

BOTANICAL FIELD RECONNAISSANCE REPORT

Lake Tahoe Basin Management Unit

Project: Burke Creek Highway 50 Crossing and Realignment Project FACTS ID:

Location: portions of SEC 22 and SEC 23 T13 N R18 E **UTM:**

Survey Dates: 5/13/, 6/25, 8/12/2015

Surveyor/s: Jacquelyn Picciani for Wood Rodgers

Directions to Site:

Access to the west portion of Burke Creek is gained by turning west on Kahle Drive, and parking in the defined parking lot. Access to the east portion of Burke Creek is gained by turning east on Kahle Drive and parking to the north in the adjacent commercial development parking area.

USGS Quad Name: South Lake Tahoe

Survey type: General and Intuitive Controlled

Describe survey route taken: Survey area includes all road shoulders and right-of-way within the proposed project boundaries, a commercial development on east side of US Highway 50 just north of Kahle Drive, and portions of the Burke Creek/Rabe Meadows complex (Figure 1).

Project description:

The project area includes open space administered by Nevada Tahoe Conservation District and the USFS, and commercial development, with the majority of the project area sloping west to Lake Tahoe. The Nevada Tahoe Conservation District is partnering with USFS, Nevada Department of Transportation (NDOT), Douglas County and the Nevada Division of State Lands to implement the Burke Creek Highway 50 Crossing and Realignment Project (Project). The project area spans from Jennings Pond in Rabe Meadow to the eastern boundary of the Sierra Colina Development in Lake Village. Burke Creek flows through five property ownerships in the project area including the USFS, private (Sierra Colina and 801 Apartments LLC), Douglas County and NDOT. The Project proposes to reduce the size of the adjacent commercial parking lot; improve conveyance capacity at HWY 50; improve stream and riparian habitat; increase stream connectivity to the floodplain; and treat stormwater runoff. The stream restoration, floodplain enhancement and stormwater treatment components of this project will reduce fine-grained sediment transport and reduce nutrient discharge to Lake Tahoe.

The Project will be designed and implemented in two phases. Phase I will install a geomorphically appropriate crossing under HWY 50, remove a portion of the parking lot for restoration of the floodplain and stream channel, spot treat headcuts upstream of HWY 50 and install additional conveyance improvements along HWY 50. Phase IIa will construct NDOT stormwater conveyance improvements and treatments on USFS land. Phase IIb will realign Burke Creek directly downstream of HWY 50 on USFS land. These improvements will eliminate the discharge of untreated stormwater to Burke Creek thereby reducing the transport of FSP, P and N to Lake Tahoe. The Project is expected to increase the water quality of Burke Creek.

Proposed improvements include the following:

Burke Creek Upstream of HWY 50

- Decommission approximately 12,000 square feet of commercial parking lot, recently acquired by Douglas County, adjacent to Burke Creek that is currently located within the historic floodplain;
- Abandon 230 feet of Burke Creek from its current location on the hillside levee and reconstruct approximately 250 feet of geomorphically stable channel within its historic floodplain located in the commercial parking to be decommissioned. The channel/floodplain design will include features to ensure protection of adjacent private properties; and
- Utilize revegetation, minor reshaping, and/or rock/log structures to restore relatively short lengths of head cuts, entrenchment and floodplain pinching along 400 feet of Burke Creek upstream of the section to be relocated.

HWY 50

- Install a culvert capable of passing 50 year Burke Creek stream flows (94 cubic feet per second). The new culvert will be approximately 100 feet long, compared to the existing which is 300 feet.
- Install storm water conveyance improvements along HWY 50 adjacent to Lake Village and the Professional Building;

- Construct two storm water treatment basins of approximately 900 square feet and 325 square feet respectively, on the west side of HWY 50; and
- Readjust the easement adjacent to HWY 50 to encompass all storm water treatment and conveyance infrastructure.

