INVASIVE PLANT RISK ASSESSMENT

Burke Creek Highway 50 Crossing & Realignment Project

Lake Tahoe Basin Management Unit

USDA Forest Service

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1 INTRODUCTION

In 2003, the United States Forest Service identified invasive species as one of four critical threats to the nation's ecosystems (Bosworth 2003). Invasive plants pose a significant threat to ecological function due to their ability to displace native species, alter nutrient and fire cycles, decrease the availability of forage for wildlife, and degrade soil structure (Bossard, Randall, and Hoshovsky 2000). Infestations can also reduce the recreational or aesthetic value of native habitats.

Forest management activities can contribute to the introduction and spread of invasive plants by creating suitable environmental conditions for establishment and by acting as vectors for spread. The following risk assessment has been prepared to evaluate the risk associated with invasive plant introduction and spread as a result of the proposed project.

1.1 ANALYSIS FRAMEWORK: PERTINENT LAWS, POLICIES, AND DIRECTION

A comprehensive summary of principal statutes governing the management of invasive plants on the National Forest System is available in FSM 2900. A brief summary of the pertinent laws, policies, and direction is provided below.

1.1.1 Federal Laws and Executive Orders

Executive Order 13112 (1999)—directs federal agencies to prevent the introduction of invasive species; detect and respond rapidly to control such species; and to minimize the economic, ecological, and human health impacts from invasive species on public lands.

1.1.2 Forest Service Policies and Direction

Forest Service Manual 2080 (USDA Forest Service 1995)—Was replaced by FSM 2900 in 2011. FSM 2080 revised USFS national policy on noxious weed management to emphasize integrated weed management, which includes prevention and control measures, cooperation, and information collection and reporting.

Forest Service Manual 2900 (USDA Forest Service 2011)—directs the Forest Service to manage invasive species with an emphasis on integrated pest management and collaboration with stakeholders, to prioritize prevention and early detection and rapid response actions, and ensure that all Forest Service management activities are designed to minimize or eliminate the possibility of establishment or spread of invasive species on the NFS or to adjacent areas.

Forest Service Manual 2070 (USDA Forest Service 2008)—provides guidelines for the use of native material on National Forest System lands. It restricts the use of persistent, non-native, non-invasive plant materials and prohibits the use of noxious weeds for revegetation, rehabilitation and restoration projects. It also requires that all revegetation projects be reviewed by a trained or certified plant material specialist for consistency with national, regional, and forest policies for the use of native plant materials.

USFS National Strategy and Implementation Plan for Invasive Species Management (USDA Forest Service 2004a)—identifies for all Forest Service programs the most significant strategic actions for addressing invasive species. It emphasizes prevention, early detection and rapid response, prioritization in control and management, and restoration or rehabilitation of degraded areas.

Region 5 Noxious Weed Management Strategy (USDA Forest Service 2000)—guides regional Forest Service goals and objectives for invasive plant management, emphasizing actions necessary to: promote

the overall management of noxious weeds; to prevent the spread of weeds; control existing stands of weed infestations; promote the integration of weed issues into all forest service activities.

1.1.3 Forest Plan Direction

LTBMU Land and Resource Plan (USDA Forest Service 1988)—Does not specifically address invasive plants (except the removal of noxious plants in grazing allotments), though it does provide for the protection and enhancement of threatened and sensitive plant habitat. It is amended by 2004 Sierra Nevada Forest Plan Amendment (SNFPA) to address invasive plant management.

Sierra Nevada Forest Plan Amendment (USDA Forest Service 2004b)—Establishes goals, standards, and guidelines for invasive plant (noxious weed) management for the Sierra Nevada forests. It emphasizes prevention and integrated weed management. It establishes the following invasive plant management prioritization: 1) prevent the introduction of new invaders; 2) conduct early treatment of new infestations; 3) contain and control established infestations. It also requires forests to conduct an invasive plant risk assessment to determine risks for weed spread (high, moderate, or low) associated with different types of proposed management activities and develop mitigation measures for high and moderate risk activities with reference to the weed prevention practices in the Regional Noxious Weed Management Strategy.

2 Project Description

2.1 Proposed Activities

Please refer to Appendix D, 50 percent design plans. 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 National Forest System (NFS) land. Phase IIb will realign Burke Creek directly downstream of HWY 50 on NFS 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.

2.2 Location and Extent

The project area is located near Stateline, Nevada, on the east shore of Lake Tahoe. The project area covers approximately 3.9 acres, and includes all road shoulders and right –of –way adjacent to US Highway 50 north of Kahle Drive and a portion of Kahle Drive, a commercial development on east side of US Highway 50 just north of Kahle Drive, a portion of Burke Creek east of US Highway 50, and portions of the Burke Creek/Rabe Meadow complex (Figure 1, Appendix B). Proposed disturbance acreage for the project totals approximately 1.84 acres. The project area appears on the South Lake Tahoe, Nevada United States Geological Survey (USGS) 7.5-minute quadrangle. It is located in Sections 22 and 23 of Township 13 North, Range 18 East of the Mt. Diablo Meridian.

3 Non-Project Dependent Factors

3.1 Inventory

3.1.1 Surveys and existing data

A Wood Rodgers botanist, Jacquelyn Picciani, conducted a floristic inventory within the project area. The LTBMU Invasive Plants of Management Concern list (Appendix A) was reviewed prior to the survey to develop the list of potential, target species. For the purposes of the survey, it was assumed that there was potential for all terrestrial invasive plant species on this list within the project area. Survey methodology consisted of a combination of general and intuitive controlled pedestrian surveys conducted along all roadways and right of ways, a commercial parking area, upland, riparian and meadow habitats targeted for Burke Creek re-alignment and water quality improvements activities. The survey dates include observations made during a wetland delineation conducted May 13, 2015, and subsequent floristic surveys conducted June 25 and August 12, 2015 to capture the appropriate phenology for the target species. Additionally, the LTBMU provided known locations of invasive plant species previously found on NFS lands (Rowe 2015a) within the survey area. These species included oxeye daisy (*Leucanthemum vulgare*) and sulfur cinquefoil (*Potentilla recta*). A Botanical Field

Reconnaissance Report was also completed at the time of the survey and provides additional information.

