Proposed Action for the
Terrestrial Non-native Invasive Plant Species Treatment Project

USDA Forest Service Pacific Southwest Region
Lake Tahoe Basin Management Unit
Alpine, El Dorado and Placer Counties, California, and Douglas and Washoe Counties, and Carson City Rural Area, Nevada

I. PROJECT AREA DESCRIPTION

A combination of manual and chemical treatments are being proposed to control, contain, and or eradicate Terrestrial Non-native Invasive Plant Species (NIPS) located throughout the Lake Tahoe Basin Management Unit (LTBMU), on National Forest System (NFS) lands, in Eldorado and Placer counties, California; Douglas, and Washoe counties, and Carson City, Nevada. Locations of known NIPS within the LTBMU are shown in Figure 1. These sites represent the current infestations requiring treatment by either manual or chemical methods.

Treatments of known infestations are proposed for up to 100 infested acres annually for chemical treatments and as many acres as feasible for mechanical, manual, or thermal treatments over the next 10 years for the control, containment, and or eradication of current NIPS infestations on the LTBMU.

II. BACKGROUND

NIPS reduce the quantity and quality of habitat for fish and wildlife, by reducing forage, shelter, and cover. Lack of sufficient cover can increase predation, decrease prey species, decrease species richness, and decrease biodiversity and ecosystem health. NIPS can also increase rates of erosion due to having comparatively less root structure than native plants. Roots help bind the soil in place. This decrease in root structure can reduce the water quality of lakes and streams, because as roots hold less soil in place, there is the potential for increased rates of sediment input. This decrease in root structure can also cause unstable stream banks. Subsequent sedimentation can smother aquatic plants, resulting, again, in less forage and cover for wildlife, such as fish and ducks.

NIPS also have damaging effects on the recreational use of NFS lands by reducing access to public lands and impacting scenic qualities; areas infested with weeds, especially those that are spiny or have prickly seeds, can become unpleasant and are avoided by users, including campers, anglers, boaters, and hikers.

Some members of the Lake Tahoe Basin Weed Coordinating Group (LTBWCG) currently treat NIPS using both manual and herbicide methods on non-federal lands in the Lake Tahoe Basin (Basin). The LTBMU currently treats NIPS on National Forest System lands using only manual methods. Manual methods are not effective for some species for a number of reasons, such as vegetative reproductive strategies. Rhizomes or root buds may be stimulated to produce new individuals or stems if all plant parts have not been removed during manual treatment, and often it is difficult to remove every piece of root.

