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Appendix U: Fish and Aquatic Wildlife Biological Assessment

Biological Assessment

Noxious Weed Treatment Project

Modoc National Forest

Prepared by: /s/ MARTY YAMAGIWA Date: February 28, 2007
Marty Yamagiwa
Forest Wildlife and Fisheries Program Manager

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Appendix U1: Fish and Aquatic Wildlife Biological Assessment

I. Introduction

This Biological Assessment (BA) evaluates the effects of the proposed actions documented in the Final Environmental Impact Statement (FEIS) titled, "Modoc National Forest Noxious Weed Treatment Project", on federally listed aquatic species found on the Modoc National Forest. A letter was received from the Fish and Wildlife Service on April 8, 2003, (ref 1-10-03-I-082), concurring with the Forest's determination that the action "may affect, but is not likely to adversely affect the Modoc, Lost River, and shortnose suckers" for this project, previously named, "Noxious Weed Strategy Implementation Project". This BA addresses the effects of the alternatives as presented in the Final Environmental Impact Statement which include data changes due to public input, changes in acres to be treated, changes in treatment methods, and additional alternatives. THIS BA SUPERCEDES the BA previously submitted on February 28, 2003 to the Fish and Wildlife Service (ref. 1-10-03-I-082) and only addresses the 4 T&E fish species found on the Forest.

Noxious weeds are spreading on public and private lands throughout the west at an alarming rate. USFS lands in the west have about 6-7 million acres of infestation with an annual rate of growth of about 8-12% per year (USDA 1998). This planning effort was initiated in 1994 to stem the onslaught. Implementation of the activities discussed within this document would begin in the spring and summer following the decision and extend for a period of at least 5 years.

The analysis area for this document includes the entire Modoc National Forest. This area encompasses about 1.6 million acres of Forest System lands as well as 337,000 acres of lands administered by other agencies or private landowners. The Forest has an incredibly diverse series of habitats ranging from sagebrush at the lowest elevations to white bark pine at the highest elevations. Tables 1 documents the threatened, endangered, and proposed fish species that are present on the Forest. The USDI Fish and Wildlife Service species list dated February 2007 was used to determine the species that should be included in this analysis.

Table 1. Federally listed aquatic species that occur on or downstream of the Modoc National Forest.

Common Name	Scientific Name	Status
Shortnose sucker	*Chasmistes brevirostris*	Endangered
Lost River sucker	*Deltistes luxatus*	Endangered
Modoc sucker	*Catostomus microps*	Endangered
Warner sucker	*Catostomus warnerensis*	Threatened
Shasta crayfish	*Pacifastacus fortis*	Endangered

This BA is written in accordance with the requirements set forth under Section 7 of the Endangered Species Act (19 U S C 1536 (c)) and follows standards established in Forest Service Manual direction (FSM 2672.42).

II. Consultation to Date

Forest and FWS personnel have been in continual contact during the course of the planning effort. A letter was received from the Fish and Wildlife Service on April 8, 2003, (ref 1-10-03-I-082), concurring with the Forest's determination that the action "may affect, but is not likely to adversely affect the Modoc, Lost River, and shortnose suckers" for this project, previously named, "Noxious Weed Strategy Implementation Project". The most current consultation with the Klamath Falls office occurred on January 31, 2007, when Rick Hardy was contacted regarding this document that would address specific changes that were included in the FEIS.

III. Current Management Direction:

Management for the Forest is detailed in the Modoc National Forest Land and Resource Management Plan (LRMP)(1991), Lost River and Shortnose Sucker Recovery Plan (1993), Final Rule of Endangered Status and Critical Habitat for Modoc Sucker (1985), and other documents, which are referenced in the LRMP. Numerous pieces of legislation including Carson-Foley Act of 1968, Noxious Weed Act of 1974, as amended, Federal Land policy and Management Act, 1976 and Public Rangelands Improvement Act, 1978, all require the USFS to deal with the issue of noxious weeds on public lands.

IV. Description of the Proposed Action:

Purpose of Project

The purpose of the project is to aggressively and efficiently eradicate, or control and contain 14 specific noxious weed species (Table 2) on the Modoc NF utilizing manual, chemical, or manual and/or chemical treatments. Please see the FEIS, Chapter 1, for more information on the purpose.

This action will help preserve the native biodiversity of the Forest and promote the ecosystem health of forested and rangeland habitats by maintaining or improving native forbs and grass communities.

Description of the Alternatives

Detailed descriptions of the alternatives can be found in the FEIS. Appendix A summarizes and provides a comparison of the alternatives.

Alternative 1 – No Action.....

Under the No Action alternative, current management plans would continue to guide management of the project area. No aggressive treatment activities would be implemented to accomplish the purpose and need. The alternative provides a baseline for comparison of effects and analysis of effects.

Alternative 2 - Proposed Alternative

The Modoc NF proposes to treat 14 species of noxious weeds on 520 sites comprising approximately 5,995 acres to eradicate, control, or contain the occurrences;

treating between 300 to 1,500 acres annually for the next five years; herbicides to be applied by directed spray treatments and backpack application utilizing the treatment methods of physical (hand-pulling), individual plant herbicide treatment, or physical and/or individual herbicide treatment.

Table 2. Targeted Noxious Weeds

Canada thistle	Mediterranean sage
Common crupina or bearded creeper	Musk thistle
Dalmatian toadflax	Plumeless thistle
Diffuse knapweed	Perennnial pepperweed or tall whitetop
Spotted knapweed	Scotch thistle
Squarose knapweed	Klamathweed or St. Johnswort
Dyers woad or Marlahan mustard	Yellow starthistle

Alternative 3

Alternative 3 was developed in response to scoping comments to provide an alternative that did not include herbicides. It does not completely meet the purpose and need because some weed species may be spread as a result of ground disturbance or incomplete removal. The Alternative consists of treating between 300 to 1,500 acres annually for the next five years utilizing physical (hand-pulling) methods.

Alternative 4 – Preferred Alternative

This alternative was developed to reflect scoping comments on the need to provide flexibility in treatment methods to eradicate, control, or contain the current occurrences and expanding or new infestations of the selected noxious weeds over a 10 year time period. In this alternative, the Modoc NF proposes to authorize annual treatments of weed infestations ranging from an estimated 300 to 3000 acres. Treatment includes physical (hand-pulling, digging, grubbing), individual plant herbicide treatment (directed spray treatment by backpack sprayer or wick applications of herbicides), physical and/or individual plant herbicide treatment, and Early Detection – Rapid Response. Herbicides proposed in Alternative 4 include clopyralid, dicamba, glyphosate, triclopyr and 2,4-D.

Adaptive management, defined as "…the process of continually adjusting management in response to new information, knowledge, or technologies," will provide the opportunity to treat sites of the identified species that have developed or expanded using the same treatments as outlined in the EIS. This strategy recognizes that unknowns and uncertainty exist in the course of achieving any natural resource management goals. Early Detection – Rapid Response, as a part of adaptive management, is used in this project.

Early Detection – Rapid Response in Alternatives 4, 5, and 6 consists of treating the same or expanded sites, new sites, and the same and new species of weeds, using the same treatments as outlined in that alternative.

Alternative 5

Alternative 5 was developed in response to public comments. This alternative is a no-herbicide alternative utilizing a range of manual and cultural methods to eradicate, control, or contain approximately 280 acres of known sites by treating between 300 to 1,500 acres annually for the next 10 years.

Early Detection – Rapid Response would allow eradication of new infestations of the identified species along with adapting the methods outlined in this alternative, while utilizing the Design Standards, to remove infestations of new noxious weed species which have been proven to be eradicated, controlled, or contained by the methods evaluated. Early Detection – Rapid Response may be used on an additional 200 acres above the currently known locations annually.

Alternative 6

Alternative 6 was also developed in response to public comments. This alternative utilizes non-herbicide and herbicide treatment methods, adding a new herbicide and two mixes. It proposes to treat approximately 341 inventoried acres and treatments may include use of surfactants and dyes, as in all alternatives that use herbicides. Surfactants increase the absorption of herbicide by the weeds, and dyes assist the applicator in efficiently treating target weeds.

Early Detection – Rapid Response would allow treating new occurrences of the 14 identified weed species utilizing adaptive management within the identified Design Standards and the full range of treatment methods listed for this alternative in the FEIS.

Description of Treatments

Physical/manual treatment – This includes hand pulling, grubbing, and excavation of plants with a shovel at or just below the soil surface. All alternatives except the No Action Alternative include physical/manual treatments.

Herbicide treatment – Alternatives 2, 4, and 6 permit use of certain herbicides. Table 3 compares the herbicides proposed in each of Alternatives. Table 4 displays trade names and typical application rates of those herbicides.

Table 3. Herbicides Proposed In The Alternatives

	Herbicides	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
	Herbicides	X		X		X
1	Clopyralid	X		X		X
2	Dicamba	X		X		X
3	Glyphosate	X		X		X
4	Triclopyr	X		X		X
5	2-4-D	X		X		X
6	Chlorsulfuron					X
7	Chlorsulfuron and 2,4-D (Mix 1)					X
8	Dicamba and 2,4-D (Mix 2)					X

Table 4. Herbicides and Typical Application Rates Proposed For Use in the Noxious Weed Treatment Project

	Chlorsulfuron	Clopyralid	Dicamba	Glyphosate	Triclopyr	2,4-D	Mix 1	Mix 2
Trade Name(s)	Telar	Transline	Banvel, Vanquish	Round-up Ultra RT, Round-up Original, Rodeo, Accord, others	Garlon 3A, Pathfinder II, Remedy RTU	20 formulations approved	Chlorsulfuron and 2,4-D	Dicamba and 2,4-D
Typical Application Rates	0.75-1.0 oz/ai/ac[1]	0.10 to 0.25 lbs/ae/ac	0.25 – 2 lbs/ae/ac	0.50 – 3.75 lbs/ae/ac	0.5 – 1.5 lbs/ae/ac	0.5 – 2 lbs/ae/ac	Chlorsulfuron 0.75 – 1.0 + 2,4-D 0.5 1.5 lbs/ae/ac	Dicamba 0.25 – 1.0 + 2,4-D 0.5 – 1.5 lbs/ae/ac

[1] ae = acid equivalent, ai = active ingredient

There will be a 100’ buffer from live water on all streams that have Threatened, Endangered, and Sensitive aquatic species. Formulations of riparian approved formulations of gyphosate can be used up to 10’ of live water.

Combination treatment – Some sites can or will be treated with a combination of treatments. Since this is a long-term strategy for treatment, increases or reductions of numbers of plants or size of a site may move it from one treatment method to another. For example, after several applications of herbicides a site may have few enough plants to effectively treat it using physical/manual treatment.

The annual combination of treatment methods would vary depending on specific conditions. There will be no applications of herbicides on aquatic species; aquatic species control will be addressed in a separate NEPA analysis. However, riparian invasive weeds could be treated using non-chemical means within 10 feet of the stream, and utilizing spot applications of riparian approved formulations of glyphosate up to 10' of live water. No herbicide use will be allowed within 100' of any live water where threatened, endangered, or sensitive aquatic species are present. Hand pulling and grubbing where appropriate would be the primary treatment within riparian areas. Infestation sites planned for treatment range in size from: single plants on <0.1 acre, occupancy of the species covering the entire acre, and occupancy of multiple acres comprising the site at various levels of infestation. High treatment priority is placed on known sites and pathways of spread from those sites. Areas adjacent to stream courses and road and trail systems have moderate incidences of weed infestations and great potential for spread. Noxious weed locations within administrative sites (campgrounds, parking lots, trail heads, river accesses) are at risk of infestation and are included in the treatment analysis.

The project will not include aerial spraying of herbicides, treatment of aquatic species, or applications of herbicides within 10 feet of live water.

There are a total of 12 occurrences of noxious weeds within 100' of live water covering a total of 2.29 acres that are adjacent to T&E fish habitat. Each of occurrence is less than 1 acre in size (See Volume 4, pages 55-59).

V. Existing Environment:

Modoc National Forest is located in northeastern corner of California. It is split into the Warner Mountain, Devil's Garden, Big Valley and Doublehead Ranger Districts. Elevations range from about 4,000 feet to over 10,000 feet. The Warner Mountain and western Big Valley Districts are steep, with perennial streams, while the Devil's Garden and Doublehead Districts are relatively flat with many ephemeral drainages and few perennial streams. The Forest supplies water to the Pit and the Klamath Rivers. The Forest has about 35,000 acres of developed wetlands, primarily on Devil's Garden.

Common vegetation types on the forest include: various sagebrush communities, Jeffrey and ponderosa pine, western juniper, mixed conifer, lodge pole pine, as well as white and red firs. Aspen stands are common on Warner Mountains and less common elsewhere. Dry grassy meadows are scattered throughout the landbase, and are frequent the Devil's Garden and Doublehead Districts. Although noxious weed occurrences exist in all habitat types, they are focused primarily in sage/juniper and disturbed coniferous sites (i.e. landings, plantations, barrow pits, roadsides).

VI. Species Accounts:

The following section provides a very brief account of the distribution and types of habitat utilized for each species analyzed within this document. Detailed species accounts for the Lost River sucker, shortnose sucker, and Modoc sucker can be found in previous Biological Consultations #1-1-96-F-57 and 1-10-96-F-35, Modoc National Forest Long Term Grazing Program. **Shortnose and Lost River sucker –** These species are found within the Lost River drainage on Devil's Garden and Double head Districts; these fish are known to be widespread in Willow, Boles, and Fletcher Creeks as well as in pools and wetlands. Primarily lake residents, the fish have been documented to successfully spawn, and live year round on the Forest. Radio-telemetry studies on these fish are on-going by National Biological Survey (NBS) and Bureau of Reclamation (BOR) personnel.

Habitat for these species consists of open water in lakes and streams, except when they move upstream to spawn. Fish begin making short migrations up into streams when discharge increases

at any time from early February through early April, although March is probably the most frequent month of movement. It appears that the spawning requirements for Lost River sucker are somewhat narrower than the shortnose sucker. In Willow Creek radio-tagged suckers were found to migrate only 3-6 km and remain on spawning grounds for 2-3 weeks (Perkins and Scoppetone 1996). The Lost River sucker requires well graveled riffles (>50%), although they will occasionally utilize well oxygenated spawning substrates upwelling springs. According to Perkins et. al. (1995) they have evolved different feeding strategies. Apparently Lost River suckers are bottom feeders, while shortnose suckers feed on smaller food items within the water column.

Modoc sucker - The Modoc sucker historically occurred in small tributaries of the Upper Pit River in Lassen and Modoc Counties, California, but is now found only in portions of two small drainage systems in Modoc County. Preferred habitat of the species consists of small streams characterized by large shallow pools with cover, soft sediments, and clear water. Food of the Modoc sucker consists of benthic invertebrates, algae, and detritus. During spring spawning runs, the species ascends creeks or tributaries that may be dry during summer months.

A 1978 California Department of Fish and Game survey reported the species from eight creeks: Washington, Hulbert, Turner, Willow, Ash, Dutch Flat, Johnson, and Rush. Additional streams were inhabited by the species historically, but its small, often intermittent stream habitat indicates that Modoc suckers may have never been common. Habitat degredation has removed natural barriers and allowed hybridization with the related Sacramento sucker (Catostomus occidentalis) , threatening the genetic integrity of the Modoc sucker.

On June 11, 1985, the Fish and Wildlife Service determined the Modoc sucker to be an endangered species. Critical habitat was also designated for the Modoc sucker. A designation of critical habitat does not create a management plan for a listed species. Designation does not automatically prohibit certain actions, establish numerical population goals, or prescribe specific management actions (inside or outside of critical habitat). However, critical habitat may provide added protection for areas designated and thus assist in achieving recovery. Areas designated as critical habitat receive protection under Section 7 of the Endangered Species Act with regard to actions carried out, funded, or authorized by Federal Agencies.

Warner sucker - The Warner sucker is endemic to the streams and lakes of the Warner Basin in south-central Oregon. Early residents of the area recalled when the suckers and other fishes were very abundant and would ascend the creeks in the spring to spawn. The Warner sucker is currently known to occur in portions of Crump and Hart Lakes, the spillway canal north of Hart Lake, and portions of Snyder, Honey, Twenty mile, and Twelve mile Creeks. Suitable habitat includes large, shallow natural lakes, although fish would spread into sloughs and ephemeral lakes during wet year; some resident fish are found in low gradient streams as well (Williams et.al. 1989). Warner suckers use low to moderate gradient streams for spawning and rearing. In streams, larvae drift feed on zooplankton near the surface and as they get older then switch to foraging on algae and associated benthic food items (Kennendy).

No treatments are being proposed within 5 miles of this species or its habitat. Therefore, there will be no direct, indirect, or cumulative effects to this species or its habitat.

Shasta Crayfish - The range of the Shasta crayfish is very limited occurring only within the mid section of the Pit River drainage system of Shasta County. It is grouped into eight geographically isolated populations. One of these populations, the Fall River/Fall River Mill population, is considered to be extirpated. The total population in 1978 was estimated to be fewer than 6,000 individuals (Daniels 1980). Subsequent loss of habitat points to a 1988 population that probably numbered fewer than 3,000 individuals. They have a low abundance and their distribution is highly fragmented. Migration and genetic exchange between populations is limited by hydroelectric development, natural barriers, and loss of habitat (USFWS 1998).

Shasta crayfish are found in cool, clear springs, lakes, and streams, frequently at or near a spring source, in areas with abundant volcanic rubble or boulders for escape cover from predators (Light and Clarke 1991). They prefer boulder/cobble substrate, but will also use silty substrate as long as rocks are not embedded. They have been observed using aquatic vegetation for cover, but use of vegetation is uncommon. The species prefers areas of water movement as in locations with distinct flow from a spring source. They are found in all habitat types, such as pools, riffles, and runs, but prefer runs.

Hydroelectric developments have resulted in habitat loss and fragmentation. The introduction of nonnative crayfish species, particularly the signal crayfish, introduction of nonnative game fish species, pathogens from introduced species, hatchery management, trout habitat restoration, and crayfishing have also contributed to a population decline. Sedimentation of lava substrate preferred by Shasta crayfish has been brought about through channelization, dredging, logging, forest fires, culverts and bridges, agriculture, grazing, and muskrat activity.

This species was listed as a Federal endangered species in 1988. Critical habitat has not been designated.

There is no habitat for Shasta Crayfish on the Modoc National Forest. This species only occurs about 25 miles west of the Modoc National Forest primarily in the Fall River and Hat Creek subdrainages of the Pit River in Shasta County. Therefore, there will be no direct, indirect, or cumulative effects to this species or its habitat.

VII. Effects of the Proposed Action

No Action Alternative (Alt 1)

Lost River sucker, shortnose sucker, and Modoc sucker

Direct Effects: Potential adverse effects to the aquatic environment from not controlling the spread of noxious weeds include but are not limited to, an increase in sedimentation, reduction in streambank stability, elevated water temperature with the lack of canopy cover, and a potential decrease in the amount of organic matter available to enter affected streams.

Indirect Effects: Without treatment, noxious weeds would likely become widely established across the Forest. This could lead to an increase in soil erosion (sediment deposition) and surface water runoff. Studies indicate a nearly three-fold increase in sediment yield from knapweed sites compared to an uninfested bunchgrass site.

Cumulative Effects: Weeds will continue to invade and spread on the Forest. As this process occurs, weed control options become narrower. Loss of native vegetation could lead to changes in channel morphology as channel stability decreases.

B. Action Alternatives (Alt's 2-6):

1) Physical/Manual

Lost River sucker, shortnose sucker, and Modoc sucker

Direct Effects/Indirect Effects: Physical/manual treatment as proposed is not expected to have any direct or indirect effects on the Lost River sucker, shortnose sucker, and Modoc sucker or habitat of the species.

Cumulative Effects: The physical/manual treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas**.** Treatment would result better riparian condition, in turn providing more stable and useful aquatic

habitat.

2) Chemical Treatments

Lost River sucker, shortnose sucker, and Modoc sucker

Direct effects: Direct effects to the Lost River sucker, shortnose sucker, and Modoc sucker would be primarily associated with herbicide application near streams and associated riparian areas, lakes, or wetlands. A total of 0.36 acres (4 sites) of noxious weeds are found adjacent to Lost River sucker and shortnose sucker habitat. A total of 1.93 acres (8 sites) of noxious weeds are found adjacent to Modoc sucker habitat

Herbicides are applied in liquid formulations and are sprayed on foliage of the target vegetation. In some cases soil may be a major receptor and contamination can occur by chemicals leaching through the soil to the groundwater and ultimately reaching the aquatic environment. This method of introduction usually poses the least amount of risk to the aquatic environment because chemicals typically disappear from the ground surface by either plant uptake of the chemical, volatilization, and natural decomposition of the active ingredients or adsorption of the herbicide by soil particles. Mitigation measures proposed to address this are included in all alternatives utilizing chemical treatments.

