Survey and Manage
Management Recommendation Amendments
For
Fuel Hazard Reduction Treatments
Around At-Risk Communities

Group 2 – Certain Mollusks, Amphibians, and Red Tree Vole

Mollusks: *Helminthoglypta hertleini, Helminthoglypta talmadgei, Monadenia chaceana, Monadenia fidelis minor, Monadenia troglodytes troglodytes, Monadenia troglodytes wintu, Prophysaon coeruleum, Vespericola shasta, Megomphix hemphilli, Oreohelix* n. species, and *Pristiloma arcticum crateris*

Amphibians: Siskiyou Mt. Salamander (*Plethodon stormi),* Shasta salamander (*Hydromantes shastae)*

Red Tree Vole , *Arborimus longicaudus*

January 2002

Attachment 1-1

MR Amendments for Fuel Hazard Reduction Treatments Around At-Risk Communities

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Introduction

The enclosed amendments were developed to apply to the National Fire Plan's highest priority fuels treatment areas: those around at-risk communities and three municipal watersheds located in short fire return interval areas. The application of these amendments is limited to specific geographic areas and fuels conditions because by quantifying and understanding the scope and intensity of potential effects to Survey and Manage (S&M) species, taxa specialists were able to develop Management Recommendations (MRs) that appropriately balance the increased risks to individual S&M site occupancies and the need to meet overall species persistence objectives.

Limited Application – The following amendments to 14 S&M Management Recommendations apply only to fuel reduction activities meeting all three of the following:

1. The activity is conducted to meet high-priority objectives of the National Fire Plan.

2. The activity is within 1-mile (in Oregon and Washington) and 1 ½ miles (in California) of at-risk communities identified in the August 2001 Federal Register, for the purpose of providing for protection of that community and appurtenant improvements, or is within the municipal watershed of the communities of The Dalles, Dufur, and Ashland (all in Oregon).

3. The activity is located within stands in fire regimes 1, 2, and 3A in condition classes 2 or 3 (have missed two or more natural fuel-reducing fire events). (Fire regime 3A is a subdivision of fire regime 3, and includes stands where the natural fire return interval is between 35-50 years. Collectively, fire regimes 1, 2 and 3A describe those stands where the natural fire return interval is less than 50-years).

Fuels treatments not meeting all of the above three conditions should rely on existing MRs. Attachment 4 displays general maps of the communities to which these MRs apply. Use these maps, the August 2001 Federal Register, and the Administrative Units fire regime layer or local information to determine which mapped communities are covered by these MR amendments. For California, the map is intended to show the boundary of communities named within the Federal Register as well as related areas where housing density exceeds 1 house per 5 acres ("urban" and "interface" areas). Local adjustments to

this boundary to reflect recent community growth are appropriate, if they conform to the housing density indicated above. Application of the enclosed MRs is then limited to a 1 ½ mile radius from the community boundary. The mapped 1 ½ mile radius surrounding the communities is an approximation of the area to which the MRs apply, and the field unit should determine the 1 ½ mile delineation of this buffer on the ground. The Oregon and Washington maps include named communities as well as more rural areas, with the 1 mile buffer included in the mapped areas. These MR amendments apply to communities-at-risk within the yellow and red shaded areas on the WA map, and the pink-shaded areas on the OR map.

Taxa specialists used these maps along with known site and survey information to develop the enclosed amendments. The recommendations presented in the amendments may allow for some increased risk to the continued persistence of some S&M sites, but due to the limited scale of the applicability of these MRs, the specialists concluded that implementation of these recommendations should provide for a reasonable assurance of continued species persistence.

Amendments - The enclosed documents do not stand alone, but are to be used as "amendments" to existing Management Recommendations (MRs), added at the section "Management Within Habitat Areas". Where there are no existing MRs, the attached documents constitute additional information for use in determining how to manage known sites. This additional information will be incorporated into MR documents as they are revised or developed in the future.

Additional Management Flexibility Intended – The additional flexibility provided in these amendments is authorized by the S&M S&G that specifies that for Management Recommendations "in high fire frequency areas such as east of the Cascades or in the Klamath provinces, specific consideration should be given to the acceptability of the use of prescribed fire in known sites to reduce the risk of future large-scale or high intensity fire, even if it entails some risk to individual site occupancy" (S&M S&Gs pg. 20). The S&M ROD highlights the need to integrate S&M requirements with National Fire Plan priorities, and references this S&G as one tool to accomplish this (S&M ROD pg. 12).

For fuels management treatments within 1 to 1 ½ miles around at-risk communities, the enclosed amendments are intended to provide more options or flexibility in and around S&M known sites. In some cases, these MR amendments allow for substantially increased risk to S&M site persistence within 300 feet of structures and developments. Where the 300 feet parameter is addressed in these amendments, this refers specifically to those S&M sites located within the critical first 300 feet of structures and developments.

The use of these amendments is optional. Sites should be managed according to either these MR amendments or the existing MRs.

Species Addressed –14 species are included here:

Mollusks: *Helminthoglypta hertleini, Helminthoglypta talmadgei, Monadenia chaceana, Monadenia fidelis minor, Monadenia troglodytes troglodytes, Monadenia troglodytes wintu, Prophysaon coeruleum, Vespericola shasta, Megomphix hemphilli, Oreohelix* n. species, and *Pristiloma arcticum crateris*

Amphibians: Shasta salamander (*Hydromantes shastae)*, Siskiyou Mt. Salamander (*Plethodon stormi)*

Red Tree Vole , *Arborimus longicaudus*

Glossary – Terminology in the MR amendments conforms to the S&M Glossary, Exhibit C of the S&M ROD, January 2001. Specifically that glossary includes references to two uses of the term "site":

> Site (as used in occupied site) – The location where a specimen or population of the target species (taxonomic entity) was located, observed, or presumed to exist (occasionally used as a local option to pre-disturbance surveys for certain vertebrates) based on indicators described in the Survey Protocol or Management Recommendation. Also, the polygon described by connecting nearby or functionally contiguous detections at the same location.
>
> Site (as used in manage known sites) – The occupied site plus any buffer needed to maintain the habitat parameters described in the Management Recommendation.

To distinguish between these two definitions in the amendments below, we attempted to precede "site" with the adjectives "occupied" or "managed ", to distinguish whether the phrase applies only to the location of the species, or to the location and an applicable buffer, respectively.

Recording sites in ISMS (Interagency Species Management System) – All species sites within fuels treatment areas will be recorded in ISMS as currently required. An additional entry will be made in ISMS in two new fields, to denote whether low risk or high risk portions of the enclosed MRs were applied. In these new fields, enter the risk category applicable to each site, and the decision date, once the location of specific treatments is known (e.g. most logically when the NEPA decision is signed). Code the entry as follows:

> Low risk: These refer to treatments identified in the MR amendments as acceptable, (low or low-moderate risk), applicable anywhere within the 1 to 1 1/2 mile radius around the community. Low and low/moderate risk treatments result in a low to low/moderate risk to the continued persistence of the S&M site.
>
> High risk: These refer to treatments identified in the MR amendments as acceptable, (high or moderate-high risk), and are applicable only to limited areas,

such as sites within the critical 300' zone and sites managed under percentage or parameter-driven exceptions to the low risk treatments. These type of treatments result in a high or moderate-high risk to the continued persistence of the individual S&M site. Although an increased risk to the individual site may occur, these activities would still result in a reasonable assurance of continued species persistence.

Only enter the above fields where an S&M site is managed according to these fire MR amendments.

Monitoring – The following monitoring requirements pertain to the application of these MRs. This monitoring is needed to confirm that expected risk levels are not being significantly exceeded, to confirm expected species site effects, and to provide experience upon which to base the expansion of these or similar MRs to other priority fuels treatment areas. Monitoring sections within the species-specific amendments may suggest parameters to be examined or considered when conducting the following monitoring.

1. Implementation monitoring of these MRs will happen during routine Forest and District staff post-NEPA or post-activity monitoring of completed projects. The results of the application of these MRs, i.e. did the activity comply with the Management Recommendations, will be specifically addressed and documented to project files. In addition to providing specific information about MR application to the local unit, such documentation will be available as needed for items 2 and 3 below.

