

Chapter 5

VEGETATION

5.1 INTRODUCTION

The Lake Tahoe Basin lies within a unique Sierra Nevada geologic basin. The lake's elevation averages 6,225 feet, and surrounding peaks reach heights of up to 10,880 feet. This range in elevation results in three general vegetation zones being present in the Basin; montane, upper montane, and subalpine vegetation. Within each vegetation zone, multiple vegetation types are represented; for example, the most recent vegetation map of the Basin identified over 60 discrete vegetation types. The majority of these vegetation types are classified as forest (68%), followed by shrub types (28%), herbaceous vegetation (2%), and unclassified areas (2%).

A wide variety of plants can be found in the Basin. A total of 1,077 vascular plants have been confirmed to occur with another 360 potentially occurring. In addition, the Basin is home to 115 species of non vascular plants (USDA 2000). There are 11 special status species¹ documented in the Basin (seven vascular and 4 non-vascular) and an additional 19 special status species potentially occur but have not been documented. Tahoe yellow cress (*Rorippa subumbellata*) is the only plant listed as Endangered by the states of CA and NV. It is also a candidate for listing under the Federal Endangered Species Act.

The Lake Tahoe Basin supports many biologically rich emergent wetlands, fens/bogs, and riparian areas. These areas have been identified as plant communities of concern and are biological hotspots that contribute substantially to the biological richness and productivity of the entire region. Another plant community of concern is the deep water plants of Lake Tahoe.

The vegetation conditions and patterns in the Lake Tahoe Region of today are a reflection of past and current human activities. Prior to the early 1800s the Tahoe Basin was managed only by the Washoe and a combination of Washoe and natural processes maintained a diversity of forest types. Logging activities began in 1859 and within 40 years about 60 percent of the Tahoe watershed had been clearcut. The remaining unlogged land was characteristically alpine, barren, or inaccessible (USDA 2000). As a result most forestlands of the Basin are less than 150 years old with few young stands and little old-growth forest present. After most of the logging was complete, federal and state governments began acquiring lands in 1899, and intensified acquisition in the 1930s. The vegetation that has

¹ Special status species are generally thought of as having low abundance, limited distributions, or small population sizes. Special status plant species are identified through an evaluation of multiple parameters that may include any or all of the following criteria:

- Rarity or limited distribution throughout the species' range or the region
- Endemism (species endemic to the Basin are found only within the Basin and no where else)
- Presence of threats and perceived vulnerability to local extirpation or extinction

developed on the landscape in the past 100-150 years following logging has, until recently, received little active management, except fire suppression. As a result much of the forestlands are even-aged and overstocked. Vegetation types that depend on frequent fire to maintain them (e.g., Jeffrey pine) are gradually being replaced by more fire resistant species. The long history of fire suppression combined with incidences of drought and insect-induced mortality has resulted in stands with a high concentration of hazardous fuels. This condition has increased the threat of large catastrophic fire and is indicative of a forest where many natural processes have been excluded.

Housing, commercial, and infrastructure construction have also influenced today's vegetation patterns. Not only have large areas of vegetative cover been removed, but the composition of remaining vegetation has been changed through landscaping. These changes in cover and composition have resulted in increased erosion and nutrient runoff from developed lots and the introduction of non-native species into the Basin.

Since 1900, 75% of the marshlands and 50% of the meadowlands in the Basin have been lost to urban development (LTBMU Forest Plan 1988). This makes the conservation of the few remaining wetland types critical. Most special status plant species in the Basin occur on public lands, and therefore, they have been afforded adequate protection to date.

Today, approximately 85 percent of the land in the Basin belongs to the USDA Forest Service (Forest Service), Nevada Division of State Parks, the California Department of Parks and Recreation, and the California Tahoe Conservancy. The remainder of the land is primarily privately owned. Because of the high percentage of public ownership there is great potential for conserving and restoring the health and diversity of plant communities in the Lake Tahoe Basin. However, responsible stewardship and management of vegetation resources on private lands remains key to their sustainability

5.2 BACKGROUND

The Tahoe Regional Planning Compact ("Compact", P.L. 96-551, 94 stat. 3233, 1980) finds that, "There is a public interest in protecting, preserving and enhancing [environmental and ecological] values for the residents of the region and for visitors to the region." The natural environment, "by virtue of the special conditions and circumstances of the region's natural ecology, developmental pattern, population distribution and human needs...is experiencing problems of resource use and deficiencies of environmental control." In order for the TRPA to protect the natural environment, the Compact directs TRPA to "establish environmental threshold carrying capacities." Prior to the adoption of thresholds, TRPA developed two value statements related to vegetation conservation and management in the Basin. These were to (1) Provide for a wide mix and increased diversity of plant communities in the Tahoe Basin, including such unique ecosystems as wetlands, meadows, and other riparian vegetation, and (2) conserve threatened, endangered, and sensitive plant species and uncommon plant communities of the Lake Tahoe Basin. These values guided the development of the vegetation

thresholds and remain Agency values. In 1982 the TRPA adopted three vegetation-related thresholds for common vegetation, uncommon plant communities, and sensitive plants (see Resolution 82-11). A fourth threshold for late seral/old growth ecosystems was added in 2001. Threshold standards and the indicators used to measure the progress toward meeting the standards are presented in Table 5-1 for each of the four vegetation threshold areas.

To attain these thresholds, the TRPA adopted three vegetation-related goals in 1986. The goals are to provide for 1) an increase in diversity of plant communities, 2) the protection and restoration of unique ecosystems, and 3) conservation of sensitive plants species and uncommon plant communities. Thirteen policies related to attaining the above goals were adopted at the same time. Two additional goals and eight policies were adopted in 2001 related to late seral/old growth ecosystems and snags and coarse woody debris. An additional policy related to the conservation of Tahoe yellow cress was added in 2002 with the adoption of the Tahoe Yellow Cress Conservation Strategy.

In addition to the value provided by vegetation directly, vegetation indirectly benefits each of the other eight thresholds. The Environmental Impact Statement for the Establishment of Environmental Threshold Carrying Capacities (1982) rated the interrelationship between the nine thresholds. The vegetation threshold was found to be the most related to the other thresholds. This study noted that:

“It [vegetation] is a major factor in maintaining water quality, stabilizing soil, producing oxygen, providing wildlife habitat, filtering noise, enhancing the recreation experience, and an integral part of the scenic resource. Adoption of a threshold that maintains this protective ability has a direct, positive impact on all other components for which [the other eight] thresholds are recommended.”

Therefore, attaining, and maintaining the vegetation thresholds would have a strong positive effect on both the natural environment and the human experience within that environment.

Table 5-1: Summary of Existing Indicators and Standards

Threshold Area	Indicator	Standard
V1- Common Vegetation	Species Richness	Maintain the existing species richness of the Basin by providing for the perpetuation of the following plant associations: yellow (Jeffrey) pine forest, red fir forest, sub-alpine forest, shrub association, sagebrush scrub association, deciduous riparian, meadow association, wetland association, cushion plant association*
	Relative abundance	Of the total amount of undisturbed vegetation in the Tahoe Basin; 1. Maintain at least 4 percent meadow and wetland vegetation. 2. Maintain at least 4 percent deciduous riparian vegetation. 3. Maintain no more than 25 percent dominant shrub association vegetation. 4. Maintain 15-25 percent of the yellow (Jeffrey) pine forest in seral stages other than mature. 5. Maintain 15-25 percent of the red fir forest in seral stages other than mature.
	Pattern	Provide for the proper juxtaposition of vegetation communities and age classes by: 1. Limiting acreage size of new forest openings to no more than eight acres. 2. Adjacent openings shall not be of the same relative age class or succession stage to avoid uniformity in stand composition and age.
	The natural qualities of the community (as determined by a qualified expert).	This standard also applies to native deciduous trees, wetlands, and meadows.
V2- Uncommon Plant Communities	The natural qualities of the community (as determined by a qualified expert).	Provide for non-degradation of natural qualities. This threshold shall apply but not be limited to (1) the deep-water plants of Lake Tahoe, (2) Grass Lake (sphagnum fen), (3) Osgood Swamp, and (4) the Freel Peak Cushion Plant Community, (5) Hell Hole (sphagnum fen), (6) Upper Truckee Marsh, (7) Taylor Creek Marsh, and (8) Pope Marsh.
V3-Sensitive Plants	The number of population sites that are maintained as suitable habitat for sensitive plant species (as determined by a qualified expert).	Maintain a minimum number of population sites for each of five sensitive plant species. The minimum number of population sites is as follows: <i>Arabis rigidissima</i> var. <i>demota</i> Galena Creek rockcress (7) <i>Draba asterophora</i> var. <i>asterophora</i> Tahoe Draba (5) <i>Draba asterophora</i> var. <i>macrocarpa</i> Cup Lake Draba (2) <i>Lewisia pygmaea longipetala</i> Long-petaled lewisia (2) <i>Rorippa subumbellata</i> Tahoe yellow cress (26)
V4-Late Seral/ Old growth ecosystems	The number of acres of forest that are in late seral or old growth condition	Attain and maintain a minimum percentage of 55% by area of forested lands within the Tahoe Region (excluding TRPA designated urban areas) in a late seral or old growth condition, and distributed across elevation zones. To achieve the 55 percent, the elevation zones shall contribute as follows: • The Sub-alpine zone (greater than 8,500 feet elevation) will contribute 5 percent (7,600 acres) of the late seral acres; • The Upper Montane zone (between 7,000 and 8,500 feet elevation) will contribute 30 percent (45,900 acres) of the late seral acres; • The Montane zone (lower than 7,000 feet elevation) will contribute 20 percent (30,600 acres) of the late seral acres.