Surfactants are used in herbicide formulations to increase the absorption of the herbicide by lowering the surface tension of the targeted plants. Since herbicides are used to kill plants, using a surfactant to make it more effective is a moot point. Inerts are used to improve the performance of a pesticide, and are ‘confidential business information’ of the chemical companies, and analysis of these herbicides is therefore impossible. Dyes will be used in herbicide treatments to show where the herbicide has been administered. Its effect on non-target terrestrial and aquatic species is unknown; however, its use has not resulted in any known problems. Using dyes can be an aid to making sure that only the target species is treated, and it has been recommended that dyes be used in the administering of herbicides. A synergistic effect is any effect of two herbicides acting together which is greater than the simple sum of their effects when acting alone: such herbicides are said to show synergism. The synergistic effect of the two mixes has been covered in Dave Bakke’s Specialist Report in support of the FEIS.

Leaks, spills, and improper storage and handling of containers are the source of most pesticide related groundwater contamination. These impacts can easily be mitigated with proper training of personnel and proper storage and disposal of chemicals. Risk from an accidental spill of herbicide into a water body on the Forest is considered low.

Another mode of pesticide entry to the aquatic system includes overland flow from precipitation events. Risk varies depending on soil composition and timing and intensity of precipitation events after application. Risk tends to be lower on well-vegetated forests and rangeland where soil infiltration is typically greater than precipitation. Overland flow occurs infrequently on most forest land because the infiltration capacity of the forest floor and soil is usually far greater than the rate of precipitation. Aquatic organisms are more at risk of negative impacts from herbicides in small perennial streams, or during late season when flow is reduced, due to their limited capability for dilution. Mitigation measures proposed to address precipitation events are included in the Proposed Action.

Specific buffer zones of 100’ are used that will reduce herbicide application within riparian areas. A reduction of noxious weeds in riparian areas and other aquatic habitats would benefit native plant species and result in better streambank and riparian condition, in turn providing more stable and useful aquatic environments.

Indirect effects: Not all noxious weeds would be chemically treated. Even under the integrated

weed management approach, not all weed populations would be eradicated, leaving an available seed source for continued propagation or the unlikely option of weeds being out-competed by native or desirable plant species.

Cumulative Effects: No adverse downstream cumulative effects would be expected from situations involving herbicide runoff or leaching because of the method of application, BMP's and mitigation measures designed to prevent these types of impacts from occurring.

C. Early Detection – Rapid Response Strategy:

Alternatives 4, 5, and 6 include treatment of up to 200 acres (100 ac max/year) under this strategy. Only methods approved for use under this NEPA decision are approved for use, therefore the direct, indirect, and cumulative effects for the Early Detection – Rapid Response Strategy will be the same as listed above for the action alternatives.

VIII. Cumulative Effects:

Timber/Silvicultural Activities: On average 2,500 acres are logged for saw logs with an additional 3,000 treated for wood fiber annually on the Modoc National Forest. Harvest prescriptions vary from clear cut to understory thinning. The various timber sales may have had effects on the species discussed in this document that would have been disclosed within their individual National Environmental Policy Act dictated documentation; discussing the potential effects of those projects is beyond the scope of this document. .

The amplitude of effect future timber and silvicultural activities is expected to significantly decrease due to the institution of noxious weed prevention measures. Timber sales and other cultural treatments will need to have changes in planning and implementation. Noxious weed locations will be presented as part of the ID team process so that activities in these areas can be avoided or mitigated (timing projects outside of high risk seasons). Logging systems design should maintain ground cover by minimizing ground disturbance and avoid opening up the overstory adjacent to noxious weed populations. Logging equipment will be washed to stem the transfer of noxious weeds (timber sale clause CT 6.343). Timber sale contract clauses C5.12 (Use of Road Purchaser), C5.4 (General and Special Maintenance Requirements), and C6.315 (Sale Operation Schedule) will be used to keep vehicles and equipment out of high-risk areas during weed seed production periods. Although cumulatively, 80% of noxious weed occurrences have been caused by past timber operations, the new regulations are anticipated to minimize this type weed spread.

Timber harvest and silvicultural treatments will continue to be regulated so any potential adverse effects would be mitigated for during the project phase for all federally listed species. Therefore, between the measures to decrease noxious weeds and the mitigations of future timber harvest activities, there are no anticipated significant cumulative effects on T&E fish.

Grazing: Grazing allotments occur on every acre of the Modoc National Forest, however, roughly 10% of these allotments are vacant and about 2% are in non-use. Approximately, 122,500 animal unit months of grazing occurs annually. There is also one wild horse territory with approximately 425 head.

The greatest potential for livestock to spread noxious weeds is transportation in the animals' hair. A secondary, but smaller concern could be the concentrated use of areas causing bare patches. If weed occurrences were adjacent, they could provide a seed bed. Livestock may be used as a tool to control of noxious weeds in the future, depending on the species and the estimated effectiveness of domestic animals.

The integration of the new guidelines are hoped to minimize the potential spread of weed occurrences as well as new infestations. The following standards and guidelines will be utilized.

Annual operating plans would provide information to the permittees regarding noxious weed identification, methods of spread and prevention measures.

The exclusion of livestock (and wildlife where feasible) from high priority noxious weed sites should be considered where the animals are likely to cause spread of the weed off site

Potential cumulative effects of livestock grazing are fairly minimal.

Fire: Fire management activities that have the potential to spread noxious weeds can be separated into two categories: fuels management and suppression. Approximately 17,000 acres are proposed for fuels treatment per year across the Forest: 5,000 acres of prescribed burns and 12,000 acres of mechanical fuels manipulation.

Areas that have mechanical treatments such as brush mowing and coniferous tree understory thinning are less likely to have potential to spread noxious weeds. Activities associated with mowing are not likely to leave bare spaces upon completion of the project. Plus, areas will be mowed when there is less of a chance of equipment spreading seed. Understory thinning will have the guidelines stated in the Timber/Silviculture section.

Prescribed burns have a potential to increase the amount of noxious weed occurrences on the Forest. Areas that are left bare post fire will be considered for seeding with appropriate seed mixes. Other mitigations to minimize the potential for noxious weed spread will be implemented during prescribed burning activities.

Timing of fire in relation to specific weed species in proposed burn area will be considered; if possible, time burning to control weeds. If burning must be during a high-risk period when weed populations are likely to be favored, NEPA documents will discuss the monitoring and prompt treatment immediately upon observing a weed problem. Monitor burned areas intensively the first year after burning, preferably for 3 years.

Fire management treatments will continue to be regulated so any potential adverse effects would be mitigated during the project phase for all federally listed species. Therefore, between the measures to decrease noxious weeds and the mitigations of future fire management activities, the 3.42 acres that could be treated in Lost River sucker, shortnose sucker, and Modoc sucker, there are no expected cumulative effect on these three species.

Wildfire and associated suppression and rehabilitation measures on the other hand certainly may provide both an excellent seed source and seed bed. Although there is little control of the location of wildfire, the following standards and guidelines will be implemented during the course of wildfire suppression.

The use of high-priority sites for fire camps and staging areas will be avoided whenever any reasonable alternative exists. Noxious weed prevention will be addressed in fire rehabilitation and restoration plans.

There is no way of quantifying the location and extent of future wildlife fires, therefore a determination of the cumulative effects of fire on T&E fish is not possible.

Recreation: Although there is a myriad of recreation associated activities that occur on the Modoc National Forest, the two past-times that have the greatest potential to cause the spread of noxious weeds are stock use and equestrian related events such as the Modoc tribe ride. Stock use on Modoc NF is estimated as 6,650 Recreation Visitor Days (RVD) annually with the vast majority within the South Warner Wilderness. Typically there is only one equestrian special use a year, however, there are a few other rides once every five years. Special event horse use averages roughly 50 horses for three days. In summary, there is a rather minor amount of stock and horse use on the Forest as a whole.

In order to decrease the potential for weed introduction via these means, the following Operating

Guides have been instituted.

Special emphasis will be placed on inventory and management of noxious weeds at trailheads.

Special Use Permits for equestrian groups would recommend pelletized feed be used rather than hay or straw.

> Facilities and high-visibility travel ways would be maintained as weed free zones. Weeds at administration sites, visitor centers, and trailheads would be controlled. Information informing the public and forest service employees that these are "zero tolerance" areas will be posted. This will also be used as opportunities for education. Working cooperatively with the State of California, State of Nevada and the County Weed Boards we will strive to prevent the introduction and establishment of noxious weed infestations as a result of roads, recreation facilities, special use permits, timber harvest, and fuels treatment (see FSM 2081.2),

Given the rather small and mostly localized use of stock and equestrians, plus the implementation of the above guidelines it is not anticipated that recreational activities will significantly contribute to noxious weed spread on this Forest.

The implementation of the weed control program discussed in this document coupled with recreational activities that occur on the Forest will have no cumulative effect on the T&E fish species.

Other Federal Lands in California:

The Modoc National Forest abuts the Klamath and Shasta-Trinity National Forests on the western flank. The Lassen National Forest administers some of these lands, and also has land that lie roughly 2 to 4 miles south of the Big Valley District.

Klamath National Forest-Goosenest District: Currently, their weed control activities have focused on survey, although they have done a small amount of mechanical treatments (less than 1 acre).

Lassen National Forest – Hat Creek District: There is roughly 40 acres on the areas adjacent to the Modoc National Forest that receive control for noxious weeds. The species targeted include dyer's woad, Scotch thistle, and squarrose knapweed.

Shasta-Trinity National Forest – Mc Cloud District: There is no noxious weed control occurring on the portion of the District administered by the Shasta-Trinity National Forest at this time. There are roughly 10 acres of noxious weeds controlled on the portion of the District administered by the Lassen.

Additional lands administered by the federal government outside of Forest Service jurisdiction include 2 wildlife refuges, 1 national park, and 2 BLM resource areas. All of these agencies have noxious weed management programs in place, which include the use of herbicides. An estimation of these agencies programs is as follows:

Klamath Basin National Wildlife Refuge: The Klamath Basin has weed treatments both as part of their noxious weed eradication program as well as farming that occurs within its jurisdiction. On the Tule Lake unit there is roughly 20-30 acres that are treated with rodeo in order to control purple loosestrife. In the Lower Klamath unit, there is another 50 acres of upland sites that are treated with Banvel and Round up to control pepperweed. There is no control occurring on the Clear Lake unit.

Modoc National Wildlife Refuge: Approximately 200 acres are treated annually to control scotch thistle. Rodeo, Roundup, 2_4D and other chemicals are applied by hand, ATV, and truck in addition to a limited amount of hand grubbing that occurs.

BLM-Alturas: About 50 acres in Modoc County are treated annually for the control of primarily Scotch thistle and Mediterranean Sage. Both Telar and 2,4D are applied using both trucks and helicopters.

BLM- Surprise Valley: There are approximately 425 acres of various weed occurrences on the BLM lands in Modoc and Lassen Counties that have been physically (which includes prescribed fire) or chemically controlled from 1997 to 2002; the vast majority is medusa head (410 acres out of 425 acres total).

Lava Beds National Park: Weed treatments on the Lava Beds National Park consist of a combination of mechanical and chemical treatment using Round Up. Weeds that can not be extracted by hand (using a pulaski) are sprayed by hand with the chemical. This occurs on approximately 170 acres. The main weed species of concern are: mullein, hoarhound mint, bull thistle, stinging nettle, and sweet clover.

Other Federal Lands Within Oregon:

Fremont National Forest: Currently, there are approximately 200 acres per year that are sprayed on the Fremont National Forest. Chemical control is focused on spotted knapweed, dalmation toadflax, and Canada thistle. The Forest also has a hand treatment program. The entire Forest encompasses 1.2 million acres.

BLM-Lakeview: This Resource Area uses both physical and chemical means to treat various noxious weeds. There are approximately 250 acres of chemical treatments that occur per year using picloram, glyphosate, and 2,4 – D (amine). These chemicals are used to treat the following weed species: Russian knapweed, hoary cress, Mediterranean sage, Canada thistle, and medusa head. There is an additional 40 acres per year treated by physical means to control musk thistle and Mediterranean sage. There are 3.2 million acres within the boundaries of this Resource Area.

State and Private Lands:

There is roughly 10,000 acres a year that are treated with herbicides on private, commercial farm ground, and private forests for noxious weed treatment within Modoc County as a whole (Joseph Moreo, pers.comm.). In addition, 1,000 acres of regulatory noxious weed control occurs. Roughly 11 acres have been treated on the Ft. Bidwell Reservation; Mediterranean sage, scotch thistle, and Dyer's woad were controlled using mechanical means.

CUMULATIVE EFFECTS SUMMARY:

Of the roughly 2.5 million acres of federal lands encompassed by our Modoc National Forest Map only 6,913 acres will receive treatment on the Modoc National Forest for noxious weeds or about 0.0028%. Of the roughly 4 million acres of state, private and federal lands encompassed by the Forest map, about 14,000 acres or .0056% are treated annually for noxious weed eradication (including the acres proposed by the Modoc National Forest). As stated previously, a maximum of 3.42 acres would be treated in areas that have any potential to effect Lost River sucker, shortnose sucker and Modoc sucker. Due to the location of most of the weed infestations in areas outside of live water occupied by T&E fish, the short duration of management activities, , and other mitigations specific within the Project Design Standards, there are no significant cumulative effects expected with implementation of mechanical, physical and chemical control activities associated with the Noxious Weed Treatment Project.

IX. Determination:

Based on the analysis of effects of the project, it is my determination that this project:

Will have "No Effect" on the Lost River sucker, shortnose sucker, Modoc sucker, Warner sucker, and Shasta Crayfish or their habitat with the implementation of the Action Alternatives.

This determination is based on the distance (over 5 miles) of the proposed treatment area from the Warner sucker and distance (25 miles) of the proposed treatment area from the Shasta crayfish.

For the Lost River sucker, shortnose sucker, and Modoc sucker, this determination is based on the fact that buffer zones (100') of no chemical use have been established for these species and the limited number of sites to be treated (2.29 acres, 12 sites). The only chemical proposed for use within 10' of live water is a riparian approved formulation of glyphosate. Vegetative or channel morphology change are not anticipated to be significant enough to affect the species.

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Appendix A: Summary Comparison of Alternatives for the Noxious Weed Treatment Project

Alternatives / Alternative Features	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Treatment Timeframe	**Ongoing**	**5 years**	**5 years**	**10 years**	**10 years**	**10 years**
Treatment Sites and Acres	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**
Total Inventoried Weeds (2004)	541/6908	541 / 6908	541 / 6908	541 / 6908	541 / 6908	541 / 6908
Inventoried Weeds Fully Treated	**20-30** ac/yr[1]	520 / **5,995**	494 / **5,993**	520 / **5,995**	520 / **180**	538/ **241**
Inventoried Weed Sites Receiving Partial Treatment2	0/0	16/904[2]	0/0	16/904[2]	0/0	0/0
Inventoried Weeds Receiving Limited Treatment3	0/**0**	0/**0**	0/**0**	0/0	9/**100**[3]	3/**100**[3]
Inventoried Weeds Not Treated4	6,878[1]	5/9[4]	47/916[4]	5/9[4]	5 / 5515	0/6,567[4]
Proportion of Inventoried Weeds Treated	0.4%	n.a. / 87 %	91% / 87%	99 % / 99 %	100 % / 4 %	100 % / 5 %
Noxious Weeds Treated Through Early Detection – Rapid Response (acres)5		0 acres	0 acres	Up to **200** acres (100 ac max/yr)	Up to **200** acres (100 ac max/yr)	Up to **200** acres (100 ac max/yr)
Total Acres of Weeds Treated	20-30 ac/yr1	**6,899** acres	**5,993** acres	**7,099** acres	**480** acres	**541** acres
Treatment Methods for Inventoried Noxious Weeds (2004)	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**
Physical – hand pulling, hoeing, grubbing	0/0	161/31	494/5,993	161/31	0/0	0/0
Physical+ – Physical plus, clipping seed head or plant, weed eater, mulch/tarp	20-30 ac/yr1	0/0	0/0	0/0	527/139	116/19
Physical and/or Herbicide Treatments	0/**0**	333/5,961	0/**0**	333/5,961	0/**0**	371/**116**
Herbicide	0/**0**	42/**907**	0/**0**	32/9**07**	0/**0**	46/**65**
Limited Treatment3	0/0	0/0	0/0	0/0	9/100	3/100
Goat Grazing (potential) (physical/herbicide)	0/0	0/0	0/0	0/0	5/41 (no herbicide)	5/**41**
Total Acres Potentially Treated with Herbicides (includes ED-RR acres)6	0/**0**	355/6,868	0/**0**	355/7,068	0/**0**	425/**522**

[1]Under Current Management (Alt. 1), approximately 20 to 30 acres of noxious weeds are treated each year through other site specific NEPA decisions as part of other projects in accordance with the Modoc NF Integrated Weed Management Strategy (2005).

[2]These sites are rhizomotous species that occur within 10 feet of H2O. Those sites that are within 10 feet of H2O would not be treated. Sites with acreage ooutside of this 10 foot no treatment zone would receive partial treatment. The acreage within the 10 foot zone would not be treated, the acreage outside the 10 foot zone would be treated with herbicides.

[3]Includes treating along borders of infestations to prevent spread using the methods specific to each alternative. Treatment is estimated at 100 acres to be proportionally distributed based on the size of the individual infestations. These acres are included in the Inventoried Noxious Weeds Treated acreage.

[4]Excluded in Alt. 2 and Alt. 4: 5 sites of rhizamotous species that are within 10' of live water and partial acreage of 16 sites of rhizamotous species that are within 10' of live water. Rhizamotous species will not be treated by physical methods in these alternatives. Excluded in Alt. 3: 47 sites of rhizamotous species. Excluded in Alt. 5: 5,658 acre Dyer's woad, 850 acre Dalmatian toadflax, 159 acre crupina, and 6 sites of rhizamotous species. These sites will receive limited treatment around the perimeter estimated at 100 acres proportionally distributed based on the size of these sites. Excluded in Alt. 6: 5,658 acre Dyer's woad, 850 acre Dalmatian toadflax, 159 acre crupina. These sites will receive limited treatment around the perimeter estimated at 100 acres proportionally distributed based on the size of these sites.

[5]May use any of the methods approved for use in this NEPA decision.

[6]For Alt. 2 this includes the acres under the physical and/or herbicide method plus the herbicide treated acres. Alt. 4 adds the same categories as Alt. 2 plus adds in the potentially treated 200 acres through early detection rapid response. Alt. 6 includes the Physical and/or Herbicide acres, the herbicide acres, the acres under goat grazing, the acres under the limited treatment category, and the 200 acres under Early Detection-Rapid Response.

Appendix U: Fish and Aquatic Wildlife Species Biological Evaluation

Biological Evaluation
Aquatic Species

Noxious Weed Treatment Project

Modoc National Forest

Final Environmental Impact Statement

Reviewed by: /S/ MARTY YAMAGIWA Date: 3/2/2007
Marty Yamagiwa
Forest Wildlife and Fish Program Manager

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I. Introduction:

This Biological Evaluation (BE) evaluates the effects of the proposed actions documented in the Final Environmental Impact Statement titled Modoc National Forest Noxious Weed Treatment Project on USDA Forest Service Pacific Southwest Region (5) sensitive aquatic species found on the Modoc National Forest. It follows standards established in Forest Service Manual direction (FSM 2672.42). This BE supercedes any previous biological evaluations for aquatic species as it addresses changes made between the "Modoc National Forest Noxious Weed Treatment Project DEIS" and the "Modoc National Forest Noxious Weed Treatment Project FEIS". A separate BE was written for the sensitive terrestrial wildlife and plant species and Biological Assessments were written for federally listed species. Implementation of the activities is expected to begin in the spring following the decision.

The analysis area for this document includes the entire Modoc National Forest. This area encompasses about 1.6 million acres of Forest System lands as well as 337,000 acres of lands administered by other agencies or private landowners. The Forest has an incredibly diverse series of habitats ranging from sagebrush at the lowest elevations to white bark pine at the highest elevations. An analysis area of this size will allow a programmatic approach to noxious weed control as well as enable mitigations to be consistently applied to each District; there should be no effect to the species described within this document. The following tables document the fish and wildlife species that are present on the Forest. The Region 5 Regional Forester's Sensitive species list dated 8 June 1998 was used to determine the species that should be included in this analysis.

Table 1. USDA Forest Service Region 5 Sensitive Aquatic Species that occur or have habitat downstream from the Modoc National Forest.