2. When activities are selected for monitoring as part of the annual range-wide implementation monitoring efforts coordinated by the Interagency Monitoring Program Manager, application of these MRs will be specifically examined and documented on at least a representative sample of species sites within the project area.

3. The Interagency Survey and Manage Program Manager with the help of taxa leads will monitor the frequency of application of these MRs as evidenced by entries in the ISMS system as described in the section above, and implement a systematic sampling and field examination as soon as a significant number of sites of one species is affected. Since specific monitoring parameters differ by species depending upon rarity, habitat, available knowledge, and number of sites affected, such parameters are not specified here but will be designed as needed. Such monitoring will include examination of documentation described in steps 1 and 2 above, will address any emphasis areas specified in the species-specific amendments below, and may require affected administrative units to make specific field visits using project resources.

Species-Specific MR Amendments

Mollusks

Helminthoglypta hertleini, Helminthoglypta talmadgei, Monadenia chaceana, Monadenia fidelis minor, Monadenia troglodytes troglodytes, Monadenia troglodytes wintu, Prophysaon coeruleum, Vespericola shasta, Megomphix hemphilli, Oreohelix n. species, and *Pristiloma arcticum crateris*

Overview

Management considerations for these species will normally include maintaining the temperature and moisture regime of the microsite habitats in which these gastropods occur (i.e., ground level microclimates and cover components). This requires that a sufficient amount of overstory crown cover and understory vegetation be retained to shade the ground, provide humidity through evapotranspiration, and impede air movement that would tend to displace the cool moist air. It also requires maintenance of large and small woody debris, undisturbed rock refugia, a thick layer of litter and duff on the forest floor and uncompacted soil through which the animals can burrow for aestivation or hibernation. These components provide cool moist places in which the animals spend the days, hide from predators, deposit their eggs, and find food. Management should also provide for future input of habitat elements to occupied sites, such as large woody debris and food resources such as leaf litter, fungi and green vegetation. An ecosystem management approach in which a mix of all habitat elements important to these and other sensitive species in the project area are maintained is likely to be the most reasonable and effective means of providing for long-term multi-species persistence.

Information specific to selected mollusk species

***Megomphix hemphilli,* the Oregon Megomphix**

The existing Management Recommendations for this species already include many of the provisions found within this amendment. Application of those provisions can be done anywhere within the range of this species. New language found in this amendment pertaining to "locally common" criteria and the use of specific fuels reduction activities is intended to apply only to fuels reduction projects covered by this amendment.

***Oreohelix* new species, The Chelan Mountainsnail,**

The Chelan Mountainsnail, *Oreohelix new sp*., is a little known and apparently quite rare snail with a very limited range in northeastern Chelan County, Washington. It is found in dry forest habitats with grass and shrub understory and relatively thick layers of litter and

duff. Specifically, habitat for this species is open Douglas-fir/Ponderosa pine forest with grassy understory and scattered shrubs. Grasses, sedges, shrubs litter and duff are important habitat components within these sites, and as with many other *Oreohelix* species rocks are also used. The species is rare and, although adapted to a high frequency fire regime, it is susceptible to fire within its habitat.

Pristiloma arcticum crateris

Pristiloma arcticum crateris is known from the Oregon Cascades in damp to wet habitats (i.e., wet meadows, springs, seeps, riparian areas and the edges of wetlands or merely areas of perennially moist ground vegetation). Large and small woody debris, grasses, sedges, forbs, and shrubs are important habitat components within these sites. The subspecies is rare within Oregon. Areas of habitat are generally small and occur at relatively high elevations. Due to perennially moist habitat conditions for this species, historically occurring fires likely were of low intensity.

Definitions

For the remainder of this document, the following terms and definitions are used:

Occupied Site: The location where a specimen or population of the target species is located, observed, or presumed to exist based on indicators described in the Survey Protocol or Management Recommendations. Also, the polygon described by connecting nearby or functionally contiguous detections as the same site. Detections noted within 30 feet or less of one another should be considered as one occupied site, defined by a polygon connecting those detections.

Managed Site: The occupied site plus any buffer needed to maintain the environmental and habitat parameters within the occupied site, as described in the Management Recommendations for that species.

The following definitions apply to Option B.

Large-scale habitat areas: An area of contiguous suitable habitat containing more than one occupied site, in which habitat elements and population centers are managed to maintain persistence of a local mollusk population. The large-scale habitat area may include all of a project area, extend outside of a project area, or be a subset of a project area, but must be at least 20 acres in size. This size is an estimated minimum required for a long-term functional population (Hohenlohe, 2002).

Population centers: Areas within the large-scale habitat area, containing concentrations of suitable habitat elements or individual and/or small populations of mollusks. Population centers are delineated around occupied sites and some surrounding habitat or they are delineated around habitat components found in high densities. Population centers are at least 60 feet in diameter. Within a large-scale habitat area, at least 20% of the total area is managed as population centers. The

population centers contain 50% or more of the occupied sites within the Habitat Area.

Management within Habitat Areas

Acceptable treatments (low to high risk) within the critical first 300 feet surrounding developments and structures associated with a community:

- For *Helminthoglypta talmadgei,* all necessary fuels treatments may occur; no specific known site management is needed.
- For the remaining species, every attempt should be made to maintain the site and route the fuel break around the managed site or sites. However, in the rare event that this would not be possible without significantly hampering the fuels management objectives, the loss of one or more sites might be inevitable. In this case all necessary fuels treatments can occur. It is the opinion of the Mollusk Taxa Team that the loss of an occasional site would not jeopardize the persistence of these species considering the following: the number of sites within the 300' zone is expected to be low; the situation where no alternative to avoid rare sites exists would occur rarely; and the species would normally be expected to be found in other sites within similar suitable habitat in or near the treatment area. Therefore, while one or more sites might be lost, the population is likely to persist in the local area. Sites subject to fuels treatments in this situation should be recorded as "high risk" in ISMS.

Acceptable (low-moderate risk) treatments in the 1 to 1½ mile fuel treatment zone (all species):

There are two "Options" presented below (Option A and Option B). For all but two species covered in this MR amendment, you may use either Option. For *Oreohelix* n. species, and *Pristiloma arcticum crateris* only Option A may be applied. Option B allows for more flexibility in site management, when the species in question is known to be "locally common" within the project area (see definition under Option B below).

Recommendations listed below, including specific percentages, distances, etc., are based on the best professional judgment and information available to the taxa team. Information specific to these species is limited, but Hohenlohe (2002) provides background information, based on several ecologically similar mollusk species, for the underlying concepts, spatial scales, and thresholds used below.

Option A: For use with all species listed in this MR amendment

Delineating occupied and managed sites

Occupied sites: Where the occupied site is represented by a polygon connecting detections within close proximity of each other, include within the polygon all trees and shrubs, including big-leaf maple trees (oldest preferred) and other hardwoods, which

could support or provide habitat elements used by the species at the site, including leaves, leaf mold, lichens, fungi, fruits and future logs. In the interest of ecosystem management, a diversity of tree species should be included in this area but emphasis should be placed on the tree species that the mollusk species is observed to be using in the local area. Mixes found at the sites supporting the greatest populations of the mollusks should determine the desired mix of hardwoods and conifers. For *Megomphix hemphilli* favor hardwoods, especially big-leaf maple. Refugia and other microhabitats should be included within the occupied site by incorporating dead and downed woody debris or rock outcrops.

Managed sites: The managed site should incorporate an area that adequately protects the environmental conditions of important habitat features expected to be utilized by the species at that occupied site during its normal lifetime. The managed site should normally be bounded by natural features (i.e., topographic breaks, vegetation type ecotones, etc.). Site features such as slope position, aspect, cover, moisture, surrounding stand condition, etc., should be used in determining the size of the area needed. In situations where the occupied site is surrounded by forest with canopy closure of approximately 70% or greater, the size of an individual managed site may be roughly equivalent to a circle with a radius of approximately one site potential tree height (this likely ranges from 1.5-3 acres). In situations where the managed site is surrounded by more open conditions, a larger managed site is recommended, in order to maintain habitat conditions at the occupied site. Dryer, more open stands (<70% canopy cover), edge locations, southerly or westerly aspects, upper slopes, etc., indicate the need for larger areas.

