildland Urban Interface zone may be required on the Royal Gorge property adjacent to the Serene Lakes development.
- Explore the opportunities to work with Onion Creek Experimental Forest, especially in managing for old growth characteristics on Royal Gorge lands adjacent to the Experimental Forest.
- Work with Sugar Bowl and others to develop a plan for low-impact recreational opportunities, with plans for a trails network that avoids sensitive communities such as wet meadows and other wetlands.
- Investigate the need for formal conservation easements on the Palisades and Serene Lakes properties, consistent with conservation objectives for the greater Donner Summit region.
- Maintain the integrity of existing viewsheds and the availability of wilderness experiences.
- Implement public outreach and natural resource education efforts for recreational users, local residents, schools, and businesses.

Partnerships are never as important as where land use is at stake. Passions and funding must be mobilized through strategically coordinated initiatives that take advantage of the varied interests of multiple stakeholders. We need to communicate the framework (*big picture*) and common goals to funders and how their contributions will be used and leveraged among other partners and contributors. Sustainable use of the area's rich natural resources is vital to continued tourism and human enjoyment of the region.

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Appendix A: Data Sources and Methods

Watershed Integrity

The ecological integrity of a landscape refers to the extent that it remains free of human modifications, which is an indication of the ability of ecosystems to function naturally. In our model, we used the distribution and extent of human land cover alteration from roads and urban and agricultural development to construct a simple cost surface over the region, which could be used to investigate ecological integrity within watershed units and across the terrestrial landscape. Costs ranged from 0 to 5, with cost and ecological integrity inversely related. Costs were assigned in the following manner:"

1. Roads from Tiger (2011) and USFS Tahoe NF Transportation (2012) and railroads from Tiger 2011 were buffered according to road type and assigned the following scores (0 = no cost, 5 = high cost):

Tiger 2011 roads MTFCC code	buffer	cost
1100 primary roads	30m	5
1200 secondary roads	20m	5
1400 local roads	5m	3
1500 4wd trails	2m	3
1630 ramps	5m	5
1640 service drive	2m	3
1710 pedestrian passage	2m	3
1740 private road for service vehicles	2m	3
1780 parking lot road	2m	3
Railroads	5m	3
Tahoe NF Transportation	**buffer**	**cost**
Roads	2m	3
Trails	2m	3

2. Land cover categories in the land cover dataset (GAP ecological systems (CA GAP update) Mapping zone 6 2008) were assigned costs as follows:

GAP CLASS	RECLASS	COST
Open Water	Natural	0
Developed, Open Space	Urban	5
Developed, Low Intensity	Urban	5
Developed, Medium Intensity	Urban	5
Developed, High Intensity	Urban	5
North Pacific Volcanic Rock and Cinder Land	Natural	0
Mediterranean California Alpine Bedrock and Scree	Natural	0

GAP CLASS	RECLASS	COST
Rocky Mountain Aspen Forest and Woodland	Natural	0
Great Basin Pinyon-Juniper Woodland	Natural	0
Mediterranean California Dry-Mesic Mixed Conifer Forest and Woodland	Natural	0
Mediterranean California Mesic Mixed Conifer Forest and Woodland	Natural	0
Mediterranean California Mixed Oak Woodland	Natural	0
California Montane Jeffrey Pine-(Ponderosa Pine) Woodland	Natural	0
Mediterranean California Red Fir Forest	Natural	0
Mediterranean California Subalpine Woodland	Natural	0
Northern California Mesic Subalpine Woodland	Natural	0
Sierra Nevada Subalpine Lodgepole Pine Forest and Woodland	Natural	0
Sierran-Intermontane Desert Western White Pine-White Fir Woodland	Natural	0
Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland	Natural	0
North Pacific Wooded Volcanic Flowage	Natural	0
Inter-Mountain Basins Big Sagebrush Shrubland	Natural	0
Mojave Mid-Elevation Mixed Desert Scrub	Natural	0
California Mesic Chaparral	Natural	0
California Montane Woodland and Chaparral	Natural	0
Northern and Central California Dry-Mesic Chaparral	Natural	0
California Central Valley Mixed Oak Savanna	Natural	0
California Lower Montane Blue Oak-Foothill Pine Woodland and Savanna	Natural	0
Inter-Mountain Basins Big Sagebrush Steppe	Natural	0
Inter-Mountain Basins Semi-Desert Grassland	Natural	0
Harvest Forest- Tree Regenerated	Agriculture	3
Harvested Forest- Shrub Regenerated	Agriculture	3
Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland	Natural	0
Mediterranean California Foothill and Lower Montane Riparian Woodland	Natural	0

3. Watershed integrity: Total area-weighted costs were calculated for each individual level 6 (planning) watershed in the region (Calwater 2.21; Interagency Watershed Mapping Committee (IWMC) 2008), producing a potential final cost of 0 (high integrity) to 5 (low

integrity) for each basin. Watershed integrity scores (Figure 9) were divided into five classes:

Relative Watershed integrity	Cost range
Very high	0 - 0.1
High	0.10001 – 0.2
Moderate	0.20001 – 0.4
Low	0.40001 – 1.19

Pacific Marten Cores

Potential marten habitat cores were delineated by Spencer and Rustigian-Romsos (2012) as part of an effort to provide spatially explicit conservation and management recommendations that can be used to inform management decisions such as conservation action prioritization, National Forest Management Plan revisions, vegetation treatment planning, or other actions that may affect marten and three other species of forest carnivores in the region.

Potential marten habitat cores were derived from an empirical marten distribution model created using Maxent software and extensive marten survey data (compiled with assistance from the USFS Redwood Sciences Laboratory). Marten detection data collected from only May to November were used because summer habitat is believed to be most limiting to martens in this region. Prior to input in Maxent, detection data were filtered to a minimum nearest neighbor distance of 7 km to ensure spatial independence (54 detection points) and environmental variables (10; described in table at end) were averaged over a 1-km^2 moving window.

Potential marten habitat was defined as areas with a predicted probability of occurrence >= 0.4 (open water or urban land cover, steep slopes (> 80%), and recent (post 2005) severe burns (VegBurnSeverity10_1, USDA Forest Service, Pacific Southwest Region, Fire and Aviation Management; 2010) were removed from consideration). Potential marten core areas were then delineated from the potential habitat layer as contiguous polygons of at least 2,500 ha (> 5 marten home range areas).

Environmental Variables

1. Latitude-adjusted elevation:
   0.625m was added to elevation for every 1 km north from the southernmost point in the study area.
   Source: USGS 1-Arc Second National Elevation Dataset, 2009

2. WHR type = Wet Meadow, Perennial Grassland, or Annual Grassland with elevation >= 1400m.
   Distance to nearest mountain meadow

Source: USGS 1-Arc Second National Elevation Dataset, 2009; USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005 – 2009; California Department of Forestry and Fire Protection, Multi-source Land Cover Data (v02_2), 2002; and NatureServe, Ecological Systems of the United States.

3. Number of high reproduction habitat patches:
   Number of CWHR reproduction rating = High (modified by Kirk and Zielinski 2009) patches.
   Source: Kirk, T.A., Zielinski, W.J. 2009. Developing and testing a landscape habitat suitability model for the American marten (*Martes americana*) in the Cascades mountains of California. Landscape Ecology 24:759-773; USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005 – 2009; California Department of Forestry and Fire Protection, Multi-source Land Cover Data (v02_2), 2002; and NatureServe, Ecological Systems of the United States.

4. Average annual precipitation:
   Average annual precipitation (mm * 100) 1971 – 2000.
   Source: PRISM, 30 arc-second (resampled to 30m), 2006

5. Perennial stream density (km/km^2).
   Source: U.S. National Atlas, Water Feature Lines, 2008

6. Proportion high reproduction habitat rating:
   Proportion of land with high CWHR reproduction rating (modified by Kirt and Zielinski 2009), CWHR type = LPN, RFR, SCN, WFR, or MRI and WHR size = 4, 5, or 6, and WHR density = M or D.
   Source: Kirk, T.A., Zielinski, W.J. 2009. Developing and testing a landscape habitat suitability model for the American marten (*Martes americana*) in the Cascades mountains of California. Landscape Ecology 24:759-773; USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005 – 2009; California Department of Forestry and Fire Protection, Multi-source Land Cover Data (v02_2), 2002; and NatureServe, Ecological Systems of the United States.

7. Proportion lodgepole pine:
   Proportion of land with CWHR type = LPN and WHR size = 4, 5, or 6, and WHR density = M or D.
   Source: USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005 – 2009; California Department of Forestry and Fire Protection, Multi-source Land Cover Data (v02_2), 2002; and NatureServe, Ecological Systems of the United States.

8. Proportion red fir:
   Proportion of land with CWHR type = RFR and WHR size = 4, 5, or 6, and WHR density = M or D.
   Source: USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005 – 2009; California Department of Forestry and Fire Protection, Multi-source Land Cover Data (v02_2), 2002; and NatureServe, Ecological Systems of the United States.

9. Proportion Sierran mixed conifer:
   - Proportion of land with CWHR type = SMC and WHR size = 4, 5, or 6, and WHR density = M or D.
   Source: USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005 – 2009; California Department of Forestry and Fire Protection, Multi-source Land Cover Data (v02_2), 2002; and NatureServe, Ecological Systems of the United States.

10. Proportion white fir:
    Proportion of land with CWHR type = WFR and WHR size = 4, 5, or 6, and WHR density = M or D.
    Source: USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005 – 2009; California Department of Forestry and Fire Protection, Multi-source Land Cover Data (v02_2), 2002; and NatureServe, Ecological Systems of the United States.