* see Resolution 82-11 for definitions of the listed plant associations.

5.2.1 MEASUREMENT AND MONITORING OF INDICATORS AND STANDARDS

V-1 Common Vegetation

There is sufficient information to evaluate most of the indices for the common vegetation threshold. A new vegetation map of the Lake Tahoe Basin, the Tahoe Basin Existing Vegetation Map (TBEVM v 4.0), was completed in 2004 and was used to assess the status of most common vegetation indicators and standards. Vegetation maps used for the previous Threshold Evaluation Report have not been updated, and therefore, would yield the same analysis as presented in the 2001 Threshold Evaluation Report. The TBEVM was produced by the Center for Spatial Technologies and Remote Sensing (CSTARS) at the University of California, Davis using 1 m resolution multispectral and panchromatic IKONOS imagery. This vegetation layer is being used by the Forest Service and TRPA in current planning efforts, except for select plant communities where more accurate data layers are available (e.g., wetlands and riparian vegetation). The only wetland type classified by the TBEVM is inundated herbaceous, and therefore a separate wetlands layer derived from aerial photographs by the Forest Service was used to assess the current cover of meadow and other wetland vegetation. The TBEVM provides an estimate of mean diameter at breast height (DBH) per forested polygon based on the correlation between actual field measurements of DBH and DBH predicted by image processing routines. These data related to average tree size were used to obtain a general estimate of the percentage of yellow pine forest and red fir forest in the mature age class because a classification of the age structure of the general forest has not been completed.

V-2 Uncommon Plant Communities

The plant communities of Grass Lake, Osgood Swamp, Hell Hole, Taylor Creek Marsh, Pope Marsh, and Freel Peak were monitored by Forest Service staff in 2002, 2003, and 2004. Upper Truckee Marsh is owned and managed by the California Tahoe Conservancy (CTC) and is therefore monitored by CTC. These monitoring data provide the basis for an assessment of the quality of and the impacts to the communities.

In 2002 all uncommon plant communities were evaluated with the relevé method to describe plant communities. This method is not appropriate for monitoring change over time. However, observations made regarding the general condition and level of disturbance to communities were noted during these surveys and are relevant to the threshold evaluation.

In 2003 transects were established in all uncommon plant communities to provide baseline data regarding a variety of parameters including frequency distribution of species, soil characteristics, and ratings of disturbance in 30 categories.

In 2004 transects were established in all uncommon plant communities (and at least 41 other meadow locations) using the Forest Service Region 5 Range Monitoring Protocol (Weixelman 2006). The range monitoring protocol employs line-intercept transects and nested frequency plot data to classify the ecological status of the community into high, medium, and low condition class. These data were collected to provide a baseline for future monitoring.

The deep-water plants of Lake Tahoe have not been surveyed since the 1960s (Frantz and Cordone 1967). A partial survey of potential habitat for deepwater macrophytes was performed in Lake Tahoe in 1999 (Karlin et al. 2000). However, no assessment of the status of these plant communities has been conducted and therefore it has not been possible to examine trends in the health of these communities over time or to assess the impacts of current allowable activities on deep-water plant communities. Therefore, the status of deep-water plants in Lake Tahoe has not been assessed for this or previous Threshold Evaluation Reports. The TRPA Code, subsection 32.3.D, states that if there is insufficient information available to make a determination, the status will not be assessed. Subsection 32.3.E states that additional factors may be used in assessing the status of a threshold, however there is not enough information to assess the deep-water plant communities.

V-3 Sensitive Plants

The population sites for *Draba asterophora v. macrocarpa*, *Draba asterophora v. asterophora*, *Lewisia pygmaea v. longipetala*, and *Arabis rigidissima var demota* have been monitored both informally and with periodic surveys by Forest Service staff during the five years since the last Threshold Evaluation Report. Staff at various times have visited the sites and noted any problems with the species. These site visits have resulted in a qualitative assessment of the site conditions and impacts to the species. In addition, TRPA contracted with BMP Ecosciences in 2002 to conduct special status plant surveys in the Basin.

All known sites for *Rorippa subumbellata* are monitored annually by a group of volunteers consisting primarily of staff of agencies that are signatories to the Tahoe Yellow Cress Conservation Strategy (Pavlik et al. 2002).

V-4 Late Seral/Old Growth Ecosystems

At the time that the late seral/old growth threshold was established in 2001 the Forest Service planned to reclassify vegetation in the region every five years from aerial photographs. These data collected at 5-year intervals would then be used to analyze the amount of late seral/old growth forests present on the landscape. However, the Forest Service received funding to perform a reclassification every 8 years, and therefore, updated data are not available for this report.

The best available data to evaluate the threshold at this time are from the TBEVM. Average stand diameters for mapped polygons were summarized by elevation band and are described in this report.

5.3 THRESHOLD STATUS

5.3.1 V-1 COMMON VEGETATION

Status of Indicators

Non-Attainment

The indicators for common vegetation are in Table 5-1. With respect to species richness, the existing diversity of the Basin is being maintained. All of the plant

associations are persisting and are not in danger of being lost from the region. Therefore, this standard is in attainment. The standard for the pattern of common vegetation on the landscape is also in attainment as the TRPA Code of Ordinances controls the size of forest openings and has not allowed any large openings or adjacent type conversion. The relative abundance standard continues to be out of attainment. Relative abundance data from the 2001 report is compared with the current evaluation in Table 5-2.

Table 5-2: Acreage and relative abundance (%) of the five vegetation types identified in the common vegetation standard.

Vegetation Type	2001 Threshold Report		2006 Threshold Report		Desired Relative Abundance
	Acres	Percent	Acres	Percent	
Meadow¹	1,660 ¹	0.8% of Basin total lands	3,651 ⁴	1.8%	at least 4%
Deciduous Riparian Vegetation	8,818 ²	4.4% of Basin total lands	4,594 ⁴	2.3%	at least 4%
Shrub	8,800 ²	4.4% of Basin total lands	57,503 ⁵	28.5%	no more than 25%
Yellow Pine Forest					
Small size classes	6,223 ^{2,3}	6% of yellow pine forest	9,992 ^{5,6}	23% of yellow pine forest	Maintain 15-25% in seral stages other than mature
Large size classes	93,723 ^{2,3}	94% of yellow pine forest	33,153 ^{5,7}	77% of yellow pine forest	
Red Fir Forest					
Small size classes	2,467 ^{2,3}	5% of red fir forest	290 ^{5,6}	0.8% of red fir forest	Maintain 15-25% in seral stages other than mature
Large size classes	49,329 ^{2,3}	95% of red fir forest	35,910 ^{5,7}	99.2% of red fir forest	

¹Value from the USDA's Watershed Assessment (2000)

²From 1997 aerial photography.

³This information is presented as supplemental information in 2001 Threshold Evaluation, but size classes were not defined.

⁴Riparian vegetation units of the Lake Tahoe Basin were mapped by the USFS on infrared aerial photographs taken in 1987. Wetland vegetation areas a minimum of 1 acre in size were classified into 5 wetland community types: coniferous riparian, deciduous riparian, deciduous/coniferous riparian, moist meadow, and wet meadow.

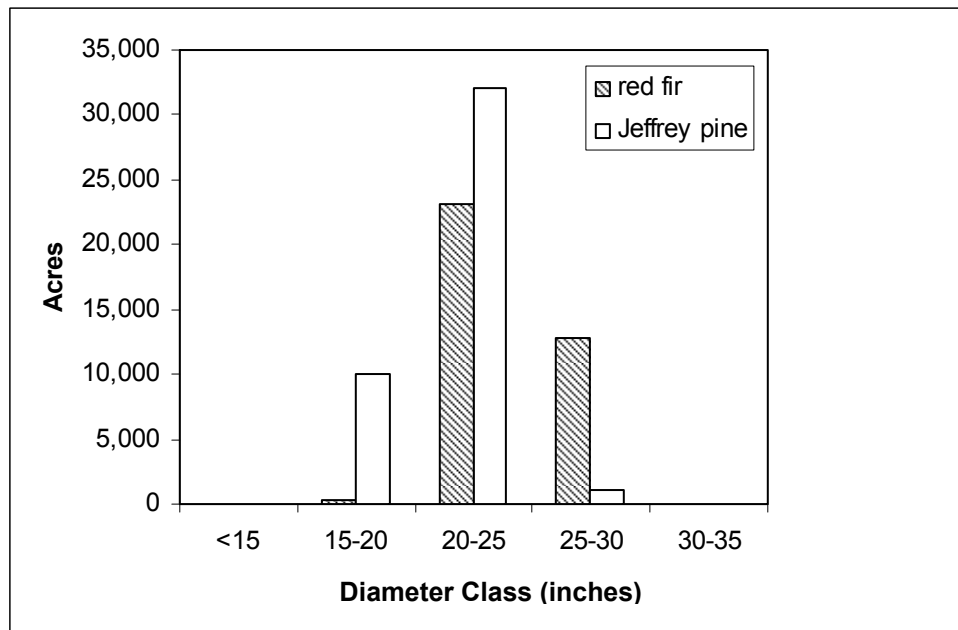
⁵2004 Tahoe Basin Existing Vegetation Map.