Burke Creek Downstream of HWY 50

- Abandon and recontour 500 feet of existing unstable channel and replace with approximately 500 feet of new geomorphically stable channel, to tie into the new HWY 50 stream crossing;
- Possibly remove willows and other stream vegetation from the decommissioned channel and replant along the new channel edge; and
- Design features would be incorporated to minimize adverse impacts to other resources during implementation including but not limited to: temporary water quality protection, recreation use and recreation infrastructure, HWY 50 traffic flow during construction, wildlife habitat, spread of invasive plants, and historic resources.

Describe habitat/s: Type, Plant series, plant associations, unique features, etc:

Stateline inclusive of the project area has been subjected to human-induced influences, which have resulted in changes to hydrologic and vegetative attributes. Influences are associated with timber extraction dating back to the Comstock era, and accelerated residential and commercial development from the 20th century to the present that altered the historic alignment of Burke Creek. Vegetation within the project area is distributed along an elevational gradient reflecting current area hydrology and soils. The surrounding uplands are characterized by second growth Jeffrey pine (*Pinus jeffreyi*) forest, with some white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*) and ponderosa pine (*P. ponderosa*) additional overstory associates. The montane shrub understory varies from sparse to solid stands within the forest, and is represented by antelope bitterbrush (*Purshia tridentata*), snowbrush (*Ceanothus velutinus*), whitethorn (*C. cordulatus*), greenleaf manzanita (*Arctostaphylos patula*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), and rubber rabbitbrush (*Ericameria nauseosa*). Occasional ground cover is provided by squawcarpet (*Ceanothus prostratus*) and bitter dogbane (*Apocynum androsaemifolium*), while common herbaceous species present in the understory include seeded wheatgrasses, California brome (*Bromus carinatus*) and bluegrasses (*Poa* spp). A few flowering natives observed include silver lupine (*Lupinus argenteus* var. *heteranthus*) and woolly mule's ears (*Wyethia mollis*).

Riparian vegetation adjacent to Burke Creek, another perennial stream and the pond, is dominated by quaking aspen (*Populus tremuloides*), mountain alder (*Alnus incana* ssp. *tenuifolia*), black cottonwood (*Populus trichocarpa*), Scouler's and Pacific willow (*Salix scouleriana* and *S. lasiandra* ssp. *caudata*). Dense to sparse shrub cover is provided by Lemmon's, coyote and arroyo willow (*S. lemmonii*, *S. exigua* and *S. lasiolepis*), redosier dogwood (*Cornus sericea* ssp. *sericea*) and Sierra current (*Ribes nevadense*). The herbaceous understory varies from completely absent to evident and includes patches of smallfruit bulrush (*Scirpus microcarpus*), bigleaf and Nebraska sedge (*Carex amplifolia* and *C. nebrascensis*), woolly sedge (*Carex pellita*), three-stamen rush (*Juncus ensifolius*), tall mannagrass (*Glyceria elata*), cow parsnip (*Heracleum maximum*) and big leaf avens (*Geum macrophyllum*). Two moss species, *Philonitis americana* and *Drepanocladus aduncus*, were found growing on the saturated soil surface of wetland/open meadow adjacent to Burke Creek by the pond. Baltic rush (*J. arcticus*), creeping wildrye (*Leymus triticoides*), and horsetails (*Equisetum hymale* and *E. arvense*) are present on the drier margins of these habitats.

Dry and somewhat disturbed meadow is adjacent to the parking lot area and on the north side of Burke Creek, west of US Highway 50. Typical graminoids include cheatgrass (*Bromus tectorum*), California brome, other brome species (*Bromus* spp.), intermediate wheatgrass (*Thinopyrum intermedium*), Idaho fescue (*Festuca idahoensis*), dense silkybent (*Apera interrupta*) and bluegrasses (*Poa* spp.). Common herbs observed include common yarrow (*Achillea millefolium*), tall annual willowherb (*Epilobium brachycarpum*), curlycup gumweed (*Grindelia squarrosa*), with some annual cover provided by spring draba (*Draba verna*) and blue-eyed Mary (*Collinsia parviflora*). Occasional rubber rabbitbrush is also present providing some shrub cover.