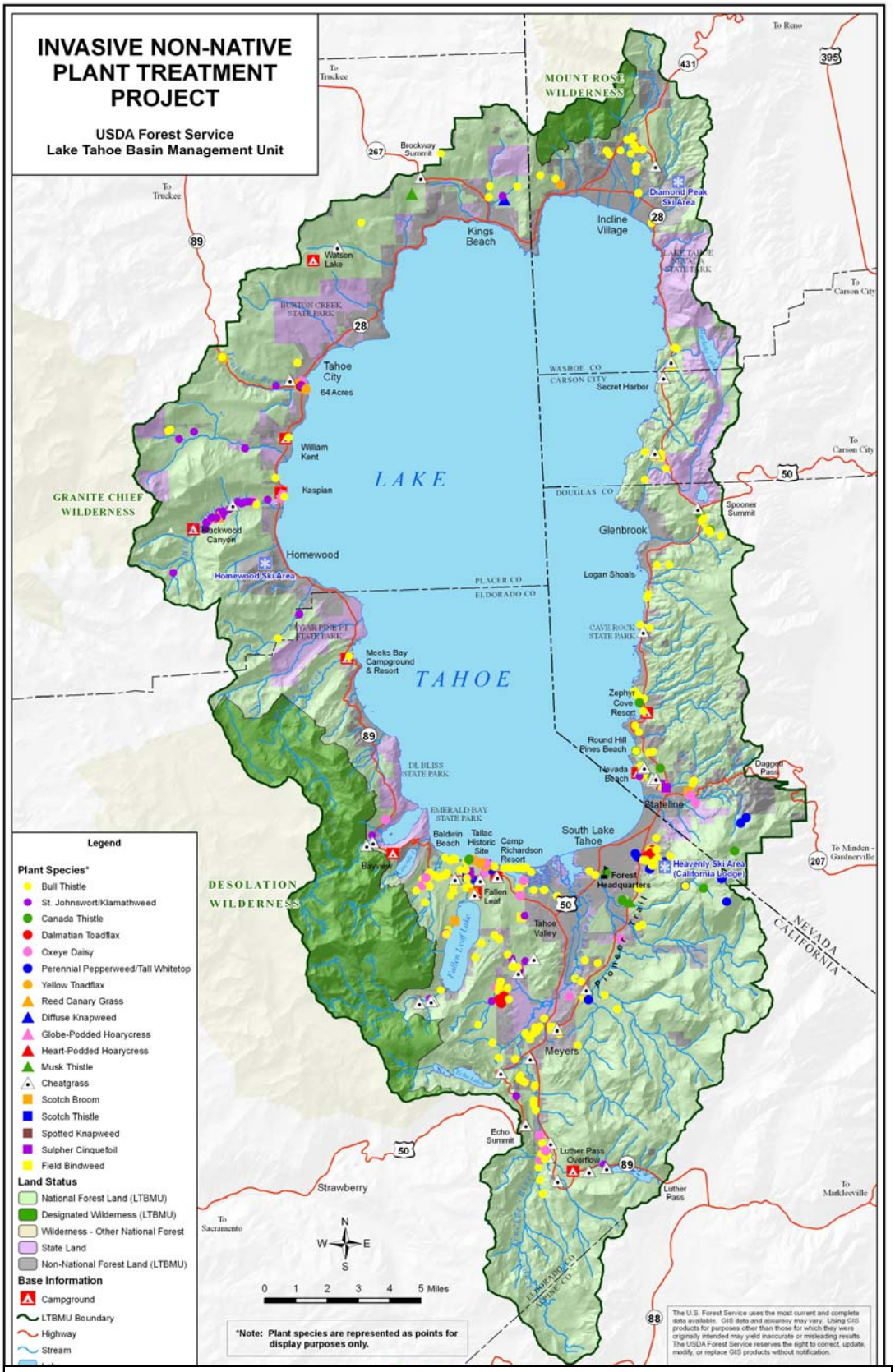


Figure 1. Locations of Known NIPS Within the LTBMU

Species that are aggressive and difficult-to-control manually on the LTBMU include: Canada thistle, Cheatgrass, Dalmatian toadflax, Ox-eye daisy, Perennial pepperweed/Tall whitetop, Yellow toadflax, Diffuse knapweed, Heart-podded and Globe-podded hoarycress, Russian knapweed, Scotch broom, Spotted knapweed, St. Johnswort/Klamathweed, Sulphur cinquefoil and Reed canary grass.

III. PURPOSE AND NEED

The purpose of this project is to treat known infestations of NIPS and treat new infestations of NIPS using manual methods and herbicides.

In 2008 there were approximately 22 infested acres of NIPS located on NFS lands managed by the LTBMU. There is a need to treat these known infestations.

In addition to the treatment areas known to be infested with NIPS, additional infestations are likely to be identified. There is a need to treat these infestations before they spread.

NIPS have the ability to spread rapidly, especially where there are soil-disturbing activities, because their populations are not kept in check by natural herbivores, pathogens, and competitors that are present in their native habitat. NIPS out-compete native plants by utilizing available moisture, sunlight, and nutrients. They can invade intact ecosystems, decrease productivity, form monocultures, displace native communities, and/or change vegetative community structure. NIPS can be classified as generalists, able to thrive in a wide variety of environmental conditions. When environmental conditions change, generalists are usually able to adapt. "More movement of people, vehicles, and domesticated animals means expanded opportunities for weed introduction and spread." Some NIPS species do not respond well to only manual (e.g. hand pulling) treatment as production of new shoots or new plants form from the remaining plant parts at the site. Some occurrences have expanded or become denser in this manner by using manual treatments. There is a need to treat some of these difficult-to-control NIPS with other methods, including herbicides.

Goals and Objectives

The goal of the NIPS Treatment Project is to eradicate, control, and or contain currently known, and future, infestations of NIPS using both manual and chemical methods.

The objective of the project would be to:

1. Conduct early treatment of newly found infestations and NIPS species in order to contain, control, or eradicate before the site or species becomes established in the LTBMU

2. Contain currently established infestations on the LTBMU

3. Eradicate currently established infestations on the LTBMU

IV. PROPOSED ACTION

The treatments proposed to treat NIPS include a manual, mechanical, selected herbicides, and thermal; or a combination of these. There are over 31 species of non-native invasive plant species (NIPS) - which can include any type of plant that may be noxious, invasive, harmful, injurious, poisonous or toxic – that are currently known from or in close proximity to the Basin. The LTBWCG, a bi-state coalition formed to stop the introduction and spread of invasive 'weeds,'annually prepares a list of Priority Invasive Weeds specifically for the Basin. As a signatory on the Memorandum of Understanding with the LTBWCG, the LTBMU coordinates with the LTBWCG. The most recent list, excluding aquatic species, includes the following 19 NIPS that are proposed for treatment in this project:

Canada thistle (*Cirsium arvense*)	Diffuse knapweed (*Centaurea diffusa*)
Hoary cress (*Cardaria* species)[1]	Musk thistle (*Carduus nutans*)
Rush skeletonweed (*Chondrilla juncea)*	Russian knapweed (*Centaurea repens*)
Scotch thistle (*Onopordum acanthium*)	Squarrose knapweed (*Centaurea virgata ssp. squarrosa*)
Sulfur cinquefoil (*Potentilla recta)*	Teasel (*Dipsacus fullonum*)
Yellow starthistle (*Centaurea solstitialis*)	Bull thistle (*Cirsium vulgare*)
Dalmatian toadflax (*Linaria dalmatica)*	St. Johnswort/Klamathweed (*Hypericum perforatum*)
Oxeye daisy (*Chrysanthemum leucanthemum*)	Perennial pepperweed/Tall Whitetop (*Lepidium latifolium*)
Scotch broom (*Cytisus scoparius*)	Spotted knapweed (*Centaurea maculosa*)
Yellow toadflax (*Linaria vulgaris*).	

In addition to the LTBWCG list, the LTBMU proposes to treat an additional twelve species (refer to the table below). These additional twelve species (eleven plus dividing the hoary cress into two separate species) have been identified through a process of internal Forest Service review based on the following parameters:

1. currently located on the LTBMU
2. identified as a problem species in the LTBMU Land and Resource Management Plan (LRMP) as amended by the Sierra Nevada Forest Plan (2004);
3. has been rated as invasive to wildlands by Cal-IPC, rated as problematic by the California Department of Food & Agriculture (CDFA) or the Nevada Department of Agriculture (NDA).