⁶Small trees are considered those less than 20 inches DBH.

⁷Large trees are considered to be greater than 20 inches DBH.

The relative abundance data for meadows, deciduous riparian, and shrub vegetation types are readily interpreted with respect to the relative abundance standard. In contrast, it is not possible to assess the status of the relative abundance standard for yellow pine forest and red fir forest because the meaning of “seral stages other than mature” has not been defined with respect to this standard, and there have been no complete surveys of the demographics of yellow pine forest and red fir forest types in the Basin. Furthermore, it is confusing to refer to a mature seral stage for a given forest type as seral stages are defined as, “the identifiable stages in the development of a sere, from an early pioneer stage, through various early and midseral stages, to late seral, subclimax, and climax stages” (Kimmins 2004). Shade intolerant, fire-dependent pine species such as Jeffrey pine are considered to be early seral species while more shade tolerant red fir is considered to be a late, or mature, seral species. These limitations aside, Figure 5-1 provides the best indication of the range of sizes, and by analogy, development stage of red fir and Jeffrey pine in the Basin.

Figure 5-1: Diameter Class Distribution of Red Fir and Jeffrey Pine in the Lake Tahoe Basin.



Source: 2004 Tahoe Basin Existing Vegetation Map

Approximately 99% of red fir forests and 77% of Jeffrey pine forests in the Basin have an average stem diameter greater than 20 inches (Table 5-2). Mature red fir trees are defined as generally ranging from 60 to 130 feet and 12-48 inches DBH (Nearctica 2000a). Mature Jeffrey pine range between 80 and 150 feet in height and 24-48 inches DBH (Nearctica 2000b). If we use these definitions of diameter to identify mature stands then less than 1/1000th of 1 % (or 0.0009%) of red fir forests are < 12” dbh and therefore would be classified as stages other than mature and 39,854 acres or 92% of Jeffrey pine have average stand diameters < 24” and therefore would be classified as stages other than mature. The intent of

the standard as written was to increase the diversity of stand ages on the landscape and create more young stands. The diameter distribution shown in Figure 5-1 illustrates that most stands contain large trees and that there are few young stands on the landscape. Therefore, this standard can be considered to be out of attainment. Because Jeffrey pine has fewer stands with an average diameter > 25" and more stands with an average diameter < 20" than red fir, Jeffrey pine stands are closer to attainment with respect to the common vegetation threshold of relative abundance.

With respect to the last standard for common vegetation, it is not completely clear if degradation is occurring to wetlands, or meadows. However, TRPA does not allow new projects to occur in wetland or meadow areas. TRPA encourages wetland restoration; however, fewer than 30 acres (29.62) were restored between 2001 and 2004 (see Appendix B, Table 12). There are provisions in TRPA's Code that can allow certain public works projects to occur in wetlands, but complete and additional mitigation is required. Degradation of native deciduous trees does occur and has been observed by TRPA. However, the total amount of native deciduous tree removal is not known. Impact to deciduous trees is not completely prohibited in TRPA's Code.

Overall, this threshold is in non-attainment, because none of the relative abundance measures are meeting the established standards. The new TRPA Regional Plan and Forest Service Forest Management Plan are developing new vegetation standards. A goal of these plans is to develop standards and indicators that can be measured to track long-term trends. Therefore, when implemented, these plans will likely result in measurable trends toward achieving a vegetation threshold.

Progress Towards Achieving Threshold

Species richness has been in attainment since 1991 and it is unlikely that any plant associations will be lost from the region. Relative abundance has not been found to be in attainment during any of the previous evaluation periods and trends over time are difficult to discern because of the continued development of new vegetation mapping products.

The area of meadow was found to be in attainment in 2001 but this was because of a mathematical error. At that time 0.8% (1,660 acres) of the land area was in meadow although it was reported that 9% of the Basin was in meadow. The most recent vegetation map for wetlands shows that 3,651 acres or 1.8% of the land area in the Basin is in meadow and therefore this vegetation type remains out of attainment.

The area of deciduous riparian vegetation was found to be in attainment in 2001 as 8,818 acres (4.4%) of this vegetation type were present on the landscape. The most recent vegetation map for wetland communities shows that 4,594 acres (2.3% of the Basin) of deciduous riparian vegetation are present on the landscape and therefore the standard of 4% is not being met.

Shrub vegetation was reported to cover 8,800 acres in 2001. In contrast the TBEVM classifies 57,503 acres (28.5%) of the Basin as shrublands. Because the standard is to have less than 25% of the vegetation in shrubland associations this

vegetation type is out of attainment. The acres in this type may be overestimated because of errors in the sagebrush scrub type; however, it is unlikely that these errors account for the 3.5% of the land area of the Basin that is preventing this vegetation type from reaching attainment.

Forest Service records indicate that there has been little progress toward reaching attainment of the standards for Jeffrey pine and red fir. Approximately 200 acres of Jeffrey pine have been converted to stages other than mature since 2001 because of the Gondola Fire. The Showers and Gondola Fires resulted in the conversion of close to 800 acres of mature red fir to early stages of stand development (Fournier 2006).

The third index, pattern, will be maintained in attainment because the cutting of trees and forest openings is controlled by the TRPA Code. The intent of this standard is to encourage the creation of early seral stages on the landscape. There has been little, if any, progress in the past five years as the Forest Service has not done any treatments to create early seral stages during this time period (Fournier 2006).

The nondegradation standard for wetlands and meadows will continue to be attained because TRPA Code controls impacts to these communities.

2006 Status Evaluation Relative to Threshold Attainment Schedules

The contribution of compliance measures to threshold attainment and the achievement of interim targets are summarized in the Compliance Forms at the end of this chapter and Appendix A.

Threshold Interim Target Status

Species richness and pattern are in attainment. With respect to relative abundance, all common vegetation types for which targets are specified are in non-attainment. The interim target specified in the 2001 Threshold Evaluation Report of 6% red fir forests in seral stages other than mature by 2005 has not been met. Approximately 92% of Jeffrey pine forests have trees <24 inches in diameter, and therefore, could be considered to be in seral stages other than mature, however, it is unlikely the current condition is what was intended by the threshold. Measurable progress toward meeting the threshold is projected to be small with <3% of red fir or Jeffrey pine stands being converted to stages of stand development other than mature within the next five years. This small change will be difficult to detect with current monitoring methods. With significant efforts toward vegetation restoration, it may be possible to measure progress toward achieving the relative abundance threshold within the next 25 years.

Threshold Target Dates

It is expected that species richness and pattern will remain in attainment. It may be possible for the relative abundance threshold to be achieved within the next 100 years.

5.3.2 V-2 UNCOMMON PLANT COMMUNITIES

Status of Indicators

Attainment

The indicators for uncommon plant communities are in Table 5-1.

The status and trends in the condition of the uncommon plant communities are described in Table 5-3.

Table 5-3: Status of Uncommon Plant Communities

Plant Community	Status	Trend
Deep Water Plants	Not evaluated	Not evaluated
Freel Peak Cushion Plant Community	An increasing number of visitors are hiking and biking to the top of Freel Peak. This had become a problem because there was no single route or path to the top of the peak, thus many new trails were continuously created. Trail improvements and the establishment of a dedicated trail to the peak have been completed.	Trail improvements have benefited this community. The cushion plant community will likely continue to improve as previously disturbed areas reestablish.
Grass Lake	Grass Lake is designated as a "Research Natural Area" by the Forest Service. This designation affords the area with the fullest protection the Forest Service provides. Although there are small minor impacts to the area, there is no serious threat to the community. However, impacts by visitors could harm this area.	The condition of this community is stable.
Hell Hole	Hell Hole is a fen that is roughly 10-15 acres in size. The immediate landscape has never been logged, but has been grazed. As a fen this area is a unique community. Hell Hole also supports the only know location of mountain yellow-legged frogs (<i>Rana mucosa</i>) in the Tahoe Basin. Following the recommendation of the 2001 Threshold Report grazing was removed from this area.	The condition of this community continues to improve as it recovers from past grazing.
Osgood Swamp	Osgood Swamp is infrequently visited, except by local neighbors walking their dogs; however the impact of these dogs is unknown. Snowmobiles have been observed traversing the area. During times of shallow snow cover these snowmobiles could drastically harm the community. Beaver activity has resulted in increasing water levels.	The condition of this community is declining because of altered hydrology caused by beaver activity.
Pope Marsh	Pope Marsh is an important area for waterfowl. Recreational use results in a moderate disturbance to this community. In addition non-native species have established in the marsh.	The condition of this community is stable but could decline if recreational use continues to be unrestricted and the frequency of invasive species increases.