Ruderal vegetation is present on the disturbed soils of road shoulders and portions of the meadow are adjacent to the parking area that host opportunistic and for the most part annual plant species that take advantage of little competition, as well as native colonizers. Commonly observed grasses include bulbous bluegrass (*Poa bulbosa*) and cheatgrass. Flowering plants include sweetclover (*Melilotus officinalis*), common yarrow, tall annual willowherb, curlycup

gumweed, pepperweeds (*Lepidium virginicum* and *L. perfoliatum*), prickly lettuce (*Lactuca serriola*), sand bursage (*Ambrosia acanthioides*), lambsquarters (*Chenopodium album*), yard knotweed (*Polygonum aviculare*), and tumble mustard (*Sisymbrium altissimum*). Common native shrub colonizers include rubber rabbitbrush and mountain big sagebrush. One moss species, *Grimmia alpestris*, was found on granite boulders on the east side of US Highway 50 in this habitat.

Dbh (Give the range for dominant tree types): N/A

Slope/s (range): 2 – 11% **Aspect/s (range):** all **Elevation (range):** 6286-6386'

Seral Stage: early to mid **Soil/Bedrock:** granitic, sandy soil

Disturbance (type and intensity visible in area):

This project is situated within a previously altered riparian/ meadow complex, with adjacent commercial development, roads and highway. The proposed project will be located on existing paved roadways and parking lots, vegetated, paved and/or bare road shoulders, and existing meadow and riparian habitat.

Are there historical populations in the area of this project? No

Were listed species found for this survey?

No. Three moss specimens were collected and sent to a bryologist, David Toren for positive identification. These were identified as *Philonotis americana* and *Drepanocladus aduncus*, common to wet meadows and *Grimmia alpestris* as commonly occurring on exposed rocks at moderate to high elevations.

Noxious Weeds found in Area:

Two locations of the Nevada Category A Noxious Weed *Hypericum perforatum* were encountered: one plant in the parking lot on the east side of US Highway 50, and one plant just east of Jennings Pond on the west side of US Highway 50. *Cirsium vulgare*, a Lake Tahoe Basin Weeds Coordination Group Group 2 species, was encountered at several locations, as was *Verbascum thapsus*. The invasive species *Bromus tectorum* was found throughout the project area on road shoulders and parking strips. Please see the accompanying *Invasive Plant Risk Assessment* for more details.

Recommendations/Additional Comments:

See attached area species list and map with survey area.

Potential for Suitable Habitat of Listed Species

Sensitive Species	Unsuitable	Suitable
<i>Boechera rigidissima</i>	x	
<i>Boechera tiehmii</i>	x	
<i>Boechera tularensis</i>	x	
<i>Botrychium ascendens</i>		x
<i>Botrychium crenulatum</i>		x
<i>Botrychium lineare</i>		x
<i>Botrychium lunaria</i>		x
<i>Botrychium minganense</i>		x
<i>Botrychium montanum</i>		x
<i>Bruchia bolanderi</i>		x
<i>Dendrocollybia racemosa</i>	x	
<i>Draba asterophora</i> var. <i>asterophora</i>	x	
<i>Draba asterophora</i> var. <i>macrocarpa</i>	x	
<i>Draba crucinata</i>	x	
<i>Erigeron miser</i>		x
<i>Eriogonum umbellatum</i> var. <i>torreyanum</i>	x	
<i>Helodium blandowii</i>		x
<i>Hulsea brevifolia</i>	x	
<i>Ivesia sericoleuca</i>	x	
<i>Lewisia kelloggii</i> ssp. <i>hutchisonii</i>	x	
<i>Lewisia kelloggii</i> ssp. <i>kelloggii</i>	x	
<i>Lewisia longipetala</i>	x	
<i>Meesia uliginosa</i>		x
<i>Orthotrichum praemorsum</i>	x	
<i>Peltigera gowardi</i>		x
<i>Pinus albicaulis</i>	x	
<i>Rorippa subumbellata</i>	x	
LTBMU Watch	Unsuitable	Suitable
<i>Boechera rectissima</i>		x
<i>Carex davyi</i>	x	
<i>Chaenactis douglassi</i> v. <i>alpina</i>	x	
<i>Claytonia megarhiza</i>	x	
<i>Cryptantha crymophila</i>	x	
<i>Epilobium palustre</i>		x
<i>Meesia longiseta</i>		x
<i>Myurella julacea</i>	x	
<i>Orthotrichum holzingeri</i>	x	
<i>Orthotrichum spjutii</i>	x	
<i>Pohlia tundrae</i>	x	
<i>Sphagnum species</i>		x
<i>Tomentypnum nitens</i>	x	