[1] The LTBMU has included *two* species of hoary cress: Heart-podded hoarycress (*Cardaria draba*), and Globe-podded hoarycress (*Cardaria pubescens*), where the LTBWCG has lumped these two species.

Cheatgrass (*Bromus tectorum*)	Purple star thistle *(Centaurea calcitrapa*)
Poison hemlock (*Conium maculatum*)	Quackgrass (*Elytrigia repens*)
Dyer's woad (*Isatis tinctoria*)	Purple loosestrife (*Lythrum salicaria*)
Reed canary grass (*Phalaris arundinacea*).	Russian thistle (*Salsola tragus*)
Medusahead (*Taeniatherum caput-medusae*)	Tamarisk (*Tamarix chinensis*)
Woolly mullein (*Verbascum thapsus*)	

Refer to Appendix A for the complete listing of NIPS proposed for treatments in this project.

Treatments of known infestations are proposed for up to 100 infested acres annually (assuming 25% growth of populations for 10 years) for chemical treatments and as many acres as feasible for mechanical, manual, or thermal treatments over the next 10 years. Treatments that would need to occur within the same year would not be counted as new treatments. The proposed action would also authorize treatment of newly discovered infestations and new NIPS. All treatments would be adjusted to meet Project Design Features as outlined below. Most sites will require more than one treatment over subsequent years over the ten year time period.

This project also proposes to treat expanding known sites or new sites with the same or new NIPS using treatments proposed. This is a critical component of any effective invasive species management program. It is a prompt and coordinated containment and eradication response that can reduce environmental and economic impacts. This action results in lower cost and less resource damage than implementing a long-term control program after the species is established, and requires vigilance and monitoring of the managed area and surrounding ecosystem. [2]

Refer to Appendix B for a flowchart displaying how the sites of known or newly discovered NIPS will be treated using proposed methods and project design features described in this Proposed Action.

The majority of NIPS treatments would occur within the mixed conifer, Jeffrey pine, or red fir ecosystems, as well as along travel corridors (e.g. roads and trails). Re-treatment ould occur until non-native invasive plants are determined to be eradicated, controlled, or contained, and, as stated above, re-treatments within the same year would not count as new treatments.

[2] The Forest Service is well suited to improve its early detection capabilities through the collaborative and coordinated efforts of the LTBWCG. For more information on this topic, refer to http://www.fs.fed.us/foresthealth/management/fhm-invasives.shtml.

The Forest Service proposes to use the following treatments[3] for known sites and or new sites with the same or new NIPS:

- **Manual treatment** – Treat approximately 100 acres for NIPS (containing an estimated 2 net acres of NIPS), not including the Angora Fire area. Manual treatments could include hand pulling, pulling using tools, clipping, mulching, tarping.
- **Mechanical treatment** – This type of treatment could include mowing, cutting, brushing, trimming, and weed-eating. The acreage would coincide with the above manual treatments.
- **Chemical treatment** – Treat approximately 90 acres for NIPS (containing an estimated 6 acres). No aerial application of herbicides is proposed in this project. Chemical treatment would include those methods listed below such as hand/selective, directed spray, or limited broadcast, and could be used to control such species as, for example, Canada thistle, Tall whitetop, Spotted knapweed, Russian knapweed, Dalmatian toadflax, Oxeye daisy, Hoary cress, Scotch broom, Sulphur cinquefoil, and Yellow toadflax.
- **Thermal treatment -** would most likely be used on small rosettes/seedlings. The net acreage would be very small, estimated at 1 acre.

A full description of each of these treatment types is described in the table below:

Treatment Method	Description
Manual Methods	
Hand Pulling	Pulling or uprooting plants can be effective against some shrubs, tree saplings, and herbaceous invasive plants. Annuals and tap-rooted plants are particularly susceptible to control by hand-pulling. It is not as effective against many perennial invasive plants with deep underground stems and roots that are often left behind to re-sprout. The advantages of pulling include its small ecological impact, minimal damage to neighboring plants, and low (or no) cost for equipment or supplies. The key to effective hand-pulling is to remove as much of the root as possible while minimizing soil disturbance. For many species, any root fragments left behind have the potential to re-sprout, and pulling is not effective on plants with deep and/or easily broken roots.
Pulling Using Tools	Most plant-pulling tools are designed to grip the plant stem and provide the leverage necessary to pull its roots out. Tools vary in their size, weight, and the size of the invasive plant they can extract. The Root Talon is inexpensive and lightweight, but may not be as durable or effective as the all-steel Weed Wrench, which is available in a variety of sizes. Both tools can be cumbersome and difficult to carry to remote sites. Both work best on firm ground as opposed to soft, sandy, or muddy substrates.
Clipping	"Clipping" means to cut or remove seed heads and/or fruiting bodies to prevent germination. This method is labor-intensive and effective for small and spotty infestations.
Mulching	Covering with certified "weed free and plastic free" mulch such as rice

[3] **Net acres** refers to the actual *infested* area.**Gross area** is the larger area that encompasses both infested area and area between plants that does not have NIPS and may be bare ground or native plants