3.1.2 Assessment summary

The floristic, pedestrian survey was conducted at the right times of year to identify plant species encountered to the species level, and visually covered 100% of all areas proposed for improvements. Therefore, the surveys and existing data are sufficient to complete the risk assessment for the proposed design.

3.2 KNOWN INVASIVE PLANTS IN ANALYSIS AREA

Cheatgrass (*Bromus tectorum*) is ubiquitous throughout the project area with several infestations observed adjacent to existing, paved roadways on road shoulders and within dry meadow habitat. Infestations range from a few, clustered stems to dense patches. St. Johnswort (*Hypericum perforatum*) was observed at two locations as mature individuals: in a parking strip adjacent to a commercial development on the east side of US Highway 50, and west of US Highway 50, just east of Jennings Pond. Bull thistle was observed at several locations, varying from dry upland sites to the mesic understory of willows adjacent to Jennings Pond and Burke Creek, duplicating the results of invasive species surveys conducted by the USFS. Additional invasive species documented by USFS surveys and not observed during the Wood Rodgers surveys include oxeye daisy at one location north of Jennings Pond, and sulfur cinquefoil at scattered locations throughout the project area west of US Highway 50 in meadow and riparian habitat.

Table 1. Invasive plant species within the project area.

Species	Common Name	CDFA rating[1]	Cal-IPC rating[2]	Number of sites within:	
				NFS Lands	Non NFS Lands
Bromus tectorum	Cheatgrass	none	High	2	2
Cirsium vulgare	Bull thistle	C	Moderate	2	3
Hypericum perforatum	St. Johnswort	C	High	1	1
Potentilla recta	Sulfur cinquefoil	A	none	1	0
Leucanthemum vulgare	Oxeye daisy	none	Moderate	1	0
TOTAL				7	6

[1] CDFA ratings - A-listed weeds: eradication or containment is required at the state or county level; B-listed weeds: eradication or containment is at the discretion of the County Agricultural Commissioner; C-listed weeds: eradication or containment required only when found in a nursery or at the discretion of the County Agricultural Commissioner.
[2] CalIPC ratings- High: attributes conducive to moderate to high rates of dispersal and establishment; usually widely distributed among and within ecosystems. Moderate: impacts substantial and apparent, but not severe; attributes conducive to moderate to high rates of dispersal; distribution may range from limited to widespread. Limited : ecological impacts are minor or information is insufficient to justify a higher rating, although they may cause significant problems in specific regions or habitats; attributes result in low to moderate rates of invasion; distribution generally limited, but may be locally persistent and problematic.

3.2.1 Cheatgrass *(Bromus tectorum)*

3.2.1.1 Species description

Cheatgrass is an early emerging, annual or winter annual grass species native to southern Europe, northern Africa and southwestern Asia. Distinguishing characteristics include slender seed stalks 4-30 inches tall; a one-sided inflorescence containing multiple spikelets of 5-8 florets per spikelet; closed leaf sheath with smooth to hairy stems and leaves; and a fibrous root system that spreads both vertically and horizontally in the soil profile, thereby maximizing access to soil moisture early in the growing

season. The plant reproduces by its awned seeds which can vary in number from 25 to 5,000 seeds per plant, typically maturing by mid-summer. Seeds can remain dormant for up to three years in the soil, and are pre-adapted to tolerate high temperatures.

Cheatgrass seed spreads through a variety of mechanisms including: wind, water, animals (e.g. birds build nests with it) and people through its light, awned seed. It can attach to clothing, animal fur and fleece, and is also a contaminant in grains, hay or straw. Mechanized transport and construction equipment is notorious for introducing this species as well. It prefers disturbed soils such as cleared land, cultivated soils, road shoulders, and recently burned areas. It can out-compete native bunchgrasses in drier habitats through its ability to access soil moisture at shallower depths at the beginning of the growing season, and after a fire can out compete both shrub seedlings and native herbaceous species, thereby altering subsequent community structure and fire patterns within an ecosystem. The standing crop thereby enhances fire regimes throughout its range, becoming increasingly dominant and decreasing species diversity (USDA Forest Service 2012)

CDFA does not currently list this species. Cal-IPC threat level is High: attributes conducive to moderate to high rates of dispersal and establishment; usually widely distributed among and within ecosystems. LTBWCG does not currently list this species. LTBMU priority threat level is Low.

The distribution of this species throughout the project area makes avoidance impossible, particularly when areas adjacent to infested road shoulders, riparian and meadow habitats are designated for improvements. Preventing further introductions of cheatgrass as a result of this project can be accomplished by spraying all equipment before entering the project area and when leaving on a daily basis. Removing plants and reducing seed production may be feasible through the implementation of BMP's, manual, chemical and mechanical control, and revegetation practices.

3.2.1.2 Infestations in project area

The locations of cheatgrass infestations are shown on Figure 3, Appendix C, and include the following:

- BRTE-1: On NFS Lands with sporadic, heavy cover adjacent to pedestrian pathways and paved parking area adjacent to Kahle Drive on west side of US Highway 50 and scattered stems adjacent to US Hwy 50; proposed improvements include culvert; realignment of Burke Creek; dewatering pipe; access road.
- BRTE-2: On NFS Lands with heavy cover just north of aspen grove where rock dissipater is proposed at Folsom Basin.
- BRTE-3: On non NFS lands with scattered stems and patches 1' x1' to 10' x 10' on the east side of US 50, some of which is in NDOT right-of-way, and some adjacent to iron fencing; improvements proposed include rolled curb and gutter, sediment trap, new culvert crossing and Burke Creek realignment.
- BRTE-4: On non NFS lands with patches throughout edge of parking lot of commercial development; vicinity of proposed staging area.