Common Name	Scientific Name	Taxon
California floater	*Anodonta californiensis*	invertebrate
Scalloped juga	*Juga acutifilosa*	invertebrate
Cascade frog	*Rana cascade*	amphibian
Northern leopard frog	*Rana pipiens*	amphibian
Spotted frog	*Rana pretiosa*	amphibian
Northwestern pond turtle	*Clemmys marmorata marmorata*	reptile
Goose Lake sucker	*Catostomus occidentalis lacusanserinus*	fish
Goose Lake tui chub	*Gila bicolor thallassina*	fish
Goose Lake lamprey	*Lampetra tridentata ssp*.	fish
Goose Lake redband trout	*Oncorhynchus mykiss pop 6*	fish
Warner Valley redband trout	*Oncorhynchus mykiss pop 4*	fish

II. Current Management Direction:

Management for the Forest is detailed in the Modoc National Forest Land and Resource Management Plan (LRMP). Numerous pieces of legislation including Carson-Foley Act of 1968, Noxious Weed Act of 1974, as amended, Federal Land policy and Management Act, 1976 and Public Rangelands Improvement Act, 1978, all require the USFS to deal with the issue of noxious weeds on public lands.

III. Description of the Proposed Action:

Purpose of Project

The purpose of the project is to aggressively and efficiently eradicate, or control and contain 14 specific noxious weed species (Table 2) on the Modoc NF utilizing manual, chemical, or manual and/or chemical treatments. Please see the FEIS, Chapter 1, for more information on the purpose.

This action will help preserve the native biodiversity of the Forest and promote the ecosystem health of forested and rangeland habitats by maintaining or improving native forbs and grass communities.

Description of the Alternatives

Detailed descriptions of the alternatives can be found in the FEIS. Appendix A summarizes and provides a comparison of the alternatives.

Alternative 1 – No Action.....

Under the No Action alternative, current management plans would continue to guide management of the project area. No aggressive treatment activities would be implemented to accomplish the purpose and need. The alternative provides a baseline for comparison of effects and analysis of effects.

Alternative 2 - Proposed Alternative

The Modoc NF proposes to treat 14 species of noxious weeds on 520 sites comprising approximately 5,995 acres to eradicate, control, or contain the occurrences;

treating between 300 to 1,500 acres annually for the next five years; herbicides to be applied by directed spray treatments and backpack application utilizing the treatment methods of physical (hand-pulling), individual plant herbicide treatment, or physical and/or individual herbicide treatment.

Table 2. Targeted Noxious Weeds

Canada thistle	Mediterranean sage
Common crupina or bearded creeper	Musk thistle
Dalmatian toadflax	Plumeless thistle
Diffuse knapweed	Perennnial pepperweed or tall whitetop
Spotted knapweed	Scotch thistle
Squarose knapweed	Klamathweed or St. Johnswort
Dyers woad or Marlahan mustard	Yellow starthistle

Alternative 3

Alternative 3 was developed in response to scoping comments to provide an alternative that did not include herbicides. It does not completely meet the purpose and need because some weed species may be spread as a result of ground disturbance or incomplete removal. The Alternative consists of treating between 300 to 1,500 acres annually for the next five years utilizing physical (hand-pulling) methods.

Alternative 4

This alternative was developed to reflect scoping comments on the need to provide flexibility in treatment methods to eradicate, control, or contain the current occurrences and expanding or new infestations of the selected noxious weeds over a 10 year time period. In this alternative, the Modoc NF proposes to authorize annual treatments of weed infestations ranging from an estimated 300 to 3000 acres. Treatment includes physical (hand-pulling, digging, grubbing), individual plant herbicide treatment (directed spray treatment by backpack sprayer or wick applications of herbicides), physical and/or individual plant herbicide treatment, and Early Detection – Rapid Response. Herbicides proposed in Alternative 4 include clopyralid, dicamba, glyphosate, triclopyr and 2,4-D.

Adaptive management, defined as "…the process of continually adjusting management in response to new information, knowledge, or technologies," will provide the opportunity to treat sites of the identified species that have developed or expanded using the same treatments as outlined in the EIS. This strategy recognizes that unknowns and uncertainty exist in the course of achieving any natural resource management goals. Early Detection – Rapid Response, as a part of adaptive management, is used in this project.

Early Detection – Rapid Response in Alternatives 4, 5, and 6 consists of treating the same or expanded sites, new sites, and the same and new species of weeds, using the same treatments as outlined in that alternative.

Alternative 5

Alternative 5 was developed in response to public comments. This alternative is a no-herbicide alternative utilizing a range of manual and cultural methods to eradicate, control, or contain approximately 280 acres of known sites by treating between 300 to 1,500 acres annually for the next 10 years.

Early Detection – Rapid Response would allow eradication of new infestations of the identified species along with adapting the methods outlined in this alternative, while utilizing the Design Standards, to remove infestations of new noxious weed species which have been proven to be eradicated, controlled, or contained by the methods evaluated. Early Detection – Rapid Response may be used on an additional 200 acres above the currently known locations annually.

Alternative 6

Alternative 6 was also developed in response to public comments. This alternative utilizes non-herbicide and herbicide treatment methods, adding a new herbicide and two mixes. It proposes to treat approximately 341 inventoried acres, and treatments may include use of surfactants and dyes, as in all alternatives that use herbicides. Surfactants increase the absorption of herbicide by the weeds, and dyes assist the applicator in efficiently treating target weeds.

Early Detection – Rapid Response would allow treating new occurrences of the 14 identified weed species utilizing adaptive management within the identified Design Standards and the full range of treatment methods listed for this alternative in the FEIS.

Description of Treatments

Physical/manual treatment – This includes hand pulling, grubbing, and excavation of plants with a shovel at or just below the soil surface. All alternatives except the No Action Alternative include physical/manual treatments.

Herbicide treatment – Alternatives 2, 4, and 6 permit use of certain herbicides. Table 3 compares

the herbicides proposed in each of Alternatives. Table 4 displays trade names and typical application rates of those herbicides.

Table 3. Herbicides Proposed In The Alternatives

	Herbicides	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
	Herbicides	X		X		X
1	Clopyralid	X		X		X
2	Dicamba	X		X		X
3	Glyphosate	X		X		X
4	Triclopyr	X		X		X
5	2-4-D	X		X		X
6	Chlorsulfuron					X
7	Chlorsulfuron and 2,4-D (Mix 1)					X
8	Dicamba and 2,4-D (Mix 2)					X

Table 4. Herbicides and Typical Application Rates Proposed For Use in the Noxious Weed Treatment Project

	Chlorsulfuron	Clopyralid	Dicamba	Glyphosate	Triclopyr	2,4-D	Mix 1	Mix 2
Trade Name(s)	Telar	Transline	Banvel, Vanquish	Round-up Ultra RT, Round-up Original, Rodeo, Accord, others	Garlon 3A, Pathfinder II, Remedy RTU	20 formulations approved	Chlorsulfuron and 2,4-D	Dicamba and 2,4-D
Typical Application Rates	0.75-1.0 oz/ai/ac[1]	0.10 to 0.25 lbs/ae/ac	0.25 – 2 lbs/ae/ac	0.50 – 3.75 lbs/ae/ac	0.5 – 1.5 lbs/ae/ac	0.5 – 2 lbs/ae/ac	Chlorsulfuron 0.75 – 1.0 + 2,4-D 0.5 1.5 lbs/ae/ac	Dicamba 0.25 – 1.0 + 2,4-D 0.5 – 1.5 lbs/ae/ac

[1] ae = acid equivalent, ai = active ingredient

There will be a 100’ buffer from live water on all streams that have Threatened, Endangered, and Sensitive aquatic species. Formulations of riparian approved formulations of gyphosate can be used up to 10’ of live water.

Combination treatment – Some sites can or will be treated with a combination of treatments. Since this is a long-term strategy for treatment, increases or reductions of numbers of plants or size of a site may move it from one treatment method to another. For example, after several applications of herbicides a site may have few enough plants to effectively treat it using physical/manual treatment.

The annual combination of treatment methods would vary depending on specific conditions. There will be no applications of herbicides on aquatic species; aquatic species control will be addressed in a separate NEPA analysis. However, riparian invasive weeds could be treated using non-chemical means within 10 feet of the stream, and utilizing spot applications of riparian approved formulations of glyphosate up to 10’ of live water. No herbicide use will be allowed

within 100' of any live water where threatened, endangered, or sensitive aquatic species are present. Hand pulling and grubbing where appropriate would be the primary treatment within riparian areas. Infestation sites planned for treatment range in size from: single plants on <0.1 acre, occupancy of the species covering the entire acre, and occupancy of multiple acres comprising the site at various levels of infestation. High treatment priority is placed on known sites and pathways of spread from those sites. Areas adjacent to stream courses and road and trail systems have moderate incidences of weed infestations and great potential for spread. Noxious weed locations within administrative sites (campgrounds, parking lots, trail heads, river accesses) are at risk of infestation and are included in the treatment analysis.

The project will not include aerial spraying of herbicides, treatment of aquatic species, or applications of herbicides within 10 feet of live water.

There are a total of 9 occurrences of noxious weeds within 100' of live water covering a total of 12.6 acres that are adjacent to sensitive aquatic species habitat. Each of occurrence is less than 1 acre in size (See Volume 4, Map Book, Page 63 for index to maps of with location of sensitive species.)

IV. Existing Environment:

Modoc National Forest is located in northeastern corner of California. It is split into the Warner Mountain, Devil's Garden, Big Valley and Doublehead Ranger Districts. Elevations range from about 4,000 feet to over 10,000 feet. The Warner Mountain and eastern Big Valley Districts are steep, with perennial streams, while the Devil's Garden and Doublehead Districts are relatively flat with many ephemeral drainages and few perennial streams. The Forest supplies water to the Pit and the Klamath Rivers. The Forest has about 35,000 acres of developed wetlands, primarily on Devil's Garden.

Common vegetation types on the forest include: various sagebrush communities, Jeffrey and ponderosa pine, western juniper, black oak, mixed conifer, lodge pole pine, as well as white and red firs. Aspen stands are common on Warner Mountains and less common elsewhere. Dry grassy meadows are scattered throughout the landbase, and are frequent the Devil's Garden and Doublehead Districts. Although noxious weed occurrences exist in all habitat types, they are focused primarily in sage/juniper and disturbed coniferous sites (i.e. landings, plantations, barrow pits, roadsides).

V. Species Accounts:

The following section provides a very brief account of the distribution and types of habitat utilized for each species analyzed within this document..

California floater - The California floater is a freshwater mussel with a historical distribution from southern British Columbia to northern Baja California (California Floater fact sheet). Its current range is the Fall and Pit Rivers, Shasta County (USDA Forest Service 1998). It occurs in lakes and slow rivers, generally on soft substrates (mud-sand) in fairly large streams and lakes only, in relatively slow current (USDA Forest Service 1998). Primary threats are eutrophication from agricultural runoff and urbanization, sedimentation that smothers mussel beds, water diversions that reduce instream flows, introduction of exotic species, grazing, water impoundments that reduce current velocities and allow for sediment deposition (USDA Forest Service 1998).

This species does not have suitable habitat that is directly, indirectly, or cumulatively affected by the proposed action and will not be carried forward for further analysis.

Scalloped juga - The scalloped juga is a large river form gastropod, restricted to swift

unpolluted, well-oxygenated areas with gravel/boulder substrate, generally at low elevations (USDA Forest Service 1998). This species still is found in a few widely separated sites in the Pit River, below the falls in Shasta County.

This species does not have suitable habitat that is directly, indirectly, or cumulatively affected by the proposed action and will not be carried forward for further analysis.

Goose Lake lamprey - The Goose Lake lamprey is an undescribed subspecies of the sea-run Pacific lamprey (*Lampetra tridentata*). It is likely that they migrate up suitable tributary streams in winter or spring to spawn. They have to move up far enough, possibly 12-19 miles upstream of the lake to find gravel for spawning and to have enough suitable soft-bottomed habitat downstream of the spawning area for survival of the ammocoetes. The ammocoetes probably spend 4 to 6 years in streams before metamorphosing into adults and moving out into the lake.

There is a need to develop an understanding of the taxonomy and life history of this form of landlocked population.

Goose Lake redband trout - The name redband trout is used to cover a confusing complex of distinctive trouts that occur in isolated headwater streams of the McCloud, Pit, Klamath, and Columbia river systems of California, Nevada, and Oregon. The Goose Lake redband trout is endemic to Goose Lake and its major tributaries (Lassen and Willow creeks in California and the extensive Thomas Creek system and Crane Creek in Oregon) as well as to smaller streams such as Cottonwood Creek in California and several small streams in Oregon. Berg (1987) reported that Joseph, Parker, and East creeks (tributaries of the upper Pit River in California) contained trout genetically similar to Goose Lake redband. This species has both lake and stream dwelling populations, which both rely on headwater streams for spawning. Riffles with clean gravels and suitable water temperatures are required.

The long-term persistence of this fish depends largely on the health of populations in the headwater streams flowing into Goose Lake in Oregon and California, even though much of the conservation attention has focused on large fish in the lake itself. The extirpation of the lake population during a drought and its subsequent partial recovery indicate the probable importance of downstream colonization of the lake from headwater populations. Because of the high level of concern over extirpation of Goose Lake redbands (and other native fishes) from Goose Lake when it dried up, conservation efforts have been under way in the watershed, by both agencies and private landowners, to restore streams (e.g., by changing grazing practices) and to remove or alter migration barriers (Moyle 2002). Populations are currently stable.

Goose Lake tui chub – In California tui chubs are native mostly to interior drainages, except the Central Valley, and absent from all coastal drainages, except where introduced. In the Sacramento-San Joaquin drainage tui chubs are native only to Pit river downstream at least as far as Hat Creek and lake Britton and to Goose Lake, although they have been introduced into some reservoirs and ponds in various locations.

The Goose Lake tui chub is considered by Snyder (1908) to be the native tui chub of the upper Pit River from Big Valley upstream to and including Goose Lake. Hubbs et. al. (1979) determined that the Pit River form and the Goose Lake form of tui chub were distinct and that the Goose Lake tui chub was a distinct subspecies with the *thalassina* name. Tui chubs in general are opportunistic omnivores and consume a wide variety of aquatic invertebrates (Moyle 1976). Tui chubs are abundant and widely distributed, and so are not in trouble as a species (Moyle 2002).

Goose Lake sucker - The Goose Lake sucker is a described subspecies of Sacramento sucker. The Goose Lake sucker was originally described in 1913 as a subspecies (Fowler 1913) and further studies indicated that the subspecies was distinct, but the differences minor. During their second year, Goose Lake suckers migrate in April or May, depending on water temperature, to

spawn in streams that are tributary to the lake (Martin 1967). Adults have been found in the lake, some of the streams, and some of the reservoirs throughout the year. During summer, young suckers are very abundant in shallow water among aquatic macrophytes. Goose Lake suckers feed primarily on algae and diatoms (Martin 1967).

Warner Valley redband trout - The Warner Valley redband trout are found in the Warner Valley drainage in south-central Oregon and small portions of northwestern Nevada and northeastern California. They are found in California in the upper Dismal and Twelve mile Creek drainages on the Modoc National Forest. Present abundance of Warner Valley redband trout in streams appears to be low. Population densities ranged from 11 to 456 redband trout per 1 mile in Honey and Twelve mile Creeks, respectively (Tait and Mulkey 1993). Warner Valley redband trout use all habitat types from the lake bottom dominated by rock and mud substrate, to the high gradient upper reaches dominated by pools and riffles with small boulder and cobble substrate.

No treatment is proposed within the watershed occupied by this species. This species does not have suitable habitat that is directly, indirectly, or cumulatively affected by the proposed action and will not be carried forward for further analysis.

Northwestern pond turtle - Northwestern pond turtles have been sighted in several locations on the Forest, including Willow Creek on Big Valley RD, Lost River on Doublehead RD, and along the Pit River near Alturas. Pond turtles utilize a variety of habitats in areas with permanent or relatively permanent water that have a slower current. They require basking sites (e.g. partially submerged logs, rocks, open mud banks) and are omnivorous.

Cascade frog - Historically the Cascade frog was continually distributed along the Cascade Mountain axis between northern Washington and northern California and extended to the extreme northern end of the Sierra Nevada. Currently, Cascade frogs are distributed from the Shasta-Trinity region eastward toward the Modoc Plateau and southward to the Lassen region and the upper Feather River system from elevations ranging from 3,000 to 9,000 feet. Cascade frogs are active during warm periods of late spring and summer. During the winter, individuals hibernate on the bottom of lakes and ponds or in saturated ground. This species is a mountain frog, closely restricted to water. Exclusively diurnal in its activity, it can be found frequenting small ponds, potholes in meadows, ponds and lakes usually in open coniferous forests.

There have been no historic or verified observations of this species in the project area (Jennings and Hayes 1994). This species does not have suitable habitat that is directly, indirectly, or cumulatively affected by the proposed action and will not be carried forward for further analysis.

Northern leopard frog - Historically, the northern leopard frog was widely distributed in North America, but uncommon and localized in California. Its known elevational range extends from 4,000 to 5,000 feet in California. In California, native populations of the northern leopard frog whose origin is largely unquestioned, are historically recorded from the Modoc and Lassen Counties. Recent surveys have indicate the species is nearly absent from these historical sites. No individuals of this taxon were encountered during field surveys by Jennings and Hayes (1994). The nearest recent siting was of a single adult at the Tule Lake National Wildlife Refuge in 1990. Depending on temperature and geography, northern leopard frogs enter hibernation during the fall and winter months and emerge from the bottom of aquatic habitats in the spring, as soon as ice melts. Northern leopard frogs require permanent aquatic habitat to breed, feed, and overwinter. Since this species is relatively susceptible to water loss, it is essential that a moist substrate occur in the vicinity of the aquatic habitat. As adults, they may take cover in grasslands, meadows, and pastures.

Most of the essential habitat is no longer present or so fragmented that the habitat can no longer support populations of this taxon. Moreover, bullfrogs have become well established along

riparian corridors where northern leopard frogs where historically present. Although the interaction between these two taxa is poorly understood, bullfrogs may have a negative effect on leopard frogs (Jennings and Hayes 1994).

Spotted frog - The spotted frog is one of the most widely distributed taxon in the western United States; however, in California historical records indicate this species was present on the Modoc Plateau, Pit River drainage, and in the Warner Mountains. Its known elevational range extends from 3,200 to 4,800 feet. The spotted frog is a highly aquatic species typically found in permanent water such as streams rivers, marshes, springs, pools, and small lakes. Spotted frogs do not seem to occur in stagnant water, which contain cattails. There is no specific data on feeding, however, the food eaten differs with age and size of the frog and includes many insects, arachnids, and mollusks.

No individuals of this taxon were found during a concerted field effort on the Modoc Plateau, Pit River drainage, and in the Warner Mountains at sites where this taxon was historically present (Jenning and Hayes 1994). A single subadult frog reported in Cedarville in 1989 has been classified as a misidentification of the species (Hayes pers. comm.).

VI. Effects of Proposed Actions:

No Action Alternative (Alt 1)

Direct Effects: Potential adverse effects to the aquatic environment from not controlling the spread of noxious weeds include but are not limited to, an increase in sedimentation, reduction in streambank stability, elevated water temperature with the lack of canopy cover, and a potential decrease in the amount of organic matter available to enter affected streams.

Indirect Effects: Without treatment, noxious weeds would likely become widely established across the Forest. This could lead to an increase in soil erosion (sediment deposition) and surface water runoff. Studies indicate a nearly three-fold increase in sediment yield from knapweed sites compared to an uninfested bunchgrass site.

Cumulative Effects: Weeds will continue to invade and spread on the Forest. As this process occurs, weed control options become narrower. Loss of native vegetation could lead to changes in channel morphology as channel stability decreases.

The no action alternative is not expected to have any direct, indirect, or cumulative adverse effects on the Goose Lake sucker, Goose Lake tui chub, Goose Lake lamprey, Goose Lake redband trout, Northwestern pond turtle, northern leopard frog, and spotted frog.

Action Alternatives (Alt's 2-6):

1) Physical/Manual

Direct Effects/Indirect Effects: Physical/manual treatment as proposed is not expected to have any direct or indirect effects on the Goose Lake sucker, Goose Lake tui chub, Goose Lake lamprey, Goose Lake redband trout, Northwestern pond turtle, Cascade frog, northern leopard frog, and spotted frog

Cumulative Effects: The physical/manual treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas. Treatment would result better riparian condition, in turn providing more stable and useful aquatic habitat.

Physical/manual treatment as proposed is not expected to have any direct, indirect, or cumulative adverse effects on the Goose Lake sucker, Goose Lake tui chub, Goose Lake lamprey, Goose

Lake redband trout, Northwestern pond turtle, Cascade frog, northern leopard frog, and spotted frog

2) Chemical Treatments

Direct effects: Direct effects to the Goose Lake sucker, Goose Lake tui chub, Goose Lake lamprey, Goose Lake redband trout, Northwestern pond turtle, northern leopard frog, and spotted frog would be primarily associated with herbicide application near streams and associated riparian areas, lakes, or wetlands. A total of 12.6 acres of noxious weeds are found adjacent to the habitat of these species.