The managed site need not be circular in shape, but can and should be modified to encompass and maintain environmental conditions of those habitat features and stand components needed to provide the life history requirements of the species. Where possible, attempt to maintain habitat contiguity by extending boundaries of managed sites to meet other reserve areas such as Riparian Reserves or untreated areas to minimize fragmentation of populations.

Activity specific recommendations

Limited activities that temporarily degrade the habitat, but which are necessary to reduce fuels around communities at risk may occur within the managed site. The following recommendations should provide for an acceptable risk (low-moderate) to site persistence.

- Broadcast burning: Broadcast burning for fuels reduction may occur on 80% of the managed site, provided that no burning occurs within 30' of the occupied site. The areas remaining unburned do not need to be delineated prior to burning, but the overall result of the treatments should meet the requirements above. Light underburning treatments are preferred, so that important habitat elements such as down wood are not completely consumed, and so that some individuals in refugia outside of the occupied site may be able to survive the fire. It is recommended that burning activities be conducted during times when mollusks are not active or present on the surface. Late summer or early fall burning is preferred.

- Piling and Pile burning: Piles of material resulting from mechanical treatments and from hand piling should be kept at least 50 feet from occupied sites if left unburned and out of any areas within the managed site which have been left untreated. Piles of chips should not be greater than 1 foot deep. Burning of piled material is acceptable if piles are not located within 80 feet of the occupied site, and no damage to the occupied site would occur from scorching and heat. Hand piling is preferred to machine piling, and piles should be completely covered and burned in the same season, if possible, or left unburned to prevent mollusks from being attracted to the piles and killed when the pile is burned. For *Oreohelix* n. species hand piles may be placed in occupied sites if the piles are not to be burned.

- Hand and Dozer Lines: Line construction should be at least 30' away from occupied sites.

- Foam: The use of foam or fire retardants for hazardous fuels treatments should not occur within a 30' radius around occupied sites. Due to the unknown effects of the chemicals contained in these materials, the use of foam within any portion of a managed site is not recommended except in emergency situations. It should not be used where it could be blown onto or otherwise affect the occupied site.

- Thinning: Thinning activities that result in crown cover of approximately 40-60% (≥60% for *Prophysaon coeruleum* in WA; 40-50% for *Megomphix hemphilli*) averaged over the managed site are acceptable. This level of average shading could be achieved by combining open areas (such as roads, skid trails, and other clearings) with denser areas. More shading on southern and western sides of the occupied site would be beneficial for moderating changes in temperature at the site. Thinning should not occur within the occupied site and a 30 foot radius surrounding the site. Trees adjacent to this no harvest buffer that must be cut should be directionally felled away from that site unless the intent is to leave them as additional woody debris.

  Falling trees within the occupied site and/or 30 feet surrounding the site to provide logs in stands where insufficient numbers occur may be done, but is not recommended unless the resulting canopy cover will provide sufficient shade to maintain cool, moist conditions. For *Megomphix hemphilli*, conifers may be converted to snags or felled when they seem to be seriously competing with a big-leaf maple, if the remaining trees will continue to provide most of the shading of the site from direct sunlight that existed before this action.

- Pruning: Maintain microclimatic conditions at the occupied site and avoid mechanical injury. Slash from pruning should be hand piled as directed above.

- Crushing and Chopping, Grinding, Mowing Raking, Chipping: Activities such as crushing, chopping, grinding, mowing, raking and chipping may occur on 80% of

the managed site, provided that none of these activities occur within 30' of the occupied site. Attempts should be made to focus treatments on areas lacking habitat elements that are in limited amounts in the managed buffer, such as snags, large down wood and hardwoods, in order to maintain post treatment habitat quality of those elements.

- Slash disposal: Slash resulting from thinning or other activities should not be dragged through occupied sites and a 30' buffer surrounding them, and should be disposed of in such a way that does not impact important habitat elements left in the remainder of the managed site, such as large down logs or hardwood trees or shrubs.

- Soil compaction from heavy equipment operation should be limited to 10-15% of the managed site and should not occur within 30 feet of occupied sites. Motor vehicles and heavy equipment should not be operated within 30 feet of occupied sites and spills of petroleum products or other potentially toxic substances in the managed site should be avoided. Refueling should take place outside of the managed site.

- ***Note:*** Care should be taken to maintain or enhance the naturally occurring diversity of plant species. This will increase the range of hosts for a variety of species of fungi and make other food substrates available throughout the season. It will also provide assurance that specific plant species, if found to be critical in the life cycle of these mollusk species, are not inadvertently lost. As yet we know too little about the needs of these species to identify an optimum mix of tree species, but it appears that mixed stands of conifer and hardwoods provide the best habitat. Certainly, maintaining a mix such as occurs in natural late-successional stands, would provide a more diverse and complete set of conditions for multiple species and a more fully functioning ecosystem.

- ***Note:*** For *Pristiloma arcticum crateris,* avoid any activities that would lower the water table long term, thus reducing soil moisture below that required by this species, or potentially altering vegetative communities. This species depends on the microhabitat provided by riparian vegetation along the margins of seeps, springs, and other wet areas; any activity that alters the distribution or species composition of this riparian vegetation zone or results in loss of riparian vegetation may threaten the persistence of this species at the site. Use of water for emergency fire fighting is not considered a long-term effect.

Option B: Limited for use with the following species only:
Helminthoglypta hertleini, Helminthoglypta talmadgei, Monadenia chaceana, Monadenia fidelis minor, Monadenia troglodytes troglodytes, Monadenia troglodytes wintu, Prophysaon coeruleum, Vespericola shasta, Megomphix hemphilli.

Individual mollusks are mobile and may move some distance from the location where they were discovered. Additional individuals may also be present in nearby areas and remain undetected and unprotected. While management of small areas around individual sites may provide a reasonable assurance of persistence for a few individuals, a management approach that addresses the management of a larger-scale area where occupancy of a species has been confirmed in multiple locations may be more effective for population survival. While a large-scale management approach may cause possible loss of some individuals, all individuals are unlikely to be critical to the viability of that population when the species is considered locally common, as described below. Managing large areas of suitable habitat where multiple locations for a species have been documented, rather than small areas around individual sites may result in a smaller but viable population in the local area without risk to the regional species distribution. There appears to be enough information about habitat associations that general management measures, as specified in the following, may be used to conserve the local population of the species.

This option allows more flexibility for implementing management activities and allows some individual known sites to be lost or degraded, especially if they occur in locations that must be treated to reduce fuels and protect communities. However, this approach provides a reasonable assurance of continued species persistence within the treatment area.

Considerations on applicability of Option B: "Locally common" criteria

Most of these species are not all well distributed in all or a portion of their ranges. All of these species may, however, be considered "locally common" in some individual treatment areas. When the same species is found repeatedly in a local area, it suggests that the species may be present throughout the intervening area where suitable habitat occurs. A more flexible approach to management can then be applied to this larger area of suitable habitat to manage the population there. Under these circumstances, it may be possible to manage a population at a local scale, while accepting some risk to individual site occupancy. **In order to use the more flexible management strategy, Option B, during fuels treatment activities, the "locally common" criteria listed below must be met;** otherwise management of the sites should follow the existing MRs or Option A.

The following **"locally common"** criteria should be based on the results of protocol survey visits to individual project areas, incidental discovery of sites, and on historic data.

1. There should be a ratio of at least one site per 10 acres of suitable habitat in the fuels treatment area. This threshold is equivalent to one site per hour of search time under the terrestrial mollusk survey protocol, and represents a natural break in survey data for medium- to large-sized terrestrial mollusks in this region. In cases where sites are common in a portion of the treatment area but not present in another portion, then the treatment area can be subdivided and separate portions managed differently. The minimum size after a

subdivision of a treatment area should be 20 acres of suitable habitat and the number of known sites must be two or more. The intent of these criteria is to display evidence that the species occupies several sites within the area being considered. If suitable habitat occurs in patches less than 20 acres in size, Option A must be used for species management.