3.2.1.3 Management Actions on NFS Lands

In order to prevent the further spread as a result of this project and in accordance with the Weed Management Plan (Rowe 2015b) for the project, infestations of cheatgrass on NFS Lands will be managed as follows:

BRTE-1: 1) do not stage equipment where present; 2) wash equipment after working in infestation; 3) do not salvage soil from infested area; 4) minimize disturbance in infested areas; 5) where possible, work should progress from infested area to uninfested area.

BRTE-2: flag and avoid during all proposed activities.

3.2.1.4 Treatment and Management Actions on non-NFS Lands

Treatment goals include initial control of existing infestations prior to construction and preventing further spread as a result of this project. Infestations of cheatgrass on non NFS Lands will be managed and/or treated as follows:

BRTE-3: Options for controlling infestations include hand pulling, cutting or digging before seed production in the early spring- approximately one week after flowering at the latest, spraying with aquatic species friendly, monocot specific, pre-emergent herbicides in spring, or spraying with aquatic species friendly, monocot specific herbicide in fall before soils are frozen, or in the spring when no more than 2-3 inches tall. The appropriate control methods will be determined under consultation with the land manager. At a minimum, management activities of this infestation shall emulate the USFS protocols including 1) do not stage equipment where present; 2) wash equipment after working in infestation; 3) do not salvage soil from infested area; 4) minimize disturbance in infested areas; 5) where possible, work should progress from infested area to uninfested area. Control methods that disturb soil would be implemented to coincide with the Tahoe Basin construction season from May 15 through October 15 as appropriate. Post construction revegetation will serve to colonize disturbed soils with desirable species.

BRTE-4: Flag and avoid during all proposed activities.

3.2.2 Bull thistle *(Cirsium vulgare)*

3.2.2.1 Species description

Bull thistle is a tap-rooted, biennial herb species of the sunflower family, 1-6 feet tall, although more commonly observed at 2-3 feet tall, and is native to Eurasia (Baldwin et al 2012). Distinguishing characteristics include dark pink to purple, vase-shaped flower heads clustered at the ends of the branches; spiny, winged stems; and spine-tipped leaves with a sandpaper texture and prominent veins. Flowers bloom from mid July to fall. (Donaldson 2009). The plant reproduces by wind-blown seed that can travel at least .5 mile (Donaldson 2008).

Bull thistle has a two year lifespan, with the flowers produced the second year, commencing seed production. Each flowerhead produces 100-300 seeds, with plants exhibiting anywhere from 1-100 flowerheads. Most seeds either germinate or die within the first year, but if buried six or more inches, can survive up to three or more years. This plant prefers the disturbed soils of pastures, forest clearcuts, rangeland, roadsides and waste areas, although it may also be found in dry meadows, foothills and riparian areas. Once established, it can outcompete native species. Bull thistle is non-palatable and infestations reduce available forage on rangelands and pastures. Changes in grazing management can reduce infestations, through timing and duration by various livestock, resulting in changes to competitiveness by desirable vegetation. Preventing the establishment of this species can be achieved by early detection of this species, stopping seed dispersal and maintaining appropriately vegetated lands.

CDFA threat level is C: eradication or containment required only when found in a nursery or at the discretion of the County Agricultural Commissioner. Cal-IPC threat level is Moderate: impacts substantial and apparent, but not severe; attributes conducive to moderate to high rates of dispersal;

distribution may range from limited to widespread. LTBWCG lists this as a Group 2 species: manage infestations with a goal of eradication. LTBMU priority threat level is High.

The distribution of this species in riparian and meadow habitat where improvements are proposed makes avoidance impossible. Preventing further spread of bull thistle as a result of this project can be accomplished by spraying (cleaning)all equipment before entering the project area and when leaving on a daily basis. Removing existing plants is feasible through the implementation of manual and chemical controls.

3.2.2.2 Infestations in project area

The locations of Bull thistle infestations are shown on Figure 3, Appendix C, and include the following:

- CIVU 223 (includes CIVU 1-5 and CIVU-1O): On NFS lands with 350 + mature and basal rosette stage plants west of US Highway 50 at north and south margins of riparian canopy adjacent to Burke Creek, and north of Burke Creek in dry meadow habitat; proposed installation of dewatering pipe, abandon and recontour existing Burke Creek, and realignment of Burke Creek.
- CIVU- 6: On NFS Lands with 2 mature plants in proximity to unnamed perennial stream west of US Highway 50; proposed trench drain and DI connection, and DI plug.
- CIVU-7: On non NFS Lands with 10 basal rosettes at edge of parking lot of commercial development; proposed removal of parking lot and subsequent realignment of Burke Creek.
- CIVU-8: On non NFS Lands with 1 mature plant adjacent to rocked drainage near ballpark on east side of US Highway 50; no improvements proposed, however rocked drainage is adjacent to paved roadway that may provide access to upstream sections of Burke Creek receiving revegetation, minor reshaping, and/or rock/log structures.
- CIVU-9: On non NFS Lands with 8 basal rosettes at upper end of rocked drainage near ballpark on east side of US Highway 50; no improvements proposed, however rocked drainage is adjacent to paved roadway that may provide access to upstream sections of Burke Creek receiving revegetation, minor reshaping, and/or rock/log structures.

3.2.2.3 Management and Treatment Actions on NFS and non-NFS Lands

In order to prevent the further spread as a result of this project and in accordance with the Weed Management Plan (Rowe 2015b) for the project , infestations of bull thistle on NFS Lands and non NFS lands will be managed as follows:

Manual control is achieved thorough eliminating seed production which requires removal of the flowering stalk prior to seed dispersal. This is best accomplished with mechanical removal at small discrete areas. More specifically, the procedure is to use a sharp, pointed shovel and dig out the top 2 inches of the root below the crown. Turn the plant over and expose the root to the air so it dries. If the plant is at the basal rosette stage (first year of growth), this is all that is required. If a flower stalk is present, cut off near base, place in a closed container (bag), remove from the site and dispose in garbage. The flowers may continue to ripen and develop to maturity, so make sure bag is securely fastened shut. The site should be monitored for a few years as seeds may still be present (Donaldson 2009). Control methods that disturb soil would be implemented to coincide with the Tahoe Basin construction season from May 15 through October 15 as appropriate.