Burke Creek HWY 50 Crossing and Realignment Project

Plant Species List 2015

Family	Scientific Name	Common Name
Amblystegineaceae	<i>Drepanocladus aduncus</i>	moss
Apiaceae	<i>Berula erecta</i>	cutleaf waterparsnip
	<i>Heracleum maximum (H. lanatum)</i>	cow parsnip
	<i>Osmorhiza occidentalis</i>	sweet anise
Apocynaceae	<i>Apocynum androsaemifolium</i>	spreading dogbane
Asteraceae	<i>Achillea millefolium</i>	common yarrow
	<i>Agoseris glauca</i>	pale agoseris
	<i>Ambrosia acanthicarpa</i>	sand bursage
	<i>Arnica lanceolata ssp. prima</i>	streamside arnica
	<i>Artemisia douglasiana</i>	mugwort
	<i>Artemesia tridentata ssp. vaseyana</i>	mountain sagebrush
	<i>Cichorium intybus</i>	chicory
	<i>Cirsium vulgare</i>	bull thistle
	<i>Conyza canadensis</i>	Canadian horseweed
	<i>Ericameria nauseosa ssp. nauseosa</i>	rubber rabbitbrush
	<i>Grindelia squarrosa var. serrulata</i>	curlycup gumweed
	<i>Hypochaeris radicata</i>	spotted cat's-ear
	<i>Lactuca serriola</i>	prickly lettuce
	<i>Sonchus asper</i>	spiny sowthistle
	<i>Madia glomerata</i>	mountain tarweed
	<i>Symphotrichum ascendens</i>	western aster
<i>Taraxacum officinale</i>	common dandelion	
<i>Tragopogon dubius</i>	goatsbeard	
<i>Wyethia mollis</i>	wooly mule's ears	
Bartramiaceae	<i>Philonitis americana</i>	moss
Betulacaceae	<i>Alnus incana ssp. tenuifolia (A. tenuifolia)</i>	mountain alder
	<i>Betula occidentalis/or escaped ornamental</i>	water birch white birch?
Boraginaceae	<i>Cryptantha affinis</i>	quill cryptantha
	<i>Phacelia heterophylla ssp. virgata</i>	varileaf phacelia
Brassicaceae	<i>Boechera pinetorum</i>	woodland rockcress
	<i>Boechera platysperma</i>	pioneer rockcress
	<i>Descurainia californica</i>	Sierra tansymustard
	<i>Descurainia sophia</i>	herb sophia
	<i>Draba verna</i>	spring draba
	<i>Lepidium perfoliatum</i>	clasping pepperweed
	<i>Lepidium virginicum</i>	Virginia pepperweed
	<i>Rorippa nastursium-aquaticum</i>	watercress
Chenopodiaceae	<i>Sisymbrium altissimum</i>	tall tumble mustard
	<i>Chenopodium album</i>	lambquarters
	<i>Chenopodium sp.</i>	annual goosefoot
Clusiaceae	<i>Salsola sp.</i>	Russian thistle
	<i>Hypericum perforatum</i>	common St. Johnswort
	<i>Hypericum scouleri ssp. scouleri</i>	Scouler's St. Johnswort
Convolvulaceae	<i>Convolvulus arvensis</i>	field bindweed
Cornaceae	<i>Cornus sericea ssp. sericea (C. alba)</i>	redosier dogwood
Cyperaceae	<i>Carex amplifolia</i>	big-leaf sedge
	<i>Carex deweyana ssp. leptopoda (C. leptopoda)</i>	short-scale sedge