Plant Community	Status	Trend
Taylor Creek Marsh	Taylor Creek is important habitat of bald eagles and other waterfowl. Disturbances to this community include recreation, non-native plants, and a fire in 2002.	The overall condition of this community is stable but could decline if recreational use continues to be unrestricted and the frequency of invasive species increases.
Upper Truckee Marsh	Upper Truckee Marsh is the largest riparian wetland complex in the region, and one of the largest in the Sierras. This area is already a wildlife (waterfowl) threshold location. The complex also contains Tahoe Yellow Cress on the beach next to the marsh. This community was influenced in the past by grazing and currently experiences moderate recreational disturbance.	This condition of this community continues to improve in response to the cessation of grazing. However, this area has recently been subjected to an increase in recreational use and associated impacts with the acquisition by the California Tahoe Conservancy.

Progress Towards Achieving Threshold

The second vegetation threshold, uncommon plant communities, has been in attainment during all evaluation periods and continues to be in attainment for all uncommon plant communities except the deep water plants of Lake Tahoe. The status of the deep-water plant community is unknown. It is likely that the reduction in lake clarity over time has increased light attenuation and therefore reduced the area available as habitat for deep-water plants. More research and information are needed to better understand this community.

2006 Status Evaluation Relative to Threshold Attainment Schedules

The contribution of compliance measures to threshold attainment and the achievement of interim targets are summarized in the Compliance Forms at the end of this chapter and Appendix A.

Threshold Interim Target Status

This threshold is in attainment and, with the exception of the deep water plants of Lake Tahoe, is expected to remain in attainment. The interim target of funding a research program to assess deepwater plants and develop a monitoring program for these unique communities by 2003, set in the 2001 Threshold Evaluation Report, was not met.

Threshold Target Dates

Not applicable. Deep water plants cannot be assessed unless they are monitored. This will require special funding.

5.3.3 V-3 SENSITIVE PLANTS

Status of Indicators

Attainment

The indicators for sensitive plants are in Table 5-1.

The Forest Service reports populations of Cup Lake draba (*Draba asterophora* var. *macrocarpa*) and long-petaled lewisia (*Lewisia longipetala*) as being stable and relatively free of any threats. Therefore, these species are in attainment.

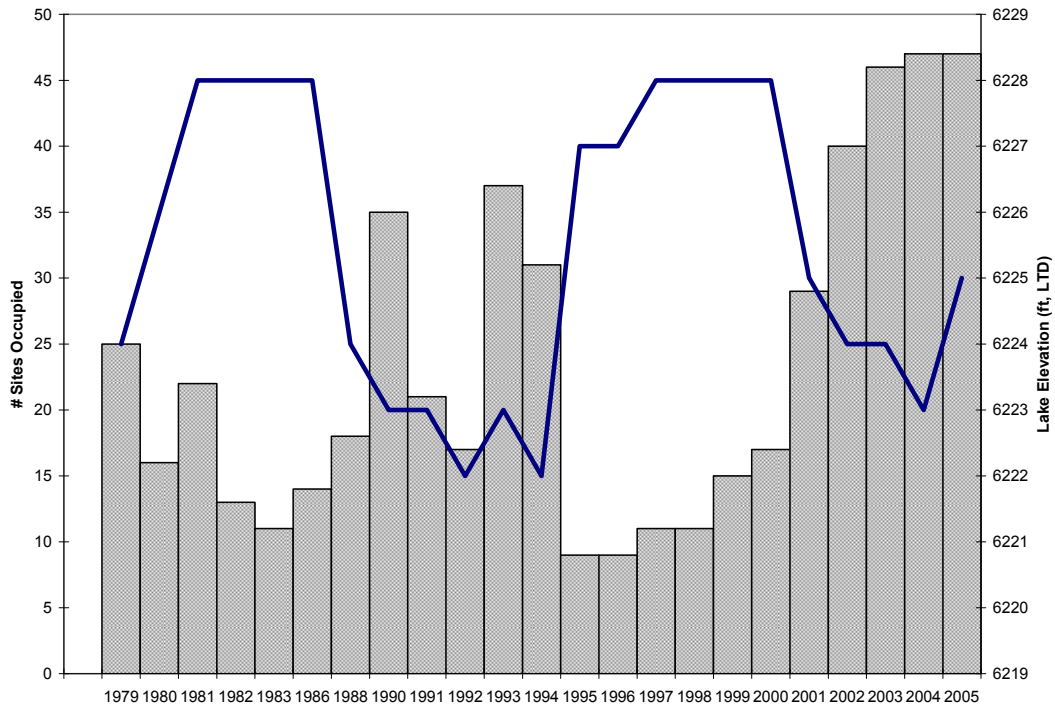
Tahoe draba (*D. a.* var. *asterophora*) is facing some threats from trampling on Freel Peak and development at Heavenly Ski Resort. A conservation status assessment is currently being conducted for Tahoe draba and a memorandum of understanding is also being pursued, which would guide the conservation and management of the species among the Heavenly and Mt. Rose ski resorts, Humboldt-Toiyabe National Forest (NF), Lake Tahoe Basin Management Unit (LTBMU), and TRPA. Greenhouse studies on the germination and propagation of the species are being conducted by the Denver Botanical Garden, and Utah State University was contracted by the Humboldt-Toiyabe NF to perform studies on population ecology, life history, habitat requirements, and genetic composition of this species. Significant impacts to the species have been documented at the ski resorts and attempts at mitigating impacts have been unsuccessful.

Surveys for Galena Creek rockcress (*Arabis rigidissima* var. *demota*) have failed to consistently locate the species at all of the 7 known locations mapped by the USFS. In addition, Populations could not be reliably identified in the field by a number of botanists, possibly because of hybridization with the common rockcress (*Arabis platysperma*). Local experts on the species defend the validity of the taxon, but genetic research is warranted to determine if hybridization is occurring. Because there is insufficient information available to make a determination of whether or not this species is in attainment, its status will not be assessed as directed by TRPA Code 32.3.D.

The number of population sites of Tahoe yellow cress exceeded the standard from 2002 through 2005 but under the standard of 26 population sites in 2006. Over the past 23 years the number of occurrences of Tahoe yellow cress has been strongly linked to lake elevation (Pavlik *et al.* 2002, Stanton *et al.* 2006) (Figure 5-2). Taken together, these 26 population sites have accounted for at least 90 percent of the counted stems in any given year from 1979 to 2003. However, several of the threshold sites have not supported plants for long periods of time and may never support them in the future (i.e., Sunnyside and Kings Beach). In addition the Truckee River and Tallac Lake sites may never have supported a continuing population. Therefore, this analysis will judge attainment based on 24 sites. Although most of the current threshold sites are home to the great majority of occurrences of the species, the fact that population numbers are so closely tied to fluctuating lake levels makes it virtually impossible to meet the threshold standard in high water years. For instance, only 13 sites were present on average in the 10 years of high water in the period from 1979 to 2003, compared to an average 28 sites during low water during the same period (Figure 5-2). Because fluctuations in

the numbers of Tahoe yellow cress sites has been shown to be correlated with lake level, and the reduction in occupied population sites in 2006 from the levels in the previous four years is predominately caused by high lake level and exacerbated by recreational pressure, it is the opinion of TRPA staff that Tahoe Yellow Cress is in attainment with the threshold though 24 sites were occupied.

Figure 5-2: Lake Level and Number of Occupied Tahoe Yellow Cress Sites by Survey Year (solid line = Lake level, Lake Tahoe Datum, LTD)



Source: Stanton and Pavlik 2006

Progress Towards Achieving Threshold

This threshold is in attainment for the four species for which data were available. There has been no change in the number of population sites for *Lewisia pygmaea longipetala*, *Draba asterophora v. macrocarpa*, and *Draba asterophora v. asterophora* since the thresholds for these species were established. Reliable data are not available to assess trends in the number of populations of *Arabis rigidissima v. demota*. A longer history of detailed surveys may find that *Arabis rigidissima v. demota* is also in attainment. The number of populations of Tahoe yellow cress has fluctuated as a function of lake level and will continue to exhibit this pattern. Although Tahoe yellow cress has been in attainment since 2001 populations are expected to decline precipitously in 2006 as a result of near record high lake levels. Because the number of sites occupied by the species is a function of lake level, the threshold standard for this species will not be in attainment again until a low water year. It will be important to protect known occurrences of Tahoe yellow cress in high water years when its habitat along beaches is much less abundant and at the same time there is concentrated recreation activity in these limited beach areas.

2006 Status Evaluation Relative to Threshold Attainment Schedules

The contribution of compliance measures to threshold attainment and the achievement of interim targets are summarized in the Compliance Forms at the end of this chapter and Appendix A.