3.2.3 St. Johnswort *(Hypericum perforatum)*

3.2.3.1 Species description

St. Johnswort is a bushy, perennial herb of the St. Johnswort family, from to 1-3 feet tall, and is native to Eurasia (Baldwin et al 2012). This plant was originally introduced in the late 1600s in the eastern United states for use as a medicinal and ornamental plant (Krueger and Sheley 2002). Distinguishing characteristics include yellow, five petaled flowers with occasional black dots on the edges; flower heads appearing in flat-topped clusters at the ends of the branches; erect stems with numerous rust-colored branches that are more or less two-ridged and woody at the base; up to one inch long, elliptic to oblong leaves with the opposite pairs of leaves attached to the stem; and unlobed fruits. Flowers bloom from June to late September (Donaldson 2009).

St. Johnswort reproduces by both its sticky seeds and rhizomes. Mature plants can support up to 30 flowering stems a year, with several flowers per stem. The mature seed capsules are green, moist and sticky, dispersing 400-500 seeds per capsule, with seeds viable for up to10 years. Although some seed falls to the ground, some can be spread a short distance by wind as well. By far the most effective dispersal mechanism is attachment to passing animals and humans. Infestations by this plant have led to extensive agricultural impacts, loss of wildlife habitat and loss of livestock forage. This plant prefers open, sunny exposures on well-drained, coarse-textured, gravelly soils. The most effective management strategy is a preventive one, embracing early detection of this species and avoidance of creating uninhabited, open habitat. This can be achieved by stopping seed dispersal and maintaining healthy plant associations that provide no niche for St. Johnswort establishment (Krueger and Sheley 2002).

CDFA C: eradication or containment required only when found in a nursery or at the discretion of the County Agricultural Commissioner. Cal-IPC threat level is Moderate: impacts substantial and apparent, but not severe; attributes conducive to moderate to high rates of dispersal; distribution may range from limited to widespread. LTBWCG lists this as a Group 2 species: manage infestations with a goal of eradication. LTBMU priority threat level is Medium.

With only two plants known at two locations, eradication is suggested prior to construction to definitively prevent the spread of this species.

3.2.3.2 Infestations in project area

The locations of St. Johnswort infestations are shown on Figure 3, Appendix C, and include the following:

- HYPE-1: On NFS Lands with one, mature plant in flower growing in mesic meadow habitat just east of Jennings Pond on the west side of US Highway 50; in proximity to proposed abandon and recontour existing Burke Creek.
- HYPE-2: On Non NFS Lands with one, mature plant in flower growing in a parking strip of a commercial development on the east side of US Highway 50; adjacent to proposed staging area requiring the installation of chainlink fencing.

3.2.3.3 Management and Treatment Actions on NFS and non-NFS Lands

In order to prevent the further spread as a result of this project and in accordance with the Weed Management Plan (Rowe 2015b) for the project , infestations of St. Johnswort on NFS Lands and non NFS lands will be managed as follows:

Manual control is the preferred option for small infestations. Pull or dig repeatedly, on an annual basis. Pulled or dug stems should be removed, bagged or burned to prevent regrowth from the stems, seed germination and dispersal. Continue this for a few years until no new stems appear. Treatment goals include initial control of existing infestations prior to construction and preventing further spread as a result of this project. It is recommended that these infestations are controlled via hand pulling or digging before seed production in the early spring- approximately one week after flowering at the latest

following the protocols outlined above. The sites should be monitored to prevent any further spread. Control methods that disturb soil would be implemented to coincide with the Tahoe Basin construction season from May 15 through October 15 as appropriate. Post construction revegetation will serve to colonize disturbed soils with desirable species.

3.2.4 Oxeye daisy *(Leucanthemum vulgare)*

3.2.4.1 Species description

Oxeye daisy is a shallow rooted, rhizomed, perennial herb of the sunflower family, to 3.5 feet tall, and is native to Eurasia. It can be distinguished from the common ornamental Shasta daisy (*L. maximum*) by its 3-7 lobed and toothed basal leaves as opposed to toothed basal leaves, and smaller stature of the white flowerheads, with the involucres 0.5 to 0.8 inches in diameter as opposed to 0.7 to 1.1 inches in diameter (Baldwin et al 2012). Seeds are long-lived, up to 38 years. Flowers bloom from June to August.

This widespread ornamental has escaped cultivation and become naturalized throughout the western United States. Flowers typically produce abundant seed, and on moist sites seed production notably increases. The seeds lack a pappus and rely on water, human activities and animals for dispersal, with seed sometimes even found in wildflower packets. The seeds survive ingestion by animals, with the plant also reproducing via root fragments and rhizomes. This plant is found on disturbed soils of roadsides, pastures, grasslands and coastal scrub. While it tolerates poor soils, it prefers moist clay soils. The plant is palatable to livestock, although it tends to be avoided and imparts an-off-taste to the milk of dairy cattle. Maintaining a densely vegetated, undisturbed site is an effective management strategy, thereby creating no niche for oxeye daisy establishment (DiTomaso et al. 2013). Competitive vegetation should shade the soil and compete for early season moisture, thereby reducing seedling establishment.

CDFA does not currently list this species. Cal-IPC threat level is Moderate: impacts substantial and apparent, but not severe; attributes conducive to moderate to high rates of dispersal; distribution may range from limited to widespread. LTBWCG lists this as a Group 2 species: manage infestations with a goal of eradication. LTBMU priority threat level is Low.

Preventing further introductions of oxeye daisy as a result of this project can be accomplished by spraying all equipment before entering the project area and when leaving on a daily basis. Removing plants and reducing seed production may be feasible through the implementation of BMP's, manual control, and revegetation practices if encountered.