Appendix B

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Appendix B-1. Special Status Animals with Known or Potential Occurrence at the Royal Gorge Property, Nevada and Placer Counties, California. *Bold-faced Common Names are state- and federally-listed species.*

Common and Scientific Name	Status Federal/State	California Distribution	Habitats	Reason for Decline or Concern	Potential Occurrence in the Property Area
Invertebrates					
Johnson's Hairstreak *Callophrys (Mitoura) johnsoni*	–/–	Sierra coniferous forests; very rare and local within a highly restricted range	Openings and clearings in coniferous forests, especially late-seral stands with host plant dwarf mistletoe	Loss of late-seral forests and other disturbance; rare, restricted range	Unknown; recorded in Placer County; no specific location data provided (Opler et. al 1995)
King's Canyon Cryptochian Caddisfly *Cryptochia excella*	FSS/–	Kings Canyon National Park; Fresno, Nevada, and Placer Counties	Small (1st order), cold (temperature 3–6°C) spring streams	Logging, grazing, water diversions, introduced exotic species, limited microhabitat	Unknown; recorded in Placer County; no specific location data provided (Erman and Erman 1995)
Amphibious Caddisfly *Desmona bethula*	FSS/–	El Dorado, Placer, and Sierra Counties	Information pending	Logging, grazing, water diversions, introduced exotic species, limited micro-habitat	Moderate; recorded in Placer County; no specific location data provided (Erman and Erman 1995)
Caddisfly – new species *Allomyia* n. sp.	–/–	Information pending	Information pending	Information pending	Moderate; recorded in Placer County in the Onion Creek Experimental Forest (Erman and Erman 1995)
Amphibians					
Sierra Nevada Yellow-legged Frog *Rana sierrae*	C, FSS/C, SSC	Sierra Nevada from 1,370 m and above; isolated populations in Butte County and near Mono Lake, Mono County	Associated with stream, lakes, and ponds in montane riparian, lodgepole pine, subalpine conifer, and wet meadow habitats; in southern California, restricted to streams in ponderosa pine, montane hardwood–conifer, and montane riparian habitats	Predation by nonnative fish; altered streamflows, water quality, and temperatures of high elevation streams and lakes	High; possible observation at Palisade Lake, and potentially suitable habitat along Mackay Creek; documented along tributaries of the North Fork American River (T.Beedy pers. obs.); and Squaw Creek, Tahoe National Forest (MVZ 2003; CNDDB 2012)
Birds					
Harlequin Duck *Histrionicus histrionicus*	FSS/SSC	May still nest in very small numbers in Calaveras County and eastern Amador and Placer Counties; winters on the coast from Del Norte to central San Luis Obispo Counties	Turbulent mountain streams in summer and rough coastal waters in winter; forages by diving along rocky shorelines	Human disturbance and shooting on breeding grounds, dams on nesting streams	Low; observed on North Fork American River at elevations of approximately 1,370–1,670 m: one female in 1992, two females in 1994, and one female in 1998 (CNDDB 2012; T. Beedy pers. obs.); the species prefers mainstem rivers with high flows; unlikely to occur at the Royal Gorge property area

Common and Scientific Name	Status Federal/State	California Distribution	Habitats	Reason for Decline or Concern	Potential Occurrence in the Property Area
Bald Eagle (wintering) *Haliaeetus leucocephalus*	PR/**SE**, FP	Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and in Lake Tahoe Basin; reintroduced into central coast; winter range includes rest of California except southeastern deserts, very high elevations in the Sierra, and east of Sierra Nevada south of Mono County; range expanding	Nests and roosts in coniferous forests within 1 mile of lake, reservoir, stream, or ocean	Nest sites vulnerable to human disturbance, pesticide contamination	Extant, documented foraging and roosting and possible nesting in the Royal Gorge property area at Lake Van Norden, Serene Lakes, and Palisade Lake; uncommon migrant and nonbreeding visitor to most large lakes, reservoirs, and rivers in Placer and Nevada (Williams 1996; T. Beedy, S. Sanders, pers. obs.)
Northern Goshawk *Accipiter gentilis*	FSS /SSC	Permanent resident in Klamath and Cascade Ranges, north Coast Ranges from Del Norte to Mendocino Counties, and Sierra Nevada south to Kern County; winters in Modoc, Lassen, Mono, and northern Inyo Counties; rare in southern California	Nests and roosts in older stands of mixed-conifer, red fir, Jeffrey pine, and lodgepole pine forests; hunts in forests and in forest clearings and meadows; nests are usually in large trees and situated near a source of water	Loss of nesting habitat and disturbance of nest sites	Extant; observed at the Royal Gorge property, but apparently no nesting records; documented nesting at higher elevation localities including near Bunker Hill, Tahoe City, Devil Peak, in the North Fork American River basin, Martis Creek, Rubicon River, and near Donner Lake (CNDDB 2012)
Golden Eagle *Aquila chrysaetos*	PR, BLMS/FP	Foothills and mountains throughout California; uncommon nonbreeding visitor to lowlands such as Central Valley	Cliffs and escarpments or tall trees for nesting; annual grasslands, chaparral, and oak woodlands with plentiful medium and large-sized mammals for prey	Habitat loss to urbanization; vulnerable to disturbance at nest sites	Extant; observed flying over the Royal Gorge property area; some suitable nesting habitat in snags and on rock outcrops in the property area but no documented nesting records; uncommon resident in Placer County (Williams 1996); nests near Mt. Lyon and Mt. Anderson (T. Beedy, S. Sanders pers. obs.)
Merlin *Falco columbarius*	–/SSC	Does not nest in California; rare but widespread winter visitor to the state	Forages along coastlines, open grasslands, savannas, and woodlands; often forages near lakes and other wetlands	Unclear; possibly chemical contamination, illegal take of young	Extant; rare nonbreeding visitor to Placer County (Williams 1996); observed near Lake Van Norden and the North Fork American River (T. Beedy pers. obs.)

American Peregrine Falcon *Falco peregrinus anatum*	-/FP	Permanent resident in North and South Coast Ranges; may summer in Cascade and Klamath Ranges south through Sierra Nevada to Madera County; winters in Central Valley south through Transverse and Peninsular Ranges and plains east of Cascade Range	Nests and roosts on protected ledges of high cliffs, usually adjacent to lakes, rivers, or marshes that support large populations of other bird species	Pesticide contamination; population recovering	Extant; an active nesting eyrie was found on the Royal Gorge property (Whitlock pers. comm.); nesting has been documented in the North Fork American River canyon upstream from Auburn; otherwise, rare migrants in the Royal Gorge area
Prairie Falcon *Falco mexicanus*	FWC/-	Found as permanent resident in South Coast, Transverse, Peninsular, and northern Cascade Ranges; southeastern deserts; Inyo-White Mountains; Modoc, Lassen, and Plumas Counties; and foothills surrounding Central Valley. Winters in Central Valley; along coast from Santa Barbara to San Diego Counties; and in Marin, Sonoma, Humboldt, Del Norte, and Inyo Counties	Nests on cliffs or escarpments; forages in adjacent dry, open terrain or uplands, marshes, and seasonal marshes	Possibly pesticide contamination, robbing of eyries by falconers, illegal shooting, human disturbance at nest site	Extant; uncommon migrant and winter resident in Placer County; observed near Crow's Nest, Mt. Lyon, Tinker's Knob, Granite Chief, Mt. Lincoln, Sugar Bowl, South of Norden, and Squaw Peak (Williams 1996; T. Beedy, S. Sanders pers. obs
California Spotted Owl *Strix occidentalis occidentalis*	FWC, FSS, BLMS/SSC	Sierra Nevada from Lassen to northern Kern Counties; occurs in localized areas of Transverse and Peninsular Ranges of southern California	Mature forest with permanent water and suitable nesting trees and snags; in southern California, nearly always associated with oak and oak-conifer habitats	Loss of late-seral nesting habitat	High; fairly common nesters in late-seral forests of headwaters basin of North Fork American River including the adjacent Onion Creek Experimental Forest but little suitable nesting habitat on the Royal Gorge property (CNDDB 2012, T. Beedy, S. Sanders pers. obs.)
Great Gray Owl *Strix nebulosa*	FWC/**SE**	Permanent resident of the Sierra Nevada in small portions of Tuolumne, Mariposa, Madera, and Fresno Counties	Late-seral coniferous forests bordering meadows; red fir, Jeffrey pine, and lodgepole pine dominate	Loss of late-seral nesting habitat, degradation of foraging habitat in meadows	Low; nonbreeding individuals observed in Nevada and Sierra counties; no breeding records from Nevada or Placer counties (CNDDB 2012)

Long-eared Owl *Asio otus*	–/SSC	Permanent resident east of Cascade Range from Placer County north to the Oregon border, east of Sierra Nevada from Alpine to Inyo Counties, along coast from Sonoma to San Luis Obispo Counties, and eastward over north Coast Ranges to Colusa County; winters in Central Valley, Mojave and Sonora Deserts, and Inyo-White Mountains; summers along eastern rim of Central Valley and Sierra foothills from Tehama to Kern Counties	Dense riparian stands of willows, cottonwoods, live oaks, or conifers; uses adjacent open lands for foraging; nests in abandoned crow, hawk, or magpie nests	Loss and degradation of riparian habitats	Low; no documented breeding records near the Royal Gorge; nonbreeding individuals observed at Sugar Bowl Lodge and near Foresthill (Williams 1996)
Black Swift *Cypseloides niger*	FWC/SSC	Breeds locally in Sierra Nevada and Cascade Ranges; San Gabriel, San Bernardino, and San Jacinto Mountains; and coastal bluffs from San Mateo to near San Luis Obispo Counties	Nests in moist crevices or caves on sea cliffs above the surf, or on cliffs behind or adjacent to waterfalls in deep canyons	Rare, localized distribution	High; known to breed in steep river canyons of Placer County; no suitable waterfall nesting habitat, but individuals observed flying over the Royal Gorge property area; several individuals observed during nesting season most years in the Royal Gorge of the North Fork American River (CNDDB 2007, T. Beedy, S. Sanders pers. obs.).
Vaux's Swift *Chaetura vauxi*	–/SSC	Coastal belt from Del Norte to Santa Cruz Counties; also nests rarely in mid-elevation forests of Sierra Nevada	Nests in hollow, burned-out, or rotted-out tree trunks in large conifers and infrequently in artificial chimneys; most other activities are conducted in the air	Reduction in number of suitable nest sites from logging and fire suppression	Extant; observed at Lake Van Norden; regular occurrence and probable nesting in headwaters basin of North Fork American River (T. Beedy pers. obs)
Willow Flycatcher *Empidonax traillii*	FWC, FSS/**SE**	Summer range includes a narrow strip along eastern Sierra Nevada from Shasta to Kern Counties, another strip along western Sierra Nevada from El Dorado to Madera Counties; widespread in migration	Riparian areas and large wet meadows with abundant willows for breeding; usually found in riparian habitats during migration	Loss of riparian breeding habitat, nest parasitism by Brown-headed Cowbirds	Extant; occupied breeding habitat exists in the meadow complex along Mackay Creek, just upstream from Palisade Lakes; nesting pairs observed in willow thickets upstream from Lake Van Norden in 1986, 1992, and 2000 (S. Sanders pers. comm.), and individuals observed in the breeding season at Martis Creek and near Tahoe City (CNDDB 2007)