2. The species is known to occur in other locations in the same sixth field watershed and/or adjacent sixth field watershed.

Identifying large-scale habitat areas

Multiple occupied sites can be managed together as a single population within a large-scale habitat area. The large-scale habitat area is the area within a polygon encompassing all of the occupied sites and the contiguous suitable habitat around and between them. **See Figure 1.** This strategy is based on the high potential that the patch of contiguous suitable habitat around and between the occupied sites is also likely occupied by the species. Within the contiguous suitable habitat, there is likely to be an identifiable concentration of favorable habitat features and conditions that are similar to where occupied sites have been located. These concentrations of habitat features can reasonably be expected to function as occupied habitat for the species, even though no species detections have been made there. If concentrations of habitat features and most of the occupied sites are protected from disturbance, some risk to other individual occupied sites may be acceptable, while still maintaining a reasonable expectation of persistence of the species at the population level within the treatment area.

In project areas that do not have an even distribution of suitable habitat, where occupied sites occur in locally clustered areas of favorable habitat within a project area, or where suitable habitat occurs only in discrete portions of a treatment area, the extent of the suitable habitat can be designated as the boundary of the large-scale habitat area. For project treatment areas that have an even distribution of suitable habitat, the entire project area can be designated as one large-scale habitat area. The large-scale habitat area may also include suitable habitat extending outside of the proposed treatment area, if it is contiguous with the occupied suitable habitat within it. This strategy could also be considered if there are multiple, small project areas that are close together in a continuous area of potential habitat, and there is a possibility of managing them and the intervening land as a single multi-site large-scale habitat area.

Suitable habitat can be considered contiguous if it is connected by corridors of habitat wider than one site-potential tree height. Corridors of this width or wider are likely to represent opportunities for active dispersal of mollusks that can maintain connections among populations in larger blocks of habitat (Baur and Baur, 1993). If large blocks of suitable habitat are connected by narrow corridors less than one site-potential tree height, these blocks should be managed separately, either as individual large-scale habitat areas (if they meet the requirements for these), or under Option A or existing management recommendations. If an area of isolated suitable habitat within the treatments area has no species detections following protocol surveys, management for the species in that area is not necessary.

Where the species is considered locally common within and adjacent to the treatment area, all occupied sites should be included within the large-scale habitat area, as well as any identifiable concentrations of habitat features within contiguous suitable habitat. There should be enough distance between these occupied sites or habitat features and the large-scale habitat area boundary that most of the original shading there would be conserved if management actions were to occur along the large-scale habitat area boundary.

Population centers

Within the large-scale habitat area, population centers should cover at least 20% of the large-scale habitat area. Population centers are areas that are located around occupied sites and around concentrations of habitat features similar to those found where the species occurs in high densities. The intended function of these undisturbed areas is to maintain environmental conditions in areas of stable, high-quality habitat for aestivation, breeding, hibernation and foraging. These population centers will act as sources of individuals for future recolonization of disturbed habitat and should incorporate all of the necessary habitat components needed during the species life cycle. In order for these population centers to best function for recolonization, they should be distributed throughout the large-scale habitat area and reflect the original distribution of occupied sites and habitat features. The size of each of these population centers depends upon the local site conditions, but should contain essential habitat components for the species and be at least 60 feet in diameter or large enough to maintain environmental conditions at the site. Population centers need not be circular in configuration. There should be enough distance between population centers and the large-scale habitat area boundary that most of the original shading there would be conserved if management actions were to occur along the large-scale habitat areas boundary.

At least half of the occupied sites in the managed habitat area must be within population centers. The remainder of the occupied sites may fall outside these population centers (such as within the 300' zone) and be subject to fuels treatments as described below.

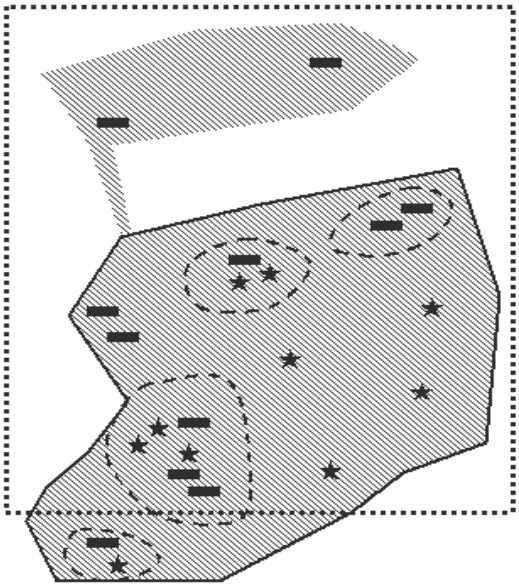

Figure 1: Schematic diagram of implementation of Option B for locally common mollusk species, not drawn to scale. Dotted line=boundary of treatment area; Cross-hatching=suitable habitat; Solid line=boundary of large-scale habitat area; Stars=species locations; Solid rectangles=habitat features; Dashed lines=population centers. The block of suitable habitat at the top is not included in the large-scale habitat area because no species locations were found there and because it is connected by only a narrow corridor to the remaining suitable habitat. Note that the large-scale habitat area can extend outside the treatment area, not all species locations are included in population centers, and not all population centers include species locations. See the text for details.

Activity specific recommendations

Limited activities that temporarily degrade the habitat, but which are necessary for fuels reduction activities, may be used within the large-scale habitat area, outside of population centers. The following guidelines should be followed when conducting fuels reduction activities:

- Broadcast burning: Broadcast burning for fuels reduction may occur, outside of areas managed as population centers. Light underburning treatments that do not completely cover the remainder of the habitat area are preferred, so that important habitat elements such as down wood are not completely consumed, and so that some individuals in refugia outside of population centers may be able to survive the fire. It is recommended that burning activities be conducted during times when mollusks are generally not active or present on the surface. Late summer or early fall burning is preferred.

- Piling and Pile burning: Piles of material resulting from mechanical treatments should be kept at least 20 feet from population centers if left unburned and out of any areas within the large-scale habitat area that have been left untreated. Piles of chips should not be greater than 1 foot deep. Burning of piled material is acceptable if piles are not located within 50 feet of population centers, to ensure that no damage to the population center would occur from scorching and heat. Hand piling is preferred to machine piling and piles should be completely covered and burned in the same season, if possible, or left unburned to prevent mollusks from being attracted to the piles and killed when the pile is burned.

- Hand and Dozer Lines: Line construction should not occur within population centers or other portions of the large-scale habitat area that have been left untreated.

- Foam: The use of foam or fire retardants for hazardous fuels treatments should not occur within population centers. Due to the unknown effects of the chemicals contained in these materials, the use of foam within any portion of the large-scale habitat area is not recommended except in emergency situations. However, if use is unavoidable, foam should not be used where it could be blown onto or otherwise affect population centers.

- Thinning: Thinning activities that result in crown cover of approximately 40-60% ($\geq$60% for *Prophysaon coeruleum* in WA; 40-50% for *Megomphix hemphilli*) averaged over the large-scale habitat area are acceptable. This level of average shading could be achieved by combining open areas (such as roads, skid trails, and other clearings) with denser areas. More shading on southern and western sides of the population centers would be beneficial for moderating changes in temperature at the site. No harvest or yarding should occur within the population centers. Trees adjacent to this no harvest buffer that must be cut should be directionally felled away from that site unless the intent is to leave them as additional woody debris.

- Pruning: Maintain microclimatic conditions in the population centers and avoid mechanical injury. Slash from pruning should be hand piled as directed above.

- Crushing and Chopping, Grinding, Mowing Raking, Chipping: Activities such as crushing, chopping, grinding, mowing, raking and chipping may occur outside areas managed as population centers. When possible, other untreated areas should be left throughout the habitat area to minimize the time needed for the area to regain full habitat functionality. Attempts should be made to focus treatments on areas lacking habitat elements that are in limited amounts in the managed buffer, such as snags, large down wood and hardwoods, in order to maintain post treatment habitat quality of those elements.

- Slash disposal: Slash resulting from thinning or other activities should not be dragged through population centers, and should be disposed of in such a way that

does not impact important habitat elements left in the remainder of the large-scale habitat area, such as large down logs or hardwood trees or shrubs.