Threshold Interim Target Status

Both *Draba* species and *Lewisia longipetala* are in attainment and are expected to remain in attainment if current regulations are enforced. The interim target specified in the 2001 Threshold Evaluation Report of adopting the Tahoe Yellow Cress Conservation Strategy, including outplanting seedlings, has been achieved. Over 26 sites for *Rorippa subumbellata* were found each year through 2005, high water in 2006 reduced the number to 24. It is not expected that *Rorippa* will reach 26 sites again until the lake level recedes to at least 6,225 feet. An interim target cannot be set for *Arabis rigidissima* until the number of populations and their locations are confirmed. This will be completed by August 2011.

Threshold Target Dates

The threshold is in attainment with the exception of *Arabis rigidissima* whose status is unknown.

5.3.4 V-4 LATE SERAL OLD GROWTH ECOSYSTEMS

Status of Indicators

Non-Attainment

The indicators for late seral/old growth forests are in Table 5-1. This threshold is not in attainment because the number of acres of late seral/old growth forests is below the threshold standard. It is estimated that at most 26% percent of forests are in a late seral or old growth condition, far below the 55% threshold standard. Montane forests are the furthest from reaching their respective threshold standard.

In developing the threshold for late seral/old growth species the authors based the definition of old growth on the ecological definition of old growth and mature trees taken from unpublished 1992 Forest Service reports by Donald Potter titled, "Ecological Characteristics of Old Growth (by species type) in California." These reports were published as part of a 1999 Forest Service publication (Beardsley et al. 1999). For most forest types, this report characterized trees 30 inches DBH and larger as mature. Lodgepole pine greater than 25 inches DBH were considered mature and aspen 18-25 inches DBH were considered mature.

Section 71.2 of the TRPA Code of Ordinances, related to enhancement and protection of late seral/old growth forests, provides for protection of trees larger than 30 inches DBH in westside forests and larger than 24 inches in eastside forests. Although the 24 inch diameter class may overestimate the acreage of late/seral old growth in the Basin, stands containing trees with an average diameter greater than 24 inches DBH were used to obtain an estimate of the acreage of late seral/old growth forest (Table 5-4).

Table 5-4: Acres of Forest with Average Diameters Greater Than 24 and 30 Inches in the Montane, Upper Montane, and Subalpine Vegetation Zones in the Lake Tahoe Basin¹.

Size class	Elevation Zone		
	Montane	Upper Montane	Subalpine
≥ 24 inches	1,410 (30,600)	29,661 (45,900)	4,216 (7,600)
≥ 30 inches	0	352	234

¹ Acreages required for attainment in each zone are shown in parentheses.

There are approximately 136,989 acres of forestland in the Basin. If stands with an average diameter greater than 24 inches DBH are considered to exhibit late seral/old growth characteristics then 35,287 acres or 26% of the forestlands in the Basin could be classified as late seral/old growth. The diameter distribution of species by forest type are shown in Figure 5-3. This figure illustrates that there are few young and old growth stands in the Basin. The frequency of larger, and by analogy, old stands is greater at higher elevations than in the montane zone.

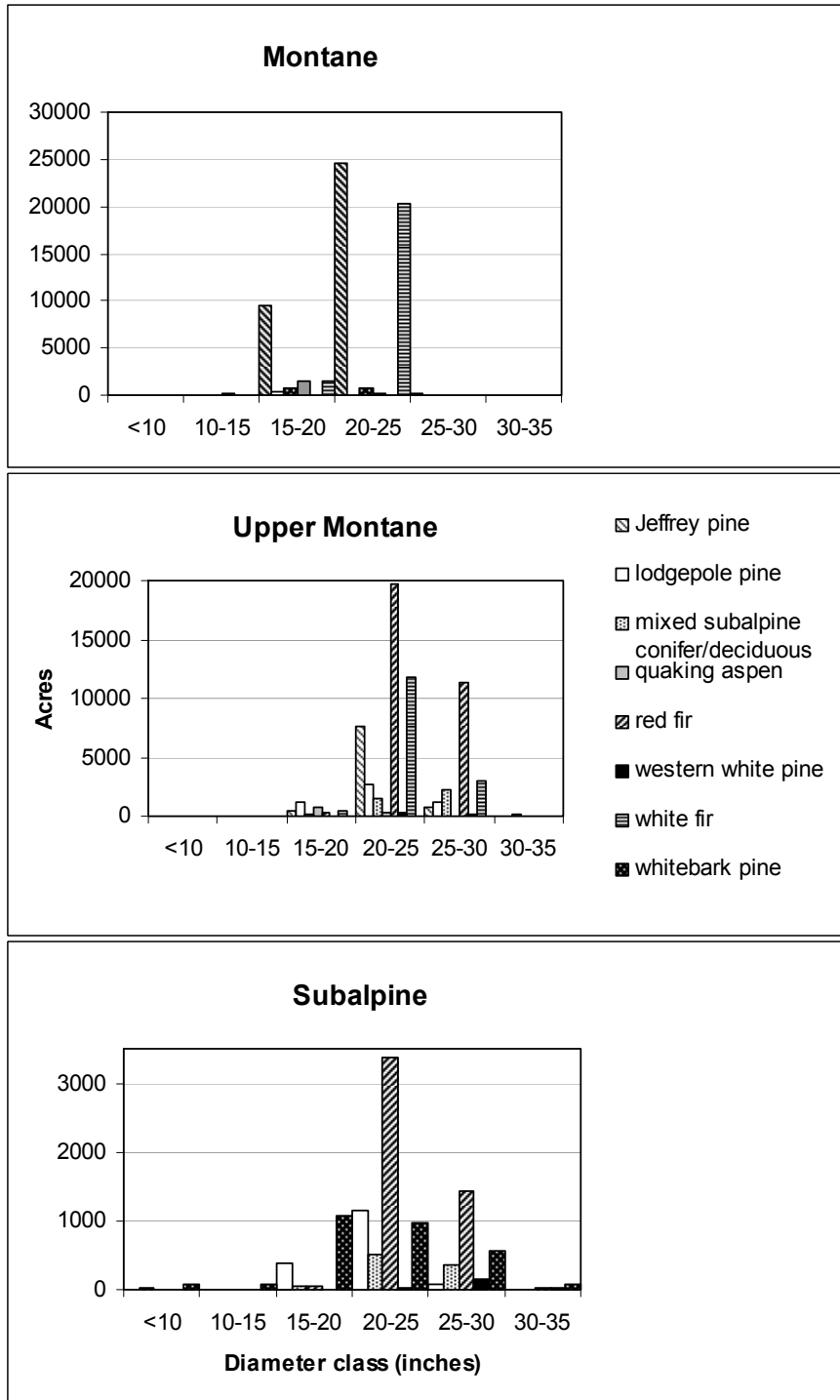
Progress Towards Achieving Threshold

As this is a new threshold, previous data were not collected and therefore it is not possible to describe long term trends. However, given that the Forest Service and the states of CA and NV manage the vast majority of the forest lands and that they have not been removing significant amounts of large trees; it can be assumed that there has been little change in the last 20 years in the total acreage of late seral/old growth forests. As the forest stands age, an increasing percentage will be classified as late seral/old growth over the long term.

Treatments to accelerate the development of late seral/old growth conditions (e.g., thinning to reduce competition, increasing structural diversity through creation of snags and downed wood) could increase the acreage of these forest types in the Basin in a shorter time period than if nature were allowed to take its course.

Without treatment to accelerate development of late seral/old growth characteristics this threshold could reach attainment within the next century. However, many stands, particularly in the upper montane zone would continue to be overstocked without treatment leading to increased susceptibility to drought, insects, and pathogens. Aggressive stand treatments could narrow the timeframe for reaching attainment, however, it is unlikely that even with these treatments, the goals for the montane and sub alpine zones would be met within the next 50 years.

Figure 5-3: Diameter Distribution by Dominant Species of the Montane, Upper Montane, and Subalpine Vegetation Zones in the Lake Tahoe Basin.



2006 Status Evaluation Relative to Threshold Attainment Schedules

The contribution of compliance measures to threshold attainment and the achievement of interim targets are summarized in the Compliance Forms at the end of this chapter and Appendix A.

Threshold Interim Target Status

If stands with an average diameter greater than 24 inches DBH are considered to exhibit late seral/old growth characteristics then 35,287 acres or 26% of the forestlands in the Basin could be classified as late seral/old growth. Therefore, the interim target set by the 2001 Threshold Evaluation Report of 6% of the forested lands being in late seral or old growth condition has been met. However, because tree growth is very slow and few, if any, treatments to accelerate the development of old growth conditions have been implemented in the Basin in the last five years, it is unlikely that measurable progress has been made toward achieving this threshold since the 2001 report.

Within the next five-year evaluation period measurable progress toward meeting the threshold is projected to be small with <3% of stands being converted to late seral or old growth conditions. This small change will be difficult to detect with current monitoring methods. With widespread implementation of treatments to accelerate the development of late seral and old growth conditions measurable progress toward achieving this threshold could be made within the next 25 years

Threshold Target Dates

This threshold could be in attainment within the next 100-150 years provided that late seral/old growth stands are protected and silvicultural treatments to accelerate the development of late seral and old growth conditions are implemented across large areas of the landscape.