Olive-sided Flycatcher *Contopus cooperi*	FWC/SSC	Breeds in montane coniferous forests throughout California including the Sierra Nevada, Coast Range, and Transverse Ranges	Primarily breeds in late-seral forests with open canopies, often near forest/meadow edges	Loss of late-seral forests due to timber harvest, and sanitation cuts that remove all or most large snags from forest stands	Extant; suitable breeding habitat exists in the meadow complex along Mackay Creek, just upstream from Palisade Lakes; common nesters around all large meadows in the Headwaters Basin of the North Fork American River (T. Beedy, S. Sanders pers. obs.)
California Yellow Warbler (nesting) *Dendroica petechia brewsteri*	FWC/SSC	Uncommon nester over most of California except Central Valley, Mojave Desert, and high elevations of Sierra Nevada; winters along lower Colorado River and in parts of Imperial and Riverside Counties; two small resident populations in San Diego and Santa Barbara Counties	Nests in riparian habitats dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral; in migration may also use oaks, conifers, and urban centers near stream courses	Loss of riparian breeding habitats; nest parasitism by Brown-headed Cowbirds	Extant; documented nesting in riparian and montane chaparral habitats of headwaters basin of North Fork American River; observed in alder thickets of the Royal Gorge property during the breeding season (T. Beedy, S. Sanders pers. obs)
Modesto Song Sparrow *Melospiza melodia mailliardi*	–/SSC	Endemic to California, resident only in north-central portion of Central Valley. Highest densities occur in Butte Sink area of Sacramento Valley and in Sacramento–San Joaquin Delta (PRBO unpubl. data)	Emergent freshwater marshes dominated by tules and cattails as well as riparian willow thickets; also nests in riparian forests of valley oak	Habitat loss, fragmentation, and degradation may be primary threats	High; song sparrow (subspecies unknown) is a common resident of eastern Placer County; fairly common nesters above about 1,800 m in headwaters basin of North Fork American River (T. Beedy pers. obs.).
Mammals					
Yuma Myotis *Myotis yumanensis*	BLMS/–	Considered common and widespread in northern California in a variety of habitats from sea level to about 2,400 m in the Sierra; uncommonly up to 3,350 m	Roosts colonially in a variety of natural and human-made sites, including caves, mines, buildings, bridges, and trees; in northern California, maternity colonies are usually in fire-scarred redwoods, pines, or oaks; forages for insects over water bodies	Human disturbance of roosting and maternity sites	Moderate; specimen records from attic of a private residence near Hobart Mills, Nevada County; no documented records from Placer County (MVZ 2003)

Long-eared Myotis *Myotis evotis*	BLMS/–	Sierra Nevada, Klamath, Coast, Transverse, and Peninsular Ranges	Roosts singly or in small groups in a variety of natural and human-made sites, including caves, mines, buildings, bridges, and trees; nursery colonies found in buildings, rock crevices, and behind bark; forages over water, shrubs, grasslands, or trees	Human disturbance of roosting and maternity sites	Moderate; specimen records from near Independence Lake and Sagehen Creek, Nevada County; no documented records from Placer County (MVZ 2003)
Fringed Myotis *Myotis thysanodes*	BLMS/–	Sierra Nevada, Klamath, Coast, Transverse, and Peninsular Ranges	Maternity colonies in caves, mine shafts, buildings, or rock crevices; forages over water and other open habitats	Human disturbance of roosting and maternity sites	Moderate; within species' known distribution (Verner and Boss 1980; Zeiner et al. 1990), but no documented records from Placer County found in CNDDB, MVZ, or UCD
Spotted Bat *Euderma maculatum*	BLMS/SSC	Throughout eastern and southern California, central Sierra Nevada, and Sierra Nevada foothills bordering San Joaquin Valley; probably occurs in other portions of the state where habitat is suitable	Roosts primarily in rock crevices; uses arid deserts and open pine forests set in rocky terrain; females may favor ponderosa pine forests during reproduction	Human disturbance of roosting and maternity sites; rare within known range	Low; extremely rare species; south of known distribution (Verner and Boss 1980; Zeiner et al. 1990); no documented Placer County records found in CNDDB, MVZ, or UCD
Pale Townsend's Big-eared Bat *Corynorhinus townsendii pallescens*	BLMS/SSC	Klamath Mountains, Cascades, Sierra Nevada, Central Valley, Transverse and Peninsular Ranges, Great Basin, and Mojave and Sonora Deserts	Mesic habitats; gleans insects from brush or trees and feeds along habitat edges; roosting and maternity sites in caves, mines, tunnels, and buildings	Unclear; possibly human disturbance of roosting and maternity sites	Moderate; within species' known distribution (Verner and Boss 1980; Zeiner et al. 1990); specimen record from San Juan Ridge, Nevada County (SFAS)
Western Mastiff Bat *Eumops perotis californicus*	BLMS/SSC	South Coast Ranges and Sierra Nevada foothills, north at least to El Dorado County	Mostly found in open, dry habitats including annual grasslands, chaparral, and open oak and pine forests; roosts in cliff faces, high trees, tunnels, and buildings; requires rock crevices for maternity sites	Human disturbance of roosting and maternity sites	Low; near species' known distribution (Verner and Boss 1980; Zeiner et al. 1990), but no documented records found in CNDDB, MVZ, or UCD

Sierra Nevada Snowshoe Hare *Lepus americanus tahoensis*	-/SSC	Sierra Nevada from Mt. Lassen south to Mono and Tulare Counties, generally at elevations of 1,460–2,440 m	Found in dense thickets of conifers, riparian vegetation, or chaparral in boreal life zones	Habitat alterations from logging and grazing; possibly illegal hunting	Extant; documented at the Royal Gorge property; specimen records from near Cisco (MVZ 2003); numerous observations in headwaters basin of North Fork American River since 1970 (T. Beedy pers. obs.)
Sierra Nevada Mountain Beaver *Aplodontia rufa californica*	-/SSC	Cascades and Sierra Nevada from Siskiyou to Tulare and Inyo Counties	Moist montane and eastside riparian thickets; burrows within and under dense understory vegetation; does not build dams	Altered habitat from grazing, logging, stream channelization, and dams	Moderate; two specimens from 1912 were collected near Blue Canyon (MVZ 2003); numerous observations from tributaries of Truckee River and in headwaters basin of North Fork American River—specimen collected in 1999 and deposited at UCD museum (CNDDB 2012; T. Beedy, S. Sanders pers. obs.)
Sierra Nevada Red Fox *Vulpes vulpes necator*	FWC/**ST**	Cascade Range east to Sierra Nevada, south to Tulare County	Red fir and lodgepole pine forests, generally from 1,500 to 2,560 m, associated with mountain meadows	Reasons for decline unclear; altered habitat from logging, grazing, and recreational activities; historic trapping	Low; within species' known distribution (Verner and Boss 1980; Zeiner et al. 1990); no TNF, MVZ or CNDDB records in the vicinity of the Royal Gorge property
American Marten *Martes americana*	FWC/–	North coast regions and Sierra Nevada, Klamath, and Cascade ranges.	Optimal habitats include late-seral coniferous forests with at least 40% crown closure and large trees and snags; dens in cavities in trees, snags, and logs, as well as crevices in rocky areas; home ranges of males average almost 243 hectares	Altered habitat from logging, historic trapping	High; observed in the property area (The Palisades pers obs.); within species' known distribution (Verner and Boss 1980; Zeiner et al. 1990); no MVZ or CNDDB records, but observed almost annually in headwaters basin of North Fork American River (T. Beedy, S. Sanders pers. obs.)
Pacific Fisher *Martes pennanti pacifica*	C, FWC, BLMS/SSC	Coastal mountains from Del Norte to Sonoma Counties, through Cascades to Lassen County; south in Sierra Nevada to Kern County	Mixed-conifer habitats with high overstory cover; preference for riparian areas and other ecotonal habitats; dens in cavities in trees, snags, and logs, as well as crevices in rocky areas; home ranges have been estimated at more than 2,590 hectares	Altered habitat from logging, historic trapping	Moderate; observed at Fisher Creek and Blackwood Creek area of Tahoe National Forest and in American River Canyon near Iowa Hill (TNF, CNDDB 2012); possibly observed in headwaters basin of North Fork American River in 2000

California Wolverine *Gulo gulo luteus*	FWC, FS/**ST**, FP	Klamath and Cascade Ranges south through Sierra Nevada to Tulare County	Sighted in a variety of habitats from 490 to 4,328 m; most common in open terrain above timberline and subalpine forests; dens in caves, cliffs, hollow logs, under rocks, and in excavated cavities in ground or snow; home ranges have been estimated at more than 3,885 hectares	Reason for decline unclear; altered habitat from logging and recreation activities; historic trapping	Moderate; within species' known distribution (Verner and Boss 1980; Zeiner et al. 1990); a single male was photographed at Sagehen Creek from 2009 to 2012; another (possibly the same animal) was photographed at Lake Spaulding in 2012; also observed in 1953 near entrance to Squaw Valley and in 1978 at Sunflower Hill near French Meadows Reservoir (TNF, CNDDB 2012)
American Badger *Taxidea taxus*	–/SSC	Most of California except extreme north coastal regions of Humboldt, Del Norte, and Siskiyou Counties	Suitable habitats include herbaceous and shrub communities and open stages of most other habitats with dry, friable soils where dens are excavated; home ranges can be up to 243 hectares	Reason for decline unclear; probably related to habitat loss in developed and agricultural areas where soils are excavated	High; within species' known distribution (Verner and Boss 1980; Zeiner et al. 1990); active burrows observed in headwaters basin of North Fork American River since the 1970s (T. Beedy pers. obs.)

Federal Status

FE = Listed as Endangered under the federal Endangered Species Act.
FT = Listed as Threatened under the federal Endangered Species Act.
FC = Candidate for listing as either Threatened or Endangered under the federal Endangered Species Act.
PR = Protected under the Bald Eagle and Golden Eagle Protection Act
FWC = Considered a species of Conservation Concern by the U.S. Fish and Wildlife Service
FSS = Considered a Sensitive Species by the U.S. Forest Service
BLMS = Considered a Sensitive Species by the U.S. Bureau of Land Management
– = No federal protected status.

State Status

SE = Listed as Endangered under the California Endangered Species Act.
ST = Listed as Threatened under the California Endangered Species Act.
SC = Candidate for listing as either Threatened or Endangered under the state Endangered Species Act.
FP = Fully-protected under the California Fish and Game Code.
SSC = Considered a Species of Special Concern by the California Department of Fish and Game
– = No state protected status.