- Soil compaction from heavy equipment operation should be limited to 10-15% of the large-scale habitat area and should not occur within population centers. Motor vehicles and heavy equipment should not be within population centers and spills of petroleum products or other potentially toxic substances should be avoided in the large-scale habitat area. Refueling should take place outside of the large-scale habitat area.

- ***Note:*** Care should be taken to maintain or enhance the naturally occurring diversity of plant species throughout the large-scale habitat area during fuels treatments. This will increase the range of hosts for a variety of species of fungi and make other food substrates available throughout the season. It will also provide assurance that specific plant species, if found to be critical in the life cycle of these mollusk species, are not inadvertently lost. As yet we know too little about the needs of these species to identify an optimum mix of tree species, but it appears that mixed stands of conifer and hardwoods provide the best habitat. Certainly, maintaining a mix such as occurs in natural late-successional stands, would provide a more diverse and complete set of conditions for multiple species and a more fully functioning ecosystem.

Research, Inventory, and Monitoring Needs

Research Needs

Although it is understood that under- or broadcast burning is a necessary tool to reduce fuel loading around communities-at-risk, regular prescribed burning during the wet seasons in spring and fall does not simulate natural fire regimes for organisms that live on and/or in the forest floor and/or litter, duff and woody debris. Mollusks and many other such organisms are active or reproducing during these wet seasons, while they may be dormant or in aestivation during the dry seasons during or near which times that natural wildfire would more likely occur. Research is needed to determine or confirm the critical periods within the life cycles of these species and essential habitat features for survival and reproduction.

Questions to be answered include, when and where do the various species aestivate, hibernate, and deposit their eggs, and what environmental features are needed for successful completion of these essential life functions. Also, what means of transport is used by the various species to colonize an area. Specific to fuel treatments around communities-at-risk, what was the effect of those treatments upon the species in question, and do different species react/persist differently as a result of these treatments?

Monitoring Needs

Many questions remain regarding the effects of fuels treatment activities on these mollusks and their habitats, and a monitoring program is needed to answer questions currently under debate. Priority for monitoring should target the rarest species to ensure their persistence, but monitoring of the more common species, might provide knowledge of why these species are less sensitive to these treatments, and suggest adaptive management that will lessen impacts on the rarer species.

Monitoring, as described in the front of this attachment, should therefore include: 1) survival rates of the various species during burns at different intensities and during different seasons; 2) the persistence of essential habitat features during these burns; 3) rates of recolonization of an area by the different species, and across different distances and terrains; and 4) persistence rates of the species at sites treated under any or all of the activities listed above?

Literature Cited

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Hohenlohe, P.A. 2002. A conservation strategy for forest-associated mollusk species. Background report, USDI Bureau of Land Management/USDA Forest Service, Corvallis, OR.

Amphibians

Siskiyou Mountains Salamander (*Plethodon stormi*)

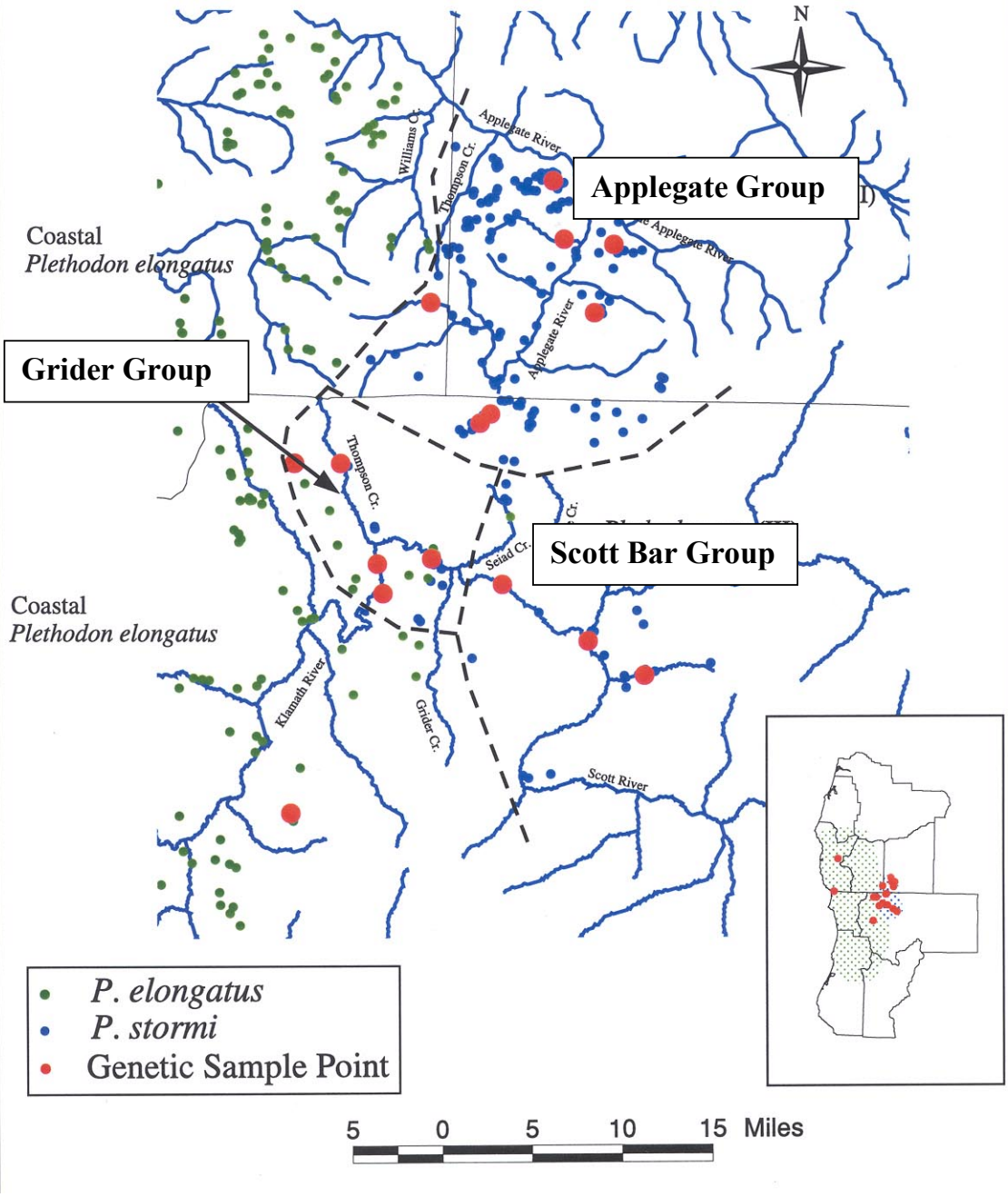
Managing for Site Persistence in Fuel Treatment Areas Around At-Risk Communities

An overarching goal of the Survey and Manage provision is to maintain species persistence range wide. Fuels treatment activities near at-risk communities were evaluated relative to rangewide species persistence in addition to site-level persistence.

For the Siskiyou Mountains salamander, known sites rangewide were evaluated relative to our knowledge of distinct populations (Pfrender and Titus, 2001). Persistence of each of three distinct populations on federal lands was evaluated to address potential activities that might not pose a risk to site persistence and also to potential sites where activities with a high risk to site-level persistence would not compromise population-level persistence. Also taken into consideration during this persistence evaluation was the knowledge that current known sites identified within the ISMS database for this taxon usually are point localities of individual detections**. For the purposes of these management recommendations, the definition of a known site includes all suitable habitat contiguous with the occupied site** as previously defined in the survey protocol for the Siskiyou Mountains salamander, unless surveys have deemed otherwise (as per the Survey Protocol dated March 1999). If the full extent of the occupied site has been delineated through extensive surveys, apply the following recommendations to that delineated area only. In particular, our knowledge of contiguous suitable habitat blocks within the northern half of this species' range suggests that sites within the radius of at-risk community fuels management may often extend a fair distance beyond those areas of proposed treatment. Management for fuels treatment may often affect only a portion of the site. A higher risk to a portion of a site may not result in loss of that site.