Herbicides are applied in liquid formulations and are sprayed on foliage of the target vegetation. In some cases soil may be a major receptor and contamination can occur by chemicals leaching through the soil to the groundwater and ultimately reaching the aquatic environment. This method of introduction usually poses the least amount of risk to the aquatic environment because chemicals typically disappear from the ground surface by either plant uptake of the chemical, volatilization, and natural decomposition of the active ingredients or adsorption of the herbicide by soil particles. Mitigation measures proposed to address this are included in all alternatives utilizing chemical treatments.

Leaks, spills, and improper storage and handling of containers are the source of most pesticide related groundwater contamination. These impacts can easily be mitigated with proper training of personnel and proper storage and disposal of chemicals. Risk from an accidental spill of herbicide into a water body on the Forest is considered low.

Another mode of pesticide entry to the aquatic system includes overland flow from precipitation events. Risk varies depending on soil composition and timing and intensity of precipitation events after application. Risk tends to be lower on well-vegetated forests and rangeland where soil infiltration is typically greater than precipitation. Overland flow occurs infrequently on most forest land because the infiltration capacity of the forest floor and soil is usually far greater than the rate of precipitation. Aquatic organisms are more at risk of negative impacts from herbicides in small perennial streams, or during late season when flow is reduced, due to their limited capability for dilution. Mitigation measures proposed to address precipitation events are included in the Proposed Action. Detailed herbicide information was published in the DEIS, Appendix E, and is incorporated into this document by this reference. Appendix E consisted of a copy of information available on the Internet and was not republished in the FEIS to reduce costs. Summary information is found in Chapter 2 of the FEIS.

Specific buffer zones of 100’ are used that will reduce herbicide application within riparian areas. A reduction of noxious weeds in riparian areas and other aquatic habitats would benefit native plant species and result in better streambank and riparian condition, in turn providing more stable and useful aquatic environments.

Indirect effects: Not all noxious weeds would be chemically treated. Even under the integrated weed management approach, not all weed populations would be eradicated, leaving an available seed source for continued propagation or the unlikely option of weeds being out-competed by native or desirable plant species.

Cumulative Effects: No adverse downstream cumulative effects would be expected from situations involving herbicide runoff or leaching because of the method of application, BMP’s and mitigation measures designed to prevent these types of impacts from occurring.

VII. Cumulative Effects:

Timber/Silvicultural Activities: On average 2,500 acres are logged for saw logs with an additional 3,000 treated for wood fiber annually on the Modoc National Forest. Harvest

prescriptions vary from clear cut to understory thinning. The various timber sales may have had effects on the species discussed in this document that would have been disclosed within their individual National Environmental Policy Act dictated documentation; discussing the potential effects of those projects is beyond the scope of this document. .

The amplitude of effect future timber and silvicultural activities is expected to significantly decrease due to the institution of noxious weed prevention measures. Timber sales and other cultural treatments will need to have changes in planning and implementation. Noxious weed locations will be presented as part of the ID team process so that activities in these areas can be avoided or mitigated (timing projects outside of high risk seasons). Logging systems design should maintain ground cover by minimizing ground disturbance and avoid opening up the overstory adjacent to noxious weed populations. Logging equipment will be washed to stem the transfer of noxious weeds (timber sale clause CT 6.343). Timber sale contract clauses C5.12 (Use of Road Purchaser), C5.4 (General and Special Maintenance Requirements), and C6.315 (Sale Operation Schedule) will be used to keep vehicles and equipment out of high-risk areas during weed seed production periods. Although cumulatively, 80% of noxious weed occurrences have been caused by past timber operations, the new regulations are anticipated to minimize this type weed spread.

Timber harvest and silvicultural treatments will continue to be regulated so any potential adverse effects would be mitigated for during the project phase for all sensitive species. Therefore, between the measures to decrease noxious weeds and the mitigations of future timber harvest activities, there are no anticipated significant cumulative effects on sensitive aquatic species.

Grazing: Grazing allotments occur on every acre of the Modoc National Forest, however, roughly 10% of these allotments are vacant and about 2% are in non-use. Approximately, 122,500 animal unit months of grazing occurs annually. There is also one wild horse territory with approximately 425 head.

The greatest potential for livestock to spread noxious weeds is transportation in the animals' hair. A secondary, but smaller concern could be the concentrated use of areas causing bare patches. If weed occurrences were adjacent, they could provide a seed bed. Livestock may be used as a tool to control of noxious weeds in the future, depending on the species and the estimated effectiveness of domestic animals.

The integration of the new guidelines are hoped to minimize the potential spread of weed occurrences as well as new infestations. The following standards and guidelines will be utilized.

Annual operating plans would provide information to the permittees regarding noxious weed identification, methods of spread and prevention measures.

The exclusion of livestock (and wildlife where feasible) from high priority noxious weed sites should be considered where the animals are likely to cause spread of the weed off site.

Potential cumulative effects of livestock grazing are fairly minimal.

Fire: Fire management activities that have the potential to spread noxious weeds can be separated into two categories: fuels management and suppression. Approximately 17,000 acres are proposed for fuels treatment per year across the Forest: 5,000 acres of prescribed burns and 12,000 acres of mechanical fuels manipulation.

Areas that have mechanical treatments such as brush mowing and coniferous tree understory thinning are less likely to have potential to spread noxious weeds. Activities associated with mowing are not likely to leave bare spaces upon completion of the project. Plus, areas will be mowed when there is less of a chance of equipment spreading seed. Understory thinning will have the guidelines stated in the Timber/Silviculture section.

Prescribed burns have a potential to increase the amount of noxious weed occurrences on the Forest. Areas that are left bare post fire will be considered for seeding with appropriate seed mixes. Other mitigations to minimize the potential for noxious weed spread will be implemented during prescribed burning activities.

Timing of fire in relation to specific weed species in proposed burn area will be considered; if possible, time burning to control weeds. If burning must be during a high-risk period when weed populations are likely to be favored, NEPA documents will discuss the monitoring and prompt treatment immediately upon observing a weed problem. Monitor burned areas intensively the first year after burning, preferably for 3 years.

Fire management treatments will continue to be regulated so any potential adverse effects would be mitigated during the project phase for all federally listed species. Therefore, between the measures to decrease noxious weeds and the mitigations of future fire management activities, the 12.6 acres that could be treated in Goose Lake sucker, Goose Lake tui chub, Goose Lake lamprey, Goose Lake redband trout, Northwestern pond turtle, northern leopard frog, and spotted frog habitat, there are no expected cumulative effect on these three species.

Wildfire and associated suppression and rehabilitation measures on the other hand certainly may provide both an excellent seed source and seed bed. Although there is little control of the location of wildfire, the following standards and guidelines will be implemented during the course of wildfire suppression.

The use of high-priority sites for fire camps and staging areas will be avoided whenever any reasonable alternative exists. Noxious weed prevention will be addressed in fire rehabilitation and restoration plans.

There is no way of quantifying the location and extent of future wildlife fires, therefore a determination of the cumulative effects of fire on sensitive aquatic species is not possible.

Recreation: Although there is a myriad of recreation associated activities that occur on the Modoc National Forest, the two past-times that have the greatest potential to cause the spread of noxious weeds are stock use and equestrian related events such as the Modoc tribe ride. Stock use on Modoc NF is estimated as 6,650 Recreation Visitor Days (RVD) annually with the vast majority within the South Warner Wilderness. Typically there is only one equestrian special use a year, however, there are a few other rides once every five years. Special event horse use averages roughly 50 horses for three days. In summary, there is a rather minor amount of stock and horse use on the Forest as a whole.

In order to decrease the potential for weed introduction via these means, the following Operating Guides have been instituted.

Special emphasis will be placed on inventory and management of noxious weeds at trailheads.

Special Use Permits for equestrian groups would recommend pelletized feed be used rather than hay or straw.

Facilities and high-visibility travel ways would be maintained as weed free zones. Weeds at administration sites, visitor centers, and trailheads would be controlled. Information informing the public and forest service employees that these are "zero tolerance" areas will be posted. This will also be used as opportunities for education. Working cooperatively with the State of California, State of Nevada and the County Weed Boards we will strive to prevent the introduction and establishment of noxious weed infestations as a result of roads, recreation facilities, special use permits, timber harvest, and fuels treatment (see FSM 2081.2),

Given the rather small and mostly localized use of stock and equestrians, plus the implementation of the above guidelines it is not anticipated that recreational activities will significantly contribute

to noxious weed spread on this Forest.

The implementation of the weed control program discussed in this document coupled with recreational activities that occur on the Forest will have no cumulative effect on the sensitive aquatic species.

Other Federal Lands in California:

The Modoc National Forest abuts the Klamath and Shasta-Trinity National Forests on the western flank. The Lassen National Forest administers some of these lands, and also has land that lie roughly 2 to 4 miles south of the Big Valley District.

Klamath National Forest-Goosenest District: Currently, their weed control activities have focused on survey, although they have done a small amount of mechanical treatments (less than 1 acre).

Lassen National Forest – Hat Creek District: There is roughly 40 acres on the areas adjacent to the Modoc National Forest that receive control for noxious weeds. The species targeted include dyer's woad, Scotch thistle, and squarrose knapweed.

Shasta-Trinity National Forest – Mc Cloud District: There is no noxious weed control occurring on the portion of the District administered by the Shasta-Trinity National Forest at this time. There are roughly 10 acres of noxious weeds controlled on the portion of the District administered by the Lassen.

Additional lands administered by the federal government outside of Forest Service jurisdiction include 2 wildlife refuges, 1 national park, and 2 BLM resource areas. All of these agencies have noxious weed management programs in place, which include the use of herbicides. An estimation of these agencies programs is as follows:

Klamath Basin National Wildlife Refuge: The Klamath Basin has weed treatments both as part of their noxious weed eradication program as well as farming that occurs within its jurisdiction. On the Tule Lake unit there is roughly 20-30 acres that are treated with rodeo in order to control purple loosestrife. In the Lower Klamath unit, there is another 50 acres of upland sites that are treated with Banvel and Round up to control pepperweed. There is no control occurring on the Clear Lake unit.

Modoc National Wildlife Refuge: Approximately 200 acres are treated annually to control scotch thistle. Rodeo, Roundup, 2_4D and other chemicals are applied by hand, ATV, and truck in addition to a limited amount of hand grubbing that occurs.

BLM-Alturas: About 50 acres in Modoc County are treated annually for the control of primarily Scotch thistle and Mediterranean Sage. Both Telar and 2,4D are applied using both trucks and helicopters.

BLM- Surprise Valley: There are approximately 425 acres of various weed occurrences on the BLM lands in Modoc and Lassen Counties that have been physically (which includes prescribed fire) or chemically controlled from 1997 to 2002; the vast majority is medusa head (410 acres out of 425 acres total).

Lava Beds National Park: Weed treatments on the Lava Beds National Park consist of a combination of mechanical and chemical treatment using Round Up. Weeds that can not be extracted by hand (using a pulaski) are sprayed by hand with the chemical. This occurs on approximately 170 acres. The main weed species of concern are: mullein, hoarhound mint, bull thistle, stinging nettle, and sweet clover.

Other Federal Lands Within Oregon:

Fremont National Forest: Currently, there are approximately 200 acres per year that are sprayed on the Fremont National Forest. Chemical control is focused on spotted knapweed, dalmation toadflax, and Canada thistle. The Forest also has a hand treatment program. The entire Forest encompasses 1.2 million acres.

BLM-Lakeview: This Resource Area uses both physical and chemical means to treat various noxious weeds. There are approximately 250 acres of chemical treatments that occur per year using picloram, glyphosate, and 2,4 – D (amine). These chemicals are used to treat the following weed species: Russian knapweed, hoary cress, Mediterranean sage, Canada thistle, and medusa head. There is an additional 40 acres per year treated by physical means to control musk thistle and Mediterranean sage. There are 3.2 million acres within the boundaries of this Resource Area.

State and Private Lands:

There is roughly 10,000 acres a year that are treated with herbicides on private, commercial farm ground, and private forests for noxious weed treatment within Modoc County as a whole (Joseph Moreo, pers.comm.). In addition, 1,000 acres of regulatory noxious weed control occurs. Roughly 11 acres have been treated on the Ft. Bidwell Reservation; Mediterranean sage, scotch thistle, and Dyer's woad were controlled using mechanical means.

Cumulative Effects Summary:

Of the roughly 2.5 million acres of federal lands encompassed by our Modoc National Forest Map only 6,913 acres will receive treatment on the Modoc National Forest for noxious weeds or about 0.0028%. Of the roughly 4 million acres of state, private and federal lands encompassed by the Forest map, about 14,000 acres or .0056% are treated annually for noxious weed eradication (including the acres proposed by the Modoc National Forest). As stated previously, a maximum of 12.6 acres would be treated in areas that have any potential to effect Goose Lake sucker, Goose Lake tui chub, Goose Lake lamprey, Goose Lake redband trout, Northwestern pond turtle, northern leopard frog, and spotted frog. Due to the location of most of the weed infestations in areas outside of live water occupied by sensitive aquatic species, the short duration of management activities, and other mitigations specific within the Project Design Standards, there are no significant cumulative effects expected with implementation of mechanical, physical and chemical control activities associated with the Noxious Weed Treatment Project.

VIII. Determination:

There will be a "No Impact" determination for all aquatic species for implementation of the No Action alternative or the implementation of the prevention program.

There will be a "No Impact" determination for all aquatic species for implementation of physical/manual treatment. The effects of these treatments are expected to be minor and temporary in duration.

There will be a "No Impact" determination for the following species for implementation of chemical treatments: California floater, scalloped juga, Cascade frog, and Warner Valley redband trout. These species do not have suitable habitat that is directly, indirectly, or cumulatively affected.

There will be a May impact individuals, but not likely to cause a trend to federal listing or a loss of viability" for chemical activities for the following species: Goose Lake sucker, Goose Lake tui chub, Goose Lake lamprey, Goose Lake redband trout, Northwestern pond turtle, northern leopard frog, and spotted frog. This determination is based on the fact that buffer zones (100') of no chemical use have been established for these species and the limited number of sites to be treated (12.6 acres). The only chemical proposed for use within 10' of live water is a riparian approved formulation of glyphosate.

IX. Personal Communications:

Marc Hayes, Washington Department of Fish and Wildlife. Olympia, WA

Joseph Moreo, Modoc County Agricultural Advisor. Alturas, CA.

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Appendix U: Fish and Aquatic Wildlife Species Management Indicator Species Report

Management Indicator Species Report
Fisheries/Aquatic Resources

Noxious Weed Treatment Project

Modoc National Forest

Prepared By /S/ MARTY YAMAGIWA Date: _1/25/07_

Marty Yamagiwa, Forest Wildlife and Fisheries Program Manager

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MANAGEMENT INDICATOR SPECIES REPORT

1. INTRODUCTION

The purpose of this report is to evaluate and disclose the impacts of the Noxious Weed Treatment Project on the Fisheries and Aquatic Management Indicator Species (MIS) identified in the Forest (NF) Land and Resource Management Plan (LRMP) (USDA 1991). This report documents the effects of project alternatives on the habitat of selected MIS. Detailed descriptions of the Noxious Weed Treatment Project alternatives are found in Chapter 2 of the Project Environmental Impact Statement (USDA 2007).

MIS are animal or plant species identified in the Modoc NF LRMP (USDA 1991, which was developed under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR 219). Guidance regarding MIS set forth in the Modoc NF LRMP directs Forest Service resource managers to (1) at project scale, analyze the effects of proposed projects on the habitats of each MIS affected by such projects, and (2) at the national forest (forest) or bioregional scale, monitor populations and/or habitat trends of forest MIS, as identified by the LRMP.

1.a. Direction Regarding the Analysis of Project-Level Effects on MIS

Project-level effects on MIS are analyzed and disclosed as part of environmental analysis under the National Environmental Policy Act (NEPA). This involves examining the impacts of the proposed project alternatives on MIS habitat by discussing how direct, indirect, and cumulative effects will change the quantity and/or quality of habitat in the analysis area.

These project-level impacts to habitat are then related to broader scale (generally national forest, and, in some cases, bioregional) population and/or habitat trends. The appropriate approach for relating project-level impacts to broader scale trends depends on the terms in the LRMP. Under the 2005 National Forest System Land Management Planning Rule (2005 Planning Rule) (70 Federal Register 1060, January 5, 2005), national forests with LRMPs developed under the 1982 planning rule, including the Modoc NF, “may comply with any obligations relating to MIS by considering data and analysis relating to habitat unless the plan specifically requires population monitoring or population surveys for the species” (36 CFR 219.14(f)).

Hence, where the Modoc NF LRMP requires population monitoring or population surveys for an MIS, the project-level effects analysis for that MIS must be informed by population monitoring data, which are gathered at the forest or bioregional scale. Population monitoring and survey data are not generally gathered for site-specific projects, consistent with the 2005 planning rule, which states, “Site-specific monitoring or surveying of a proposed project or activity area is not required, but may be conducted at the discretion of the Responsible Official” (36 CFR 219.14(f)). For certain MIS, the Modoc NF LRMP does not require population monitoring or surveys; for these MIS, project-level MIS effects analysis can be informed by forest-scale habitat monitoring and analysis alone. The Modoc NF LRMP requirements for MIS analyzed for the Noxious Weed Treatment Project are summarized in Section 3 of this report.

Therefore, adequately analyzing project effects to MIS, including Threatened, Endangered, and Sensitive (TES) species that are also MIS, involves the following steps:

Identifying which MIS have habitat that would be either directly or indirectly affected by the project alternatives; these MIS are potentially affected by the project.

Identifying the LRMP forest-level or bioregional-level monitoring requirements for this subset of forest MIS.

Analyzing project-level effects on MIS habitats or habitat components for this subset of forest MIS.

Discussing forest or bioregional scale habitat and/or population trends for this subset of forest MIS.

Relating project-level impacts on MIS habitat to habitat and/or population trends for the affected MIS at the forest or bioregional scale.

These steps are described in detail in the Pacific Southwest Region's draft document "MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination" (USDA 2006). This Management Indicator Species (MIS) Report documents application of the above steps to select and analyze potentially affected MIS for the Noxious Weed Treatment Project.

1.b. Direction Regarding Monitoring of MIS Population and Habitat Trends at the Forest or Bioregional Scale

Forest or bioregional scale monitoring requirements for the Modoc NF's MIS are found in the Monitoring Plan of the LRMP (USDA 1991) and in Appendix E of the Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement (FEIS) (USDA 2001), as adopted by the 2004 Sierra Nevada Forest Plan Amendment (SNFPA) Record of Decision (ROD) (USDA 2004).

Habitat Status and Trend

The Modoc NF LRMP (USDA 1991) requires forest-scale monitoring of habitat status and trend for select MIS on the Modoc NF; for MIS with habitat potentially affected by the Noxious Weed Treatment Project, these habitat monitoring requirements are summarized in Table 2 of this report. Habitat status is the current amount of habitat on the Modoc NF. Habitat trend is the direction of change in the amount of habitat between the time the LRMP was approved and the present. The methodology for assessing habitat status and trend is described in detail in the Modoc National Forest MIS Report (USDA 2007).

Habitats are the vegetation types (for example, mixed conifer forest) and/or ecosystem components (for example, cliffs or lakes) and any special habitat elements (for example, snags) required by an MIS for breeding, cover, and/or feeding. Required habitat is identified using habitat relationships data or models. Habitat relationships for fish MIS are identified individually.

Population Status and Trend

Population monitoring requirements for the MIS of the Modoc NF are identified in either Appendix E of the Sierra Nevada Forest Plan Amendment (SNFPA) FEIS (USDA 2001), as adopted by the 2004 Sierra Nevada Forest Plan Amendment Record of Decision (ROD) (USDA 2004), or the Monitoring Plan of the LRMP (USDA 1991).

For Modoc NF MIS (USDA 1991) that are listed in Appendix E of the SNFPA FEIS (USDA 2001), population monitoring requirements are identified in Appendix E. For all other Modoc NF MIS, population monitoring requirements are identified in the LRMP Monitoring Plan (USDA 1991). This document requires monitoring of population status and trend for select MIS on the Modoc NF. There are many types of population data, and this document also identifies the type of population monitoring data required for each MIS. The population monitoring requirements

for the MIS with habitat potentially affected by the Noxious Weed Treatment Project are summarized in Table 2 of this report. All population monitoring data are collected and/or compiled at the forest or bioregional scale, consistent with the LRMP as amended by the SNFPA and the 2005 Planning Rule that "site specific monitoring or surveying of a proposed project or activity area is not required" (36 CFR 219.14(f)).

Population status is the current condition of the MIS related to the type of population monitoring data (population measure) required in the LRMP for that MIS. Population trend is the direction of change in that population over time.