Treatment Method	Description
	straw, grass clippings, wood chips, newspaper
Tarping	Placing tarps to shade out weeds or solarize (to injure by long exposure to heat of the sun) them
Mechanical Methods	
Mowing, cutting, brushing, trimming, weed eating	
	Mowing and cutting can reduce seed production and restrict invasive plant growth, especially in annuals cut before they flower and set seed. Some species, however, re-sprout vigorously when cut, replacing one or a few stems with many that can quickly flower and set seed. These treatments are used as primary treatments to remove above-ground biomass in combination with herbicide treatments to prevent re-sprouting, or as follow-up treatments to treat target plants missed by initial herbicide use. Also, mowing and cutting can be sued, in conjunction with herbicide treatments, to reduce vegetative materials and to promote vigorous growth in order to decrease the amount of herbicide application needed, and to increase herbicide effectiveness.
Herbicide Methods	
	Herbicide treatments would include use of adjuvants such as surfactants and dyes. Adjuvants are materials that facilitate the activity of herbicides, such as the emulsifying, dispersing, spreading, wetting, or other surface modifying properties of liquids; and dyes assist the applicator in efficiently treating target NIPS and also avoiding contact with herbicide-treated plants by showing which plants have been treated already.
Hand/Selective	Treatment of individual plants to avoid spraying other desirable plants. There is a low likelihood of drift or delivery of herbicides away from treatment sites. This method is used in sensitive areas, such as near water, to avoid getting any herbicide on the soil or in the water. Hand/Selective methods could be done under more variable conditions than spot spraying or broadcast spraying (Tu et al., 2001). Specific methods include: 1. Dip and clip – similar to cut stump, where cutting tool is first dipped in herbicide, then used to cut target NIPS to be treated 2. Cut stump – herbicide is sprayed on cut surfaces to eliminate or greatly reduce re-sprouts; this is an indiviual target NIPS treatment 3. Wicking and wiping – herbicide is wiped onto the target NIPS as the wick of the applicator comes in contact with the target NIPS
Directed spray	Accomplished by sprayer wand with regulated nozzle in such a fashion that spray is concentrated at the target NIPS
Limited broadcast spray	Hand application with sprayer want wetting more than one plant at a time of target NIPS; used for dense occurrences of target NIPS where individual plant application would not be effective.
Other Methods	
Thermal	Steaming, flaming, to be done only when weather conditions permit, such as in a wet season (spring). This method is especially useful for small plants, plants in the rosette stage, or seedlings. For example, thermal is being considered for cheatgrass prior to seed maturity in the spring, and for rosettes of knapweeds.

Herbicides Proposed

Herbicides are already used in the Basin. Private landholders, county and state agencies and other signatories of the LTBWCG, already use herbicides. The herbicides

glyphosate, clorpyrald, and chlorsulfuron were approved for use in the Basin in 2003 by the California Lahontan Water Quality Control Board (CLWQCB). However, federal agencies such, as the Forest Service, must first go through an environmental review process before using specific herbicides, to comply with the National Environmental Policy Act (NEPA)[4].

Only herbicides that have been approved for use in the respective states of California or Nevada would be used. In addition to the herbicides that the Lahontan Regional Water Quality Control Board (LRWQCB) has approved previously, the LTBWCG has requested use of additional herbicides and is awaiting approval in an amended 2003 approval letter. The additional herbicides will not be used until this approval had been granted.

Described next are the herbicides proposed for use for the NIPS Treatment Project:

Glyphosate. This herbicide is a non-selective herbicide that is currently approved for use by the LRWQCB. It has little soil activity and is not absorbed in the rooting zone. Its non-selectiveness causes this herbicide to kill most plants where applied, including desirable native plant species. Although glyphosate is a broad spectrum, non-selective herbicide, a good applicator can somewhat selectively remove targeted plants by focusing the spray only on the plants to be removed. Plants can take several weeks to die and a repeat application is often necessary to remove plants that were missed during the first application. It is approved for use adjacent to water and can have utility within riparian buffers. **Roundup** is the commercial trade name for an example of this product that many homeowners are familiar with. Examples of aquatically labeled formulations **Rodeo, Aquamaster,** and **AquaPro** are also available. Aquatic formulations present low risks to aquatic animals because toxic inert ingredients, such as surfactants, have been left out of the formulation, leaving the choice of a surfactant to the applicator. All label directions will be adhered to and to determine if surfactants are required, as *they are usually required for efficacy*. However, it is not part of this project to apply herbicides to standing water, the type of site where aquatic formulations are normally used.

***Chlorsulfuron*.** This herbicide is used to control many broadleaf weeds and some annual grasses and is currently approved for use by the LRWQCB. It is absorbed by the leaves and roots and moves rapidly through the plant. Chlorsulfuron prevents the plant from producing an essential amino acid that inhibits cell division in root tips and shoots of sensitive plants. It is generally active in the soil and tends to leach in all permeable soils. Its half life is 1-3 months. Chlorsulfuron has no effect on soil microorganisms and is practically nontoxic – that is, the risk is low - to most fish, aquatic invertebrates, birds, and mammals. A product example is **Telar.**

Aminopyralid. This is a recently registered herbicide that is being sought for approval by the LTBWCG which provides systemic postemergence broadspectrum control of a

[4] In previous decisions, the LTBMU has been authorized to use borax, a fungicide, on cut tree stumps to control annosum root rot, a common root and butt rotting pathogen that is especially common on second-growth mountain conifers. The use of borax is outside the scope of this decision.

number of key noxious and invasive annual, biennial, and perennial weed species. Aminopyralid can also provide residual weed control activity controlling re-infestations and reducing the need for re-treatment depending on the rate applied and the target weeds. Two field studies indicate that aminopyralid is likely to be non-persistent and relatively immobile in the field. Half-lives of 20 and 32 days were determined with minimal leaching below the 15 to 30 cm soil depth. Aminopyralid has been shown to be practically non-toxic to birds, fish, honeybees, earthworms, and aquatic invertebrates. A product example is **Milestone.**

***Triclopyr*.** This is a selective herbicide that is being sought for approval by the LTBWCG for control of woody and broadleaf plants along rights-of-way, in forests, on industrial lands and on grasslands. In this project it is proposed only for use in combination with aminopyralid, a pre-mixed herbicide, such as **Milestone VM Plus**. Such an herbicide would be used as a broad-spectrum control of broad-leaved and woody plants.