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(CNDDB)	Records search (2012) of the California Department of Fish and Game's Natural Diversity Data Base for Placer and Nevada Counties, Sacramento, CA
(MVZ)	Records search (2003) of the Museum of Vertebrate Zoology, University of California, Berkeley, CA
(SFAS)	Unpublished Placer County field notes and databases compiled by members of the Sierra Foothills Audubon Society, Grass Valley, CA
(TNF)	Tahoe National Forest wildlife and fisheries files, Nevada City, CA (2002 record searches by U.S. Forest Service personnel)
(UCD)	Records search of the Wildlife and Entomology Museums, University of California, Davis (2001)
(UNR)	Records search of the Wildlife Museum, University of Nevada, Reno (2002)

Appendix B-2. Special Status Plants with Known or Potential Occurrence at the Royal Gorge property of Nevada and Placer counties, California. *Status codes are provided in the footnote below.*

Common Name ***Scientific Name***	**Legal Status[a] Federal/State/ CNPS/USFS**	**Distribution**	**Habitat Associations**	**Flowering Period**	**Potential Occurrence in the Royal Gorge Property Area**
Simple androsace *Androsace occidentalis* var. *simplex*	--/--/2.3/FSW	Placer County; southwestern U.S.	Upper montane coniferous forest, generally moist sites; 1,675-1,700 meters (5,500-5,580 feet)	August-September	Low to moderate; known in California only from 1882 collection at Emigrant Gap (CNDDB 2007, Calflora 2007) but much suitable habitat present
Carson Range rock cress *Arabis rigidissima* var. *demota*	--/--/1B.2/FSS	Placer and Nevada counties; Nevada	Broadleaved upland forest, upper montane coniferous forest on rocky substrate; 2,255-2,560 meters (7,400-8,400 feet)	August	Low; known in California from two occurrences near Martis Peak. (CNDDB 2007). Not expected to occur on Sierra west slope
Woolly-leaved milk-vetch *Astragalus whitneyi* var. *lenophyllus*	--/--/4.3/FSW	Alpine, Butte, Nevada, Placer, Plumas, and Sierra Counties	Alpine boulder and rock field, subalpine coniferous forest on rocky substrate; 2,135-3,050 meters (7,000-10,000 feet)	July-August	High; documented occurrences nearby on Castle Peak (True 1973) and Sand Ridge (C. Chainey-Davis pers obs), and in Placer County at Ward Peak (Calflora 2007)
Leathery grape fern *Botrychium multifidum*	--/--/--/FSS	Scattered throughout the Sierra Nevada and northern Coast Range	Moist sites in red fir and north coast coniferous forests, often among willows; 914-3,050 meters (3,000-10,000 feet)	July- September	Observed during reconnaissance survey in meadows north of project area (C. Chainey-Davis pers obs)
Moonworts *Botrychium lunaria, B. crenulatum, B. minganense, B. simplex*	--/--/2/FSS	Widely scattered from Washington to Arizona and east to Utah	Bogs and fens, meadows and seeps, lower and upper montane conifer forest, subalpine forest; 1,500-3,280 meters (4,920-10,758 feet)	July- September	High; common moonwort observed in meadows north of project area and suitable habitat present in wet meadows, particularly north of Palisade Lake. *B. lunaria* documented at Sagehen (True 1973, Calflora 2007)
Bolander's candle moss *Bruchia bolanderi*	--/--/2.2/FSS	Tehama, Plumas, Nevada, Mariposa, Tuolumne, and Fresno Counties; Oregon, Utah	Damp soil in meadows and seeps, lower and upper montane conifer forest; 1,700-2,800 meters (5,576-9,184 feet)	Spring to summer at higher elevations	High; documented occurrence at Castle Valley (CNDDB 2007)

Common Name ***Scientific Name***	**Legal Status[a] Federal/State/ CNPS/USFS**	**Distribution**	**Habitat Associations**	**Flowering Period**	**Potential Occurrence in the Royal Gorge Property Area**
Dissected-leaved toothwort *Cardamine pachystigma* var. *dissectifolia*	--/--/3/FSW	Butte, Glenn, Mendocino, Placer, Sonoma, and Tehama Counties	Chaparral, lower montane coniferous forest, usually serpentenite and rocky substrate; 255-2,100 meters (840-6,700 feet)	February-May	Low; known occurrences on serpentine or metasedimentary substrates (Plumas NF Botany Program unpublished records), which are not present in the Royal Gorge property area (USDA 1994). Placer County occurrence at Mosquito Creek (Calflora 2007) and Dutch Flat PH Rd (Chainey-Davis pers obs). Most documented occurrences at much lower elevations.
Constance's sedge *Carex constanceana*	--/--/1B.1/--	Nevada County; Oregon and Washington	Shady and mesic sites in subalpine coniferous forest; 2,000 meters (in California) (6,560 feet)	August	Moderate to high; known in California from single collection at Sagehen (CNDDB 2004) but may be overlooked
Davy's sedge *Carex davyi*	--/--/4.3/--	Alpine, Amador, Calaveras, El Dorado, Nevada, Placer, and Tuolumne Counties	Moist meadows in subalpine coniferous forest, upper montane coniferous forest; 1,500-3,200 meters (4,900-10,500 feet)	May-June	High; type specimen of this species was collected in the Truckee River Basin in Placer County (Harvard University Herbarium); however, Nevada County record at Sagehen Creek (True 1973) recently identified as *C. constanceana* (CNDDB 2007)
Shore sedge *Carex limosa*	--/--/2.2/--	Siskiyou, Butte, Plumas, Nevada, El Dorado, Tuolumne, and Fresno Counties; Nevada	Bogs and fens, meadows and seeps, marshes and swamps, wet sites in lower and upper montane conifer forest; 1,200-2,700 meters (3,936-8,856 feet)	June-August	Moderate; most documented occurrences in floating bogs, rich fens. Nearby occurrences at Eagle Lakes and Sagehen Creek (True 1973, CNDDB 2007)

Common Name ***Scientific Name***	**Legal Status[a] Federal/State/ CNPS/USFS**	**Distribution**	**Habitat Associations**	**Flowering Period**	**Potential Occurrence in the Royal Gorge Property Area**
Sheldon's sedge *Carex sheldonii*	--/--/2.2/--	Lassen, Modoc, Placer, Plumas Counties; Idaho, Oregon, Utah, and other states	Wet places in lower montane coniferous forest, freshwater marsh, riparian scrub; 1,200-1,755 meters (3,950-5,760 feet)	May-August	Low; only Placer Co. record is of historical collections (1949, 1950) by Raven (California Academy of Sciences), thought to be from Baxter (CNDDB 2007). Nearest occurrence to north at Graeagle in Sierra County (V. Dains pers obs).
Truckee cryptantha *Cryptantha glomeriflora*	--/--/4.3/--	Sierra, Nevada, Alpine, Mono, Tuolumne, Fresno, and Tulare Counties	Sandy granitic or volcanic areas in Great Basin scrub, upper montane and subalpine coniferous forest, and meadows; 1,800-3750 meters (5,900-12,300 feet)	June-September	Low to moderate; known in project vicinity only from 1887 specimens collected "Below Truckee" and "Ice ponds below Truckee". May be overlooked, however, and suitable habitat present in property area.
English sundew *Drosera anglica*	--/--/2.3/FSS	Siskiyou, Lassen, Plumas, and Nevada Counties; Oregon, Idaho, and Washington	Bogs and fens, saturated acidic, often peaty soils in coniferous forests; up to 2,440 meters (8,000 feet)	June-September	Moderate, not observed during October survey but at least marginally suitable habitat present at spring-fed meadow north of property area. Documented occurrences at Sagenhen and historical collection from Coldstream canyon (Calflora 2007)
Round leaved sundew *Drosera rotundifolia*	--/--/--/FSW	Northwest California, Cascade Range, and Sierra Nevada; circumboreal	Saturated acidic, often peaty soils in coniferous forests; up to 2,440 meters (8,000 feet)	June-September	Moderate, not observed during October survey but at least marginally suitable habitat present at spring-fed meadow north of property area. Documented occurrences at Sagenhen and historical collection from Coldstream canyon (Calflora 2007)

Common Name ***Scientific Name***	**Legal Status[a] Federal/State/ CNPS/USFS**	**Distribution**	**Habitat Associations**	**Flowering Period**	**Potential Occurrence in the Royal Gorge Property Area**
Subalpine fireweed *Epilobium howellii*	--/--/1B.3/FSS	Sierra, Nevada, Tuolumne, and Mono Counties	Meadows and seeps, mesic areas in subalpine conifer forest; 2,000-2,700 meters (6,560-8,856 feet)	July-August	High; Type locality at Yuba Pass winter park extirpated but recently found in meadows nearby (Tahoe NF unpublished records). Widely scattered occurrences in Sierra Nevada wet meadows (CNDDB 2007)
Oregon fireweed *Epilobium oreganum*	--/--/1B.2/--	Del Norte, El Dorado, Glenn, Humboldt, Mendocino, Nevada, Placer, Shasta, Siskiyou, Tehama, Tulare, and Trinity Counties	Bogs and fens, lower mesic montane coniferous forest; 500-2,240 meters (1,640-7,350 feet), Sierra Nevada records are above 1,646 meters (5,400 feet)	June-August	High; reported to occur near Donner Lake (CNDDB 2007) and on Tahoe NF (Calflora 2007); specimen records exist in Nevada County at Uhlen Valley and Fall Creek (True 1973).
Starved daisy *Erigeron miser*	--/--/1B.3/FSS	Nevada and Placer Counties	Upper montane coniferous forest on rocky substrate; 1,840-2,620 meters (6,040-8,600 feet)	June-October	High; population of approximately 20 plants observed during October 3, 2007 survey in south-central portion of property area (C. Chainey-Davis pers obs). Many local occurrences recorded: three historical from Devil's Peak, Soda Springs, and Donner Pass (CNDDB 2007); and many others verified in Nevada City and Truckee RDs of Tahoe National Forest (USFS 2000). Much suitable habitat present in property area on granitic and volcanic outcrops.