Three distinct genetic lineages of salamanders have been determined within the range of this species (Pfrender and Titus, 2001). The groups are identified as the Applegate Group, the largest group with the most extensive range and number of sites, the Grider group, and the Scott Bar group (Figure 1). Management recommendations for fuels management treatments near at-risk communities differ between the Applegate Group, and the Grider and Scott Bar Groups.

Figure 1: Map of the three genetic groups within Plethodon stormi.



Management within Habitat Areas

Acceptable (low risk) treatments in the 1 to 1½ mile fuel treatment zone (including the critical first 300 feet surrounding developments and structures associated with a community) are separated out by the three distinct populations:

Grider/Scott Bar Groups - Handwork such as removing ladder fuels, manual understory thinning, hand piling debris and underburning with seasonal restrictions that limit activities to times when animals are **not** active near the surface (from late spring through early fall (in fall, before 1.5 inches of rain falls), or when environmental conditions are "out of protocol" (e.g., in winter, after freezing), can occur in known sites, but no ground disturbing (displacement, compaction, or other types of ground disturbance, either by heavy machinery or by yarding of logs or similar activities) or canopy reducing activities should occur in these two areas.

Applegate Group - The general approach for addressing fuels management at known sites within at-risk communities is a 3-pronged, hierarchical approach involving maintenance of canopy, limited ground disturbance, and seasonal restrictions. This approach allows flexibility for management while maintaining a low-risk to the species persistence at the site level. All applicable mitigation criteria should be used. Activity-specific mitigations are discussed below.

1) To retain suitable microclimatic conditions for salamander survival and reproduction, maintain >70% canopy closure on at least 80% of the known site and maintain no less than 40% canopy closure on the remaining 20% of the known site. The percent of habitat affected may be determined in either of two ways:

    a) 20% of the known site and contiguous suitable habitat within the unit boundary or project area, or;
    b) 20% of the full extent of the known site and contiguous suitable habitat, including consideration of contiguous habitat that extends beyond the project boundary.

    Note: The 70% canopy closure guideline stems from research results of salamander occupancies with forest condition and should be measured using a concave spherical densiometer (Ollivier et.al. 2000).

2) To retain suitable microclimatic and substrate conditions for salamander survival and reproduction, avoid ground disturbing activities on 80% of the known site. Activities that displace, compact, or otherwise disturb the substrate either by heavy machinery or by yarding of logs or similar activities are only allowed on no more than 20% of the known site.

    Note: The "20%-rule" relative to ground disturbance is based on expert opinion as well as policy for maximum allowable levels of ground disturbance

in the R-6 Forest Service Manual Supplement 2520.3 and Bureau of Land Medford District Soils Management Guidelines (George Arnold pers. comm.).

3) To reduce direct impacts to animals, it is recommended that habitat or ground disturbing activities and burning occur when salamanders are **not** surface-active, which is from late spring through early fall (in fall, before 1.5 inches of rain falls), or when environmental conditions are "out of protocol" (e.g., in winter, after freezing temperatures). If needed, surface activity can be determined by conducting surveys at known sites or where the project activity is proposed.

For the Applegate Group, canopy reduction below 70% and total ground disturbance is cumulative across all treatments, activities, and seasons of project implementation. In other words, the impacts of any combination of activities that would reduce canopy or disturb the substrate need to be 20% or less of the known site.

Activity-Specific Recommendations

To maintain a low-risk to site persistence, the following measures are recommended.

- *Broadcast/Understory Burning* – This activity may occur within the entire known site. For reduced effects to microhabitat elements within known sites, utilize "cool" burns with short flame lengths (generally less than 2-4 feet), maintaining at least 50% of the duff layer and all possible large woody-debris post-burn. If possible, leave areas of suitable habitat within the known site unburned.

- *Hand Piling*- Avoid hand piling to the extent that the piles would cover more than 20% of a known site. Machine piling is not recommended at a known site; however, if necessary, limit ground disturbance to 20% at known sites.

- *Pile burning*- Within known sites attempt to burn piles during mid-winter during freezing events, late spring, or early fall, when animals are not surface active. In coastal areas where winter freezing is rare; attempt to burn piles outside of conditions when animals are surface active (late spring to early fall).

- *Pruning*- Within known sites there are no mitigations recommended for this activity unless pruning is done using heavy machinery. If so, the mitigations listed above apply.

- *Understory Thinning* - Within known sites canopy closure mitigations do not apply to manual thinning of suppressed understory trees and ladder fuels. Ground-disturbance mitigations (20% of a known site) apply to all activities associated with mechanized understory thinning (yarding, temporary road construction, landings, etc).

- *Chipping* - Within known sites there are no mitigations recommended for this activity unless the machine is hauled into a known site by heavy equipment. If so,

then the ground disturbance mitigations listed above (ground disturbance limited to less than 20% of the known site) apply.

- *Raking* - Within known sites there are no mitigations recommended for this activity.

- *Hand Firelines* - Hand firelines at known sites should be limited to 20% of the known site.

Acceptable treatments within the 1-1 ½ mile fuels treatment zone (including the critical first 300 feet surrounding developments and structures associated with a community) where some risk to continued site persistence is permissible:

The primary goal of the Survey and Manage provision is to maintain species persistence range wide. Fuels treatment activities near at-risk communities have been evaluated relative to rangewide species persistence in addition to site-level persistence. Identification of sites was conducted where high risk treatments, (high risk treatments are those treatments that would not follow the above described recommendations), might be applied that would not compromise rangewide species persistence.

For the Siskiyou Mountains salamander, known sites rangewide were evaluated relative to our knowledge of the three distinct populations (Pfrender and Titus, 2001). Persistence of each of three distinct populations on federal lands was evaluated to address potential sites where activities with a high risk to site-level persistence would not compromise population-level persistence.

- **Grider/Scott Bar Groups** – Because of the rarity of this species in these two areas, there are no sites located within these subpopulations where higher risk fuels reduction treatments can be applied. Follow the recommendations listed above for these subpopulations, or follow the recommendations for this species listed in the 2001 S&M ROD.

- **Applegate Group** –High risk treatments that could result in the loss of a site could be applied to up to 20% of the known sites within any 6th field watershed with 5 or more known sites. However, the amount of suitable habitat (unsurveyed and/or occupied) within those sites treated may not constitute more than 20% of the total suitable habitat (unsurveyed and/or occupied) within that 6th field watershed. A review of the currently known sites, suitable habitat, and the communities-at-risk to which these MR amendments apply indicate that the potential loss of up to 20 percent of the suitable habitat or sites would not pose a significant risk to species persistence. There are relatively few 6th field watersheds that occur within the 1 to 1½ mile fuels treatment zone, in fire regime 1, 2, and 3A areas, that are within condition class 2 and 3, and have 5 or more known sites. Consequently relatively few sites within the range of the species would potentially be impacted. In

addition, no unique genetic material would be lost as research shows that all populations within the Applegate Group are genetically very similar (Pfrender and Titus 2001). Tracking of the sites with high risk treatments would be monitored through the review of the ISMS database, tracking the new fields.

Monitoring, Reporting, and Inventory

Monitoring Requirement

Annual accomplishment reporting in ISMS includes a requirement to fill out all applicable ISMS data fields (e.g., site management status, non-standard conservation action; threat type; and threat description) when impacts to known sites occur. Site impacts and losses are required to be recorded into ISMS database in order to facilitate persistence monitoring.

Literature Cited

Lisa Ollivier, Welsh, H.H., Clayton D. 2001. Habitat Correlates of the Siskiyou Mountains salamander, *Plethodon stormi* (Caudata: Plethodontidae). Report to the California Department of Fish and Game, USDI Bureau of Land Management, Medford District, and USDA Forest Service, Rogue River National Forest.

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Arnold, George. Medford District BLM, Ashland Resource Area. March 27, 2002.

Shasta Salamander (*Hydromantes shastae*)

Managing for Site Persistence in Fuel Treatment Areas Around At-Risk Communities

For the Shasta salamander, known sites rangewide were evaluated for proximity to at-risk communities. There appears to be some limited overlap between known sites and/or suitable habitat (as defined in the survey protocol) and a 1½-mile zone around the communities. The 3-pronged management recommendations provided below allow some management flexibility for achieving fuels reduction objectives while maintaining a high level of assurance of salamander persistence at known sites.