As discussed in Appendix E of the 2001 SNFPA (USDA 2001), there is a wide range of monitoring data that can be used to describe the status and trend (or change) of populations, ranging from describing changes in distribution based on presence-absence data to describing changes in population structure. A distribution population monitoring approach is identified for most MIS listed in Appendix E (Tables E-9 to E-11). Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations; over time, changes in the distribution of the MIS can be identified and tracked. Presence data is collected using a number of direct and indirect methods, such as surveys (population surveys), bird point counts, tracking number of hunter kills, counts of species sign (such as deer pellets), and so forth.

Presence population data for MIS are collected and consolidated by the Modoc NF in cooperation with State and Federal agency partners (including the California Department of Fish and Game, U.S. Geological Survey, and USDI Fish and Wildlife Service) or conservation partners (including Partners in Flight and various avian joint ventures). The Modoc NF's MIS monitoring program for species typically hunted, fished, or trapped was designed to be implemented in cooperation with California Department of Fish and Game (CDFG), consistent with direction in the 1982 Planning Rule to monitor forest-level MIS population trends in cooperation with state fish and wildlife agencies to the extent practicable (36 CFR 219.19(a)(6)). To be biologically meaningful for wide-ranging MIS, presence data are collected and tracked not only at the forest scale, but also at larger scales, such as rangewide, state, province, or important species management unit (for example, Deer Assessment Unit or waterfowl migratory routes). Population data at various scales are important to both assess and provide meaningful context for population status and trend at the forest scale.

2. Selection of Project Level Fisheries/Aquatic MIS

Management Indicator Species (MIS) for the Modoc NF are identified in the LRMP (USDA 1991). The Fisheries/Aquatic MIS analyzed for the Project were selected from this list of MIS identified in the LRMP and are listed below in Table 1. In addition, Table 1 identifies the status of the MIS (2nd column), reason each MIS was identified in the LRMP (3rd column) and discloses whether or not the MIS is potentially affected by the Noxious Weed Treatment Project (4th column).

Table 1. Fisheries/Aquatic Management Indicator Species Selected for Project-Level Analysis for the Noxious Weed Treatment Project, Modoc NF.

Management Indicator Species	Species Status	LRMP Habitat Indicator	Category for Project Analysis [1]
Shortnose sucker	Endangered	Cold water aquatic	3
Lost river sucker	Endangered	Cold water aquatic	3
Modoc sucker	Endangered	Cold water aquatic	3
Goose Lake redband trout	Sensitive	Cold water aquatic	3
Rainbow trout	Non-TES	Cold water aquatic	3
Brook trout	Non-TES	Cold water aquatic	2
Brown trout	Non-TES	Cold water aquatic	3
Largemouth bass	Non-TES	Warm water aquatic	3

[1] **Category 1:** MIS whose habitat is not in or adjacent to the project area and would not be affected by the project.

Category 2: MIS whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project.

Category 3: MIS whose habitat would be either directly or indirectly affected by the project.

Brook trout, identified as Category 2 above, will not be further discussed because, although there is suitable habitat in the area, this species is found at higher elevations where no treatment is scheduled and therefore will have no impact on forest-level brook trout habitat or population trends.

The Fisheries/Aquatic MIS whose habitat would be either directly or indirectly affected by the Noxious Weed Treatment Project, identified as Category 3 in Table 1, are carried forward in this analysis, which will evaluate the direct, indirect, and cumulative effects of the proposed action and alternatives on the habitat of these MIS. The MIS selected for Project-Level MIS analysis for the Noxious Weed Treatment Project are: Shortnose sucker, Lost River sucker, Modoc sucker, Goose Lake redband trout, rainbow trout, brown trout, and largemouth bass.

3. LRMP Monitoring Requirements for MIS Selected for Project-Level Analysis

3.a. MIS Monitoring Requirements

The Modoc NF LRMP (USDA 1991) and Appendix E of the Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement (USDA 2001), as adopted by the 2004 Sierra Nevada Forest Plan Amendment ROD (USDA 2004), identify forest and bioregional scale habitat and population monitoring requirements for the Modoc NF MIS. As discussed in the introduction to this report, forest-scale habitat monitoring requirements are identified in the Monitoring Plan of the Modoc NF LRMP (USDA 1991). For those Modoc NF MIS that are listed in Appendix E of the SNFPA FEIS (USDA 2001), population monitoring requirements are described in Appendix E. For all other Modoc NF MIS, population monitoring requirements are described in the LRMP Monitoring Plan (USDA 1991). Habitat and population monitoring results for Modoc NF's MIS are described in the Modoc National Forest Management Indicator Species

Report (USDA 2007) and are summarized below for the MIS being analyzed for the Noxious Weed Treatment Project.

Table 2. Modoc NF LRMP MIS Requirements for the Selected Project-Level Fisheries/Aquatic MIS for the Noxious Weed Treatment Project (USDA 2007, as amended by the SNFPA 2004).

SELECTED PROJECT-LEVEL MIS	mis Monitoring Requirements	
	Habitat	Population
Shortnose sucker	Stream surveys, photo points	Recovery Plan
Lost River sucker	Stream surveys, photo points	Recovery Plan
Modoc sucker	Stream surveys, channel profiles, photo points	Population sampling
Goose Lake redband trout	Stream surveys, photo points	Distribution/relative abundance
Rainbow trout	Stream/lake habitat surveys	Distribution/population
Brook trout	Stream/lake habitat surveys	Distribution/population
Brown trout	Stream/lake habitat surveys	Distribution/population
Largemouth bass	Stream/lake habitat surveys	Distribution/population

LRMP, Monitoring Plan (USDA 1991). FEIS, Appendix E (USDA 2001).

3.b. Methodologies for MIS Monitoring

Shortnose Sucker/Lost River Sucker

Quality of habitat is assessed using a variety of techniques that range from subjective observation to intensive measurements. Photographs can be used to document conditions over time. Assessment of Proper Functioning Condition (PFC) can be used by Interdisciplinary teams to document observations of channel morphology and riparian vegetation. PFC is a nationally adopted protocol most useful in low gradient stream systems where range management is often the management practice of concern. Two other regionally adopted inventory protocols are used to evaluate habitat condition. Fish Habitat Inventory collects information at the scale of the habitat unit and is useful in characterizing condition. The R5 Stream Condition Inventory is used to monitor changes at the reach scale, and to compare reaches. Both methodologies include attributes most likely to be changed by management; these include shade, substrate composition, pools, channel shape, and large wood. Data is used to determine trend in conditions, and evaluated using data from similar streams, rather than against a model or set of standard objectives. The Modoc National Forest MIS Report (USDA 2007) provides additional information about the distribution and population trend for this species.

Modoc Sucker

Important habitat components for the Modoc sucker include: the shading of streams by vegetation; coarse woody debris; the presence of pools in the summer; the presence of algae, detritus, and aquatic invertebrates; the presence of sand and gravels of various sizes not covered by sediment; and good water quality. This species is found in the following CWHR habitat type: riverine.

Quality of Modoc sucker habitat is assessed using a variety of techniques that range from subjective observation to intensive measurements. Photographs can be used to document conditions over time. Assessment of Proper Functioning Condition (PFC) can be used by Interdisciplinary teams to document observations of channel morphology and riparian vegetation. PFC is a nationally adopted protocol most useful in low gradient stream systems where range management is often the management practice of concern. Two other regionally adopted

inventory protocols are used to evaluate Modoc sucker habitat condition. Fish Habitat Inventory collects information at the scale of the habitat unit and is useful in characterizing condition. The R5 Stream Condition Inventory is used to monitor changes at the reach scale, and to compare reaches. Both methodologies include attributes most likely to be changed by management; these include shade, substrate composition, pools, channel shape, and large wood. Data is used to determine trend in conditions, and evaluated using data from similar streams, rather than against a model or set of standard objectives. Channel cross-sections and vegetative greenline survey are also used to monitor riparian condition over time. The Modoc National Forest MIS Report (USDA 2007) provides additional information about the distribution and population trend for this species.

Goose Lake Redband Trout

Quality of redband trout habitat is assessed using a variety of techniques that range from subjective observation to intensive measurements. Photographs can be used to document conditions over time. Assessment of Proper Functioning Condition (PFC) can be used by Interdisciplinary teams to document observations of channel morphology and riparian vegetation. PFC is a nationally adopted protocol most useful in low gradient stream systems where range management is often the management practice of concern. Two other regionally adopted inventory protocols are used to evaluate redband trout habitat condition. Fish Habitat Inventory collects information at the scale of the habitat unit and is useful in characterizing condition. The R5 Stream Condition Inventory is used to monitor changes at the reach scale, and to compare reaches. Both methodologies include attributes most likely to be changed by management; these include shade, substrate composition, pools, channel shape, and large wood. Data is used to determine trend in conditions, and evaluated using data from similar streams, rather than against a model or set of standard objectives. The Modoc National Forest MIS Report (USDA 2007) provides additional information about the distribution and population trend for this species.

Rainbow Trout, Brown Trout, Largemouth Bass

Quality of habitat for these species is assessed using a variety of techniques that range from subjective observation to intensive measurements. Photographs can be used to document conditions over time. Assessment of Proper Functioning Condition (PFC) can be used by Interdisciplinary teams to document observations of channel morphology and riparian vegetation. PFC is a nationally adopted protocol most useful in low gradient stream systems where range management is often the management practice of concern. Two other regionally adopted inventory protocols are used to evaluate trout habitat condition. Fish Habitat Inventory collects information at the scale of the habitat unit and is useful in characterizing condition. The R5 Stream Condition Inventory is used to monitor changes at the reach scale, and to compare reaches. Both methodologies include attributes most likely to be changed by management; these include shade, substrate composition, pools, channel shape, and large wood. Data is used to determine trend in conditions, and evaluated using data from similar streams, rather than against a model or set of standard objectives. The Modoc National Forest MIS Report (USDA 2007) provides additional information about the distribution and population trend for these species.

4. Description of Proposed Project.

Summary Comparison of Alternatives for the Noxious Weed Treatment Project

Alternatives / Alternative Features	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Treatment Timeframe	**Ongoing**	**5 years**	**5 years**	**10 years**	**10 years**	**10 years**
Treatment Sites and Acres	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**
Total Inventoried Weeds (2004)	541/6908	541 / 6908	541 / 6908	541 / 6908	541 / 6908	541 / 6908
Inventoried Weeds Fully Treated	**20-30** ac/yr[1]	520 / **5,995**	494 / **5,993**	520 / **5,995**	520 / **180**	538/ **241**
Inventoried Weed Sites Receiving Partial Treatment2	0/0	16/904[2]	0/0	16/904[2]	0/0	0/0
Inventoried Weeds Receiving Limited Treatment3	0/**0**	0/**0**	0/**0**	0/0	9/**100**[3]	3/**100**[3]
Inventoried Weeds Not Treated4	6,878[1]	5/9[4]	47/916[4]	5/9[4]	5 / 5515	0/6,567[4]
Proportion of Inventoried Weeds Treated	0.4%	n.a. / 87%	91% / 87%	99 % / 99 %	100 % / 4 %	100 % / 5 %
Noxious Weeds Treated Through Early Detection – Rapid Response (acres)5		0 acres	0 acres	Up to **200** acres (100 ac max/yr)	Up to **200** acres (100 ac max/yr)	Up to **200** acres (100 ac max/yr)
Total Acres of Weeds Treated	20-30 ac/yr1	**6,899** acres	**5,993** acres	**7,099** acres	**480** acres	**541** acres
Treatment Methods for Inventoried Noxious Weeds (2004)	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**	**Sites/Acres**
Physical – hand pulling, hoeing, grubbing	0/0	161/31	494/5,993	161/31	0/0	0/0
Physical+ – Physical plus, clipping seed head or plant, weed eater, mulch/tarp	20-30 ac/yr1	0/0	0/0	0/0	527/139	116/19
Physical and/or Herbicide Treatments	0/**0**	333/5,961	0/**0**	333/5,961	0/**0**	371/**116**
Herbicide	0/**0**	42/**907**	0/**0**	32/9**07**	0/**0**	46/**65**
Limited Treatment3	0/0	0/0	0/0	0/0	9/100	3/100
Goat Grazing (potential) (physical/herbicide)	0/0	0/0	0/0	0/0	5/41 (no herbicide)	5/**41**
Total Acres Potentially Treated with Herbicides (includes ED-RR acres)6	0/**0**	355/6,868	0/**0**	355/7,068	0/**0**	425/**522**

[1]Under Current Management (Alt. 1), approximately 20 to 30 acres of noxious weeds are treated each year through other site specific NEPA decisions as part of other projects in accordance with the Modoc NF Integrated Weed Management Strategy (2005).

[2]These sites are rhizomotous species that occur within 10 feet of H2O. Those sites that are within 10 feet of H2O would not be treated. Sites with acreage ooutside of this 10 foot no treatment zone would receive partial treatment. The acreage within the 10 foot zone would not be treated, the acreage outside the 10 foot zone would be treated with herbicides.

[3]Includes treating along borders of infestations to prevent spread using the methods specific to each alternative. Treatment is estimated at 100 acres to be proportionally distributed based on the size of the individual infestations. These acres are included in the Inventoried Noxious Weeds Treated acreage.

[4]Excluded in Alt. 2 and Alt. 4: 5 sites of rhizamotous species that are within 10' of live water and partial acreage of 16 sites of rhizamotous species that are within 10' of live water. Rhizamotous species will not be treated by physical methods in these alternatives. Excluded in Alt. 3: 47 sites of rhizamotous species. Excluded in Alt. 5: 5,658 acre Dyer's woad, 850 acre Dalmatian toadflax, 159 acre crupina, and 6 sites of rhizamotous species. These sites will receive limited treatment around the perimeter estimated at 100 acres proportionally distributed based on the size of these sites. Excluded in Alt. 6: 5,658 acre Dyer's woad, 850 acre Dalmatian toadflax, 159 acre crupina. These sites will receive limited treatment around the perimeter estimated at 100 acres proportionally distributed based on the size of these sites.

[5]May use any of the methods approved for use in this NEPA decision.

[6]For Alt. 2 this includes the acres under the physical and/or herbicide method plus the herbicide treated acres. Alt. 4 adds the same categories as Alt. 2 plus adds in the potentially treated 200 acres through early detection rapid response. Alt. 6 includes the Physical and/or Herbicide acres, the herbicide acres, the acres under goat grazing, the acres under the limited treatment category, and the 200 acres under Early Detection-Rapid Response.

5. Effects of Proposed Project on Selected Fisheries/Aquatic MIS

Detailed information on MIS for the Forest is documented in the Modoc Forest MIS Report (USDA 2007).

5.a. Shortnose Sucker, Lost River Sucker

The shortnose sucker and Lost River sucker are federally listed endangered species; additional information on affected environment and environmental consequences of the Noxious Weed Treatment Project on these species is found in the project BA.

5.a.1. Habitat/Species Relationship

Detailed information on MIS for the Modoc NF is documented in the Modoc National Forest MIS Report (USDA 2007), which is hereby incorporated by reference.

The habitat requirements of the shortnose and Lost River suckers are not well known. It appears that the Lost River sucker is primarily a lake species and spends most of its time in fairly deep water (Moyle 2002). The shortnose sucker is thought to have a life history similar to the cui-ui (*Chasmistes cujus*) of Pyramid Lake, Nevada: it is thought to spend most of the year in the open waters of large lakes (Ibid).

Cool water, high amounts of dissolved oxygen, and cool freshwater refuges appear to be important habitat components for both species (Buettner and Scoppettone 1991). When conditions become stressful in lakes, such as in the summer when there can be heavy algal blooms and fluctuations in dissolved oxygen, pH, and suspended and dissolved materials, areas where streams or springs flow into lakes may be important refugia (USFWS 1993).

5.a.2. Project-level Effects Analysis based on Habitat

Key Habitat Factor(s) for the Analysis: The Forest LRMP identified these species as associated with riparian habitats. These species are found in the following CWHR habitat types: lacustrine and riverine.

Analysis Area for Project-level Effects Analysis: These species migrate from Clear Lake Reservoir to spawn in Willow Creek and Boles Creek. Summer holding occurs in reservoirs as well as deeper pools within the channels.

Current Condition of the Key Habitat Factor(s) in the Analysis Area: There are currently 35.5 miles of stream habitat and 1,962 acres of reservoir habitat for the species on the Forest.

Alternative 1 (No Action)

Direct and Indirect Effects to Habitat: Potential adverse effects to the aquatic environment from not controlling spread of noxious weeds include but are not limited to, an increase in sedimentation, reduction in streambank stability, elevated water temperature with the lack of canopy cover, and a potential decrease in the amount of organic matter available to enter affected streams. Without treatment, noxious weeds would likely become widely established across the Forest. This could lead to an increase in soil erosion (sediment deposition) and surface water runoff.

Cumulative Effects to Habitat: As weed infestations become more severe, it becomes more difficult to restore natural or near natural conditions. Conditions arise where instead of using physical treatments or relatively low applications of low toxicity herbicides, more intensive physical treatment or intensive applications at higher concentrations of more toxic herbicides may be necessary to control later stages of weed infestations. When this occurs, the risk to the aquatic environment also increases and viability of aquatic species may also be at risk.

Cumulative Effects Conclusion: It is anticipated that under the No Action alternative there will be an increase in noxious weeds within suitable habitat. The relative cumulative effect to shortnose and Lost River suckers of this increase would be relatively small compared to the existing amount of habitat in the analysis area.

Alternatives 2/4/6

Direct and Indirect Effects to Habitat: Mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas. Treatment would result in better riparian condition, in turn providing more stable and useable aquatic habitat.

Under these alternatives, potential direct effects to aquatic resources would be primarily associated with herbicide application near streams and associated riparian areas, lakes, or wetlands. Most herbicides are applied in liquid formulations and are sprayed on foliage of the target vegetation. In some cases soil may be a major receptor and contamination can occur by chemicals leaching through the soil to the groundwater and ultimately reaching the aquatic environment. This method of introduction usually poses the least amount of risk to the aquatic environment because chemicals typically disappear from the ground surface by either plant uptake of the chemical, volatilization, and natural decomposition of the active ingredients or adsorption of the herbicide by soil particles. Norris et al. (1991), indicates leaching of chemicals through the soil profile is a process of major public concern, but is least likely to occur in forest environments. Prevention measures proposed to address this are included as part of the Project Design Standards. Leaks, spills, and improper storage and handling of containers are the source of most pesticide related groundwater contamination. These impacts can easily be prevented with proper training of personnel and proper storage and disposal of chemicals. Risk from an accidental spill of herbicide into a water body on the Forest is considered low.

Another mode of pesticide entry to the aquatic system includes overland flow from precipitation events. Risk varies depending on soil composition and timing and intensity of precipitation events after application. Risk tends to be lower on well-vegetated forests and rangeland where soil infiltration is typically greater than precipitation. Norris et al. (1991) indicated that overland flow occurs infrequently on most forestland because the infiltration capacity of the forest floor and soil is usually far greater than the rate of precipitation. Aquatic organisms are more at risk of negative impacts from herbicides in small perennial streams, or during late season when flow is reduced, due to their limited capability for dilution. Prevention measures proposed to address precipitation events are included in the Project Design Standards. Under these alternatives, a buffer zones of 100’ have been established where no herbicides except aquatic formulations of gylphosate will be used. A reduction of noxious weeds in riparian areas and other aquatic habitats would benefit native plant species and result in better streambank and riparian condition, in turn providing more stable and useful aquatic environments. An indirect effect of these buffer zones is that not all noxious weeds would be chemically treated. Even under the integrated weed management approach, not all weed populations would be eradicated, leaving an available seed source for continued propagation or the unlikely option of weeds being out-competed by native or desirable plant species.

Cumulative Effects to Habitat: The mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated

areas**.** Treatment would result better riparian condition, in turn providing more stable and useful aquatic habitat. Mechanical treatment as proposed is not expected to have any direct, indirect, or cumulative adverse effects on these species.

No adverse downstream cumulative effects would be expected from situations involving herbicide runoff or leaching because of the method of application, Best Management Practices (BMP's), and Design Standards to prevent these types of impacts from occurring. See Appendix D for a list of the specific BMP's.

It is not anticipated that there will be any cumulative effects by chemical spraying of noxious weeds due to the use of chemicals at only their prescribed label rate, the relative non-toxicity of the chemicals to other than target (i.e. plant) organisms, the use of riparian buffers, and the limited area of chemical treatment. Riparian habitat would benefit by decreasing weeds and the acreages to be treated are very small so there is no direct contact with fish and other aquatic species.

Cumulative Effects Conclusion: It is anticipated that implementation of these alternatives, in combination with these past, present, and reasonably foreseeable future actions, would result in the treatment of 0.36 acres (4 sites) of suitable habitat across the analysis area. Therefore, the cumulative effect to shortnose sucker and Lost River sucker under these alternatives would be negligible compared to the amount of existing habitat in the analysis area.