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Plant Species List 2015

Family	Scientific Name	Common Name
Cyperaceae	<i>Carex douglasii</i>	Douglas' sedge
	<i>Carex fracta</i> (<i>C. amplexans</i>)	fragile-sheathed sedge
	<i>Carex nebrascensis</i>	Nebraska sedge
	<i>Carex illiota</i>	sheep sedge
	<i>Carex pellita</i>	woolly sedge
	<i>Carex phaeocephala</i>	mountain hare sedge
	<i>Carex praeceptorum</i>	early sedge
	<i>Carex rossii</i>	Ross' sedge
	<i>Scirpus microcarpus</i>	smallfruit bulrush
Ericaceae	<i>Arctostaphylos patula</i>	green-leaf manzanita
	<i>Pyrola asarifolia</i> ssp. <i>asarifolia</i>	bog wintergreen
	<i>Sarcodes sanguinea</i>	snow plant
Equisetaceae	<i>Equisetum arvense</i>	field horsetail
Fabaceae	<i>Acmispon americanus</i> var. <i>americanus</i>	Spanish clover
	<i>Lathyrus latifolius</i>	everlasting pea
	<i>Lupinus argenteus</i>	silvery lupine
	<i>Lupinus grayi</i>	Gray's lupine
	<i>Lupinus polyphyllus</i>	bigleaf lupine
	<i>Medicago lupulina</i>	black medic
	<i>Mellilotus officinalis</i>	sweetclover
Gentianaceae	<i>Zelterna venusta</i> (<i>Centaureum venustum</i>)	charming centaury
Geraniaceae	<i>Erodium cicutarium</i>	filaree
Grimmiaceae	<i>Grimmia alpestris</i>	moss
Grossulariaceae	<i>Ribes nevadense</i>	Sierra currant
Iridaceae	<i>Iris missouriensis</i>	Rocky Mountain iris
Juncaceae	<i>Juncus arcticus</i> (<i>J. balticus</i> ssp. <i>ater</i>)	Baltic rush
	<i>Juncus ensifolius</i>	three-stamen rush
	<i>Juncus nevadensis</i>	Sierra rush
Lamiaceae	<i>Mentha arvensis</i>	wild mint
Lemnaceae	<i>Lemna</i> sp.	duckweed
Linaceae	<i>Linum perrene</i>	blue flax
Malvaceae	<i>Sidalcea oregana</i>	Oregon checkermallow
Montiaceae	<i>Montia linearis</i>	narrowleaf minerslettuce
Onagraceae	<i>Chamerion angustifolium</i> ssp. <i>circumvagum</i>	fireweed
	<i>Epilobium brachycarpum</i>	tall annual willowherb
	<i>Epilobium ciliatum</i>	hairy willowherb
Orchidaceae	<i>Platanthera dilatata</i> var. <i>eucostachys</i>	bog orchid
Paeoniaceae	<i>Paeonia brownii</i>	Brown's peony
Papaveraceae	<i>Eschscholzia californica</i>	California poppy
Phrymaceae	<i>Mimulus guttatus</i>	common yellow monkeyflower
	<i>Mimulus primuloides</i>	primrose monkeyflower
Pinaceae	<i>Abies concolor</i>	white fir
	<i>Pinus contorta</i>	lodgepole pine
	<i>Pinus jeffreyi</i>	Jeffrey pine
	<i>Pinus ponderosa</i>	ponderosa pine
Plantaginaceae	<i>Collinsia parviflora</i>	blue-eyed Mary