3.2.4.2 Infestations in project area

One previously documented occurrence of this species is known within the project area, with surveys conducted in 2014 and 2015 failing to detect its presence. Therefore, it is doubtful that this species will be encountered during project implementation.

The locations of oxeye daisy infestations are shown on Figure 3, Appendix C, and include the following:

- LEVU 461: Previously documented occurrence on NFS Lands, with the 2014 surveys indicating a spot location along north margin of Burke Creek west of US highway 50; proposed abandon and recontour existing Burke Creek, and Burke Creek realignment.

3.2.4.3 Management and Treatment Actions on NFS Lands

In order to prevent the further spread as a result of this project and in accordance with the Weed Management Plan (Rowe 2015b) for the project, infestations of oxeye daisy on NFS Lands will be managed as follows:

The preferred method for treatment is dependent on the size of infestation. Mechanical control is the preferred option for small infestations. Manually hand pull repeatedly, on an annual basis, prior to flowering and subsequent seed production and dispersal. Pulled or dug stems should be removed, bagged or burned to prevent regrowth from the stems, seed germination and dispersal. Continue this for a few years until no new stems or resprouts appear. Please note that should a large infestation be encountered, consultation with the Forest Botanist is required to develop a treatment plan. A chemical application of Aminopyralid is preferred, with mowing or cutting weeks before the chemical treatment implemented to stimulate greater leaf area to absorb herbicide products.

Treatment goals include preventing further spread as a result of this project. It is recommended that if encountered, this infestation is controlled via hand pulling before seed production in the spring/summer, following the protocols outlined above. The site should be monitored to prevent any further spread. Control methods that disturb soil would be implemented to coincide with the Tahoe Basin construction season from May 15 through October 15 as appropriate. Post construction revegetation will serve to colonize disturbed soils with desirable species.

3.2.5 Sulfur cinquefoil *(Potentilla recta)*

3.2.5.1 Species description and summary of management options

Sulfur cinquefoil is a tap-rooted, short-lived, shrubby, perennial herb of the rose family, to 2.0 feet tall, and is native to Eurasia. It can be distinguished from the common, native meadow species slender cinquefoil (*P. gracilis*) by its glandular aspect; presence of short and long, perpendicular stem hairs, not just of one length; underside of palmate leaflets green, not silvery; strongly veined fruit, not smooth; and notched; pale yellow flower petals, usually not bright yellow (Donaldson 2009). Seeds are viable up to 4 years (DiTomaso et al 2013). Flowers bloom from May to July.

This plant is widespread throughout the western states, and occurs in open canopy forests, grasslands, and shrub dominated habitats (DiTomaso et al 2013), and is most problematic where these habitats are disturbed by roadsides, in pastures and rangeland (Donaldson 2009). An individual plant can produce 1,500 seeds or more, with seeds falling to the ground in the vicinity of the parent plant. The plant is not readily grazed by either wildlife or livestock. (DiTomaso et al 2013).

CDFA threat level is A: eradication or containment required at the state or county level. Cal-IPC does not currently list this species. LTBWCG lists this as a Group 1 species: manage infestations with a goal of eradication. LTBMU priority threat level is Medium.

Preventing further spread of sulfur cinquefoil as a result of this project can be accomplished by spraying (cleaning) all equipment before entering the project area and when leaving on a daily basis. Removing existing plants is feasible through the implementation of manual and chemical controls.

3.2.5.2 Infestations in project area

The distribution of this species in riparian and meadow habitat where improvements are proposed makes avoidance impossible.

The locations of sulfur cinquefoil infestations are shown on Figure 3, Appendix C, and include the following:

- PORE5 338: Documented occurrence on NFS Lands in 2015 of approximately 1,000 plants over 4.7 acres; proposed dewatering pipe; access road, abandon and recontour existing Burke Creek, and Burke Creek realignment.

3.2.5.3 Management and Treatment Actions on NFS Lands

In order to prevent the further spread as a result of this project and in accordance with the Weed Management Plan (Rowe 2015b) for the project, infestations of sulfur cinquefoil on NFS Lands will be managed as follows:

"Because sulfur cinquefoil is often confused with many North American native cinquefoils, confirm identification with trained botanist prior to treatment. While manual treatment is preferred for small infestations, the size of the infestation determines the actual treatment. Manual treatment consists of hand digging or pulling, obtaining as much of the root as possible, then bagging all plant parts and disposing properly. Clipping, mowing, and prescribed burning alone are not recommended as they can stimulate regrowthThe preferred chemical treatment consists of a spring application at the pre-bud stage of Aminopyralid. Note that leaf and stem hairiness require the use of a surfactant. Handheld application may be required in the vicinity of Burke Creek, as no sprayers are allowed within 10 feet of perennial water (Rowe 2015b)".

Treatment goals include preventing further spread as a result of this project. It is recommended that if encountered, this infestation is controlled via chemical control in the spring, following the protocols outlined above. Please note that large infestations such as this one require additional consultation with the Forest Supervisor to obtain annual approval for the preferred chemical treatment. The site should be monitored to prevent any further spread. Should hand digging or pulling be implemented at spot locations, soil disturbance would be implemented to coincide with the Tahoe Basin construction season from May 15 through October 15 as appropriate. Post construction revegetation will serve to colonize disturbed soils with desirable species.

3.2.6 Assessment summary

Cheatgrass distribution is relegated to disturbed, dry meadow habitats, road shoulders and existing pedestrian pathways west of US Highway 50, and adjacent to commercial development and road shoulders east of US Highway 50. It occurs as both scattered sparse, stems and in small, dense stands where improvements are proposed. Bull thistle is common on the north and south margins of the Burke Creek riparian canopy west of US Highway 50, and at a few locations east of US Highway 50 by a commercial development, and rocklined ditch. It occurs as both mature, flowering plants and as plants in the basal rosette stage where improvements are proposed. St. Johnswort occurs as one mature plant east of US Highway 50 in a commercial development slated for project improvements, and at one location as a mature plant west of US Highway 50 in a mesic meadow in proximity to proposed improvements. Sulfur cinquefoil occurs in dry meadow and riparian habitats west of US Highway 50, while oxeye daisy has been documented within the riparian canopy of Burke Creek west of US highway 50. These described habitats are slated for project improvements, and support annual, biennial and perennial invasive plant species.