5.4 EIP IMPLEMENTATION STATUS

5.4.1 COMPLETED EIP PROJECTS AND CONTRIBUTION TO THRESHOLDS

Approximately 18 environmental improvement projects focused on vegetation have been identified in the Environmental Improvement Program. TRPA records indicate that 9 vegetation EIP projects have been completed to date (Table 5-5). The five projects focused on hazardous fuels reduction (253, 924, 925, 926, and 8000) have benefited the common vegetation threshold as has the project focused on noxious weeds (10184). Three projects have focused on the protection of the sensitive plant species Tahoe yellow cress. Additional programmatic, research and evaluation, and regulatory projects have been completed that will result in an overall benefit to the vegetation program. Four of six programmatic EIP projects and six of 13 research projects have been completed. In addition four of nine projects to revise TRPA regulations have been completed since the inception of the EIP program.

The EIP program is currently in the process of being updated. Therefore, recommendations for projects directed toward meeting attainment of the vegetation thresholds will be made through that process.

Table 5-5: Completed EIP Capital Improvement Projects

EIP Number	Title	Project Description	Status
253	Forest Health - Kingsbury Defensible Space	Provide neighborhood defensible space program to assist private and public land holders to reduce fuel loading.	Completed
924	Urban Lots	USFS will conduct fuels reduction work (tree thinning, dead tree removal) on National Forests urban lots within priority subdivision treatment areas as established by Tahoe Re-Green. Estimated 225 lots have been identified for treatment.	Multiple subprojects have been completed
925	Forest Restoration Phase I	Harvest plan, hazard tree removal, fuel wood sales, and inmate projects. Plan and implement needed road improvements. Vegetation management projects will continue to reduce fuel loading as a fire prevention objective and will create desired stand structure and enhance forest health. Restoration objectives will be met by using prescribed burning to restore historic fire regimes.	Multiple subprojects have been completed
926	Forest Restoration Phase II	Implement harvest plan contract and operations including completion of road improvements. Begin preliminary work for Van Sickle properties. Additional work includes: hazard tree removal, reforestation projects, fuel wood sales, inmate crew projects, and the Gondola fired burned area emergency rehabilitation.	Multiple subprojects have been completed
977	Habitat Protection of Tahoe Yellow Cress - Baldwin Beach	Develop and construct protective structures for Tahoe Yellow Crest colony sites. Should include educational component and may include transplanting.	Completed
978	Habitat Protection of Tahoe Yellow Cress - Meeks Bay & NV Beach	Reconstruct and expand Tahoe Yellow Cress enclosure at Meeks Bay and Nevada Beach. Include educational/interpretive displays. May include transplants.	Completed
979	Habitat Protection of Tahoe Yellow Cress - D L Bliss State Park	Repair and maintain Tahoe Yellow Crest habitat protective structure at D L Bliss State Park include educational/interpretive displays. May include transplants.	Completed

EIP Number	Title	Project Description	Status
8000	Fuel Reduction and Planning Projects	Various hazardous fuel reduction projects.	Multiple fuel reduction projects have been completed
10184	Noxious Weed Assessment and Management	Mapping and treatment of noxious weed infestations.	Completed

5.5 THRESHOLD NEED FOR CHANGE

A conclusion of this evaluation is that several of the vegetation threshold standards, management standards and policies require re-evaluations for either recalibration or amendment. These changes also relate to updating the management system itself and coordination with other agencies. It is the recommendation of this report that TRPA should pursue the amendments to the environmental threshold carrying capacities developed and recommended as part of the Pathway 2007 process. The sections below summarize the proposed amendments. As noted, amendments are scheduled for action with adoption of the Regional Plan package in 2008, while others will require further development and analysis by TRPA. The proposed changes include replacing the current value statements with the statement of an all encompassing vision for vegetation and more specific threshold goals for healthy forest and vegetation, sensitive plants and communities, and hazardous fuels.

The following proposed Vision Statement and Threshold Goal Statements reflect the recommended basis for changing the existing threshold standard.

Vegetation Vision: Vegetation in the Lake Tahoe Basin is healthy and dynamic with the full compliment of native plant communities, wildlife habitats and ecological processes.

In addition to the vision statement, four separate threshold goals were developed. They include:

Threshold Goal 1: Healthy Forest and Vegetation: A full range of native species, development stages, habitats and ecological processes occur.

The common vegetation and late seral/old growth ecosystems threshold indicators (V-1 and 4) fall under this threshold goal.

Threshold Goal 2: Plant Communities of Concern: The natural conditions and functions of plant communities of concern are sustained.

The uncommon plant communities' threshold indicator (V-2) falls under this threshold goal.

Threshold Goal 3: Special Status Species: Populations of, and environmental conditions and processes important to native threatened, endangered, rare, special interest or sensitive species are maintained at a level which insures sustainability.

The sensitive plants threshold indicator (V-3) falls under this threshold goal.

Threshold Goal 4: Hazardous Fuels: Fuel conditions pose low wildfire risk to communities.

There is no existing threshold indicator for this threshold goal.

Many of the recommendations from the 2001 Threshold Evaluation Report form the basis for changes to thresholds being proposed through the Pathway 2007 planning process and will be addressed by revisions to the TRPA Regional Plan. Overall these changes reflect the need for an integrated management approach to achieve the desired future conditions of resources in the Lake Tahoe Basin that have been expressed by the Pathway 2007 agencies, state and local governments, and other stakeholders in the Basin.

5.5.1 V-1 COMMON VEGETATION

Threshold Recommended Changes

The primary recommendation is to combine common vegetation and late seral/old growth threshold areas under a common threshold goal for healthy vegetation. The threshold goal for healthy vegetation will be a full range of native species, development stages, habitats and ecological processes occurring on the landscape. This threshold goal proposes to use an indicator of departure from historic vegetation structure for all vegetation types. The recommended standard is to achieve 3% reduction in departure from historic structure for each vegetation/forest type over a 5-year evaluation period. Indicators and associated standards are also recommended for invasive weeds. The proposed indicators are the number and extent of occurrences. The recommended standard is to achieve no new occurrences of noxious weeds and a 1-3% reduction in the extent of existing infestations over a 5-year evaluation period. With the exception of the invasive weed indicators which will apply to the entire basin, these proposed changes will apply to lands outside of urban areas and will likely be implemented in the future after further analysis by TRPA.

Rationale for Change

The recommended changes to existing thresholds for common vegetation are based on the finding that additional threshold standards are required to maintain a significant value.

The current standard for species richness has been in attainment. The current standard for relative abundance of common vegetation is difficult to evaluate as some of the measures are not well defined, and therefore, need revision. In addition, the relative abundance standard would be more effective in restoring and maintaining healthy vegetation in the Basin if it were applied across all vegetation

types, as the current recommendation specifies. Targets for the proportion of each vegetation type and its associated structural attributes have been determined for each watershed in the Basin thereby providing improved spatial precision on the landscape for measuring and monitoring progress toward meeting this standard. These watershed-level targets will provide the basis for the revised threshold. Targets were developed using historic data that has been analyzed by the Forest Service as a Research and Evaluation EIP project (see Section 5.4) completed since the publication of the 2001 Threshold Evaluation Report. In addition to addressing the richness standard and improving upon the relative abundance standard for common vegetation, this approach will address the need to create a diversity of age classes on the landscape which is not currently addressed by the pattern standard which limits the size and proximity of regeneration harvests but does not encourage their use as a means of creating early seral stages on the landscape.

An additional standard related to noxious weeds is proposed as noxious weeds have been identified as a public concern. Noxious weeds continue to become established in the Basin and the proposed standard would aid in achieving the goal of stopping their spread and where possible eradicating them from the Basin.

5.5.2 V-2 UNCOMMON PLANT COMMUNITIES

Threshold Recommended Changes

The recommendation is to change the name of the existing threshold to plant communities of concern and to retain the essence of the current non-degradation standard but to change the standard with respect to how degradation will be measured. The threshold goal will be to sustain the natural conditions and functions of plant communities of concern. The proposed indicator is an ecological status index which will incorporate measures of species frequency, depth to water table, rooting depth, and percent cover of vegetation. This will result in a monitoring program that can track trends in the effects that noxious weeds, changes in hydrology, and disturbance have on plant communities of concern. The proposed standard will be to maintain or improve the Ecological Status of all monitored locations in an evaluation period. It is further proposed that the list of unique plant communities be revised to include more broad community types (e.g., fens, meadows, marshes) rather than remaining restricted to seven specific locations in the Basin.

Existing data for six threshold locations (all but deepwater plants) as well as that which has been collected at 48 meadow locations around the Basin will provide the foundation for establishing a baseline for assessing the relative health and trend of these uncommon plant communities.

These proposed changes will likely be implemented in the future after further analysis by TRPA..

Rationale for Change

The recommended changes to existing thresholds for uncommon plant communities are based on the finding that additional threshold standards are required to maintain a significant value.

The recommended threshold would be expanded to apply to uncommon plant community types as a whole, rather than restricting protection to a few specific

locations (e.g., all fens in the Basin would be afforded a similar degree of protection as Grass Lake and Hell Hole). Aspen communities have been added to the list of plant communities of concern, and therefore, would be afforded more protection than under the current vegetation thresholds. Addition of aspen addresses recommendations in the 2001 Threshold Evaluation Report.