Management Within Habitat Areas

Acceptable (low risk) treatments in the 1 to 1½ mile fuel treatment zone (including the critical first 300 feet surrounding developments and structures associated with a community):

The approximately 40 Shasta salamander records are concentrated in no more than 20 independent habitat patches. This species has a small range and limited habitat within the range. Almost nothing is known about its population biology. Thus, persistence of this species may depend upon management of the known sites and contiguous habitat as high priority sites. Pre-project surveys are required.

The general approach for addressing fuels management at known sites within at-risk communities for the Shasta salamander is a 3-pronged, hierarchical approach involving maintenance of canopy, limited ground disturbance, and seasonal restrictions. **For the purposes of these management recommendations, the definition of a known site includes all contiguous suitable habitat as previously defined in the survey protocol for the Shasta salamander,** unless the occupied area has been determined by surveys (as per the Survey protocol dated March 1999). Activity-specific mitigations are discussed in a separate section that follows the general 3-pronged approach described below.

1) To retain suitable microclimatic conditions for salamander survival and reproduction, maintain >70% canopy closure on at least 85% of the site (i.e., contiguous suitable habitat unless otherwise delineated by surveys) and maintain no less than 40% canopy closure on the remaining 15% of the site. The percent of habitat affected may be determined in either of two ways:
    a) <15% of the contiguous suitable habitat within the unit boundary or project area;
    b) <15% of the full extent of the contiguous suitable habitat, including consideration of contiguous habitat that extends beyond the project boundary.

Note: The 70% canopy closure guideline stems from research results of salamander occupancies with forest condition; the "15%-rule" relative to ground disturbance is based on expert opinion. Canopy closure is naturally variable in and around limestone outcrops. Its role in maintaining suitable microclimatic conditions is not well understood. Topography and aspect may play a proportionally larger role than canopy cover in some habitat patches. The main goal of the recommendation about canopy cover is to avoid reducing canopy cover below 70% where it contributes to cool microclimates.

2) To reduce direct mortality to animals and prevent destruction of habitat, heavy equipment (wheeled or tracked equipment used for crushing, chopping, grinding, mowing, thinning, piling, etc) is not recommended for use at the site. If heavy equipment use is necessary, limit use to <15% of each site (i.e., contiguous suitable habitat, unless site is delineated by surveys).

3) To reduce direct impacts to animals, it is recommended that ground-disturbing activities occur when salamanders are **not** surface-active, from late spring through early fall (in fall, before 1.5 inches of rain falls), or when environmental conditions are "out of protocol" (e.g., in winter, after freezing temperatures). If needed, surface activity can be determined by surveys at known sites.

Canopy reduction below 70% and total ground disturbance is cumulative across all treatments, activities, and seasons of project implementation. In other words, the impacts of any combination of activities that are not "low-risk" need to be 15% or less of the site.

Activity-Specific Recommendations

To maintain a low-risk to site persistence, the following measures are recommended.

- *Broadcast/Understory Burning* – This activity may occur within the entire known site. For reduced effects to microhabitat elements within known sites, utilize "cool" burns with short flame lengths (generally less than 2-4 feet), maintaining at least 50% of the duff layer and all possible large woody-debris post-burn. If possible, leave areas of suitable habitat within the known site unburned.

- *Hand Piling*- Avoid hand piling to the extent that the piles would cover more than 15% of a known site. Machine piling is not recommended at a known site; however, if necessary, limit ground disturbance to 15% at known sites.

- *Pile burning*- Within known sites attempt to burn piles during late spring, or early fall, when animals are not surface active.

- *Pruning*- Within known sites there are no mitigations recommended for this activity unless pruning is done using heavy machinery. If so, the mitigations listed above apply.

- *Understory Thinning* - Within known sites canopy closure mitigations do not apply to manual thinning of suppressed understory trees and ladder fuels. Ground-disturbance mitigations (15% of a known site) apply to all activities associated with mechanized understory thinning (yarding, temporary road construction, landings, etc).

- *Chipping* - Within known sites there are no mitigations recommended for this activity unless the machine is hauled into a known site by heavy equipment. If so, then the ground disturbance mitigations listed above (ground disturbance limited to less than 15% of the known site) apply.

- *Raking* - Within known sites there are no mitigations recommended for this activity.

- *Hand Firelines* - Hand firelines at known sites should be limited to 15% of the known site.

Acceptable treatments within the 1-1 ½ mile fuels treatment zone (including the critical first 300 feet surrounding developments and structures associated with a community) where some risk to continued site persistence is permissible:

An overarching goal of the Survey and Manage provision is to maintain species persistence rangewide. Fuels treatment activities near at-risk communities were evaluated relative to rangewide species persistence in addition to site-level persistence. At this time, due to the limited range, patchy habitat, and nearly complete lack of population biology knowledge, the loss of any known sites or habitat patches could compromise the persistence of this species. Because of the rarity of this species, there are no sites where higher risk fuels reduction treatments should be applied. Follow the recommendations listed above, or follow the recommendations for this species listed in the 2001 S&M ROD.

Monitoring, Reporting, and Inventory

<u>Monitoring Requirement</u>
Annual accomplishment reporting (implementation monitoring of completed projects) includes a requirement to fill out all applicable ISMS data fields (e.g., site management status, non-standard conservation action; threat type; and threat description) when impacts to known sites occur.

RED TREE VOLE

Arborimus longicaudus (Oregon Red Tree Vole – Vertebrate)

Overview

Management of red tree vole sites in accordance with the following guidance assumes that development of Habitat Areas for each active site as described in the Management Recommendation for the Oregon Red Tree Vole, version 2.0, has been completed.

> *Note:* A site that after a complete protocol survey is determined to consist of only confirmed inactive nest trees (an inactive site) does not require the delineation of a Habitat Area, and no Management Recommendations apply.

Management within Habitat Areas

Acceptable treatments within the critical first 300' from structures and developments:

- All necessary fuels treatments may occur, with no known site protection needed.

Acceptable (low risk) treatments in the remaining 1- 1 ½ mile fuel treatment zone include:

The following treatments are considered acceptable/compatible activities within Habitat Areas, and result in a low risk to continued site occupancy.

- Pile and Broadcast Burning: Broadcast and pile burning may occur within the Habitat Area. Within the Habitat Area hand pile & burn, or pull, pile & burn (in jackpot burns) down material away from the bole of any red tree vole nest (confirmed active, assumed active and status underdetermined) trees. Piles should be created and burned to meet the objective of minimizing direct heat and smoke from entering nest tree crowns, including nests that are confirmed active, assumed active or status underdetermined. The number of piles per acre should not place the delineated Habitat Area at a greater risk of loss from naturally or human caused fire ignition. Pile burning should be conducted during a time of year and under conditions when the likelihood of fire escaping into the tree canopy is low.

  Burning should not remove or modify nest trees that contain confirmed active, assumed active and status underdetermined nests; the canopy structure of the stand; or remove any of the dominant, co-dominant, or intermediate (Daniel et al. 1979) crowns within the Habitat Area. Prior to broadcast burning ensure that fuels within the Habitat Area will be at a level that allows for broadcast burning to be accomplished with an average scorch height of $\leq$ 15 feet. A fire behavior program, such as Behave Plus may be used to determine the appropriate weather

conditions for meeting these desired fire effects. If needed within the Habitat Area, first hand pile and burn, or pull, pile and burn (in jackpot burns) down material a sufficient distance to minimize heat and smoke from entering the crown of the nest tree. Piles will then be burned prior to broadcast burning (under burning) to minimize smoke and heat entering the canopy during the broadcast burn.

Both pile burning and broadcast burning should be conducted during a time of year and under conditions when the likelihood of fire escaping into the tree canopy is lowest. Burning prescriptions and flame lengths should meet the objective of minimizing direct heat and smoke from entering nest tree crowns. Because red tree voles are potentially affected by heat and smoke that penetrates the crown, burning should not occur beneath confirmed active, assumed active and status underdetermined nest trees.