3.3 HABITAT VULNERABILITY

Vegetation: 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. The surrounding uplands are characterized by second growth Jeffrey pine (*Pinus jeffreyi*) forest, with sparse to solid cover provided by a montane shrub understory. Riparian vegetation adjacent to Burke Creek, another unnamed perennial stream and Jennings Pond, is variously dominated by willow species (*Salix spp.*), quaking aspen (*Populus tremuloides*), mountain alder (*Alnus incana* ssp. *tenuifolia*), and black cottonwood (*Populus trichocarpa*) in the woody overstory, with the herbaceous understory consisting of graminoids and forbs. The dry

and somewhat disturbed meadow adjacent to Burke Creek includes seeded and native, graminoid and forb species. Ruderale vegetation is present on the disturbed soils of road shoulders, parking strips and areas adjacent to parking areas that host opportunistic and for the most part annual plant species that take advantage of little competition, as well as native colonizers. More complete descriptions of these habitats are contained in the attached Botanical Reconnaissance Report with its attendant plant species list.

Hydrology: The project area drains to Lake Tahoe via Burke Creek. Roadside ditches adjacent to US Highway 50 currently convey stormwater as well.

General Disturbance: The majority of the project area has been altered from its native state by Comstock era logging and historic livestock grazing. Residential and commercial development have also altered the historic Burke Creek alignment. Subsequent to the USFS purchasing Rabe Meadows, a casino foundation was partially removed and buried. Currently disturbed areas in or adjacent to the project site consist of road shoulders, drainage ditches and portions of dry meadow habitat impacted by rodent burrows. The project area does not have a history or exhibit evidence of being used as a wasteland, landfill, or a redevelopment site.

Erosion: Evidence of erosion includes soil movement, rilling and channeling in roadside ditches and shoulders.

Fire & fuels: Although there has been no recent fire activity in the area, controlled burns have been implemented nearby.

Cultivation: The project area does not have a history of or exhibit evidence of being used for cultivation, including crop production, orchards, or nurseries.

Grazing: Although the project area was historically grazed, it is not presently used for grazing, nor is there evidence of rangeland activities.

3.3.1 Assessment summary

The overall habitat vulnerability of the project area is assessed as high, given the amount of commercial development, and the existing infestations of invasive and noxious weed species.

3.4 Non-Project Dependent Vectors

Existing roads and trails: Douglas County maintains paved roadways including Kahle Drive and access to the ballpark and county facilities on the east side of US Highway 50. Additionally, a commercial center on the east side of US Highway 50 includes paved parking that is privately maintained. US Highway 50 is maintained by NDOT. Established trails are present for recreational use in the Burke Creek/Rabe Meadows complex west of US Highway 50. Unauthorized routes include footpaths crossing Burke Creek both upstream and downstream of US Highway 50.

Traffic / visitor use: The project area is comprised of a developed, commercial area, and the Burke Creek/Rabe Meadows complex used for hiking, wildlife viewing and biking.

Utility corridors: There are many underground utilities located within the project area, crossing US Highway 50, and underground at the commercial parking lot on the east side of US Highway 50. These include natural gas, communications, electrical, water and sewer. Utilities are located within Douglas County and NDOT right- of- way.

Livestock/wildlife migration: The majority of the project area is within a stream/meadow complex, and is not used for grazing. No wildlife migration corridors are known to occur within this habitat.

3.4.1 Assessment summary

The overall non-project dependent vectors are assessed as high, given the existing developed nature of the area that supports invasive plant species dispersal.

4 PROJECT-DEPENDENT FACTORS

4.1 HABITAT ALTERATION EXPECTED AS A RESULT OF THE PROJECT

Vegetation: The project will require the removal of some vegetation in order to realign Burke Creek, recontour the existing Burke Creek, construct stormwater treatment basins and conveyance features. . Where feasible, any areas disturbed as a result of construction will be revegated with USFS approved species.

Ground disturbance: The project will implement ground disturbing actions including soil disturbance and heavy equipment use to construct water quality improvements and stream abandonment, recontouring and realignment activities.

Fire & fuels: Fire will not be used during project implementation, nor will fire be used for suppression or fuel reduction activities.

4.2 INCREASED VECTORS AS A RESULT OF PROJECT IMPLEMENTATION

Roads & trails: Travel management is not a part of the project.

Traffic/visitor use: The project includes construction, maintenance or redevelopment of a visitor use/recreation area, i.e. the Burke Creek/Rabe Meadows complex administered by NTCD and LTBMU. While access trails are located within the project area, proposed improvements are not located adjacent to the trail system.

Equipment: The project does include the movement of construction equipment from one location to the next throughout its implementation. This would be a temporary vector.

Utility Corridors: The project does not include maintenance or upgrades to underground utilities, only the relocation of existing utilities.

Grazing: Grazing is not a component of the project.

Materials: The project may utilize the use of road base, mulches and/or wood chips. Should the project use these materials, these will be inspected for the presence of invasive, noxious and undesirable plant species. Process of stream realignment will incur the movement from one water body to the next. All precautions will be taken to insure that invasive, noxious and undesirable plant species and/or their propogules are not transported from one site to another.

4.2.1 Assessment summary

The overall increase in project dependent vectors are assessed as high, given the importation of materials, the use of equipment , and large scale of disturbance associated with project implementation.

4.3 MANAGEMENT MEASURES

4.3.1 Standard management measures for invasive plants

The following measures are designed to minimize risk of new weed introductions, minimize the spread of weeds within units, and minimize the spread of weeds between units. These measures are consistent

with Forest Service policy and manual direction (USDA 2000, USDA 2004, FSM 2900) and the LTBMU LRMP (1988) as amended by the SNFPA (USDA 2004).