V. PROJECT DESIGN FEATURES

The project includes design features to address environmental resources and to ensure consistency with the Forest Land and Resource Management Plan, as amended. Specific design features are listed below that would be applied to all NFS lands within the LTBMU that are affected by this project.

Code	Design Feature
DF-01	Manual treatment will be utilized in lieu of chemical treatment where effective.
DF-02	Manual treatment: To reduce seed spread, disposal of NIPS that are grubbed or manually removed will be as follows: If no flowers or seeds are present: Pull the weed and place it on the ground to dry out if species is not rhizomatous or there is a potential for re-sprouting. If flowers or seeds are present: Pull the weed carefully to prevent seeds from falling and place in an appropriate container for disposal, or separate the flowers and seedheads from the plant and dispose separately as above.
DF-03	Heritage Resources: Weed treatments will be coordinated with the Forest heritage resource specialist to protect heritage resources such as traditional plant gathering areas, rock art, and historic structures in both Nevada and California. In California, soil disturbance will be limited to one cubic meter per acre, without prior authorization from the heritage resources specialist. (R5 Programmatic Agreement for minimum disturbance activities with State Historic Preservation Officer)
DF-04	Do not use herbicides to treat NIPS in any Area of Concern or gathering site for the Washoe tribe without consultation with the Tribe. If weeds become established in the future, consult with the tribe to determine suitable treatment methods under Early Detection – Rapid Response.
DF-05	Heritage: Cultural surveys will be conducted as needed and evaluation will occur on a case by case basis. Existing properties will be considered with each treatment of weeds.
DF-06	Wildlife: Limited Operating Periods for TE&S species, as called for in the Forest Plan will be implemented if weed infestations occur within the specified protection areas.
DF-07	Aquatics: Where possible, utilize manual weed treatment methods within 50 feet of perennial rivers, streams, lakes and other water bodies (including wetlands).
DF-08	Aquatics: Chlorsulfuron and triclopyr will not be applied within 50 feet of perennical rivers, streams, lakes, and other water bodies (including wetlands).

Code	Design Feature
DF-09	Aquatics: Use only dip & clip or wicking & wiping applications of glyphosate and aminopyalid within 50 feet of perennial rivers, streams, lakes and other water bodies, including adjacent to occupied Lahontan cutthroat trout and Sierra Nevada yellow-legged frog habitats. Use only the aquatic formulation of glyphosate within 10 feet of perennial rivers, streams, lakes and other water bodies (including wetlands).
DF-10	Aquatics: Herbicide applications will not take place within 6 hours of predicted rainfall. Spot weather forecasts will be made available to the applicator.
DF-11	Aquatics: Herbicides will not be applied in seasonally flooded SEZs during the flooded phase. SEZs will only be treated with herbicide during the seasonal dry phase in areas that do not have standing water at the time of application.
DF-12	Aquatics: Streams or other surface waters must not be used for washing herbicide application equipment or personnel.
DF-13	Aquatics: Preparation of herbicides for application will take place at a distance greater than 100 feet of perennial rivers, streams, lakes and other water bodies (including wetlands).
DF-14	Aquatics: Herbicide application in meadows will be limited to the use of aquatic formulations of glyphosate and aminopyralid. No broadcast spraying methods will be used (directed spray is acceptable).
DF-15	Water – SEZ Treatments: Herbicide application to treat NIPS in SEZs will be limited to the use of aquatic formulations of glyphosate and aminopyalid.
DF-16	Aquatics and Water: -Other herbicide treatment methods than those in DF-09 and DF-14 will be considered on a case by case basis in consultation with the Forest Aquatics Biologist and the Forest Hydrologist, when glyphosate and aminopyalid or other methods are not effective in the treatment of NIPS.
DF-17	Water - Herbicides can be used near ephemerel, intermittent, or non-flowing streams when there is no water present.
DF-18	Recreation: The Recreation Department will be consulted prior to treatment of public developed recreation sites and areas of concentrated public use to reduce conflicts with operational needs. Application of herbicides in recreation areas would ideally occur before Memorial Day or after Labor Day, or during the week.
DF-19	Soils: Areas with greater than 0.1 acre of bare soil created by the treatment of NIPS would be evaluated for rehabilitation and revegetation. Temporary Best Management Practices (TBMP), such as use of rice grass mulch, will be implemented as needed.
DF-20	Property boundary locations will be confirmed before herbicides are applied.
DF-21	Storage of chemicals will be in designated storage facilities according to the manufacturer's labels.
DF-22	Herbicides: All herbicide spray tanks will be equipped with a pressure gauge to ensure that low pressure application of herbicides is achieved.
DF-23	Botany: Only wicking, wiping, dip & clip and manual treatments may take place within 50 feet of sensitive plants.
DF-24	Control of Drift or Herbicide Migration: All herbicide application will follow EPA approved *label directions* in regards to control of drift of herbicides during spraying. These directions have specific wind speeds and air temperatures for application of each herbicide. In addition, applicators will utilize droplet size and spray pressure to ensure droplets do not travel outside of the targeted zone.
DF-25	Safety and Health: All Personal Protective Equipment will be used in accordance with the Material Safety Data Sheet (MSDS) & product label for the specific type of chemical being applied during field operations.
DF-26	Safety and Health: Signs regarding herbicide use will be placed at access points to treatment areas prior to initiating treatment. Signs will list herbicides to be used, effective dates, and name and phone number of Forest contact.
DF-27	Safety and Health: Herbicides will only be applied by trained and/or certified applicators in accordance with label instructions and applicable federal and state pesticide laws. Label instructions include constraints on application under certain wind, temperature, precipitation and other weather conditions to eliminate drift, volatilization, leaching, or runoff.