- Fire Lines: Fire lines may be constructed through Habitat Areas but should not remove sound green trees that are providing structure to the intermediate, co-dominant or dominant tree canopy within the delineated Habitat Area. In some cases, trees that are providing intermediate, co-dominant or dominant tree canopy and have the potential to burn through and fall or crown out may be felled and if they do not contain and are not adjacent to (confirmed active, assumed active or status undetermined) nests. Modification of canopy structure around active nest trees due to removal of adjacent trees should not occur. Removal of shrubs, ground cover, or low-hanging limbs is acceptable throughout the Habitat Area.

- Foam: Fire fighting foam may be applied to understory vegetation within Habitat Areas as long as it is not directly applied to confirmed active, assumed active or status undetermined tree vole nests or the foliage of the nest tree or adjacent trees.

- Thinning: Refer to "Management Recommendations for the Oregon Red Tree Vole", Version 2.0 which states that: "Thinning should not remove or modify nest trees, the canopy structure of the stand, or remove any of the dominant, co-dominant, or intermediate (Daniel et al. 1979) crowns within the Habitat Area." This includes activities that may isolate nest trees or reduce the interconnectivity of branches within the canopy.

- Pruning: Pruning of lower branches is acceptable. Pruning >15 feet from ground level should not occur. If mechanical equipment is used, mechanical damage should not be inflicted on confirmed active, assumed active or status undetermined red tree vole nest trees, nest tree roots or trees within a 50-foot radius of the active red tree vole nest tree.

- Grinding: Grinding of understory shrubs and ground fuels is acceptable, but there should be no removal of Dominant, Co-Dominant or Intermediate trees. Grinding of material >15 feet from ground level should not occur. Mechanical damage to confirmed active, assumed active or status undetermined red tree vole nest trees,

nest tree roots or trees within a 50-foot radius of the active red tree vole nest tree should be avoided.

- Crushing, Chopping/Mowing, Chipping, Raking: To the extent practicable, mechanical damage should not be inflicted on confirmed active, assumed active or status undetermined red tree vole nest trees, nest tree roots or trees within a 50-foot radius of the active red tree vole nest tree.

Acceptable treatments within the 1-1 ½ mile fuels treatment zone where some risk to continued site persistence is permissible:

"Low Quality" Habitat Conditions

Fuels reduction treatments following the recommendations listed below result in a risk to continued site occupancy but are acceptable in the described "Low Quality" Habitat Conditions. An increased risk to the persistence of some of the Habitat Areas described in the following Habitat Conditions should not result in an overall increased risk to the continued persistence of the species.

Low quality Habitat Areas are defined by three different Habitat Area Conditions. If a Habitat Area meets any one of the following definitions, the Habitat Area is considered to be of "Low Quality", and the recommendations for fuels reduction treatment listed below may be used in the management of that Habitat Area.

1. Habitat Condition 1 is where a Habitat Area has been delineated for sites located within stands **less than or equal to 10 inches** Quadratic Mean Diameter (QMD) or Arithmetic Mean Diameter (AMD). This applies to Habitat Areas within all Distribution Zones.

2. Habitat Condition 2 is dependent upon the Distribution Zone in which the Habitat Area is located. Refer to Table 1 in Version 2.1 of the Survey Protocol for a list of the various administrative units by Distribution Zones. This has been updated to reflect the current understanding of the species distribution. Habitat Condition 2 applies where the Habitat Area that has been delineated for the site is located within stands that are **greater than 10"** QMD/AMD, but does not meet the suitable habitat description, by Distribution Zone described in Version 2.1 of the Survey Protocol.

3. *Habitat Condition 3* applies in suitable habitat conditions as described in Version 2.1 of the Survey Protocol where, after a complete protocol survey, the survey has identified 2 or fewer active nests (or assumed active) within the Habitat Area. This applies to Habitat Areas within all Distribution Zones.

Limitations on applicability

Because the recommendations listed here allow some risk to continued site occupancy, there is a limit as to the number of Habitat Areas that can be managed in accordance with these recommendations. For Habitat Condition 2 and 3, these recommendations can be applied to ***no more than 10%*** of the delineated ***Habitat Areas*** per administrative unit (BLM District or National Forest) that are within Habitat Condition 2 or 3 until the completion of either the High Priority Site Management Recommendations for the species or the site's identification as a non-high priority site. This limitation on applicability allows for flexibility in the implementation of fuels reduction objectives while not precluding sites that may be needed in the future to assist with species persistence objectives. Treatment of Habitat Areas in Low Quality Habitat Condition 1, following these recommendations ***do not count*** towards the 10% total.

Recommendations for specific fuels reduction treatments

Low Quality Habitat Condition 1: Habitat Areas treated following the recommendations below ***do not count*** toward the administrative unit's 10% site limit, but must be appropriately identified in ISMS in accordance with the reporting requirements. These recommendations may be applied to all Habitat Areas in this Habitat Condition.

- Pile and Broadcast Burning: Broadcast and pile burning may occur within the Habitat Area. Trees that contain nests (confirmed active, assumed active and status underdetermined) and trees with crowns touching trees with nests should not be removed, damaged or modified. To the extent practicable, burning prescriptions and flame lengths should meet the objective of minimizing direct heat and smoke from entering these trees crowns.

- Thinning, Grinding, Fire Lines, Pruning: These activities may occur within these Habitat Areas as long as trees that contain nests (confirmed active, assumed active and status underdetermined) and trees with crowns touching trees with nests are not removed, damaged or modified.

- Crushing, Foam, Chopping/Mowing, Chipping, Raking, Piling: These activities are acceptable within the Habitat Area. To the extent practicable, mechanical damage should not be inflicted on red tree vole nest trees (confirmed active, assumed active, or status undetermined), or trees within a 50-foot radius of these nest trees.

Low Quality Habitat Condition 2 & 3: Habitat Areas following the recommendations listed below ***do count*** towards the 10% maximum per administrative unit and must be appropriately identified in ISMS, in accord with the reporting requirements listed below.

- Pile and Broadcast Burning: Broadcast and pile burning may occur within the Habitat Area. Trees that contain nests (confirmed active, assumed active and status underdetermined) and trees with crowns touching trees with nests should not be removed, damaged or modified. To the extent practicable, burning prescriptions and flame lengths should meet the objective of minimizing direct heat and smoke from entering these trees crowns.

  Conduct broadcast burning in such a manner so as to minimize intermediate, co-dominant, and dominant tree loss. A fire behavior program, such as Behave Plus may be used to determine the appropriate weather conditions for meeting these desired fire effects. If needed within the Habitat Area, first hand pile and burn, or pull, pile and burn (in jackpot burns) down material to achieve this goal. Piles may need to be burned prior to broadcast burning to minimize smoke and heat entering the canopy during the broadcast burn.

  Both pile burning and broadcast burning should be conducted during a time of year and under conditions when the likelihood of fire escaping into the tree canopy is lowest. Burning prescriptions and flame lengths should meet the objective of minimizing direct heat and smoke from entering nest tree crowns.

- Thinning, Grinding: Light commercial thinning (includes thinning for Defensible Fuel Zones) or grinding may occur. Trees removed should only be the overtopped and poorest intermediates (Graham et. al. 1999). Thinning or grinding may occur as long as trees that contain nests (confirmed active, assumed active and status underdetermined), or trees with adjacent crowns touching trees with nests are not removed, damaged or modified.

- Fire Lines, Pruning: These activities may occur within these Habitat Areas as long as trees that contain nests (confirmed active, assumed active and status underdetermined) and trees with adjacent crowns touching trees with nests are not removed, damaged or modified.

- Crushing, Foam, Chopping/Mowing, Chipping, Raking, Piling: These activities are acceptable within the Habitat Areas. To the extent practicable, mechanical damage should not be inflicted on red tree vole nest trees(confirmed active, assumed active, or status undetermined), nest tree roots or trees within a 50-foot radius of these nest trees.

Monitoring, Reporting, and Inventory

Reporting Requirements

Sites that are treated following recommendations that result in a risk to continued site persistence should be identified in ISMS, as described in the cover memo preceding this

MR amendment. If the decision is made to not determine the activity or species status of sites then these sites should be entered into the ISMS database as Managed Sites ONLY.