Common Name *Scientific Name*	**Legal Status[a] Federal/State/ CNPS/USFS**	**Distribution**	**Habitat Associations**	**Flowering Period**	**Potential Occurrence in the Royal Gorge Property Area**
Donner Pass buckwheat *Eriogonum umbellatum* var. *torreyanum*	--/--/1B.2/FSS	Nevada, Placer, and Sierra Counties	Meadows, upper montane coniferous forest on volcanic, rocky substrate; 1,855-2,620 meters (6,100-8,600 feet)	July-September	High; seven occurrences recorded, one extirpated (CNDDB 2007); many additional occurrences verified in Nevada City and Truckee RDs of Tahoe National Forest (USFS 2000) including Donner Pass area between old Hwy 40 and I-80, and ridge above Frog Lake. Suitable habitat present in open rocky barren areas, especially on volcanic substrates (USDA 1994).
American manna grass *Glyceria grandis*	--/--/2.3/--	Humboldt, Mendocino, Mono, and Placer Counties; widespread outside of California	Bogs and fens, meadows, marshes on streambanks and at lake margins; 15-1,980 meters (50-6,500 feet)	June-August	Moderate; one documented historical (1934) collection by Jepson from the Truckee River near Squaw Creek (CNDDB 2007). May be overlooked; suitable habitat present in marshes along Palisade Creek.
Amethyst stickseed *Hackelia amethystina*	--/--/4.3/--	Trinity, Mendocino, Lassen, Tehama, Plumas, Lake, Glenn, and Placer Counties	Openings and disturbed areas in lower and upper montane conifer forest, meadows and seeps; 1,500-2,300 meters (4,920-7,544 feet)	June-July	Low; known in Placer Co. only from 1912 collection at Deer Park. Range in Nevada County only implied in literature; no documented occurrences (Calflora 2007)
Plumas ivesia *Ivesia sericoleuca*	--/--/1B.2/FSS	Lassen, Nevada, Placer, Plumas, and Sierra Counties	Vernally mesic Great Basin scrub, lower montane coniferous forest, and meadows, vernal pools, usually volcanic substrate; 1,465-2,200 meters (4,800-7,200 feet)	May-September	Low; three occurrences documented in Martis Valley (CNDDB 2007), verified in Truckee RD of Tahoe National Forest (USFS 2000) and all known occurrences on east side in vernal pools and vernally wet meadows in eastside scrub and forest.

Common Name ***Scientific Name***	**Legal Status[a] Federal/State/ CNPS/USFS**	**Distribution**	**Habitat Associations**	**Flowering Period**	**Potential Occurrence in the Royal Gorge Property Area**
Center Basin rush *Juncus hemiendytus* var. *abjectus*	--/--/4.3/--	Shasta, Lassen, Plumas, Sierra, Nevada, Alpine, Mono, Tuolumne, and Tulare Counties; to Oregon and Idaho	Meadows and seeps and mesic areas in subalpine coniferous forest; 1,400-3,400 meters (4,592-11,152 feet)	May-June (July)	Moderate to high; documented occurrences at Boca Springs Rd, (True 1973) and Dog Valley (Calflora 2007) east of crest but many other occurrences on west slope in other parts of range.
Hutchison's lewisia *Lewisia kelloggii* ssp. *hutchisonii*	--/-- /3.3 (proposed 1B) /FSS	Siskiyou*, Butte, Placer, Plumas, and Sierra Counties	Openings in upper montane coniferous forest, on gravelly substrates; 1,800-2,135 meters (5,900-7,000 feet)	June-August	High; documented occurrence near northern boundary on USFS land (USFS 2007) and on the Royal Gorge property (CNPS unpublished records). Much suitable habitat present in open, gravelly, barren areas of granitic or volcanic origin (USDA 1994)
Long-petaled lewisia *Lewisia longipetala*	--/--/1B.3/FSS	El Dorado, Fresno, Nevada, and Placer Counties	Alpine boulder and rock field, subalpine coniferous forest, on mesic and rocky substrates; 2,500-2,925 meters (8,200-9,600 feet)	July-August	Low; elevations in property area probably too low except near eastern boundary. Two documented occurrences near Squaw Valley Ski Resort, Granite Chief area (CNDDB 2007); verified in Truckee RD of Tahoe National Forest (USFS 2000). Nevada County occurrence on Basin Peak (USFS 2000) not seen in recent years but habitat still intact.
Saw-toothed lewisia *Lewisia serrata*	--/--/1B.1/FSS	El Dorado and Placer Counties	Broadleaved upland forest, lower montane coniferous forest, riparian forest; 900-1,435 meters (2,950-4,700 feet)	May-June	Low; elevations in project area too high. Known only from the North Fork American and Rubicon River drainages and on Grouse Creek below approximately 5,000 feet (CNDDB 2007, USFS 2000).

Common Name ***Scientific Name***	**Legal Status[a] Federal/State/ CNPS/USFS**	**Distribution**	**Habitat Associations**	**Flowering Period**	**Potential Occurrence in the Royal Gorge Property Area**
Northern bugleweed *Lycopus uniflorus*	--/--/4.3/--	Siskiyou, Shasta, Lassen, Del Norte*, Humboldt, Plumas, Nevada, Placer, and Tuolumne Counties; to Canada and eastern U.S.	Bogs and fens, marshes and swamps; 5-2,000 meters (16-6,560 feet)	July-September	High; documented occurrence at Lake Valley Reservoir in Nevada County (Calflora 2007) and much suitable habitat present in property area
Three-ranked hump-moss *Meesia triquetra*	--/--/4.2/FSS	Siskiyou, Shasta, Lassen, Humboldt, Tehama, Butte, Plumas, Sierra, Nevada, Placer, Alpine, Mariposa, Madera, Fresno, Tulare, and Riverside Counties; circumpolar, circumboreal	Bogs and fens, wet meadows; wet areas in upper montane and subalpine conifer forest; 1,300-2953 meters (4,264-9,686 feet)	N/A	Moderate to high, particularly in spring-fed portions of meadow north of property area but may also occur in wet meadow of the Royal Gorge property. Documented occurrences at Sagehen and other rich fens and spring-fed meadows to Independence Lake (Dillingham 2005). May be overlooked and occur elsewhere in region.
Broad-nerved hump-moss *Meesia uliginosa*	--/--/2.2/FSS	Siskiyou, Tehama, Plumas, Sierra, Nevada, Tulare, and Riverside Counties; circumpolar, circumboreal	Bogs and fens, wet meadows; wet areas in upper montane and subalpine conifer forest; 1,300-2953 meters (4,264-9,686 feet)	N/A	Moderate to high, particularly in spring-fed portions of meadow north of property area but may also occur in wet meadows of the Royal Gorge propert. Documented occurrences at Sagehen and other rich fens and spring-fed meadows to Independence Lake (Dillingham 2005). May be overlooked and occur elsewhere in region.
Jones's muhly *Muhlenbergia jonesii*	--/--/4.3/--	Lassen, Mono, Modoc, Nevada, Placer, Plumas, Shasta, Siskiyou, and Trinity Counties	Lower and upper montane coniferous forest; 1,130-2,130 meters (3,700-7,000 feet)	June-August	Moderate to high; known in area from 1881collection at Soda Springs (Calflora 2007) but may be overlooked. Also documented at Eagle Lakes (True 1973). Reported to occur in Placer County

Common Name *Scientific Name*	**Legal Status[a] Federal/State/ CNPS/USFS**	**Distribution**	**Habitat Associations**	**Flowering Period**	**Potential Occurrence in the Royal Gorge Property Area**
Stebbins' phacelia *Phacelia stebbinsii*	--/--/1B.2/FSS	El Dorado, Nevada, and Placer Counties	Rocky soils of metamorphic origin (USFS 2000) in woodland, lower montane coniferous forest, meadows; 610-2,010 meters (2,000-6,600 feet)	June-July	Low to moderate; no rock outcrops or soils of metamorphic origin in property area (USDA 1994). Area Documented occurrences in North Fork American River drainage in Cisco Grove quadrangle, Cisco Grove area north of I-80, and Bear Valley area (USFS 2000).
Coleman's rein orchid *Piperia colemanii*	--/--/4.3/--	Butte, Colusa, Fresno, Madera, Mariposa, Placer, Plumas, Shasta, Siskiyou, Tulare, and Tuolumne Counties	Chaparral, lower montane coniferous forest, often sandy soils; 1,200-2,300 meters (3,900-7,550 feet)	June-August	Low; range in Placer-Nevada County only implied in literature (Calflora 2007) and most documented occurrences in Sierra Nevada at much lower elevations (Calflora 2007)
Sierra podistera *Podistera nevadensis*	--/--/4.3/--	Alpine, El Dorado, Mono, Placer, San Bernardino*, and Tuolumne Counties	Alpine boulder and rock field; 3,000-4,000 meters (9,800-13,100 feet)	July-September	Low; range in Placer-Nevada County only implied in literature (Calflora 2007) and elevations in property area probably too low
Kruckeberg's sword fern *Polystichum kruckebergii*	--/--/4.3/--	Alpine, Butte, Placer, Plumas, San Bernardino, Shasta, Sierra, Siskiyou, and Tuolumne Counties; Idaho, Nevada, Oregon, Utah, Washington	Rocky areas in subalpine and upper montane conifer forest; 2,100-3,200 meters (6,890-10,500 feet)	June-August	Low to moderate; one record reported from Placer County (Howell and Long 1970) and in Sierra Buttes area of Sierra County (Calflora 2007). Much suitable habitat present in property area.
Slender-leaved pondweed *Potamogeton filiformis*	--/--/2.2/FSW	Lassen, Modoc, Sierra, El Dorado, Placer, Mono, Merced, Mariposa, Santa Clara*, and Contra Costa; circumboreal	Freshwater marsh, shallow emergent wetlands; 300-2,150 meters (985-7,054 feet)	May-July	Moderate; known in Placer from a 1931 collection from Mink Harbor, Crystal Bay, Lake Tahoe (CNDDB 2007, UCJEPS) and Packer Lake in Sierra County (Calflora 2007).
White-stemmed pondweed *Potamogeton praelongus*	--/--/2.3/--	Shasta, Sierra, Plumas, Nevada Counties; circumboreal	Marshes and swamps (deep water, lakes); 1,800-3,000 meters (5,904-9,840 feet)	July-August	Moderate; documented occurrence in Sierra County (Mason 1957) and at Catfish Lake near Jackson Meadows in Nevada County (Calflora 2007).