In addition to revising the plant communities protected by this threshold, the indicator measured would be refined to allow for measurement and quantification to determine status of communities and populations. The current non-degradation standard does not provide a reference condition to measure divergence from the desired condition over time. In addition, because the non-degradation standard is not numeric, measures of attainment are open for interpretation by varied evaluators and thus are not consistent or reliably repeatable.

5.5.3 V-3 SENSITIVE PLANTS

Threshold Recommended Changes

The recommendation is to expand the sensitive species list to include those species on the USFS Region 5 sensitive species list that are known to occur (9) or have the potential to occur (11) in the Basin. The threshold title will be changed from sensitive plants to special status species.

The desired condition will be to maintain populations of native, threatened, endangered, rare, special interest or sensitive species found in the Basin at levels which insure sustainability. The proposed indicator for sensitive species is conservation status (high, medium, low priority) and the proposed standard is to maintain existing occurrences of high and medium priority species (low priority species would be those with the potential to occur in the Basin but with no known occurrences). Survey protocols, data collection and evaluation procedures, and database management should be refined for the species deemed to be the highest conservation priorities.

In light of the important influence of lake level on Tahoe yellow cress populations, one possible change to the current threshold would be a variable number of "threshold sites" that are linked to lake elevation. The following changes to the Tahoe yellow cress threshold are based on the relationship between the mean number of occupied Tahoe yellow cress sites and lake elevation for the years 1979-2003 (Table 5-6; # sites = $-2.4555 (\text{lake elevation}) + 15305$, $r^2 = 0.53$). Although requiring the presence of a greater number of sites during low water years more closely fits the parameters outlined for imminent extinction in the Tahoe Yellow Cress Conservation Strategy (Pavlik et al. 2002), there are often only 13 sites that persists when the lake elevation is between 6,227 and 6,228 feet.

Table 5-6: Recommended Number of Tahoe Yellow Cress Threshold Sites Based on the Relationship Between the Number of Occupied Sites and Lake Level.

Lake Elevation (feet)	# of recommended threshold sites
≤ 6,222	26
6,223	24
6,224	21
6,225	19
6,226	17
6,227	14
≥ 6,228	12

These proposed changes would likely be implemented in the future after further analysis by TRPA

Rationale for Change

The recommended changes to existing thresholds for sensitive plants are based on the finding that additional threshold standards are required to maintain a significant value.

Currently five special status species are protected by TRPA threshold standards. However, there is no technical basis for limiting protection to these five species as other species in the Basin may warrant similar conservation priority. The USFS Region 5 list recognizes over 350 plant species as sensitive, 9 of which are known to occur in the Lake Tahoe Basin and 11 that have the potential to occur. Adding these species to the TRPA list of sensitive species will ensure their protection and provide consistent regulation across federal and other jurisdictions in the Basin.

In addition to revising the list of sensitive species protected by this threshold, the indicator measured would be refined to allow for data collection to determine status and trends of sensitive plant populations over time. Measures of population status in addition to presence and absence would enable monitors to measure divergence from the desired condition over time.

5.5.4 V-4 LATE SERAL/OLD GROWTH ECOSYSTEMS

Threshold Recommended Changes

The recommendation is to incorporate this threshold into the “healthy vegetation” threshold goal along with common vegetation. The target for old growth acreage in each forest type will be based on historic conditions.

These proposed changes would likely be implemented as part of in the future after further analysis by TRPA

Rationale for Change

The recommended changes to existing thresholds for late seral/old growth are based on the finding that additional threshold standards are required to maintain a significant value. In addition, since the time this threshold was adopted research has been completed by the Forest Service that provides a more meaningful basis to set thresholds for old growth in the Basin. Therefore, changes to the existing standard are also based on the finding that substantial evidence to provide a basis for the threshold standard, as currently defined, does not exist.

In the past five years the Forest Service has completed several research projects under the Environmental Improvement Program to determine past and present vegetation patterns in the Basin. These include developing a regional model for potential natural vegetation (PNV) of the Basin, establishing baseline information on natural fire history and vegetation conditions in the Basin, and evaluating the density, distribution, and dynamics of vegetation species in the Lake Tahoe Region. These efforts have resulted in refined maps of historic vegetation patterns by watershed which form the basis of future desired conditions. This will allow for a more geographically explicit approach to restoring old growth on the landscape as restoration efforts will be focused at the watershed level rather than at the scale of broad elevation bands.

5.5.5 OTHER

Threshold Recommended Changes

An additional threshold goal is proposed for hazardous fuels in the wildland urban interface (WUI). The threshold goal will be for fuel conditions to pose a low wildfire risk to communities. The proposed indicator is predicted fire behavior and the proposed standard is to achieve 90% probability that predicted fire behavior in treated areas of urban and WUI zones does not exceed surface fire type. This new threshold goal, standard and indicator is proposed to be brought forth in the Regional Plan Update.

Rationale for Change

The public has expressed a great deal of concern over the high amounts of hazardous fuels in the wildland urban interface (WUI). There is a basis for a finding that an additional threshold standard is required to maintain this significant value. This threshold would address this concern by prioritizing removal of hazardous fuels that present a threat to lives and property.

5.6 RECOMMENDATIONS

The recommendations for changes to all vegetation thresholds are described in section 5.5 of this Evaluation Report and also included in the Draft Pathway 2007 Evaluation Report (Version 1.1, 2006) and Technical Supplement. Some of the recommended changes will be addressed in the 2008 Regional Plan Update. The specific changes to be brought forth in the update will be evaluated in an Environmental Impact Statement to be completed before public hearings and requests for Governing Board action. The Compliance Measure updates listed in this document are intended to provide new information on monitoring, interim targets and to correct previous grammatical and factual errors. Potential changes to threshold standards and indicators will be addressed in the Threshold Update portion of the EIS for the Regional Plan Update.

5.6.1 V-1 COMMON VEGETATION

Status of 2001 Threshold Recommendations

Table 5-7: Status of 2001 Threshold Recommendations for the Common Vegetation Threshold

Recommendation	Rationale	Status
Amend TRPA Code of Ordinances to clarify protection of SEZ vegetation	The current Code language for SEZ vegetation protection should be clarified to increase protection. The codification of these protection measures will likely facilitate Project Review and allow for a clear basis for compliance action	Incomplete. This recommendation will be addressed thoroughly through the Pathway 2007 planning process.
Aspen conservation plan	Aspens are a valuable resource within the Tahoe Region. The management of these aspen stands lacks a coordinated effort. An 'aspen working group' would help all land management agencies share information and develop better techniques of management.	Incomplete. Management of aspen stands as plant communities of concern will be addressed through the Pathway 2007 planning process.
Amend TRPA's Code of Ordinances to include the protection of native deciduous trees	TRPA has a non-degradation standard for native deciduous trees, yet does not have language in its Code of Ordinances to clearly protect these species. The proposed amendment will likely regulate all removal of native deciduous trees in the Conservation and Recreation Plan Area Statements, and develop a mitigation policy for removal of native deciduous trees within the urban areas.	Incomplete
Change snow cover restrictions for winter Off Highway Vehicle (OHV) use	Currently, winter OHV use is restricted when the snow cover is less than six inches in depth. In most National Parks and Forest Service lands winter OHV use is restricted when the snow cover is less than one foot in depth. Currently the restriction for over snow logging is two feet in depth of snow.	Incomplete

Recommendation	Rationale	Status
Develop wildlands fire protection section of code.	Currently, the Code section on wildfire protection is "reserved" and is unwritten. There is a great deal of confusion regarding what actions can be taken to improve fire protection and how those actions should be balanced with resource protection.	Incomplete. This recommendation will be more thoroughly addressed by the Pathway 2007 planning process.
Develop an invasive weed control program	The Lake Tahoe Watershed Assessment lists twelve exotic plants as focal species to be actively managed; yet there is no coordinated effort to control these plants. There are a number of model projects already developed in the west to address invasive weed issues. The first step should be to develop an invasive weed council that would coordinate monitoring and eradication efforts. The Natural Resource Conservation Service will be an important partner in this effort.	Incomplete
Update TRPA Approved Vegetation List	Frequently plant material must be replaced after disturbance. TRPA has an old list of plants acceptable for replanting, but this list needs updating.	Incomplete. The SEZ plant list is being updated as part of the Pathway 2007 planning process.
Increase training and education of MOU compliance inspectors	Many of the compliance inspections in the region are done by other agencies under MOUs with TRPA. Education of these enforcement efforts and issues will improve compliance for threshold attainment.	Ongoing
Code changes for construction-related vegetation protection	The current vegetation protection measures exist mainly as guidelines and not specified within the Code. The codification of these protection measures, such as protective fencing, will likely facilitate Project Review and allow for a clear basis for action from the Compliance Division.	Complete
Develop draft for new common vegetation threshold	Recraft the "Common Vegetation" threshold to focus on vegetation goals for the whole landscape. This will require addressing fire and fire protection zones.	Incomplete. This recommendation is being addressed by the Pathway 2007 planning process.
Forest pathology working group	Currently, there is no formal coordination with land management agencies regarding forest pathology. A technical working group could review current forest pathology load and make region-wide recommendations if problems need management action.	Incomplete

Recommended Changes for 2006

As indicated above, The Regional Plan Update will address recommendations for future programmatic and regulatory changes to Compliance Measures.