Alternative 3/5

Direct and Indirect Effects to Habitat: Mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas. Treatment would result in better riparian condition, in turn providing more stable and useful aquatic habitat.

Cumulative Effects to Habitat: The mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas**.** Treatment would result better riparian condition, in turn providing more stable and useful aquatic habitat.

Cumulative Effects Conclusion: Mechanical treatment as proposed is not expected to have any direct, indirect, or cumulative adverse effects on these species.

5.a.3. Summary of Habitat and Population Status and Trend at the Forest/Bioregional Scale

The Modoc NF LRMP (as amended by the SNFPA) requires forest-scale habitat monitoring and bioregional-scale population monitoring for the shortnose sucker and Lost River sucker (Table 2); hence, the shortnose sucker and Lost River sucker effects analysis for the Noxious Weed Treatment Project must be informed by both habitat and population monitoring data. The sections below summarize the habitat and population status and trend data for the shortnose and Lost River sucker. This information is drawn from the detailed information on habitat and population trends in the Modoc National Forest MIS Report (USDA 2007), which is hereby incorporated by reference.

Habitat Status and Trend: Barring future water developments on the Modoc National Forest, the amount of habitat appears stable. As fish passage problems are recognized, it is probable that quality of habitat will be increased.

Lost River sucker and shortnose sucker habitat on the Modoc is considered abundant and has

remained relatively constant since the development of the Forest Plan (M.Yamagiwa pers. comm.).

Population Status and Trend: The shortnose and Lost River suckers were listed as endangered species on July 18, 1988 (USFWS 1988). No Critical Habitat has been designated. A recovery plan has been written for both species (USFWS 1993). Population decreases of these suckers seem to be primarily related to decreasing spawning habitat from damming, draining, and dredging of historical spawning areas (Ibid). Other predominant threats to these suckers are continued loss of habitat, water diversions, competition and predation by introduced species, hybridization with other sucker species, insularization of remaining habitats, and drought (USFWS 1988). Decreases in water quality resulting from timber harvest, dredging activities, removal of riparian vegetation, and livestock grazing may also cause problems for these species (USFWS 1988).

All of the streams containing these fish on the Modoc National Forest have become intermittent during the drought of the late 1980s and early 1990s. The varied causes for the declines in these two species are not clearly understood (USFWS 1988). What is clear is that there has been a drastic reduction in the spawning success of these long-lived species; for example, populations of both species in Oregon and in Copco Reservoir have not spawned for about 18 years (Ibid).

Based upon recent surveys conducted by the National Biological Survey, there are 23,000 Lost River suckers and 73,000 shortnose suckers on the Modoc NF. According to past survey records there appears to be an increasing trend in the population numbers in the past ten year period (Ibid). Habitat availability trends for this same time period seem to be experiencing an increasing trend (Ibid). The Annual Monitoring Report for 2002 suggest that populations of these two species are relatively stable but the demographics of the populations appears to be changing. Data suggest that fish captured are beginning to appear in the older age class (U.S. Geological Survey 2003).

Both the Lost River and Shortnose Suckers were petitioned for delisting. The USFWS found that the petition did not present substantial scientific or commercial information indicating that either species warranted delisting (67 FR 34422).

5.a.4. Relationship of Project-Level Impacts to Forest-Scale Habitat and Population Trends for the Species: Mechanical treatment as proposed will not alter or contribute to existing forest-wide trend in population or distribution.

Herbicide treatment would result in the treatment of 0.36 acres (4 sites) of suitable habitat across the analysis area. Therefore, the impact of the Noxious Weed Treatment Project will not alter or contribute to existing forest-wide trend in population or distribution for the shortnose sucker and Lost River sucker.

5.b. Modoc Sucker

The Modoc sucker is a federally listed endangered species; additional information on affected environment and environmental consequences of the Noxious Weed Treatment Project on these species is found in the project BA.

5.b.1. Habitat/Species Relationship

Detailed information on MIS for the Modoc NF is documented in the Modoc National Forest MIS Report (USDA 2007), which is hereby incorporated by reference.

Suitable habitat consists of large, shallow, muddy-bottomed pools that are partially shaded by vegetation and contain cool (less than 77° F.), moderately clear water (Moyle 2002). The

temperature of water in two Modoc sucker streams indicated that a maximum water temperature of less than 70° F., with daily temperature variations of less than 10° F., provides suitable conditions, and that maximum temperatures of 60 to 65° F. seem to be optimum (Studinski 1993).

Most of the creeks in which Modoc suckers occur become intermittent by mid summer, severely limiting the available habitat. Pools, especially during drought years, may be the most critical factor limiting populations (Ibid). The Modoc sucker utilizes toe-logs and tips of juniper revetments and coarse woody debris in streams for cover (USFS unpublished data). They also will use rocky substrate and algae if no other cover is available in the pool.

5.b.2. Project-level Effects Analysis based on Habitat

Key Habitat Factor(s) for the Analysis: The Forest LRMP identified these species as associated with riparian habitats. These species are found in the following CWHR habitat types: lacustrine and riverine.

Analysis Area for Project-level Effects Analysis: The Modoc sucker occurs in two sub-drainages of the Pit River system within the Modoc NF in northeastern California. The streams in which this species occurs are characterized by low summer flows and large, shallow pools with cover, soft sediments, and clear water (USFWS 1985). In many cases, large sections of the streams have only subsurface flows in the summer and the suckers are confined to relatively small permanent pools (Studinski 1993). These streams are within the Devil's Garden and Big Valley Ranger Districts of the Modoc NF

Current Condition of the Key Habitat Factor(s) in the Analysis Area: The Modoc sucker has been extirpated from a significant portion of its naturally limited range due to hybridization with the Sacramento sucker (*Catostomus occidentalis*) (USFWS 1985) and habitat loss from overgrazing, siltation, channelization, and other agricultural activities (USFWS 1985). Habitat degradation has also eliminated some natural within-stream barriers that prevented Sacramento suckers from invading Modoc sucker habitat (USFWS 1985). Additional factors include predation by introduced brown trout (*Salmo trutta*) (Ibid) and the late 1980 and early 1990 drought, which has increased the number of creeks which were intermittent during the summer

Alternative 1 (No Action)

Direct and Indirect Effects to Habitat: Potential adverse effects to the aquatic environment from not controlling spread of noxious weeds include but are not limited to, an increase in sedimentation, reduction in streambank stability, elevated water temperature with the lack of canopy cover, and a potential decrease in the amount of organic matter available to enter affected streams. Without treatment, noxious weeds would likely become widely established across the Forest. This could lead to an increase in soil erosion (sediment deposition) and surface water runoff.

Cumulative Effects to Habitat: As weed infestations become more severe, it becomes more difficult to restore natural or near natural conditions. Conditions arise where instead of using physical treatments or relatively low applications of low toxicity herbicides, more intensive physical treatment or intensive applications at higher concentrations of more toxic herbicides may be necessary to control later stages of weed infestations. When this occurs, the risk to the aquatic environment also increases and viability of aquatic species may also be at risk.

Cumulative Effects Conclusion: It is anticipated, that under the No Action Alternative, there will be an increase in noxious weeds within suitable habitat. The relative cumulative effect to Modoc suckers would be relatively small compared to the existing amount of habitat in the analysis area.

Alternatives 2/4/6

Direct and Indirect Effects to Habitat: Mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas. Treatment would result in better riparian condition, in turn providing more stable and useful aquatic habitat.

Under these alternatives, potential direct effects to aquatic resources would be primarily associated with herbicide application near streams and associated riparian areas, lakes, or wetlands. Most herbicides are applied in liquid formulations and are sprayed on foliage of the target vegetation. In some cases soil may be a major receptor and contamination can occur by chemicals leaching through the soil to the groundwater and ultimately reaching the aquatic environment. This method of introduction usually poses the least amount of risk to the aquatic environment because chemicals typically disappear from the ground surface by either plant uptake of the chemical, volatilization, and natural decomposition of the active ingredients or adsorption of the herbicide by soil particles. Norris et al. (1991), indicates leaching of chemicals through the soil profile is a process of major public concern, but is least likely to occur in forest environments. Prevention measures proposed to address this are included as part of the Project Design Standards. Leaks, spills, and improper storage and handling of containers are the source of most pesticide related groundwater contamination. These impacts can easily be prevented with proper training of personnel and proper storage and disposal of chemicals. Risk from an accidental spill of herbicide into a water body on the Forest is considered low.

Another mode of pesticide entry to the aquatic system includes overland flow from precipitation events. Risk varies depending on soil composition and timing and intensity of precipitation events after application. Risk tends to be lower on well-vegetated forests and rangeland where soil infiltration is typically greater than precipitation. Norris et al. (1991) indicated that overland flow occurs infrequently on most forestland because the infiltration capacity of the forest floor and soil is usually far greater than the rate of precipitation. Aquatic organisms are more at risk of negative impacts from herbicides in small perennial streams, or during late season when flow is reduced, due to their limited capability for dilution. Prevention measures proposed to address precipitation events are included in the Project Design Standards. Under these alternatives, a buffer zones of 100’ have been established where no herbicides except aquatic formulations of gylphosate will be used. A reduction of noxious weeds in riparian areas and other aquatic habitats would benefit native plant species and result in better streambank and riparian condition, in turn providing more stable and useful aquatic environments. An indirect effect of these buffer zones is that not all noxious weeds would be chemically treated. Even under the integrated weed management approach, not all weed populations would be eradicated, leaving an available seed source for continued propagation or the unlikely option of weeds being out-competed by native or desirable plant species.

Cumulative Effects to Habitat: The mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas**.** Treatment would result better riparian condition, in turn providing more stable and useful aquatic habitat. Mechanical treatment as proposed is not expected to have any direct, indirect, or cumulative adverse effects on these species.

No adverse downstream cumulative effects would be expected from situations involving herbicide runoff or leaching because of the method of application, Best Management Practices

(BMP's) and Design Standards to prevent these types of impacts from occurring. See Appendix D for a list of the specific BMP's.

It is not anticipated that there will be any cumulative effects by chemical spraying of noxious weeds due to the use of chemicals at only their prescribed label rate, the relative non-toxicity of the chemicals to other than target (i.e. plant) organisms, the use of riparian buffers, and the limited area of chemical treatment. Riparian habitat would benefit by decreasing weeds and the acreages to be treated are very small so there is no direct contact with fish and other aquatic species.

Cumulative Effects Conclusion: It is anticipated that implementation of these alternatives, in combination with these past, present, and reasonably foreseeable future actions, would result in the treatment of 1.93 acres (8 sites) of suitable habitat across the analysis area. Therefore, the cumulative effect to Modoc sucker under these alternatives would be negligible compared to the amount of existing habitat in the analysis area.

Alternative 3/5

Direct and Indirect Effects to Habitat: Mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas. Treatment would result in better riparian condition, in turn providing more stable and useful aquatic habitat.

Cumulative Effects to Habitat: The mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas**.** Treatment would result better riparian condition, in turn providing more stable and useful aquatic habitat.

Cumulative Effects Conclusion: Mechanical treatment as proposed is not expected to have any direct, indirect, or cumulative adverse effects on these species.

5.b.3. Summary of Habitat and Population Status and Trend at the Forest/Bioregional Scale

The Modoc NF LRMP (as amended by the SNFPA) requires forest-scale habitat monitoring and bioregional-scale population monitoring for the Modoc sucker (Table 2); hence, the Modoc sucker effects analysis for the Noxious Weed Treatment Project must be informed by both habitat and population monitoring data. The sections below summarize the habitat and population status and trend data for the Modoc sucker. This information is drawn from the detailed information on habitat and population trends in the Modoc National Forest MIS Report (USDA 2007), which is hereby incorporated by reference.

Habitat Status and Trend: Based on the observations of biologists, habitat availability, as a result of improved cattle allotment management, has increased over the past ten year period (M. Yamagiwa pers. comm.).

Population Status and Trend: Past reports estimated the population of the Modoc sucker to be less than 5,000 individual fish (Moyle 2002) and 2,605 (Ford 1977), with the reproductive (effective) population being 200 and 104, respectively, based on length-frequency analyses (Ford 1977, USFS unpublished data). Moyle and Ford, however, did not census the entire reaches where Modoc suckers are known to exist.

A more recent estimate of the effective population is 3,000 individual fish, which was determined from 1994 surveys conducted by the National Biological Survey (M. Yamagiwa pers. comm.).

Population numbers for Modoc suckers is difficult to obtain and interpret. Visual counts have been conducted during night surveys with no definitive population numbers obtained, just distribution. It is known that there is a positive increase in numbers of Modoc suckers where exotic fish (largemouth bass) are removed (S. Reid pers. comm.). Based upon past survey records, it is estimated that the population trend for this species is increasing over the past ten year period (Ibid).

5.b.4. Relationship of Project-Level Impacts to Forest-Scale Habitat and Population Trends for the species: Mechanical treatment as proposed will not alter or contribute to existing forest-wide trend in population or distribution.

Herbicide treatment would result in the treatment of 1.93 acres (8 sites) of suitable habitat across the analysis area. Therefore, the impact of the Noxious Weed Treatment Project will not alter or contribute to existing forest-wide trend in population or distribution for the Modoc sucker.

5.c. Goose Lake Redband Trout

The Goose Lake redband trout is a Forest Service listed sensitive species; additional information on affected environment and environmental consequences of the Noxious Weed Treatment Project on these species is found in the project BE.

5.c.1. Habitat/Species Relationship

Detailed information on MIS for the Modoc NF is documented in the Modoc National Forest MIS Report (USDA 2007), which is hereby incorporated by reference.

The Goose Lake redband trout is a Forest Service sensitive species. The name redband trout is used to cover a complex of distinctive trouts that occur in isolated headwater streams of the McCloud, Pit, Klamath, and Columbia river systems of California, Nevada, and Oregon. The Goose Lake basin can be considered a disrupted part of the Sacramento River basin because Goose Lake has overflowed to the Pit River in historical times.

5.c.2. Project-level Effects Analysis based on Habitat

Key Habitat Factor(s) for the Analysis: The Forest LRMP identified these species as associated with riparian habitats. These species are found in the following CWHR habitat types: lacustrine and riverine.

Analysis Area for Project-level Effects Analysis: The Goose Lake redband trout is endemic to Goose Lake and its major tributaries (Lassen and Willow creeks in California and the extensive Thomas Creek system and Crane Creek in Oregon) as well as to smaller streams such as Cottonwood Creek in California and several small streams in Oregon. Berg (1987) reported that Joseph, Parker, and East creeks, tributaries of the upper Pit River in California, contained trout genetically similar to Goose Lake redband trout. It is generally recognized that the native trout of the upper Pit River are Goose Lake redband trout.

Current Condition of the Key Habitat Factor(s) in the Analysis Area: The long-term persistence of this fish depends largely on the health of populations in the headwater streams flowing into Goose Lake in Oregon and California, even though much of the conservation attention has focused on large fish in the lake itself. The extirpation of the lake population during a drought and its subsequent partial recovery indicate the probable importance of downstream colonization of the lake from headwater populations. Because of the high level of concern over extirpation of Goose Lake redbands (and other native fishes) from Goose Lake when it dried up,

conservation efforts have been under way in the watershed, by both agencies and private landowners, to restore streams (e.g., by changing grazing practices) and to remove or alter migration barriers (Moyle 2002).

Alternative 1

Direct and Indirect Effects to Habitat: Potential adverse effects to the aquatic environment from not controlling spread of noxious weeds include but are not limited to, an increase in sedimentation, reduction in streambank stability, elevated water temperature with the lack of canopy cover, and a potential decrease in the amount of organic matter available to enter affected streams. Without treatment, noxious weeds would likely become widely established across the Forest. This could lead to an increase in soil erosion (sediment deposition) and surface water runoff.

Cumulative Effects to Habitat: As weed infestations become more severe, it becomes more difficult to restore natural or near natural conditions. Conditions arise where instead of using physical treatments or relatively low applications of low toxicity herbicides, more intensive physical treatment or intensive applications at higher concentrations of more toxic herbicides may be necessary to control later stages of weed infestations. When this occurs, the risk to the aquatic environment also increases and viability of aquatic species may also be at risk

Cumulative Effects Conclusion: It is anticipated, that under the No Action Alternative, there will be an increase in noxious weeds within suitable habitat. The relative cumulative effect to Goose Lake redband trout would be relatively small compared to the existing amount of habitat in the analysis area.

Alternatives 2/4/6

Direct and Indirect Effects to Habitat: Mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas. Treatment would result in better riparian condition, in turn providing more stable and useful aquatic habitat.

Under these alternatives, potential direct effects to aquatic resources would be primarily associated with herbicide application near streams and associated riparian areas, lakes, or wetlands. Most herbicides are applied in liquid formulations and are sprayed on foliage of the target vegetation. In some cases soil may be a major receptor and contamination can occur by chemicals leaching through the soil to the groundwater and ultimately reaching the aquatic environment. This method of introduction usually poses the least amount of risk to the aquatic environment because chemicals typically disappear from the ground surface by either plant uptake of the chemical, volatilization, and natural decomposition of the active ingredients or adsorption of the herbicide by soil particles. Norris et al. (1991), indicates leaching of chemicals through the soil profile is a process of major public concern, but is least likely to occur in forest environments. Prevention measures proposed to address this are included as part of the Project Design Standards. Leaks, spills, and improper storage and handling of containers are the source of most pesticide related groundwater contamination. These impacts can easily be prevented with proper training of personnel and proper storage and disposal of chemicals. Risk from an accidental spill of herbicide into a water body on the Forest is considered low.

Another mode of pesticide entry to the aquatic system includes overland flow from precipitation events. Risk varies depending on soil composition and timing and intensity of precipitation events after application. Risk tends to be lower on well-vegetated forests and rangeland where soil infiltration is typically greater than precipitation. Norris et al. (1991) indicated that overland flow

occurs infrequently on most forestland because the infiltration capacity of the forest floor and soil is usually far greater than the rate of precipitation. Aquatic organisms are more at risk of negative impacts from herbicides in small perennial streams, or during late season when flow is reduced, due to their limited capability for dilution. Prevention measures proposed to address precipitation events are included in the Project Design Standards. Under these alternatives, a buffer zones of 100' have been established where no herbicides except aquatic formulations of gylphosate will be used. A reduction of noxious weeds in riparian areas and other aquatic habitats would benefit native plant species and result in better streambank and riparian condition, in turn providing more stable and useful aquatic environments. An indirect effect of these buffer zones is that not all noxious weeds would be chemically treated. Even under the integrated weed management approach, not all weed populations would be eradicated, leaving an available seed source for continued propagation or the unlikely option of weeds being out-competed by native or desirable plant species.

Cumulative Effects to Habitat: The mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas**.** Treatment would result better riparian condition, in turn providing more stable and useful aquatic habitat. Mechanical treatment as proposed is not expected to have any direct, indirect, or cumulative adverse effects on these species.

No adverse downstream cumulative effects would be expected from situations involving herbicide runoff or leaching because of the method of application, Best Management Practices (BMP's) and Design Standards to prevent these types of impacts from occurring. See Appendix D for a list of the specific BMP's.

It is not anticipated that there will be any cumulative effects by chemical spraying of noxious weeds due to the use of chemicals at only their prescribed label rate, the relative non-toxicity of the chemicals to other than target (i.e. plant) organisms, the use of riparian buffers, and the limited area of chemical treatment. Riparian habitat would benefit by decreasing weeds and the acreages to be treated are very small so there is no direct contact with fish and other aquatic species.

Cumulative Effects Conclusion: It is anticipated that implementation of these alternatives, in combination with these past, present, and reasonably foreseeable future actions, would result in the treatment of 12.6 acres (9 sites) of suitable habitat across the analysis area.

Therefore, the cumulative effect to Goose Lake redband trout under these alternatives would be negligible compared to the amount of existing habitat in the analysis area

5.d. Rainbow Trout, Brown Trout, and Largemouth Bass

The rainbow trout, brown trout, and largemouth bass are MIS game species on the Modoc NF. They are all found in lacustrine and riverine habitats on the forest. These species have historically been moved and stocked in many streams and lakes of the Modoc NF throughout the 20th century, although many lakes and streams have naturally reproducing populations. It is unknown to what extent naturally reproducing rainbow trout are of native genetic stock, unaffected by hatchery introductions, while all brown trout and largemouth bass are non-native to the area.

5.d.1. Habitat/Species Relationship

Detailed information on MIS for the Modoc NF is documented in the Modoc National Forest MIS Report (USDA 2007), which is hereby incorporated by reference.

5.d.2. Project-level Effects Analysis based on Habitat

Key Habitat Factor(s) for the Analysis: The Forest LRMP identified these species as associated with riparian habitats. These species are found in the following CWHR habitat types: lacustrine and riverine.