Common Name ***Scientific Name***	**Legal Status[a] Federal/State/ CNPS/USFS**	**Distribution**	**Habitat Associations**	**Flowering Period**	**Potential Occurrence in the Royal Gorge Property Area**
Sierra starwort *Pseudostellaria sierrae*	--/--/3.2/--	Nevada, Placer, El Dorado, Mariposa, and Tuolumne Counties	Chaparral, cismontane woodland, lower and upper montane conifer forest; 1,250-1,970 meters (4,100-6,462 feet)	May-August	Moderate to high; Nevada County occurrences in Grouse Ridge area (Calflora 2007), known in Placer County from Junction Reservoir, expected to be more common (CNDDB 2005). Proposed as a CNPS 1B (CNDDB 2005)
White beaked-rush *Rhynchospora alba*	--/--/2.2/--	Plumas, Nevada*, Mendocino, Mariposa*, and Inyo* Counties; circumboreal	Bogs and fens, meadows and seeps, marshes and swamps (freshwater); 60-2,040 meters (197-6,691 feet)	July-August	Moderate to high; known in Nevada County from collection in Eagle Lakes area (True 1973). Suitable habitat present in spring-fed meadows north of property area and wet meadows of the Royal Gorge property.
Tahoe yellow cress *Rorippa subumbellata*	C/E/1B.1/--	El Dorado, Nevada*, and Placer Counties	Lower montane coniferous forest, meadows on decomposed granitic beaches; 1,895-1,900 meters (6,217-6,233 feet)	May-September	Low; known only from the shores of Lake Tahoe (CNDDB 2007); reported historic occurrences in Truckee area believed extirpated or erroneous (Pavlik et al 2002)
Water bulrush *Scirpus subterminalis*	--/--/2.3/--	Del Norte, Shasta, Trinity, Lassen, Humboldt, Tehama, Butte, Plumas, Nevada, and El Dorado Counties; to Alaska and eastern U.S.	Bogs and fens, marshes and swamps (montane lake margins); 750-2,250 meters (2,460-7,380 feet)	May-September (October)	Moderate to high; documented occurrence at Eagle Lakes (True 1973)

Common Name *Scientific Name*	**Legal Status[a] Federal/State/ CNPS/USFS**	**Distribution**	**Habitat Associations**	**Flowering Period**	**Potential Occurrence in the Royal Gorge Property Area**
Marsh skullcap *Scutellaria galericulata*	--/--/2.2/FSW	El Dorado, Lassen, Modoc, Nevada, Placer, Plumas, Shasta, San Joaquin, and Siskiyou (?) Counties; circumboreal	Lower montane coniferous forest, mesic meadows, marshes; up to 2,100 meters (up to 6,900 feet)	June-September	Moderate to high; known in Nevada County from 1885 collection at "Truckee River" (Calflora 2007), in Placer County from historical record from the vicinity of Truckee, exact location uncertain (CNDDB 2007, UCJEPS); also known from nearby El Dorado County in Tallac Creek and Meeks Creek near Lake Tahoe in Eldorado National Forest. Much suitable habitat present in meadows north of property area and in wet meadow north of Palisade Lake.
Small bur-reed *Sparganium natans*	--/--/4.3/--	El Dorado, Lassen, Placer, Plumas, Shasta, and Tuolumne Counties; circumboreal	Bogs and fens, marshes at lake margins; 1,645-2,500 meters (5,400-8,200 feet)	July-August	Moderate to high; collected at Kyburz Flat north of Truckee (Calflora 2007) and near Agate Bay, north end of Lake Tahoe (UCJEPS).
Munroe's desert mallow *Sphaeralcea munroana*	--/--/2.2/--	Placer County at Squaw Creek; Great Basin states	Great Basin scrub; 2,000 meters (6,560 feet)	May-June	Low; known in California only from a 1922 collection from Squaw Creek, near Tahoe (CNDDB 2007)
Obtuse starwort *Stellaria obtusa*	--/--/4.3/--	Shasta, Lassen, Tehama, Humboldt, Glenn, Plumas, Butte, Sierra, Nevada, and Tuolumne Counties; to British Columbia and east to Colorado and Montana	Riparian woodland, streambanks and mesic areas in lower and upper montane conifer forest; 150-2135 meters (492-7,003 feet)	May-September (October)	Moderate to high; Nevada County occurrences in Grouse Ridge area at Fall Creek (Calflora 2007); may be overlooked
Cusick's speedwell *Veronica cusickii*	--/--/4.3 /FSW	Alpine, Amador, Madera, Mariposa, Placer, Sierra, and Tuolumne Counties; Oregon, Washington, and other states	Alpine boulder and rock field, meadows, subalpine coniferous forest, upper montane coniferous forest; 2,135-3,000 meters (7,000-9,800 feet)	July-August	High; nearby occurrence in the North Fork American River drainage (Calflora 2007, Palmer et al. 1983) and collected near Granite Chief (UCJEPS). Suitable habitat present in property area.

Common Name *Scientific Name*	Legal Status[a] Federal/State/ CNPS/USFS	Distribution	Habitat Associations	Flowering Period	Potential Occurrence in the Royal Gorge Property Area
Woolly violet *Viola tomentosa*	--/--/4.2/FSW	El Dorado, Nevada, Placer, Plumas, and Sierra Counties	Lower montane coniferous forest, subalpine coniferous forest, upper montane coniferous forest on gravelly substrates; 1,435-2,000 meters (4,700-6,560 feet)	May-October	Moderate to high; collected near Emigrant Gap and Big Valley Bluff in Placer County and in Nevada County at Bear Valley, Omega Mine, French Meadows, and Weaver Lake (USFS 2000). Most occurrence at lower elevations than found in property area

[a] Status explanations:

-- = no status definition.

Federal

E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.
C = Candidate

State

-- = no status definition.
E = listed as endangered under the California Endangered Species Act.
R = listed as rare under the California Native Plant Protection Act. This category is no longer used for newly listed plants, but some plants previously listed as rare retain this designation.

California Native Plant Society

1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
2 = List 2 species: rare, threatened, or endangered in California, but more common elsewhere.
3 = List 3 species: plants about which more information is needed to determine their status.
4 = List 4 species: plants of limited distribution – a watch list.

New Threat Code extensions and their meanings:
.1 - Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

USDA Forest Service

FSS = Forest Service Sensitive Plant.
FSW = Tahoe National Forest Watch-list Plant Species.

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Appendix B-3. List of Vascular Plants Potentially Occurring on the Royal Gorge Property

***Taxa shown in bold type are native to California** ; non-native plants are indicated in regular typeface.*

Family	Scientific Name	Common Name
	NON-FLOWERING PLANTS	
	FERNS & FERN ALLIES	
Dennstaedtiaceae		**BRACKEN FAMILY**
	Pteridium aquilinum var. pubescens	bracken fern
Equisetaceae		**HORSETAIL FAMILY**
	Equisetum arvense	horsetail
Isoetaceae		**QUILLWORT FAMILY**
	Isoetes bolanderi	quillwort
	Isoetes occidentalis	western quillwort
Ophioglossaceae		**ADDER'S-TONGUE FAMILY**
	Botrychium multifidum	leathery grape fern
Pteridaceae		**BRAKE FAMILY**
	Chielanthes gracillima	lip fern, lace fern
	Cryptogramma acrostichoides	American parsley fern
	Pellaea bridgesii	Bridge's cliff-brake
	CONIFERS	
Cupressaceae		**CYPRESS FAMILY**
	Calocedrus decurrens	**incense cedar**
	Juniperus occidentalis ssp. australis	Sierra juniper
Pinaceae		**PINE FAMILY**
	Abies concolor	white fir
	Abies magnifica	red fir
	Pinus contorta ssp. murrayana	lodgepole pine
	Pinus jeffreyi	Jeffrey pine
	Pinus monticola	western white pine
	Tsuga mertensiana	mountain hemlock
	FLOWERING PLANTS	
	MONOCOTYLEDONS	
Alismataceae		**WATER-PLANTAIN FAMILY**
	Sagittaria cuneata	arum-leaf arrowhead
Cyperaceae		**SEDGE FAMILY**
	Carex filifolia* var. *erostrata	shorthair sedge
	Carex leporinella	Sierra hare sedge
	Carex microptera	small-winged sedge
	Carex multicostata	many-ribbed sedge
	Carex rossii	Ross' sedge
	Carex utriculata	beaked sedge
	Carex vesicaria* var. *vesicaria	bladder sedge
	Eleocharis pauciflora	few-flowered spikerush
	Scirpus microcarpus	small-fruited bulrush

Family	Scientific Name	Common Name
Juncaceae		**RUSH FAMILY**
	Juncus balticus	Baltic rush
	Juncus ensifolius	swordleaf rush, three-stemmed rush
	Juncus howellii	Howell's rush
	Juncus nevadensis	Sierra rush
	Juncus orthophyllus	straightleaf rush
	Juncus parryi	Parry rush
	Luzula subcongesta	Donner woodrush
Liliaceae		**LILY FAMILY**
	Allium campanulatum	Sierra onion
	Calochortus leichtlinii	Leichtlin's mariposa lily
	Lilium parvum	alpine lily
	Triteleia ixioides ssp. anilina	mountain prettyface
	Veratrum californicum var. californicum	corn lily
Orchidaceae		**ORCHID FAMILY**
Poaceae		**GRASS FAMILY**
	Achnatherum occidentale ssp. californicum	California needlegrass
	Agrostis exarata	spiked bentgrass
	Agrostis pallens	leafy bentgrass
	Agrostis scabra	ticklegrass, rough bentgrass
	Agrostis variabilis	mountain bentgrass
	Bromus carinatus var. carinatus	California brome
	Bromus suksdorfii	suksdorf brome
	Bromus tectorum	cheatgrass
	Calamagrostis breweri	shorthair reedgrass
	Calamagrostis canadensis	bluejoint
	Cinna latifolia	drooping wood reed
	***Danthonia* sp.**	oatgrass
	Deschampsia cespitosa ssp. cespitosa	tufted hairgrass
	Deschampsia danthonioides	annual hairgrass
	Deschampsia elongata	slender hairgrass
	Elymus elymoides* ssp. *elymoides	squirreltail
	Elymus glaucus ssp. glaucus	blue Wildrye
	Hordeum brachyantherum ssp. brachyantherum	meadow barley
	Melica aristata	awned melic
	Muhlenbergia richardsonis	mat muhly
	Panicum acuminatum var. acuminatum	Pacific panic grass
	Poa fendleriana* ssp. *longilgula	mutton grass
	Poa pratensis ssp. pratensis	Kentucky bluegrass
	Poa sierrae	Sierra blue grass
Potamogetonaceae		**PONDWEED FAMILY**
	***Potamogeton* sp. (*P. natans?*)**	grass-leaved pondweed
Typhaceae		**CATTAIL FAMILY**
	***Sparganium* sp. ? (*S. emersum* ?)**	narrowleaf bur-reed

DICOTYLEDONS

Aceraceae		**MAPLE FAMILY**
	Acer glabrum var. ***torreyi***	Torrey's mountain maple