Burke Creek HWY 50 Crossing and Realignment Project

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Family	Scientific Name	Common Name
	<i>Penstemon strictus</i>	Rocky Mountain penstemon
Plantaginaceae	<i>Plantago lanceolata</i>	narrowleaf plantain
	<i>Plantago major</i>	common plantain
	<i>Veronica anagallis-aquatica</i>	water speedwell
Poaceae	<i>Agropyron cristatum</i>	crested wheatgrass
	<i>Agrostis exarata</i>	spike bentgrass
	<i>Agrostis stolonifera</i>	creeping bentgrass
	<i>Apera interrupta</i>	dense silkybent
	<i>Avena sativa</i>	common oat
	<i>Bromus carinatus</i>	California brome
	<i>Bromus tectorum</i>	cheatgrass
	<i>Dactylis glomerata</i>	orchard grass
	<i>Deschampsia cespitosa</i>	tufted hairgrass
	<i>Deschampsia danthonioides</i>	annual hairgrass
	<i>Elymus glaucus</i>	blue wildrye
	<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i> (<i>Agropyron trachycaulum</i>)	slender wheatgrass
	<i>Festuca idahoensis</i>	Idaho fescue
	<i>Glyceria elata</i>	tall manna grass
	<i>Hordeum brachyantherum</i>	meadow barley
	<i>Hordeum jubatum</i>	foxtail barley
	<i>Hordeum marinum</i> ssp. <i>gussoneum</i>	Mediterranean barley
	<i>Leymus triticoides</i>	creeping wildrye
	<i>Poa bulbosa</i>	bulbous bluegrass
	<i>Poa fendleriana</i>	Fendler's bluegrass
<i>Poa palustris</i>	fowl bluegrass	
<i>Poa pratensis</i> ssp. <i>pratensis</i>	Kentucky bluegrass	
<i>Poa secunda</i>	Sandberg bluegrass	
<i>Thinopyrum intermedium</i>	intermediate wheatgrass	
Polemoniaceae	<i>Leptosiphon nuttallii</i>	Nuttall's desert trumpets
	<i>Microsteris gracilis</i>	graceful phlox
Polygonaceae	<i>Eriogonum umbellatum</i>	sulphur flower
	<i>Polygonum aviculare</i>	yard knotweed
	<i>Rumex acetosella</i>	common sheep sorrel
	<i>Rumex crispus</i>	curly dock
	<i>Rumex salicifolius</i>	willow dock
Ranunculaceae	<i>Myosurus</i> sp.	mousetail
	<i>Thalictrum fendleri</i>	meadow rue
Rhamnaceae	<i>Ceanothus cordulatus</i>	mountain whitethorn
	<i>Ceanothus prostratus</i>	prostrate ceanothus
	<i>Ceanothus velutinus</i>	snowbrush ceanthosus
Rosaceae	<i>Geum macrophyllum</i>	big leaf avens
	<i>Potentilla glandulosa</i>	sticky cinquefoil
	<i>Potentilla gracilis</i>	slender cinquefoil
	<i>Purshia tridentata</i>	antelope bitterbrush
	<i>Rosa woodsii</i> ssp. <i>ultramontana</i>	Wood's rose
Rubiaceae	<i>Galium aparine</i>	stickywilly

Burke Creek HWY 50 Crossing and Realignment Project

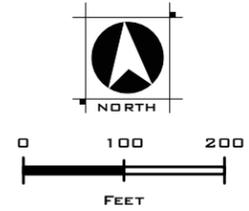
Plant Species List 2015

Family	Scientific Name	Common Name
	<i>Galium trifidum</i>	threepetal bedstraw
	<i>Kelloggia galiodes</i>	milk kelloggia
Ruscaceae	<i>Maianthemum stellatum (Smilacena stellata)</i>	false Solomon's seal
Salicaceae	<i>Populus tremuloides</i>	quaking aspen
	<i>Populus trichocarpa</i>	black cottonwood
	<i>Salix exigua</i>	coyote willow
	<i>Salix lemmonii</i>	Lemmon's willow
	<i>Salix lasiolepis</i>	arroyo willow
	<i>Salix lasiandra var. caudata</i>	Pacific willow
	<i>Salix scouleriana</i>	Scouler's willow
Scrophulariaceae	<i>Verbascum thapsus</i>	woolly mullein
Urticaceae	<i>Urtica dioica</i>	stinging nettle
Typhaceae	<i>Typha sp.</i>	cattail
Violaceae	<i>Viola adunca</i>	Western dog violet

Note: Nomenclature follows B. Baldwin et al. 2012. The Jepson Manual: Vascular Plants of California 2nd ed.