Analysis Area for Project-level Effects Analysis: Rainbow trout are widely distributed throughout streams and lakes within the Sierra Nevada bio-region. Rainbow trout habitat on the Modoc is considered abundant and has remained relatively constant since the development of the Forest Plan (M. Yamagiwa pers. comm.).

Brown trout are widely distributed throughout streams and lakes within the Sierra Nevada Bio-region. Brown trout habitat on the Modoc is considered abundant and well distributed at higher elevations across the Forest, primarily on the Warner Mountain Ranger District (M.Yamagiwa pers. comm.).

Available largemouth bass habitat on the Modoc National Forest consists primarily of Big Sage Reservoir with bass occupying several other small reservoirs on the Devil's Garden and Doublehead Districts

Current Condition of the Key Habitat Factor(s) in the Analysis Area: Several grazing strategies have been implemented on allotments (containing rainbow trout) to improve riparian conditions. Habitat trend for rainbow trout on the Modoc appears to be stable at this time (M. Yamagiwa pers. comm.).

This species has stable populations across the Sierra Nevada Bioregion. Some Forests, including the Modoc National Forest, are actively removing brown trout from streams to restore native fisheries and amphibian populations.

The amount of largemouth bass habitat has remained relatively stable since the development of the Forest Plan, as the existing lakes and reservoirs have not undergone any substantial change in habitat conditions.

Alternative 1

Direct and Indirect Effects to Habitat: Potential adverse effects to the aquatic environment from not controlling spread of noxious weeds include but are not limited to, an increase in sedimentation, reduction in streambank stability, elevated water temperature with the lack of canopy cover, and a potential decrease in the amount of organic matter available to enter affected streams. Without treatment, noxious weeds would likely become widely established across the Forest. This could lead to an increase in soil erosion (sediment deposition) and surface water runoff.

Cumulative Effects to Habitat: As weed infestations become more severe, it becomes more difficult to restore natural or near natural conditions. Conditions arise where instead of using physical treatments or relatively low applications of low toxicity herbicides, more intensive physical treatment or intensive applications at higher concentrations of more toxic herbicides may be necessary to control later stages of weed infestations. When this occurs, the risk to the aquatic environment also increases and viability of aquatic species may also be at risk

Cumulative Effects Conclusion: It is anticipated, that under the No Action Alternative, there will be an increase in noxious weeds within suitable habitat. The relative cumulative effect to

these species would be relatively small compared to the existing amount of habitat in the analysis area.

Alternatives 2/4

Direct and Indirect Effects to Habitat: Mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas. Treatment would result in better riparian condition, in turn providing more stable and useful aquatic habitat.

Under these alternatives, potential direct effects to aquatic resources would be primarily associated with herbicide application near streams and associated riparian areas, lakes, or wetlands. Most herbicides are applied in liquid formulations and are sprayed on foliage of the target vegetation. In some cases soil may be a major receptor and contamination can occur by chemicals leaching through the soil to the groundwater and ultimately reaching the aquatic environment. This method of introduction usually poses the least amount of risk to the aquatic environment because chemicals typically disappear from the ground surface by either plant uptake of the chemical, volatilization, and natural decomposition of the active ingredients or adsorption of the herbicide by soil particles. Norris et al. (1991), indicates leaching of chemicals through the soil profile is a process of major public concern, but is least likely to occur in forest environments. Prevention measures proposed to address this are included as part of the Project Design Standards. Leaks, spills, and improper storage and handling of containers are the source of most pesticide related groundwater contamination. These impacts can easily be prevented with proper training of personnel and proper storage and disposal of chemicals. Risk from an accidental spill of herbicide into a water body on the Forest is considered low.

Another mode of pesticide entry to the aquatic system includes overland flow from precipitation events. Risk varies depending on soil composition and timing and intensity of precipitation events after application. Risk tends to be lower on well-vegetated forests and rangeland where soil infiltration is typically greater than precipitation. Norris et al. (1991) indicated that overland flow occurs infrequently on most forestland because the infiltration capacity of the forest floor and soil is usually far greater than the rate of precipitation. Aquatic organisms are more at risk of negative impacts from herbicides in small perennial streams, or during late season when flow is reduced, due to their limited capability for dilution. Prevention measures proposed to address precipitation events are included in the Project Design Standards. Under these alternatives, buffer zones have been established. The prescribed widths of the Streamside Management Zones (SMZ's) are consistent with the LRMP as modified by the Sierra Nevada Framework ROD, 2001. The specified distances for perennial streams, lakes and special aquatic features is 300 feet and 150 for seasonally flowing streams. Herbicide treatment for these alternatives are as follows: From high water outward to 10 feet – no herbicide use. From a distance of 10 feet to the outer edge of the SMZ only glyphosate may be applied by wicking on the plant. From the outer edge of the SMZ, glyphosate, clopyralid, diacamba, and triclopyr may be used. 2,4-D will not be applied within 1,000 feet of surface or live water. A reduction of noxious weeds in riparian areas and other aquatic habitats would benefit native plant species and result in better streambank and riparian condition, in turn providing more stable and useful aquatic environments. An indirect effect of these buffer zones is that not all noxious weeds would be chemically treated. Even under the integrated weed management approach, not all weed populations would be eradicated, leaving an available seed source for continued propagation or the unlikely option of weeds being out-competed by native or desirable plant species.

Cumulative Effects to Habitat: The mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas**.** Treatment would result better riparian condition, in turn providing more stable and useful aquatic habitat. Mechanical treatment as proposed is not expected to have any direct, indirect, or cumulative adverse effects on these species.

No adverse downstream cumulative effects would be expected from situations involving herbicide runoff or leaching because of the method of application, Best Management Practices (BMP's) and Design Standards to prevent these types of impacts from occurring. See Appendix D for a list of the specific BMP's.

It is not anticipated that there will be any cumulative effects by chemical spraying of noxious weeds due to the use of chemicals at only their prescribed label rate, the relative non-toxicity of the chemicals to other than target (i.e. plant) organisms, the use of riparian buffers, and the limited area of chemical treatment. Riparian habitat would benefit by decreasing weeds and the acreages to be treated are very small so there is no direct contact with fish and other aquatic species.

Cumulative Effects Conclusion: Under these alternatives, the potential for direct and indirect effects to water quality would be prevented through the application of Design Standards. It is unlikely that these alternatives would introduce pesticides into either the North/South Fork of the Pit River or Klamath River that are in excess of the applicable Basin Water Quality Plans and would meet state and federal water quality objectives (Adams 2007).

Therefore, the cumulative effect to rainbow trout, brown trout, and largemouth bass under these alternatives would be negligible.

Alternative 3/5

Direct and Indirect Effects to Habitat: Mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas. Treatment would result in better riparian condition, in turn providing more stable and useful aquatic habitat.

Cumulative Effects to Habitat: The mechanical treatment of weed sites could result in some localized soil disturbance and possibly increased sedimentation of nearby drainages. These effects would be expected to be minor and temporary in duration because of the comparatively few acres of soil disturbance followed by the reclamation and restoration (where appropriate) of treated areas**.** Treatment would result better riparian condition, in turn providing more stable and useful aquatic habitat.

Cumulative Effects Conclusion: Mechanical treatment as proposed is not expected to have any direct, indirect, or cumulative adverse effects on these species.

Alternative 6

Direct and Indirect Effects to Habitat: See Alternative 2/4 discussion. The primary difference is under this alternative the SMZ's would be treated for noxious weeds by the use of herbicides other than glyphosate. From the outer edge of the high water mark for a distance of 10 feet, aquatic formulations of glyphosate may be used. From 10 feet from the edge of the high water mark outward, 2,4-Damine, chlorsulfuron, and glyphosate may be used. From 25 feet from the edge of the high water mark outward clopyralid, dicamba, triclopyr, and Tank Mix #1

(chlorsulfuron + 2,4-D amine) and Tank Mix #2 (dicamba + 2,4-D amine). Outside of 100 feet ester forms of 2,4-D may be used in the tank mix.

Cumulative Effects to Habitat: In this alternative, 6.1 acres are within 10 feet of a waterway and 37.5 acres are located within 100 feet of water. The concentrations of herbicides that are proposed to be applied near or adjacent to water (within 25 feet of high water mark for streams, lakes, and special aquatic features) are less than label directions and are determined to be a low risk to adversely effect downstream beneficial uses (Adams 2007).

Cumulative Effects Conclusion: Under these alternatives, the potential for direct and indirect effects to water quality would be prevented through the application of Design Standards. It is unlikely that these alternatives would introduce pesticides into either the North/South Fork of the Pit River or Klamath River that are in excess of the applicable Basin Water Quality Plans and would meet state and federal water quality objectives (Adams 2007).

Therefore, the cumulative effect to rainbow trout, brown trout, and largemouth bass under these alternatives would be negligible.

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Personal communication

Stewart Reid Ph.D., Western Fishes, Ashland, OR

Marty Yamagiwa, Forest Biologist, Modoc National Forest

Modoc National Forest

Noxious Weed Project

Aquatic Resources Supplement

Prepared by /s/ Marty Yamagiwa **Date: 1/28/08**

Marty Yamagiwa, Forest Wildlife and Fisheries Program Manager

This supplement provides additional information on the aquatic resources potentially affected by the Modoc National Forest Noxious Weed Treatment Project.

Sensitive species:

The current (March 2005), USDA Forest Service, Pacific Southwest Region Sensitive Animal Species list was reviewed for consistency with the list used during the preparation of the Biological Evaluation for this project. An additional species, the Topaz snail, Juga (Calibasis) acutifilosa, was found to be on the latest list. This snail occurs in the Fall River and Hat Creek subdrainages far downstream of the project area in the Fall River Mills area of Shasta County. Like the Scalloped Juga, this species does not have suitable habitat that is directly, indirectly, or cumulatively affected by the Modoc National Forest Noxious Weed Treatment Project and will not be carried forward for further analysis.

Threatened or endangered species:
The current USFWS species list (February 2007) was reviewed for consistency with the Biological Assessment prepared for the project. No new listed species were found for the vicinity of the project area.

Risk assessment information:

Specific sites

We excluded all sites that were greater than 100 feet from water because the potential for contamination from the chemical was essentially zero because the chemical does not move that far off site under typical conditions. Typical conditions were described in the EIS and were tied back to labeling requirements (wind speed, time until precipitation, droplet size, temperature limits for volatilization, etc.)

The following are specific noxious weed occurrences within 100’ of TES species habitat.

WM012CIAR4 – This is a Canada thistle site of 0.08 acres. It is located near Fitzhugh Creek which is occupied by the Goose Lake redband trout. There are approximately 100 plants in the area.

WM003LIDA – This is a Dalmation toadflax site of 8.25 acres near Lassen Creek which is occupied by the Goose Lake redband trout.

BV006CEDI3 – This is a Diffuse Knapweed site of 0.06 acres near Johnson Creek which is occupied by the Goose Lake redband trout and Modoc sucker. There are more than 100 plants in the area.

BV004CEDI3 - This is a Diffuse Knapweed site of 0.08 acres near Johnson Creek which is occupied by the Goose Lake redband trout and Modoc sucker. There are more than 1000 plants in the area.

BV006CEDI - This is a Diffuse Knapweed site of 0.87 acres near Johnson Creek which is occupied by the Goose Lake redband trout and Modoc sucker. There are approximately 100 plants in the area.

WM002ISTI – This is a Dyers woad site of 2.58 acres near Buck Creek which is occupied by Goose Lake redband trout.

BV001SAAE – This is a Mediterranean sage site of 0.27 acres near Johnson Creek which is occupied by the Goose Lake redband trout and Modoc sucker. There are more than 100 plants in the area.

BV260ONAC – This is a Scotch thistle site of 0.10 acres near Johnson Creek which is occupied by the Goose Lake redband trout and Modoc sucker. There are more than 100 plants in the area.

BV002CEMA4 – This is a Spotted knapweed site of 0.31 acres near Johnson Creek which is occupied by the Goose Lake redband trout and Modoc sucker. There are approximately 300 plants in the area.

BV117ONAC – This is Scotch thistle site of 0.15 acres near Ash Creek which is occupied by Modoc sucker.

DG043ONAC – This is a Scotch thistle site of 0.09 acres near Cottonwood Campground. This is within Modoc sucker habitat.

DG005CIAR4 – This is a Canada thistle site of 0.10 acres along the Fairchild Swamp ditch which is shortnose sucker habitat. This ditch is often seasonally dry.

DG006CIAR4 - This is a Canada thistle site of 0.09 acres along the Fairchild Swamp ditch which is shortnose sucker habitat. This ditch is often seasonally dry.

DG016CIAR4 - This is a Canada thistle site of 0.09 acres along the Fairchild Swamp ditch which is shortnose sucker habitat. This ditch is often seasonally dry.

DH012CIAR4 – This is a Canada thistle site of 0.08 acres along Willow Creek near Clear Lake Reservoir, habitat for the Lost River and shortnose sucker.

Total habitat affected: Lost River sucker, shortnose sucker, and Modoc sucker (endangered) is 2.29 acres. Goose Lake redband trout (sensitive) is 12.6 acres. There is overlap in the distribution of the Modoc sucker and Goose Lake redband trout, so the total area affected is 13.2 acres.

Herbicides proposed for use and rates of application can be found in ***Table 2-11*** in Chapter 2 of the Noxious Weed Treatment Project Environmental Impact Statement**.**

General Discussion of Effects on Selected Herbicides on Aquatic Species:

Herbicides are specially formulated chemicals to kill all or parts of target plants. Many kinds of herbicides, varying from broad-spectrum varieties, which are effective against most species of plants, to narrow-spectrum varieties, which are effective against specific target plants or classes of plants, could be used for noxious weed treatment. Herbicide formulations come in both liquid and solid forms.

The risk rating system is based on typical application rates and resulting exposure rates relative to the LC_{50} and the NOEL/NOAELs, when they are available.

Two main factors determine the degree to which adverse effects on a species could occur from herbicide applications: 1) the toxicity of the herbicide, and 2) the likelihood that an animal or plant species would be exposed to toxic levels of the herbicide.

Information regarding the effects of the proposed herbicides on riparian and aquatic species in their natural environments is almost non-existent, effects have been measured under laboratory conditions. The data presented for aquatic and riparian associated special status species are derived from numerous studies conducted primarily on species that serve as surrogates.

For each of the herbicides considered in this analysis, information concerning the hazard identification, exposure assessment, dose-response assessment, and risk characterization come directly from SERA reports, pesticide fact sheets, US EPA, and other references cited below. Where information is inconsistent, an interpretation is made as it relates to forest aquatic and riparian-associated species.

The NPE surfactant associated with herbicides are analyzed in this Final Supplement. During the site-specific implementation, NPE or any other surfactants proposed for use would be analyzed.

Aquatic and Riparian-Associated Species Risk Assessment

Herbicide and NPE-based Surfactants Effects on Surrogate Species

Table 1 below illustrates the herbicide and NPE-based surfactant typical application rates, exposure rate, NOECs, and LC_{50}s for a variety of fish species. Exposure rate estimates for fish species are based on a water contamination rates. Three exposure scenarios presented are: 1) acute exposure in a stream contaminated by runoff and/or percolation; 2) chronic exposure in a stream contaminated by runoff and/or percolation; and 3) acute exposure in a small pond after a spill of 200 gallons of an herbicide mixture. These three scenarios are based on the typical application and dilution rates. NOEC and LC_{50} values for fish species were taken from SERA and the US EPA Reregistration Eligibility Decisions (1993, 1998). Exposure numbers are from the project file worksheets. Additional references not included in these documents are identified. Soil or organic matter absorption, transport through soil, water dilution, degradation, dispersion, etc., are considered. Different formulations than the ones noted below may have different effects on individuals and/or different LC_{50}s.

Information about effects on aquatic invertebrates, aquatic macrophytes, and algae are not included in the following section. If these organisms are affected by herbicides or NPE-based surfactants, fish could be indirectly affected by changes food supply or habitat. The following compound-specific discussions are excerpted from the indicated SERA or Forest Service documents. Exposure numbers are from the project file worksheets. Additional references not included in these documents are identified.

Clopyralid

Clopyralid appears to have a very low potential to cause adverse effects in any aquatic species. As shown in Table XX, using the application rate of 0.25 lb/ac results in a potential acute exposure for the aquatic animal of 0.0022 mg/L for runoff and percolation, 0.00052 mg/L for potential chronic exposure, and 0.908 mg/L for a spill scenario. These concentrations are far below the LC_{50} values for fathead minnow (greater than 1,015 mg/L), Rainbow trout (103.5 mg/L), and Bluegill (1,000 mg/L). Daphnia (water flea), a benchmark species for fish, have acute and chronic NOEC values of 23.1 mg/L, well above the exposure rate levels. All of the potential exposure rates for fish and aquatic invertebrates are below the LC_{50} and NOEC values (SERA 1999).

Glyphosate

At the typical application rate of 2.55 lb e.i./ac, the anticipated short-term (acute) levels in water as a result of runoff or percolation would be 0. 0077mg/L. Chronic values would be about 0. 00255 mg/L. In the event of a spill, glyphosate would reach concentrations of 9.24 mg/L. Exposures via percolation and runoff would be below the fish LD_{50}s (as low as 8.7 mg/L) and the fish NOEC for glyphosate (1 mg/L), so it is unlikely that effects would occur from the application of glyphosate. However, a spill would represent a risk of toxic effects to fish. A major difference between the effect of glyphosate and glyphosate formulations on aquatic and terrestrial organisms is attributed to the polyethoxylated tallow amine surfactant (POEA) used in Roundup formulations. For fish, the surfactant is more toxic than glyphosate. This is reflected in the lower NOEC for Roundup of 0.1 mg/L. For exposures via percolation and runoff, the acute and chronic exposures would still be below the Roundup NOEC (by at least a factor of 13), hence no adverse effects to fish would be anticipated. A spill involving Roundup, like glyphosate itself, would represent a risk of toxic effects (SERA 1996).

Table 1. Expected herbicide exposure rates of surrogate fish species from typical application rates and central/typical water contamination rates compared to effects thresholds.

Herbicide	Application Rate	Test Species	LC_{50} (mg/L = ppm)	Exposure Rate	NOEC Effect Level or Concentrations
Clopyralid	0.25lbs/ac	Fathead minnow Rainbow trout Bluegill	>1,015 mg/L 103.5 mg/L 1000 mg/L	0.0022 mg/L (acute) 0.00052 mg/L (chronic) 0.9084 mg/L (spill)	23.1 mg/L (acute and chronic)
Glyphosate	3lbs/ac	Fathead minnow Rainbow trout Bluegill Coho salmon (fry) Sockeye salmon (fry)	84.9 mg/L 38 ppm >24 mg/L 12.8 ppm 8.7 ppm	0.0077 mg/L (acute) 0.00255 mg/L (chronic) 9.24 mg//L (spill)	1.0 mg/L=glyphosate 0.1mg/L=Roundup (acute and chronic)
Chlorsulfuron	0.05-0.0625 lbs/ac	Rainbow trout embryos, alevins, and fingerlings	Not determined since 50% mortality not observed	18-900 mg/L	32 mg/L
Triclopyr BEE	1.5lbs/ac	Fathead minnow Rainbow trout Bluegill	2.31 ppm 0.65 ppm 0.36 ppm	0.135 mg/L (acute) 0.045 mg/L (chronic) 5.45 mg/L (spill)	0.6 mg/L (acute and chronic)
Triclopyr TEA	1.0lbs/ac	Fathead minnow Rainbow trout Bluegill	279 ppm 240 ppm 471 ppm	0.09 mg/L (acute) 0.03 mg/L (chronic) 3.63 mg/L (spill)	50 mg/L (acute and chronic)
Diacamba	1.5lbs/ac	Fish, typical	100-500 mg/L	0.0001-0.0004 mg/L (acute) 1-10 mg/L (spill)	
2, 4-D	1.5lbs/ac	Fathead minnow Rainbow trout	263 mg/L 358 mg/L		

Sources: SERA (1996-2001, and 2003), USDA Forest Service (2003), and US EPA Reregistration Eligibility Decisions (1993, and 1998).
Note: Tests were not conducted above NOECs.

Chlorsulfuron

Acute toxicity studies have been conducted in several species of fish. A single study investigated the effects of chronic exposure of chlorsulfuron in rainbow trout. Due to limited water solubility of chlorsulfuron, full dose-response curves counld not be generated. However, fish do not appear particularly susceptible to chlorsulfuron toxicity, with LC_{50} values in most species exceeding the limit of solubility for chlorsulfuron toxicity (250 to 989 ppm) (SERA 2004).