Family	Scientific Name	Common Name
Apiaceae		**CARROT FAMILY**
	Angelica breweri	Brewer's angelica
	Cicuta douglasii	western water hemlock
	Cymopterus terebinthinus	turpentine cymopterus
	Heracleum lanatum	cow parsnip
	Ligusticum grayi	Gray's lovage
	Osmorhiza chilensis **(syn.** ***O. berteroi*** **)**	mountain sweet cicely
	Peridérida bolanderi	Bolander's yampah
	Sanicula graveolens	western sanicle
	Sanicula tuberosa	tuberous sanicle
Apocynaceae		**DOGBANE FAMILY**
	Apocynum androsaemifolium	bitter dogbane
Asteraceae		**SUNFLOWER FAMILY**
	Achillea millefolium	yarrow
	Ageratina occidentalis	western eupatorium
	Anaphalis margaritacea	pearly everlasting
	Antennaria rosea ssp. confinis	rosy pussytoes
	Aster alpigenus var. andersonii **(syn.** ***Oreostemma a. anders***	alpine aster
	Aster eatonii **(syn.** ***Symphyotrichum eatonii)***	Eaton's aster
	Aster integrifolius **(syn.** ***Eurybia integrifolia*** **)**	entire-leaved aster
	Cirsium andersonii	anderson's thistle
	Erigeron miser	starved daisy
	Eriophyllum lanatum **var.** ***integrifolium***	
	Gnaphalium palustre	western marsh cudweed
	Helianthella californica var. nevadensis	California helianthella
	Hieracium albiflorum	white-flowered hawkweed
	Madia minima	dwarf madia
	Senecio integerrimus	tower butterweed
	Senecio integerrimus var. major	lambstongue ragwort
	Senecio triangularis	arrowhead butterweed
	Solidago canadensis ssp. elongata	Canada goldenrod
	Wyethia mollis	woolly mule's-ears
Betulaceae		**BIRCH FAMILY**
	Alnus incana ssp. tenuifolia	mountain alder
Boraginaceae		
	Hackelia **sp.**	stickseed
Brassicaceae		**MUSTARD FAMILY**
	Arabis drummondii	Drummond's rock-cress
	Rorippa curvisiliqua	western yellow cress
	Streptanthus tortuosus	mountain jewelflower
Cabombaceae		**WATER-SHIELD FAMILY**
	Brasenia schreberi	water shield
Caprifoliaceae		**HONEYSUCKLE FAMILY**
	Lonicera conjugialis	double honeysuckle
Caryophyllaceae		**PINK FAMILY**
	Arenaria kingii var. glabrescens **(syn.** ***Eremogone kingii*** **)**	King's smooth sandwort
Cornaceae		**DOGWOOD FAMILY**
	Cornus sericea ssp. sericea	red twig dogwood

Family	Scientific Name	Common Name
Crassulaceae		**STONECROP FAMILY**
	Sedum obtusatum ssp. obtusatum	Sierra stonecrop
Ericaceae		**HEATH FAMILY**
	Arctostaphylos nevadensis	pinemat manzanita
	Arctostaphylos patula	greenleaf manzanita
	Ledum glandulosum	western Labrador tea
	Orthilia secunda	One-sided wintergreen
	Phyllodoce breweri	Brewer's mountain heather
	Pterospora andromedea	pine drops
	Pyrola asarifolia ssp. asarifolia	bog wintergreen
	Pyrola picta	white-veined wintergreen
	Sarcodes sanguinea	snow plant
	Vaccinium caespitosum	dwarf bilberry
	Vaccinium uliginosum ssp. occidentale	western blueberry
Fabaceae		**LEGUME FAMILY**
	***Lupinus* sp. (*L. fulcratus*?)**	lupine
	Lupinus polyphyllus var. burkei	meadow lupine
	Trifolium longipes	long-stalked clover
Fagaceae		**OAK FAMILY**
	Quercus vaccinifolia	huckleberry Oak
Geraniaceae		**GERANIUM FAMILY**
	Geranium richardsonii	Richardson's geranium
Grossulariaceae		**GOOSEBERRY FAMILY**
	Ribes roezlii var. roezlii	Sierra gooseberry
	Ribes viscosissimum* var. *Hallii	sticky currant
Haloragaceae		**WATER-MILFOIL FAMILY**
	Myriophyllum sibiricum	Siberian water-milfoil
Hydrophyllaceae		**WATERLEAF FAMILY**
	Nama lobbii	Lobb's nama
	Phacelia hastata ssp. compacta	timberline phacelia
	Phacelia hydrophylloides	waterleaf phacelia
Hypericaceae		**ST. JOHN'S WORT FAMILY**
	Hypericum anagalloides	Tinker's penny
Lamiaceae		**MINT FAMILY**
	Agastache urticifolia	horse-mint
	Monardella odoratissima ssp. pallida	pallid mountain monardella
	Scutellaria californica	California skullcap
Malvaceae		**MALLOW FAMILY**
	Sidalcea glaucescens	glaucous checker-mallow
	Sidalcea oregana ssp. spicata	Oregon checker mallow
Nympaeaceae		**WATERLILY FAMILY**
	Nuphar luteum ssp. polysepalum	cow lily, yellow pond-lily
Onagraceae		**EVENING-PRIMROSE FAMILY**
	Epilobium angustifolium ssp. circumvagum	fireweed
	Epilobium canum ssp. latifolium	California fuchsia
	Epilobium ciliatum ssp. ciliatum	fringed willow herb
	Epilobium oregonense	Oregon willow herb
	***Gayophytum* sp.**	groundsmoke

Family	Scientific Name	Common Name
Polemoniaceae		**PHLOX FAMILY**
	Linanthus ciliatus	whisker brush
	Phlox diffusa	spreading phlox
	Polemonium californicum	Jacob's ladder, California polemonium
Polygonaceae		**BUCKWHEAT FAMILY**
	Eriogonum lobbii* var. *lobbii	Lobb's buckwheat
	Eriogonum umbellatum var. polyanthum	many-flowered sulfur buckwheat
	Eriogonum wrightii* ssp. *subscaposum	Wright's buckwheat
	Polygonum douglasii	Douglas' knotweed
	Polygonum phytolaccifolium	alpine knotweed
	Rumex salicifolius	triangular-fruited dock
Portulacaceae		**PURSLANE FAMILY**
	Calyptridium umbellatum	pussypaws
	Lewisia kelloggii* ssp. *hutchisonii	Hutchison's lewisia
Ranunculaceae		**BUTTERCUP FAMILY**
	Aconitum columbianum	monkshood
	Aquilegia formosa	western columbine
	Ranunculus aquatilus var. capillaceus	water buttercup
	Thalictrum fendleri	Fendler's meadow rue
Rhamnaceae		**BUCKTHORN FAMILY**
	Ceanothus cordulatus	mountain whitethorn
Rosaceae		**ROSE FAMILY**
	Amelanchier utahensis	pale-leaved serviceberry
	Holodiscus microphyllus var. microphyllus	rock spiraea, little-leaf creambush
	Horkelia fusca	dusky horkelia
	Potentilla glandulosa ssp. nevadensis	Nevada cinquefoil
	Potentilla gracilis	five-finger cinquefoil
	Prunus emarginata	bitter cherry
	Rubus parviflorus	thimbleberry
	Spiraea densiflora	mountain spiraea
Rubiaceae		**MADDER FAMILY**
	Galium triflorum	sweet-scented bedstraw
Salicaceae		**WILLOW FAMILY**
	Populus balsamifera ssp. trichocarpa	black cottonwood
	Populus tremuloides	quaking aspen
	Salix lemmonii	Lemmon's willow
	Salix scouleriana	Scouler's willow
Saxifragaceae		**SAXIFRAGE FAMILY**
	Heuchera rubescens var. glandulosa	pink alumroot
	***Saxifraga* sp. (*S. oregana or bryophora* ?)**	streambank saxifrage
Scrophulariaceae		**FIGWORT FAMILY**
	***Castilleja* sp.**	paintbrush
	Mimulus guttatus (or M. tillingii ?)	seep-spring monkeyflower
	Mimulus primuloides	primrose monkeyflower
	Pedicularis attollens	little elephants head
	Pedicularis semibarbata	dwarf lousewort, pinewoods lousewort
	Penstemon azureus	azure penstemon
	Penstemon newberryi var. newberryi	mountain pride, Newberry's penstemon
	Penstemon rydbergii var. oreocharis	meadow penstemon, Rydberg's penstemon
Violaceae		**VIOLET FAMILY**
	Viola adunca	western dog violet
Viscaceae		**MISTLETOE FAMILY**
	Arceuthobium abietinum	fir dwarf mistletoe

Appendix B-4. Vertebrate Species with Known or Potential Occurrence at the Royal Gorge Property, Nevada and Placer counties, CA. *(See footnote at bottom for the status codes).*

Family/Common Name	Scientific Name
FISHES	
Trout (*Salmonidae*)	
Rainbow Trout (I)	*Oncorhynchus mykiss irideus*
Brown Trout (I)	*Salmo trutta*
Eastern Brook Trout (I)	*Salvelinus fontinalis*
Yellow Perch (I)	*Perca flavescens*
Bullhead Catfish (I)	*Ameiurus* sp.
AMPHIBIANS	
True Toads (*Bufonidae*)	
Western Toad	*Bufo boreas*
Chorus Frogs (*Hylidae*)	
Pacific Chorus Frog	*Pseudacris regilla*
True Frogs (*Ranidae*)	
Sierra Nevada Yellow-legged Frog (?)	*Rana sierrae*
Mole Salamanders *(Ambystomidae)*	
Long-toed Salamander (?)	*Ambystoma macrodactylum*
REPTILES	
Iguanids (*Phrynosomatidae*)	
Western Fence Lizard	*Sceloporus occidentalis*
Skinks (*Scincidae*)	
Western Skink (?)	*Eumeces skiltonianus*
Boas (*Boidae*)	
Rubber Boa	*Charina bottae*
Colubrids (*Colubridae*)	
Gopher Snake	*Pituophis melanoleucus*
California Mountain Kingsnake (?)	*Lampropeltis zonata*
Common Garter Snake (?)	*Thamnophis sirtalis*
Western Terrestrial Garter Snake	*Thamnophis elegans*
Western Aquatic Garter Snake	*Thamnophis couchi*
Vipers (*Viperidae*)	
Western Rattlesnake (?)	*Crotalus viridis*
BIRDS	
Waterfowl (*Anatidae*)	
Canada Goose	*Branta canadensis*
Mallard	*Anas platyrhynchos*
Ring-necked Duck	*Aythya collaris*
Bufflehead	*Bucephala albeola*
Common Goldeneye	*Bucephala clangula*
Common Merganser	*Mergus merganser*
Quail (*Odontophoridae*)	
Mountain Quail	*Oreortyx pictus*