Code	Design Feature
DF-28	Any hazardous materials spills will be reported to the LTBMU Forest Spill Coordinator and treated in accordance with the LTBMU Hazardous Materials Response and Spill Safety Plan.
DF-29	Safety and Health: Unused herbicides will be disposed of in accordance with the manufacturer's label.
DF-30	If NIPS are discovered in the Grass Lake RNA, approval for treatment will be coordinated with the station director. Refer to FSM 4060.
DF-31	If herbicide use is proposed to control an infestation of NIPS in any Wilderness Area (Desolation, Granite Chief, Mt. Rose), Regional Forester approval will be sought. Refer to FSM 2320.

Currently there are no known sites with wilderness areas (Desolation, Mt Rose, and Granite Chief) or the Grass Lake Research Natural Areas (RNA) on the LTBMU. If a new infestation of NIPS is discovered in the wilderness areas or RNA the specific design features (#DF-28 for RNAs and #DF-29 for Wilderness areas) would be applied.

Monitoring, such as implementation and effectiveness monitoring would be accomplished as funding permits, in order to ensure that the treatment program continues to contain, control, and or eradicate NIPS. The length of time required for herbicides to kill plants varies with herbicide and plant species, and the schedule of when to monitor for effectiveness may not be the same for all treatments. Also, not every treated occurrence will need to have implementation or effectiveness monitoring. A random sample of treatments over an array of plant species, treatment areas and types would be sufficient for program oversight. Effective treatments will reduce the NIPS occurrence by at least 75% following the applied treatment (refer to Appendix C for the description of effectiveness ratings).

VI. CONCERNS / ISSUED RAISED DURING INTERNAL DIALOGUE

Described below are a number of conerns that are related to the use of chemical treatments. These concerns have been addressed through internal Forest Service specialist dialogue in the development of the NIPS Treatment Project proposed action and associated design features.

Concern 1 – Human health:
The use of herbicides for non-native invasive plant control may cause health problems for people who are exposed to herbicide drift or recently treated areas. Although federal and state licensing and certification requirements for herbicide use build in strict safety features, some people have reservations about the use of these products. While many believe limited use of herbicides does not pose a significant threat to human health, others believe that an alternative that authorizes herbicide use could result in health problems.

Concern 2 – Traditional use: The proposed application of herbicides for weed control may affect the gathering practices of Native Americans, and others to collect native plants for traditional or medicinal use. This concern relates to potential human health problems that may be caused with the application of herbicides. In addition, herbicides

may kill specific plants that are collected in specific areas and used for medicinal or traditional purposes.

Concern 3 – Soil and water:
The use of herbicides has the potential to adversely affect the soil and water resources and therefore may harm humans, animals, and native plants.
Concern 4 – The proposed application of herbicides may cause pollution of Lake Tahoe.

Concern 5 – Fish and wildlife:
The active ingredients of herbicides are specifically engineered to disrupt plant physiology. However, surfactants, adjuvants, and dyes that are added to herbicides, could affect some species of fish, amphibians, or wildlife. Herbicides that have been rated as toxic to honey bees are of greatest concern.

Concern 6 – Urban Lots:
Herbicide treatment of NIPS (those that reproduce by rhizomes) in Urban Lots may present a number of potential problems. These include public contact of the homeowners prior to treatment may be difficult due to rentals and second homes; use of herbicides near homes or gardens may anger some residents; control of NIPS on Urban Lots may be short-lived if there is a source of NIPS propagules nearby on private land that is not controlled at the same time; some residents may be planting horticultural NIPS such as ox-eye daisy on Urban Lots because they think they are pretty, and thus, the control may be cancelled out by new plantings; pets or small children cannot read signage.

Concern 7 – Aquatic NIPS are present in Meeks Creek. This is outside the scope of this project. This project will cover terrestrial NIPS only.

VII. DECISION TO BE MADE

The decision to be made by the Forest Supervisor is:

1. to implement the proposed action, take action through an alternative (to be developed), or take no action at this time, and
2. to make a determination as to the potential for and nature of significant effects.

This decision would authorize manual treatment of infestatons in wilderness. If it is determined a new infestation of NIPS occurs in wilderness areas, and would require the use of herbicides, the responsible official and decision lies with the Regional Forester (FSM 2320). The Regional Forester has the authority to approve herbicide use in wilderness areas. Project Design Feature DF-29 requires that if new infestations are discovered in any of the three wilderness areas, coordination and approval by the Regional Forester will be sought before implementing any treatments.