Triclopyr

Two commercial formulations of triclopyr, Garlon 3A and Garlon 4, have been used in Forest Service vegetation management programs. Garlon 3A consists of the triethylamine salt of triclopyr (TEA) (44.4 %) plus emulsifiers, surfactants, and ethanol. Garlon 4 contains the butoxyethyl ester (BEE) of triclopyr (61.6 %) plus inerts (38.4 %) that include deodorized kerosene (SERA 1996).

Triclopyr BEE

At a typical application rate of 1.5 lbs/ac, the estimated acute and chronic concentration of triclopyr BEE in water is 0.135 and 0.045 mg/L, respectively, while a spill could result in concentration of 5.45 mg/L. These concentrations are below the LC_{50} for fathead minnows (2.31 ppm), rainbow trout (0.65 ppm) and bluegill (0.36 ppm). However, the exposure rate from the spill scenario exceeds the acute and chronic NOEC of less than or equal to 0.25. A spill involving triclopyr BEE appears to have a potential to cause adverse effects in fish species.

Triclopyr TEA

At the typical application rate of 1.0 lbs/ac, the estimated acute and chronic concentration of triclopyr TEA in water is 0.09 and 0.03 mg/L, respectively,, while a spill could result in a concentration of 3.63 mg/L. These exposure levels are below the lowest LC_{50} of 240 mg/L for rainbow trout and the acute and chronic NOEC of 199 mg/L and 104 mg/L, respectively for fish. Triclopyr TEA is not expected to have a direct effect on fish species.

Dicamba

Relatively little information is available regarding the toxicity of dicamba to aquatic species. The only endpoints that have been examined are acute lethal responses for aquatic animals (LC_{50} values) and growth inhibition in unicellular algae (EC_{50} values). Comparable studies on aquatic algae and aquatic animals clearly indicate that some species of algae are much more sensitive to dicamba, compared to fish and aquatic invertebrates. Under typical conditions of exposure ambient concentrations of dicamba in water would be far below any plausible effect levels, even in the most sensitive algal species.

For most fish species and amphibians, maximum anticipated levels in water would not exceed 0.1 of the LC_{50}. Although some mortality might occur in these species as a result of a severe spill (i.e. dicamba levels of 10 mg/L), mortality is far less likely to occur in a moderate spill (i.e. dicamba levels of 1 mg/L).

..... 2, 4-D

Fish (fathead minnows and rainbow trout) were more sensitive to 2, 4-D acid than to the dimethylamine formulation over 24 to 96-hour exposure periods. The EC_{50} values for the acid ranged between 260 and358 mg/L. For the dimethylamine EC_{50} values ranged from 250 to more than 600 mg/L. Using the acid as a surrogate for the amine may be a conservative assumption.

2, 4-D has been reported to cause behavioral effects in some fish species. Swimming behavior of green sunfish was affected by the butoxyethanol ester after about 60 minutes of exposure to 100 ppm (Sargent et al. 1970). Rainbow trout exposed to a butoxyethanol ester of 2, 4-D became lethargic and could not avoid capture (Dodson and Mayfield 1979). The rheotropic response of rainbow trout was also modified such that they no longer oriented themselves into the water current. Smaller fish were least affected, while larger fish were the first to die.

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Herbicide Effects on Surrogate Invertebrate Species

Table 2 below illustrates the typical herbicide application rates, exposure rates, NOECs, and LC_{50}s for a variety of surrogate invertebrate species. Exposure rate estimates for invertebrate species are based on a water contamination rates. Three exposure scenarios presented are: 1) acute exposure in a stream contaminated by surface or subsurface runoff, 2) chronic exposure in a stream contaminated by surface or subsurface runoff, and 3) acute exposure in a small pond after a spill of 200 gallons of an herbicide mixture. These three scenarios are based on the typical application and dilution rates. NOEC and LC_{50} values for invertebrate species were taken from SERA (1996-2001), and USDA Forest Service (2003), and the US EPA Reregistration Eligibility Decisions (1993,1998). Additional references not included in these documents are identified. Soil or organic matter absorption, transport through soil, water dilution, degradation, and dispersion, etc., are considered. Formulations different than the ones noted below may have different effects on individuals and/or a different LC_{50}.

Table 2. Expected herbicide exposure rates of surrogate aquatic invertebrate species from typical application rates and central and typical water contamination rates.

Herbicide	Application Rate	Test Species	Exposure Rate (mg/L = ppm)	NOEC	LC_{50} for animal (48 to 96hr exposures)
Clopyralid	0.25lbs/ac	Daphnia magna (water flea)	0.0022 mg/L (acute) 0.00052mg/L (chronic) 0.9084 mg/L (spill)	(1) 23.1 mg/L[1]	232–350 mg/L
Glyphosate	3.0lbs/ac	Daphnia sp. Midge larvae Grass shrimp Fiddler crab Larval oyster	0.0077 mg/L (acute) 0.00255 mg/L (chronic) 9.24 mg/L (spill)	-- -- (2) 210 ppm[2] (2) 650 ppm[2] (2) 10 ppm[2]	218-780 ppm 1,216 ppm
Chlorsulfuron	0.05-0.0625 lbs/ac	Daphnia magna	0.01 to 100 mg/L for 48 hours	10 mg/L	>100 mg/L. Estimated mortality of 30% at 100 mg/L concentration.
Triclopyr BEE	1.5lbs/ac	Daphnia magna Ephemeroptera Mayflies Plecoptera Stoneflies Trichoptera Caddisflies Odonata Dragonflies Diptera Blackflies Shrimp Oyster	0.135 mg/L (acute) 0.045 mg/L (chronic) 5.45mg/L (spill)	NA	1.7-12 mg/L >320 mg/L (1-hr) 249-370 mg/L (1-hr) 21.8–290mg/L(1-hr) >320 mg/L (1-hr) 0.6 mg/L (1-hr) 1.7–2.47 mg/L 0.32 mg/L (EC_{50})
Triclopyr TEA	1.0lbs/ac	Daphnia magna Oyster Shrimp Crab	0.09 mg/L (acute) 0.03 mg/L (chronic) 3.63 mg/L (spill)	80.7 mg/L (reproduction) LOEC = 149 mg/L	950–1,590 mg/L 56-87 ppm (EC_{50}) 326-895 ppm >1000 ppm
Dicamba	1.5lbs/ac	Daphnia sp.			10->40 mg/L
2, 4-D	1.5lbs/ac	Daphnia magna Dragonfly nymph Culex triaeniorhynchus			3390 mg/L 1540 mg/L 1.6 mg/L

Table Footer:
mg/L = milligrams per liter, ppm = parts per million, mg/L = ppm; Note: Tests for LC_{50}s were not available.
Table Footer:
(1)=NOEC, (2)=NOEL; [1] Chronic exposure [2] Acute exposure [3] Subchronic exposure.
Source = SERA 1996-2001, and 2003 USDA Forest Service (2003), and US EPA Reregistration Eligibility Decisions (1993, and 1998).

Clopyralid

The application of clopyralid at the typical rate of 0.25 lb/acre could lead to potential exposure rates of 0.0022 mg/L (acute) and 0.00052 mg/L (chronic) for aquatic invertebrates living in streams. In the scenario involving an herbicide spill into a pond, the potential exposure rate is 0.9084 mg/L. A NOEC of 23.1 mg/L and an LC_{50} of 232-350 mg/L have been established for the water flea. This is the only species of aquatic invertebrate for which there is data available. For all of the scenarios considered in this analysis, the potential exposure rates are below the NOEC and LC_{50} for the water flea (SERA 1999).

Glyphosate

At the typical application rate of 2.55 lb/acre, scenarios for runoff and/or percolation into a stream yield potential exposure rates of 0.0077 mg/L (acute) and 0.00255 mg/L (chronic). In the case of a spill into a pond, the estimated exposure rate is 9.24 mg/L. The LC_{50} for the water flea ranges from 218 to 780 mg/L. For aquatic invertebrates the acute NOEC is less than or equal to 11.0 mg/L and the chronic NOEC is 0.7 mg/L Exposure rates for aquatic invertebrates are below NOECs and LC_{50}s for all species tested (SERA 1996).

Chlorsulfuron

Chlorsulfuron appears to be relatively non-toxic to aquatic invertebrates. Standard toxicity bioassays to assess the effects of chlorsulfuron on aquatic invertebrates were conducted in daphnia and mysid shrimp. Similar LC_{50} values are reported for both species. For reproductive effects, an NOEC of 20 mg/L was reported in a 21-day exposure study in *D. magna* (SERA 2004).

Triclopyr BEE

Potential exposures expected with the typical application of 1.5 lb/acre of triclopyr BEE in a stream scenario are 0.135 mg/L (acute) and 0.045 mg/L (chronic). A spill into a pond could result in an exposure rate of 5.45 mg/L. Tests for effects of this herbicide have been performed for several species of aquatic invertebrates, including aquatic larvae of insects. Exposure rates for stream scenarios are below all of the LC_{50} values for these species. The acute NOEC is 8.55 mg/L and the chronic NOEC is 80.7 mg/L (NOTE* the chronic is higher than the acute because triclopyr BEE quickly changes to triclopyr TEA in water). In the case of a spill, the exposure could exceed the LC_{50} for the water flea, blackfly larvae, shrimp, and oysters (SERA 1996).

Triclopyr TEA

The application of triclopyr TEA at the typical rate of 1 lb/acre could lead to potential exposure rates of 0.09 mg/L (acute) and 0.03 mg/L (chronic) for aquatic invertebrates living in streams. In the scenario involving an herbicide spill into a pond, the potential exposure rate is 3.63 mg/L. A reproductive chronic NOEC of 80.7 mg/L and an LC_{50} of 950-1590 mg/L have been established for the water flea. Estimated exposure rates do not exceed the NOEC and LC_{50} values published for various species of aquatic invertebrates (SERA 1996).

..... Dicamba

At the typical application rate of 1.5 lbs/ac, the LC_{50} of 10->40 mg/L have been established. Aquatic invertebrates are somewhat intermediate in sensitivity between sensitive algal species and fish. Mortality is a plausible concern for sensitive invertebrate species like Daphnia pulex after a severe spill.

..... 2, 4-D

The relative toxicity of the various formulations of 2, 4-D can vary considerably for different species of aquatic crustaceans. Toxicity of 2, 4-D varies between groups of organisms. Ranked in order of greatest to least sensitivity to 2, 4-D are insect larvae, oligochaetes, snails, and zooplankton (Sarkar 1991).

The exposure scenarios as modeled in the risk assessment worksheets represent generalized conditions and assumptions based upon typical herbicide applications. Site-specific environmental information regarding the suitability and timing of certain treatments reduces the potential risk to some degree. Toxicity tests are generally conducted under static laboratory conditions and do not accurately represent, and may not account for, the range of conditions facing species in their natural environments. It is reasonable to assume the model and toxicity values represented in the literature are conservative and provide some further reduction in risk. In the spill scenario, the peak concentrations of any chemical would be greatest at the point of introduction. The ameliorating effects of flow would quickly reduce the spill concentrations as they travel downstream to levels unlikely to incur direct effect. Aquatic systems and riparian habitats are not the targets of herbicide treatment in this project and the effects to these systems and habitats should rarely occur and with low intensity.

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ATTACHMENT A

Letter of Concurrence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Klamath Falls Fish and Wildlife Office
1936 California Avenue
Klamath Falls, Oregon 97601
(541) 885-8481 FAX (541)885-7837

In Reply Refer To:
1-10-07-I-0006
Cross-reference: 1-10-98-TA-042, 1-10-99-TA-067,
1-10-03-I-082, 1-10-04-234, 1-10-05-I-021, 1-10-05-105-SP

MAR 0 8 2007

Stanley G. Sylva, Forest Supervisor
Modoc National Forest
800 West 12th Street
Alturas, California 96101-3132

Dear Mr. Sylva:

Thank you for your email received on February 28, 2007, requesting U.S. Fish and Wildlife Service (Service) concurrence with the Modoc National Forest's (Forest) effects determinations for the proposed Noxious Weed Implementation Project (Project) documented in the Final Environmental Impact Statement (FEIS) that is currently *in press*. On February 26, 2007, the Service received the Wildlife Biological Assessment (BA) via email and received the final Botany and Aquatic Species BAs on March 6, 2007 via email.

The Forest has determined the Project may affect, but is not likely to adversely affect the federally threatened bald eagle (*Haliaeetus leucocephalus*). This consultation is based on information provided in the BAs, FEIS for the Noxious Weed Treatment Project and additional materials and information provided by Forest staff or acquired through our office. This response is prepared in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq*.).

The BAs also assessed the potential for effects to the federally endangered Lost River sucker (*Deltistes luxatus*), shortnose sucker (*Chasmistes brevirostris*), and Shasta crayfish (*Pacifastacus fortis*); and the federally threatened northern spotted owl (*Strix occidentalis caurina*), Warner sucker (*Catstomus warnerensis*) and slender Orcutt grass (*Orcuttia tenuis*) and determined that the proposed project is likely to have no effect on those listed species or their associated habitat. The Service acknowledges those determinations, and the Service will not consider those species further in this concurrence.

Consultation History

Our project records indicate that discussions and correspondence on this project have been ongoing since 1998. This section 7 consultation is a reinitiation of consultation from 2003. On April 8, 2003, the Service issued a Letter of Concurrence (FWS#1-10-03-I-082) to the Forest on

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the Proposed Action alternative found in the November 2004 Draft EIS. Since then, the Forest has finalized the EIS (FEIS) and developed two new alternatives. Alternative 6 is now the Preferred Alternative in the FEIS triggering reinitiation of consultation with the Service. Since 2003 there have been numerous correspondences between the Service and the Forest upon development of the FEIS. See page three and four of the Terrestrial Wildlife Biological Assessment for a culmination of the correspondence.

On November 29, 2006, the Modoc National Forest sent a letter to the Service requesting concurrence on the Project. Upon receipt of that letter the Service did not have the Terrestrial Wildlife Species BA nor did the Forest indicate which of the six alternatives presented in the FEIS you wished to receive concurrence on. The consultation process could not begin until this information was received. We finally received the necessary information, including modified Botany and Aquatic Species BAs on March 6, 2007.

This concurrence memorandum supersedes the previous consultations for the Modoc National Forest Noxious Weed Implementation Project.

Description of Proposed Action

The Project would authorize treatment of 14 species of noxious weeds. The control of these plants will promote the ecosystem health of forested and rangeland habitats by maintaining or improving native forbs and grass communities and promoting biological diversity on the Forest. The Project encompasses the entire Forest, which is located in portions of Modoc, Lassen, and Siskiyou Counties of northeastern California.

Alternative 6 in the FEIS is the preferred alternative and is the Proposed Action. The Proposed Action is comprised of two components. The first component defines specific treatments in defined areas that target known noxious weeds sites. The second component is a reactive strategy that will implement treatments of new sites of noxious weeds as they are located on the Forest.

The Modoc National Forest proposes to treat noxious weeds on a total of 541 existing sites comprising approximately 341 acres through physical and herbicide methods over a ten-year period. Table 2-8 in Chapter 2 of the FEIS provides site-specific treatment information including information on noxious weed species, type of treatment proposed (physical and/or chemical), distance to water and potential total amount of herbicide application. Also in Chapter 2, Table 2-11b lists the herbicides proposed for use on the noxious weeds species and their rates of application. Listed below are features of Alternative 6:

- Treating approximately 341 acres (541 known sites).
- 116 sites (19 acres) will be treated using physical methods to include manual hand pulling, grubbing, hoeing, clipping (including "weedeaters"), and mulching/tarping.
- 371 sites (116 acres) will be treated using the physical methods listed above and/or herbicides.
- 46 sites (65 acres) will be treated using herbicide methods.

- Five sites (41 acres) may be treated using goat grazing. These sites may alternatively be treated with physical and/or herbicide methods.
- Three sites (5,658 acre dyers woad site, 159 acre common crupina site, and 850 acre Dalmatian toadflax site) would be treated utilizing limited treatment methods along major travel ways to reduce potential for spread. These sites will be treated around the borders to contain the infestations. The estimated number of acres treated would be 100 acres along the borders. These treatment acres are estimated proportionally to the size of the current inventoried acres for these three sites.
- Herbicide treatments include: Chlorsulfuron, Clopyralid, Dicamba, Glyphosate, Triclopyr, 2-4-D, and two herbicide mixtures (Mix 1: Chlorsulfuron + 2,4-D, and Mix 2: Dicamba + 2,4-D).
- No 2,4-D treatments will be applied to noxious weed occurrences greater than 2 acres in size.
- Herbicide treatments in this alternative will include use of surfactants and dyes. Surfactants increase the absorption of herbicide by the target weeds, and dyes assist the applicator in efficiently treating target weeds.
- Herbicide treatments will be the primary treatment for rhizomatous species.

The Proposed Action also identifies an Early Detection - Rapid Response Strategy. This strategy will provide the opportunity to treat new sites of the identified species that have developed, existing sites that have expanded, and new sites of new noxious weeds using the same treatments as outlined for the noxious weed species identified provided that environmental effects are within the design standards, and effects analyses are reflected in the FEIS. Proposed treatment under this strategy will be capped at 200 acres over the life of the alternative with no more than 100 acres being treated in any given year. The rationale for this cap is to provide limited flexibility to treat new and/or expanding weed sites while remaining within the range of effects as displayed in this analysis.

If the Forest finds it necessary to implement this strategy and they implement it in occupied bald eagle habitat, then the Forest intends to coordinate with the Service to ensure that the action is consistent with this consultation/concurrence.

Species Occurrences

Before the Modoc National Forest Land and Resource Management Plan (LRMP) was finalized, there were 10 active bald eagle territories on the Forest. During the planning phase for the Modoc LRMP, a recovery goal of 21 territories of bald eagle was established. As of 2005, there were 33 territories found on the Modoc National Forest. In the last five years, 31 out of 33 territories have produced offspring, often annually. More information regarding eagle trends and status at both the local and bioregional scales can be found on pages 11 and 12 of the Terrestrial Wildlife BA.

Impacts and Effects from the Proposed Action

Project Design Standards are measures incorporated into a project to minimize or avoid effects to endangered or threatened species. Table 2-2 in Chapter 2 of the FEIS has the complete list of Design Standards associated with the Proposed Action.

There are six noxious weed locations on the Modoc National Forest within 0.5 miles of bald eagle nests and one noxious weed occurrence within potential habitat on Forest Service lands. There are 4.68 acres that could receive manual treatments and 4.78 acres that could receive chemical treatments within occupied habitat; chemical treatments could be significantly less if the 3.84 acres of Mediterranean sage occurrence is treated using manual methods.

Annually, a program of work will be presented to biologists so they can survey nests to determine if the nests are active and require Limited Operating Periods (LOPs) to protect the bald eagle pair. If nesting eagles are present, a LOP will be instituted up to 0.5 miles line of sight around active nest sites to minimize disturbance to nesting birds (Design Standard-10).

There will be no direct effects to bald eagle habitat by physical or chemical removal of weeds; no potential nest or pilot trees will be affected by this project.

There may be a beneficial effect to prey habitat by weed removal. Although bald eagles on the Modoc National Forest tend to forage on fish, waterfowl, and carrion, there have been remains of ground squirrels and other animals found under active nests. Eliminating weeds and allowing native plants to thrive could improve potential cover and food for some types of prey.

The only chemical of concern for a bald eagle is the herbicide 2,4-D, which has hazard quotient rating above one for a predatory bird consuming contaminated fish scenario. Under the Proposed Action only 0.27 acres forest-wide could be treated with 2,4-D either by itself or in a tank mix. One site of Canada thistle (DG006CIAR4) is within 25 feet of the water's edge. However, Design Standard-13 in the FEIS states that no 2,4-D will be used within 25 feet of the water's edge in occupied bald eagle habitat. This significantly reduces the risk of 2,4-D contaminating a water source and fish within eagle habitat.

See page nine through 15 of the Wildlife BA for a more detailed effects analysis.

Concurrence

Based upon our review of the proposed action, the Service concurs with the Forest's determination that the action may affect, but is not likely to adversely affect the bald eagle. This concurrence is based on the reasons mentioned in the "Impacts and Effects of the Proposed Action" section above. In summary, we base our concurrence as follows:

The Project would likely have insignificant or discountable effects, if any, due to:

- Use of limited operating periods to avoid disturbances during nesting.
- Implementation of buffers that prohibit the use of herbicides near water sources that could contaminate an eagle's prey species.

Unless new information reveals effects of the proposed actions that may affect species in a manner or to an extent not considered in the information provided by the Forest, or a new species is listed or critical habitat designated that may be affected by the proposed actions, no further action pursuant to the Act is necessary.

If you have any questions regarding this response, please contact Trisha Roninger or Rick Hardy of my staff at (541) 885-8481.

Sincerely,

Curt Mullis

Curt Mullis
Field Supervisor

cc:
Marty Yamagiwa, USFS, Modoc NF
Mary Flores, USFS, Modoc NF
Cheryl Beyer, USFS, Modoc NF