Family/Common Name	Scientific Name
Grouse (*Phasianidae*)	
Sooty Grouse	*Dendragapus fuliginosus*
Herons and Egrets (*Ardeidae*)	
Great Blue Heron	*Ardea herodias*
Great Egret (?)	*Ardea alba*
New World Vultures (*Cathartidae*)	
Turkey Vulture	*Cathartes aura*
Osprey *(Pandionidae)*	
Osprey	*Pandion haliaetus*
Hawk and Eagles (*Accipitridae*)	
Bald Eagle	*Haliaeetus leucocephalus*
Sharp-shinned Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperii*
Northern Goshawk	*Accipiter gentilis*
Red-tailed Hawk	*Buteo jamaicensis*
Golden Eagle	*Aquila chrysaetos*
Falcons (*Falconidae*)	
American Kestrel	*Falco sparverius*
Merlin	*Falco columbarius*
Peregrine Falcon	*Falco peregrinus*
Prairie Falcon	*Falco mexicanus*
Plovers (*Charadriidae*)	
Killdeer	*Charadrius vociferus*
Sandpipers (*Scolopacidae*)	
Spotted Sandpiper	*Actitis macularia*
Pigeons (*Columbidae*)	
Band-tailed Pigeon	*Columba fasciata*
Typical Owls (*Strigidae*)	
Western Screech-Owl (?)	*Megascops kennicottii*
Great Horned Owl	*Bubo virginianus*
Northern Pygmy-Owl (?)	*Glaucidium gnoma*
Spotted Owl (?)	*Strix occidentalis*
Northern Saw-Whet Owl (?)	*Aegolius acadicus*
Nighthawks (*Caprimulgidae*)	
Common Nighthawk	*Chordeiles minor*
Common Poorwill (?)	*Phalaenoptilus nuttallii*
Swifts (*Apodidae*)	
Black Swift (?)	*Cypseloides niger*
Vaux's Swift	*Chaetura vauxi*
White-throated Swift	*Aeronautes saxatalis*
Hummingbirds (*Trochilidae*)	
Anna's Hummingbird	*Calypte anna*
Calliope Hummingbird	*Stellula calliope*
Rufous Hummingbird	*Selasphorus rufus*

Family/Common Name	Scientific Name
Kingfishers (*Alcedinidae*)	
Belted Kingfisher	*Megaceryle alcyon*
Woodpeckers (*Picidae*)	
Red-breasted Sapsucker	*Sphyrapicus ruber*
Williamson's Sapsucker	*Sphyrapicus thyroideus*
Hairy Woodpecker	*Picoides villosus*
White-headed Woodpecker (?)	*Picoides albolarvatus*
Black-backed Woodpecker	*Picoides arcticus*
Northern (Red-shafted) Flicker	*Colaptes auratus*
Pileated Woodpecker (?)	*Dryocopus pileatus*
Tyrant Flycatchers (*Tyrannidae*)	
Olive-sided Flycatcher	*Contopus cooperi*
Western Wood-Pewee	*Contopus sordidulus*
Willow Flycatcher	*Empidonax traillii*
Hammond's Flycatcher	*Empidonax hammondii*
Dusky Flycatcher	*Empidonax oberholseri*
Vireos (*Vireonidae*)	
Cassin's Vireo	*Vireo cassinii*
Hutton's Vireo (?)	*Vireo huttoni*
Warbling Vireo	*Vireo gilvus*
Jays, Magpies and Crows (*Corvidae*)	
Steller's Jay	*Cyanocitta stelleri*
Clark's Nutcracker	*Nucifraga columbiana*
Common Raven	*Corvus corax*
Swallows (*Hirundinidae*)	
Tree Swallow	*Tachycineta bicolor*
Violet-green Swallow	*Tachycineta thalassina*
Cliff Swallow	*Petrochelidon pyrrhonota*
Barn Swallow	*Hirundo rustica*
Chickadees and Titmice (*Paridae*)	
Chestnut-backed Chickadee (?)	*Poecile rufescens*
Mountain Chickadee	*Poecile gambeli*
Bushtits (*Aegithalidae*)	
Bushtit (?)	*Psaltriparus minimus*
Nuthatches (*Sittidae*)	
Red-breasted Nuthatch	*Sitta canadensis*
White-breasted Nuthatch	*Sitta carolinensis*
Creepers (*Certhiidae*)	
Brown Creeper	*Certhia americana*
Wrens (*Troglodytidae*)	
House Wren	*Troglodytes aedon*
Winter Wren	*Troglodytes troglodytes*
Dippers (*Cinclidae*)	
American Dipper (?)	*Cinclus mexicanus*

Family/Common Name	Scientific Name
Kinglets (*Regulidae*)	
Golden-crowned Kinglet	*Regulus satrapa*
Ruby-crowned Kinglet	*Regulus calendula*
Thrushes (*Turdidae*)	
Western Bluebird (?)	*Sialia mexicana*
Mountain Bluebird	*Sialia currucoides*
Townsend's Solitaire	*Myadestes townsendi*
Hermit Thrush	*Catharus guttatus*
American Robin	*Turdus migratorius*
Varied Thrush (?)	*Ixoreus naevia*
Wood-Warblers *(Parulidae)*	
Orange-crowned Warbler	*Oreothlypis celata*
Nashville Warbler	*Oreothlypis ruficapilla*
Yellow Warbler	*Setophaga petechia*
Yellow-rumped Warbler	*Setophaga coronata*
Black-throated Gray Warbler	*Setophaga nigrescens*
Townsend's Warbler	*Setophaga townsendi*
Hermit Warbler	*Setophaga occidentalis*
Wilson's Warbler	*Cardellina pusilla*
Towhees and Sparrows (*Emberizidae*)	
Green-tailed Towhee	*Pipilo chlorurus*
Spotted Towhee	*Pipilo maculatus*
Chipping Sparrow	*Spizella passerina*
Fox Sparrow	*Passerella iliaca*
Song Sparrow	*Melospiza melodia*
Mountain White-crowned Sparrow	*Zonotrichia leucophrys oriantha*
Dark-eyed Junco	*Junco hyemalis*
Tanagers, Grosbeaks, and Buntings (*Cardinalidae*)	
Western Tanager	*Piranga ludoviciana*
Black-headed Grosbeak	*Pheucticus melanocephalus*
Lazuli Bunting (?)	*Passerina amoena*
Blackbirds and Relatives (*Icteridae*)	
Red-winged Blackbird	*Agelaius phoeniceus*
Western Meadowlark	*Sturnella neglecta*
Brown-headed Cowbird	*Molothrus ater*
Bullock's Oriole (?)	*Icterus bullockii*
Finches (*Fringillidae*)	
Pine Grosbeak	*Pinicola enucleator*
Purple Finch	*Carpodacus purpureus*
Cassin's Finch	*Carpodacus cassinii*
Red Crossbill	*Loxia curvirostra*
Pine Siskin	*Spinus pinus*
Lesser Goldfinch (?)	*Spinus psaltria*
Evening Grosbeak	*Coccothraustes vespertinus*

Family/Common Name	Scientific Name
MAMMALS	
Shrews (*Soricidae*)	
Vagrant Shrew	*Sorex vagrans*
Trowbridge's Shrew (?)	*Sorex trowbridgii*
Water Shrew (?)	*Sorex palustris*
Moles (*Talpidae*)	
Broad-footed Mole	*Scapanus latimanus*
Vespertilionid Bats (*Vespertilionidae*)	
Little Brown Myotis (?)	*Myotis lucifugus*
California Myotis (?)	*Myotis californicus*
Yuma Myotis (?)	*Myotis yumanensis*
Long-eared Myotis (?)	*Myotis evotis*
Fringed Myotis (?)	*Myotis thysanodes*
Big Brown Bat (?)	*Eptesicus fuscus*
Hoary Bat (?)	*Lasiurus cinereus*
Pikas (*Ochotonidae*)	
Pika (?)	*Ochotona princeps*
Rabbits (*Leporidae*)	
Snowshoe Hare	*Lepus americanus*
Mountain Beaver (*Aplodontidae*)	
Sierra Nevada Mountain Beaver (?)	*Aplodontia rufa californica*
Squirrels, Chipmunks and Marmots (*Sciuridae*)	
Yellow-pine Chipmunk (?)	*Tamias amoenus*
Allen's Chipmunk (?)	*Tamias senex*
Long-eared Chipmunk (?)	*Tamias quadrimaculatus*
Lodgepole Chipmunk	*Tamias speciosus*
Yellow-bellied Marmot	*Marmota flaviventris*
California Ground Squirrel	*Spermophilus beecheyi*
Golden-mantled Ground Squirrel	*Spermophilus lateralis*
Douglas' Squirrel	*Tamiasciurus douglasii*
Northern Flying Squirrel	*Glaucomys sabrinus*
Pocket Gophers (*Geomyidae*)	
Mountain Pocket Gopher	*Thomomys monticola*
Mice, Voles, and relatives (*Cricetidae*)	
Brush Mouse	*Peromyscus boylii*
Deer Mouse	*Peromyscus maniculatus*
Bushy-tailed Woodrat	*Neotoma cinerea*
Montane Vole	*Microtus montanus*
Jumping Mice (*Zapodidiae*)	
Western Jumping Mouse (?)	*Zapus princeps*
New World Porcupines (*Erethizontidae*)	
Porcupine	*Erethizon dorsatum*

Family/Common Name	Scientific Name
Foxes, Wolves and relatives (*Canidae*)	
Coyote	*Canis latrans*
Gray Fox (?)	*Urocyon cineroargenteus*
Bears (*Ursidae*)	
Black Bear	*Ursus americanus*
Weasels, Badgers, and relatives (*Mustelidae*)	
American Marten	*Martes americana*
Pacific Fisher (?)	*Martes pennanti*
Long-tailed Weasel	*Mustela frenata*
Wolverine (?)	*Gulo gulo*
American Badger (?)	*Taxidea taxus*
Striped Skunk (?)	*Mephitis mephitis*
Cats (*Felidae*)	
Mountain Lion	*Felis concolor*
Bobcat	*Lynx rufus*
Deer (*Cervidae*)	
Mule Deer	*Odocoileus hemionus*

Status Codes :

(I) = Introduced species that is not native to high elevations of Nevada and Placer counties.

(?) = Status at the Royal Gorge property uncertain; suitable habitat present and confirmed sightings within the Headwaters Basin of the North Fork American River, but no apparently no photo or specimen records available.

Compiled by Ted Beedy, Ph.D. 8/30/12

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