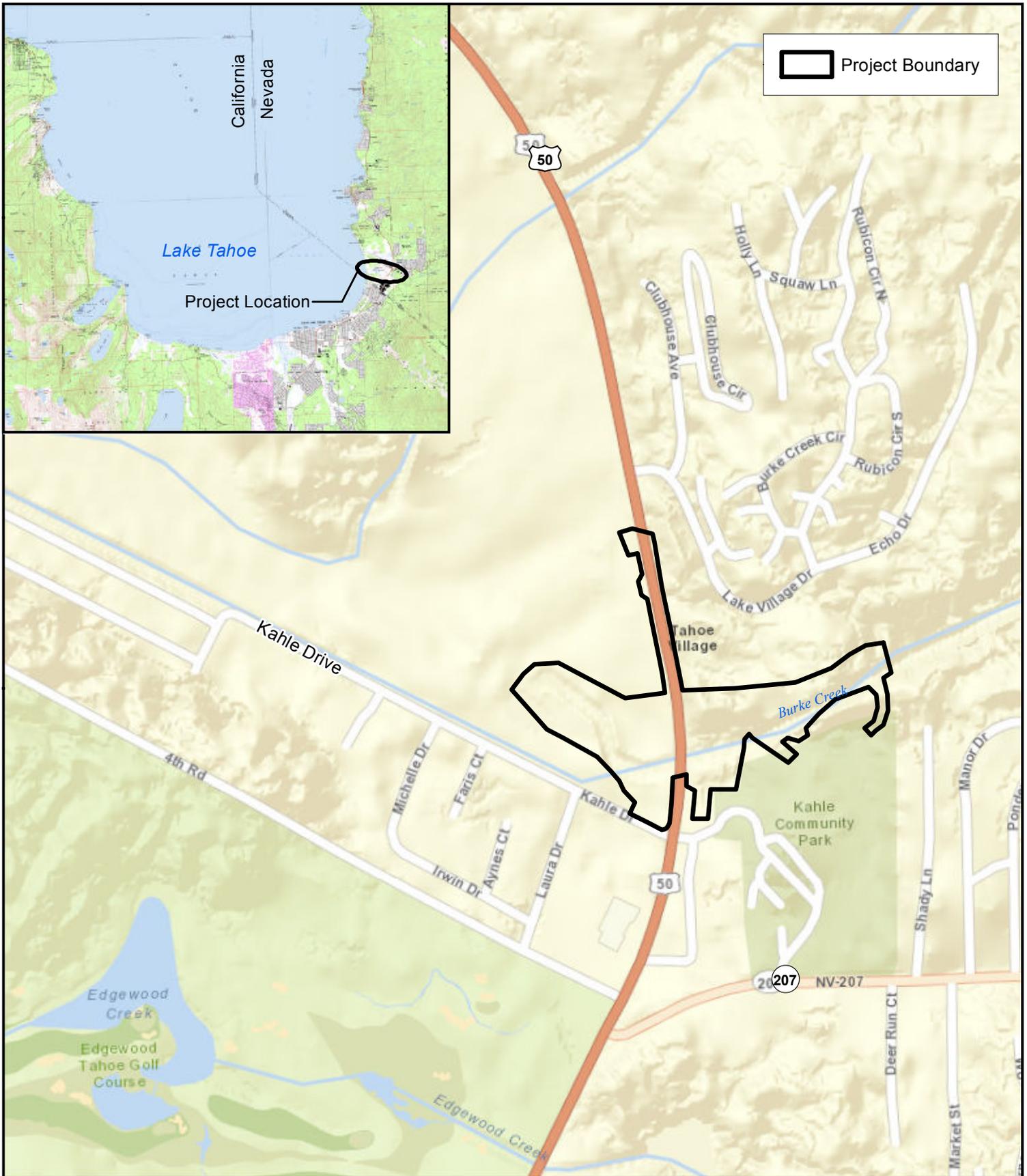
BOTANICAL RECONNAISSANCE SURVEY AREA
BURKE CREEK RESTORATION
STATELINE, NV
OCTOBER, 2015



 New 2015 Project Boundary

NOTES:





**FIGURE 1: VICINITY MAP
BURKE CREEK REALIGNMENT
DOUGLAS COUNTY, NV
APRIL, 2015**

NOTES:
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand),