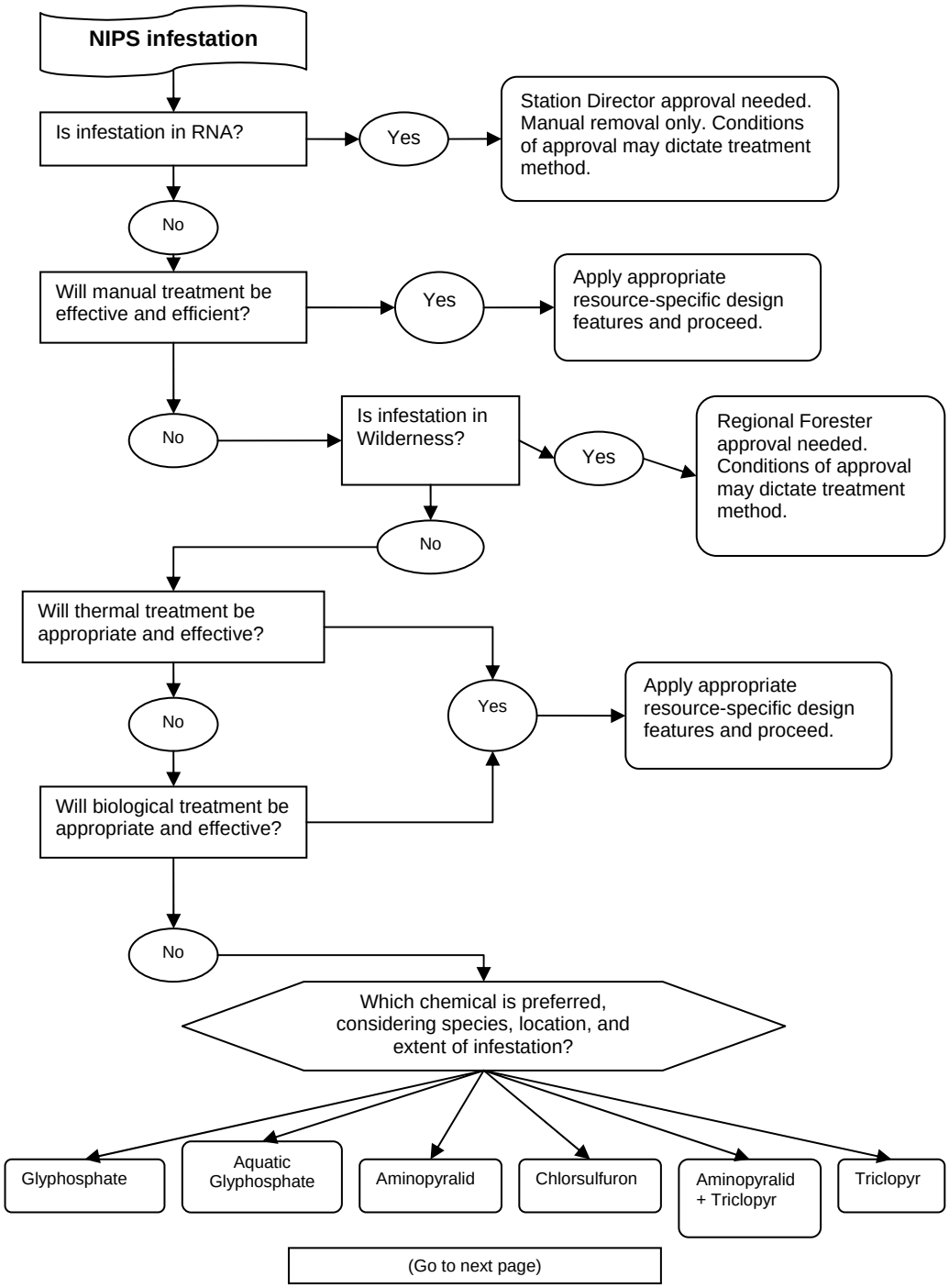
If it is determined a new infestation of NIPS occurs in RNAs the responsible official and decision lies with Research Station Director (FSM 4060). The Responsible Official for the LTBMU would need to coordinate and request approval for all treatment types within RNAs. Project Design Feature DF-28 requires that if new infestations are discovered