1. **Inventory—**
   - ***a)*** *As part of site-specific planning, project areas and adjacent areas (particularly access roads) will be inventoried for invasive plants.*
   - ***b)*** *Any additional infestation discovered prior to or during project implementation should be flagged and avoided, then reported to the Forest Botanist or their designated appointee for prioritization and assessment for treatment.*
2. ***Equipment Cleaning—***
   - *a) All equipment and vehicles (Forest Service and contracted) used for project implementation must be free of invasive plant material before moving into the project area. Equipment will be considered clean when visual inspection does not reveal soil, seeds, plant material or other such debris. Cleaning shall occur at a vehicle washing station or steam-cleaning facility before the equipment and vehicles enter the project area.*
   - *b) When working in known invasive plant infestations or designated weed units, equipment shall be cleaned before moving to other National Forest Service system lands. These areas will be identified on project maps.*
3. ***Staging areas—****Do not stage equipment, materials, or crews in invasive plant-infested areas.*
4. ***Control Areas—****Where feasible, invasive plant infestations will be designated as Control Areas—areas where equipment traffic and soil-disturbing project activities would be excluded. If Control Areas are designated, they will be identified on project maps and delineated in the field with flagging.*
5. ***Project-related disturbance—****Minimize the amount of ground and vegetation disturbance in staging and construction areas. Where feasible, reestablish vegetation on disturbed bare ground to reduce invasive species establishment; revegetation is especially important in staging areas.*
6. ***Early Detection****—Any additional infestation discovered prior to or during project implementation should be reported to the Forest Botanist or their designated appointee for prioritization and assessment for treatment.*
7. ***Post Project Monitoring–****After the project is completed the Forest Botanist should be notified so that (as funding allows) the project area can be monitored for invasive plants subsequent to project implementation.*
8. ***Gravel, fill, and other materials—****All gravel, fill, or other materials are required to be weed-free. Use onsite sand, gravel, rock, or organic matter when possible. Otherwise, obtain weed-free materials from sources that have been certified as weed-free. If an LTBMU inspector is not available to inspect material source, then the project proponent will provide a weed-free certificate for its material source.*
9. ***Mulch and topsoil—****Use weed-free mulches and topsoil. Salvage topsoil from project area for use in onsite revegetation, unless contaminated with invasive species. Do not use material (or soil) from areas contaminated by cheatgrass.*
10. ***Livestock****-If supplemental fodder (e.g. hay, silage) is required for livestock, including horses and other pack animals, it will be certified weed-free.*
11. ***Revegetation—***
    - *a) Seed and plant mixes must be approved the Forest Botanist or their designated appointee who has knowledge of local flora.*
    - *b) Invasive species will not be intentionally used in revegetation. Seed lots will be tested for weed seed and test results will be provided to Forest Botanist or their designated appointee.*

c) *Persistent non-natives, such as such as timothy (Phleum pretense), orchardgrass (Dactylis glomerata), ryegrass (Lolium spp.), or crested wheatgrass (Agropyron cristatum) will not be used in revegetation.*
d) *Seed and plant material will be from native, high-elevation sources as much as possible. Plant and seed material should be collected from as close to the project area as possible, from within the same watershed, and at a similar elevation whenever possible.*

4.3.2 Project-specific management measures

The following measures are included either to a) address the specific risks identified in this analysis that are not addressed by the standard measures or b) to provide site-specific direction to implement the standard management measures:

Table 2. Preferred Management and Treatment Measures

Species	Occurrence	Preferred Management/Treatment
Cheatgrass (Bromus tectorum)	BRTE-1 BRTE-3	1) do not stage equipment; 2) wash equipment after working in infestation; 3) do not salvage soil from infested area; 4) minimize disturbance in infested areas; 5) where possible, work should progress from infested area to uninfested area
Cheatgrass (Bromus tectorum)	BRTE-2 BRTE-4	Flag and avoid
Bull thistle (Cirsium vulgare)	CIVU 223, CIVU- 6, CIVU-7 CIVU-8 CIVU-9	Manual removal- dig and bag, dispose of properly
Oxeye daisy (Leucanthemum vulgare)	LEVU 461	Manual removal- dig and bag, dispose of properly
Sulfur cinquefoil (Potentilla recta)	PORE5 338	Chemical control -amino-pyralid; handheld sprayers within 10 feet of Burke Creek

4.3.3 Assessment summary

The risk of weed introduction and spread will be minimized by cleaning all construction equipment on a daily basis, using only certified weed free sources for road base, mulch, woodchips and revegetation seed, and implementing control methods as outlined above prior to construction. Consequences of not using these measures will result in increased risk of weed infestations throughout the project area.

5 ANTICIPATED WEED RESPONSE TO PROPOSED ACTION

The overall risk of noxious/invasive weed establishment as a result of the project is high. This determination is based on the following:

1. Presence of cheatgrass, bull thistle, St. Johnswort, oxeye daisy and sulfur cinquefoil in the project area;

2. Soil disturbance will occur adjacent to roadways and within riparian and meadow habitat; and

3. Potential importation/spreading of weed propagules via construction equipment.

Table 3. Summary of Risk Factors

	Factor	Risk	Assessment Summary

	Factor	Risk	Assessment Summary
NON-PROJECT DEPENDENT FACTORS	Inventory	N/A	Adequate
	Known invasive plants	High	Cheatgrass occurs on road shoulders and dry meadow habitat in patches and as single stems at 4locations. Bull thistle occurs in rocklined ditch, riparian and dry meadow habitats as mature and basal rosettes at 4 locations. St. Johnswort occurs in a parking strip and a mesic meadow as mature plants at 2 locations. Sulfur cinquefoil occurs throughout riparian and dry meadow habitats at 1 location .
	Habitat vulnerability	High	High level of historic and recent disturbance due to urban development. Variable plant cover - ranges from altered native habitats with high to medium canopy cover to small areas with bare soils on road and path shoulders, and rodent burrows in dry meadow habitat.
	Non-project dependent vectors	High	Infestations are present along existing roads, motorized and non-motorized trails, riparian and dry meadow habitat.
PROJECT-DEPENDENT FACTORS	Habitat alteration expected as a result of project	High	Partial abandonment of old channel and creation of new channel will change the existing hydrology with subsequent vegetation removal and die off of perennial stream dependent plant species. However, constructed stream channel riparian zone will be revegetated with adapted , native species resulting in a temporary loss of habitat.
	Increased vectors as a result of project implementation	High	Temporary construction activities associated with water quality improvements, stream alteration tasks, and short-term traffic increase. Implementation of weed control and BMPs during, and pre and post- construction.
	Management measures		Standard management measures implemented in preferred alternative.
ANTICIPATED WEED RESPONSE		High	Low risk of new introduction; high risk of spread

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USDA FOREST SERVICE, LAKE TAHOE BASIN MANAGEMENT UNIT
2015

INVASIVE PLANTS OF MANAGEMENT CONCERN

Scientific Name	Common Name	LTBMU Priority	NDA	CD FA	Cal-IPC	LTB WCG	Known in project
Acroptilon repens	Russian knapweed	Medium	B	B	Moderate	Group 1	
Ailanthus altissima	tree of heaven	High		C	Moderate	Group 1	
Bromus tectorum	cheat grass	Low			High		**X**
Carduus nutans	musk thistle	High	B	A	Moderate	Group 1	
Centaurea calcitrapa	purple starthistle; red starthistle	Medium	A	B	Moderate	Group 1	
Centaurea diffusa	diffuse knapweed	High	B	A	Moderate	Group 1	
Centaurea maculosa	spotted knapweed	High	A	A	High	Group 2	
Centaurea solstitialis	yellow starthistle	Medium	A	C	High	Group 1	
Centaurea virgata ssp. *squarrosa*	squarrose knapweed	High	A	A	Moderate		
Chondrilla juncea	rush skeletonweed	High	A	A	Moderate	Group 1	
Cirsium arvense	Canada thistle	High	C	B	Moderate	Group 1	
Cirsium vulgare	bull thistle	Low		C	Moderate	Group 2	**X**
Conium maculatum	poison hemlock	Low	C		Moderate		
Cytisus scoparius	Scotch broom	Medium		C	High	Group 2	
Dipsacus fullonum	teasel; Fuller's teasel	Low			Moderate	Group 1	
Dittrichia graveolens	stinkwort	Low			Moderate	Group 1	
Elymus caput-medusae	medusahead	High	B	C	High	Group 1	
Elymus repens	quackgrass	Low		B			
Hydrilla verticillata	hydrilla; waterthyme	N/A	A	A	High; Alert		
Hypericum perforatum	St. Johnswort; Klamathweed	Medium	A	C	Moderate	Group 2	**X**
Isatis tinctoria	Dyer's woad	High	A	B	Moderate	Group 1	
Lepidium appelianum	hairy whitetop; globe-podded hoary cress	Medium		B	Limited	Group 1	
Lepidium draba	whitetop; heart-podded hoary cress	Medium	C	B	Moderate	Group 1	
Lepidium latifolium	tall whitetop; perennial pepperweed	High	C	B	High	Group 2	
Leucanthemum vulgare	oxeye daisy	Low			Moderate	Group 2	**X**
Linaria genistifolia spp. *dalmatica*	Dalmatian toadflax	High	A	A	Moderate	Group 2	
Linaria vulgaris	yellow toadflax; butter & eggs	High	A		Moderate	Group 2	
Lythrum salicaria	purple loosestrife	High	A	B	High	Group 1	
Myriophyllum spicatum	Eurasian watermilfoil	N/A	A		High		
Onorpordum acanthium ssp. *acanthium*	Scotch thistle	High	B	A	High	Group 1	
Potamogeton crispus	curlyleaf pondweed	N/A			Moderate		
Potentilla recta	sulfur cinquefoil	Medium	A	A		Group 1	**X**
Rubus armeniacus	Himalaya blackberry	Medium			High		
Tamarix chinensis, T. ramosissima, & T. parvifolia	tamarisk; saltcedar	High	C	B	High	Group 1	

LTBMU: High—Species that have a large ecological impact or invasive potential; species that are easily controlled. Medium—Species that have a moderate ecological impact or invasive potential; species that may be difficult to control. Low—Species that have a low ecological impact or invasive potential; species that require substantial effort to control. N/A—species not evaluated.
NDA: Nevada Department of Agriculture Noxious Weed List (http://agri.nv.gov/nwac/PLANT_NoxWeedList.htm) Category A—Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the state in all infestations. Category B—Weeds established in scattered populations in some counties of the state; actively excluded where possible, actively eradicated from nursery stock dealer premises; control required by the state in areas where populations are not well established or previously unknown to occur. Category C—Weeds currently established and generally widespread in many counties of the state; actively eradicated from nursery stock dealer premises; abatement at the discretion of the state quarantine officer.
CDFA: California Department of Food and Agriculture Noxious Weed List (http://www.cdfa.ca.gov/phpps/ipc/). A--Eradication or containment is required at the state or county level. B—Eradication or containment is at the discretion of the County Agricultural Commissioner. C--Require eradication or containment only when found in a nursery or at the discretion of the County Agricultural Commissioner. Q—Require temporary "A" action pending determination of a permanent rating.
Cal-IPC: California Invasive Plant Council Online Invasive Plant Inventory (2006) (http://www.cal-ipc.org/ip/inventory/weedlist.php). High—Species having severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Moderate—Species having substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Limited—Species that are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Alert—Species with significant potential for invading new ecosystems.
LTBWCG: Lake Tahoe Basin Weed Coordinating Group Weed Priority List (2010). Group 1--Watch for, report, and eradicate immediately. Group 2--Manage infestations with the goal of eradication.