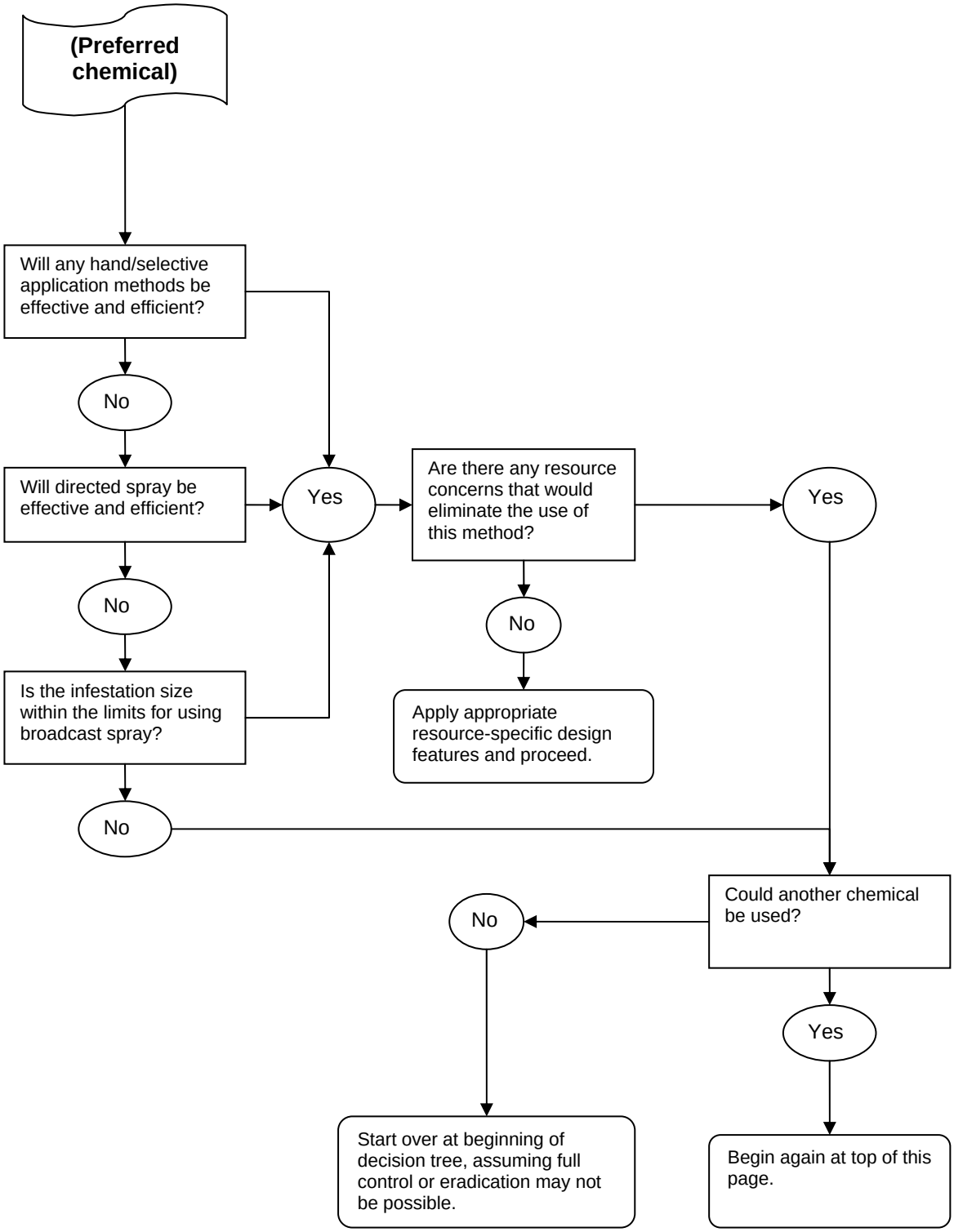
within the Grass Lake RNA, all treatments will be coordinated and approval sought by the Research Station Director.

Appendix A
Non-native Invasive Plant Species Proposed for Treatment

Scientific Name	Common Name	Symbol
Bromus tectorum	Cheatgrass	BRTE
Cardaria draba	Heart-podded hoary cress	CADR
Cardaria pubescens	Globe-podded hoary cress	CAPU6
Carduus nutans	Musk thistle	CANU4
Centaurea calcitrapa	Purple starthistle	CECA2
Centaurea diffusa	Diffuse knapweed	CEDI3
Centaurea repens	Russian knapweed	CERE3
Centaurea solstitalis	Yellow starthistle	CESO3
Centaurea stoebe ssp. *micranthos* (aka *Centaurea maculosa*)	Spotted knapweed	CESTM (aks CEMA)
Centaurea virgata ssp. *squarrosa*	Squarrose knapweed	CEVIS2
Chondrilla juncea	Rush skeletonweed	CHJU
Chrysanthemum leucanthemum	Oxeye daisy	LEVU
Cirsium arvense	Canada thistle	CIAR4
Cirsium vulgare	Bull thistle	CIVU
Conium maculatum	Poison hemlock	COMA2
Cytisus scoparius	Scotch broom	CYSC4
Dipsacus fullonum	Teasel	DIFU2
Elytrigia repens	Quackgrass	ELRE4
Hypericum perforatum	St. Johnswort/ Klamathweed	HYPE
Isatis tinctoria	Dyer's woad	ISTI
Lepidium latifolium	Perennial pepperweed/ Tall whitetop	LELA2
Linaria dalmatica	Dalmatian toadflax	LIDA
Linaria vulgaris	Yellow toadflax	LIVU2
Lythrum salicaria	Purple loosestrife	LYSA2
Onopordum acanthium	Scotch thistle	ONAC
Phalaris arundinacea	Reed canary grass	PHAR3
Potentilla recta	Sulfur cinquefoil	PORE5
Salsola tragus	Russian thistle	SATR12
Taeniatherum caput-medusae	Medusahead	TACA8
Tamarix chinensis	Tamarisk	TACH2
Verbascum thapsus	Woolly mullein	VETH

Appendix B
Flowchart




(Preferred chemical)
Will any hand/selective application methods be effective and efficient?
No
Will directed spray be effective and efficient?
Yes
Are there any resource concerns that would eliminate the use of this method?
Yes
No
No
Apply appropriate resource-specific design features and proceed.
Is the infestation size within the limits for using broadcast spray?
No
Could another chemical be used?
No
Yes
Start over at beginning of decision tree, assuming full control or eradication may not be possible.
Begin again at top of this page.

Appendix C
Treatment Effectiveness Rating

PERCENT	RATING	DESCRIPTION
0	No effect	No effect can be detected on the target species population
1-5%	Failure	Little to no effect can be detected on the target weed population.
6-25%	Poor	Treatment killed less than a quarter of the population.
26-50%	Marginal	Less than half of the weed population was controlled
51-75%	Fair	Over half of the weed population was controlled.
76-90%	Good	Treatment was successful in killing most of the weeds, but a few remain.
91-99%	Excellent	Most of the weed population has been killed with the treatment. A few plants remain could restart the infestation.
100%	Complete	Not a single individual of the target species population was found after a complete survey.
UNK	Unknown	Treatment success cannot be determined.

Table from FACTS, Oracle Application Server Form