Implementation of Supplemental Compliance Measures

The following Supplemental Compliance Measures were identified in the 2001 Threshold Evaluation Report to enhance threshold attainment and maintenance of the common vegetation threshold: 146.

Measure 146 is to control and/or eliminate noxious weeds. Noxious weeds continue to become established and spread in the Basin, therefore implementation of this measure is essential to their control.

Modifications or Deletions of Past Compliance Measures

The following Compliance Measures were identified as “measures in place” in the 2001 Threshold Evaluation Report:

13, 14, 15, 37, 127, 128, 129, 130, 132, 133, 134, 136, 137, 139, 140, 141, 142, 143, and 151.

Of these, measure 151 is recommended for deletion because it is the same as vegetation measures 132, and 134.

Measures 39 (land use planning and controls on timber harvesting), 135 (shorezone protection), and 138 (development standards in the backshore), are recommended for addition. The previous omission of these Compliance Measures from common vegetation appears to have been an oversight.

5.6.2 V-2 UNCOMMON PLANT COMMUNITIES

Status of 2001 Threshold Recommendations

Table 5-8: Status of 2001 Threshold Recommendations for the Uncommon Plant Communities Threshold

Recommendation	Comments	Status
Include Taylor Creek Marsh, Upper Truckee Marsh, Pope Marsh, and Hell Hole as threshold communities under the second vegetation threshold	The language of the second vegetation threshold, uncommon plant communities, is very clear that any unique community should be considered for threshold protection if it provides significant scientific, ecological, or scenic value (see above). Taylor Creek Marsh, Upper Truckee Marsh and Hell Hole provide sufficient value to be specifically named within the second vegetation threshold.	Complete
Fund research program for deepwater plants	There is not enough information about the deepwater plants to assess the status of this community. A methodology needs to be developed along with an assessment of the status of this community.	Incomplete
Revise the list of unique plant communities	Conduct new surveys for unique plant communities within the Region and amend the threshold list of rare plant communities.	Incomplete. The list of uncommon plant communities is being revised and expanded under the Pathway 2007 planning process.

Recommended Changes for 2006

As indicated above, The Regional Plan Update will address recommendations for future programmatic and regulatory changes to Compliance Measures.

Implementation of Supplemental Compliance Measures

The following Supplemental Compliance Measures were identified in the 2001 Threshold Evaluation Report to enhance threshold attainment and maintenance of the uncommon plant communities threshold: 147 and 148

Measure 147, protection of deepwater plants, has not been implemented but is recommended for implementation to protect these unique plant communities. Measure 148 has resulted in the improvement of Freel Peak Cushion Plant Communities.

Modifications or Deletions of Past Compliance Measures

The following Compliance Measures were identified as “measures in place” in the 2001 Threshold Evaluation Report: 37, 127, 129, 130, 131, 133, 135, 136, 137, 140, and 141.

Measures 13 (restrictions on SEZ encroachment and vegetation alteration), 14 (SEZ restoration program), and 15 (SEZ setbacks) are recommended for addition. The previous omission of these Compliance Measures from common vegetation appears to have been an oversight.

5.6.3 V-3 SENSITIVE PLANTS

Status of 2001 Threshold Recommendations

Table 5-9: Status of 2001 Threshold Recommendations for the Sensitive Plants Threshold

Recommendation	Comments	Status
Conduct further research on Tahoe Yellow Cress management issues.	In order to implement the Tahoe Yellow Cress Conservation Strategy, more scientific knowledge needs to be gained. Indeed, the continual increase in the knowledge base of this species is critical to implementing the adaptive management strategy.	Ongoing
Revise the list of rare threshold plants	Conduct new surveys for rare plants within the Region, and amend the threshold list of rare plants.	Incomplete. The list of sensitive plants is being revised and expanded as part of the Pathway 2007 planning process.

Recommendation	Comments	Status
Finish and participate in the Tahoe Yellow Cress conservation strategy.	The Tahoe Yellow Cress Conservation Strategy is scheduled to be completed by Winter 2002. This strategy will outline three years worth of conservation projects and commitment to the proposed adaptive management scheme. There will be annual surveys and data analysis by the Technical Advisory Group members.	Complete; Participation is ongoing
Include galena creek rockcress species on the third threshold list, and remove <i>Carex paucifructus</i> from the list.	The Galena Creek rockcress is proposed for inclusion on the third threshold list of sensitive plants, and one species shall be proposed for removal.	Complete

Recommended Changes for 2006

As indicated above, The Regional Plan Update will address recommendations for future programmatic and regulatory changes to Compliance Measures.

Implementation of Supplemental Compliance Measures

No Supplemental Compliance Measures were identified in the 2001 Threshold Evaluation Report to enhance threshold attainment and maintenance of the sensitive plants threshold:

Modifications or Deletions of Past Compliance Measures

The following Compliance Measures were identified as “measures in place” in the 2001 Threshold Evaluation Report: 15, 37, 127, 129, 130, 131, 133, 134, 135, 136, 137, 138, 141, 142, and 145

All measures are recommended for retention.

5.6.4 V-4 LATE SERAL/OLD GROWTH ECOSYSTEMS

Status of 2001 Threshold Recommendations

Table 5-10: Status of 2001 Threshold Recommendations for the Late Seral/Old Growth Ecosystems Threshold

Recommendation	Comments	Status
Develop draft for new common vegetation threshold	Recraft the "Common Vegetation" threshold to focus on vegetation goals for the whole landscape. This will require addressing fire and fire protection zones.	Incomplete. This recommendation is being addressed by the Pathway 2007 planning process.
Forest pathology working group	Currently, there is no formal coordination with land management agencies regarding forest pathology. A technical working group could review current forest pathology load and make region-wide recommendations if problems need management action.	Incomplete

Recommended Changes for 2006

As indicated above, The Regional Plan Update will address recommendations for future programmatic and regulatory changes to Compliance Measures.

Implementation of Supplemental Compliance Measures

No Supplemental Compliance Measures were identified in the 2001 Threshold Evaluation Report to enhance threshold attainment and maintenance of the late seral/old growth ecosystems threshold:

Modifications or Deletions of Past Compliance Measures

The following Compliance Measures were identified as "measures in place" in the 2001 Threshold Evaluation Report: 128, 129, 141, and 142.

All measures are recommended for retention.

5.7 REFERENCES

- Beardsley, D, C. Bosinger, and R. Warbinton. 1999. Old-Growth Forests in the Sierra Nevada: By Type in 1945 and 1993 and Ownership in 1993. Research Paper PNW RP-516. Portland, OR: 46pp.
- Frantz, T.C. and A.J. Cordone. 1967. Observations on deepwater plants in Lake Tahoe. *Ecology*. 48:709-714.
- Karlin, R., R. Schweickert, M. Lahren, and K. Smith. 2000. Status report on seismic profiling and sidescan sonar swath imaging in Lake Tahoe to identify deep-water macrophyte habitats. Unpublished report to the Tahoe Regional Planning Agency.
- Kimmins, J.P. 2004. *Forest Ecology: A Foundation for Sustainable Forest Management and Environmental Ethics in Forestry*. Third Edition. Pearson Prentice Hall, Upper Saddle River, NJ, USA.
- Pavlik, B., D. Murphy, and the Tahoe Yellow Cress Technical Advisory Group. 2002. Conservation Strategy for Tahoe Yellow Cress (*Rorippa subumbellata*). Tahoe Regional Planning Agency, Lake Tahoe, NV. Online: http://heritage.nv.gov/reports/rosu_CS.pdf, Accessed: June, 27 2006.
- Nearctica. 2000a. California red fir (*Abies magnifica*). <http://www.nearctica.com/trees/conifer/abies/Amagni.htm> Accessed: June 26, 2006.
- Nearctica. 2000b. Jeffrey pine (*Pinus jeffreyii*) <http://www.nearctica.com/trees/conifer/pinus/Pjeff.htm> Accessed: June 26, 2006
- Stanton, A.E. and B.M. Pavlik. 2006. Implementation of the Conservation Strategy for Tahoe Yellow Cress (*Rorippa subumbellata*). http://heritage.nv.gov/reports/rosu_res_2005_V2.pdf Accessed: April 4, 2007
- USDA Forest Service. 2000. Lake Tahoe Watershed Assessment. General Technical Report. PSW-GTR-175. Pacific Southwest Research Station.
- USDA Forest Service. 1988. Land and Resource Management Plan. Lake Tahoe Basin Management Unit. Pacific Southwest Region.
- Weixelman, D. 2006. USFS Region 5 Range Monitoring Project 2005 Report. Adaptive Management Services. U.S. Forest Service, Nevada, City, CA. January 4, 2006.
- Personal communications**
- Fournier, D. 2006. Personal communication with vegetation planner David Fournier. Phone conversation. June 7, 2006.

Category: vegetation protection

Parameter: common vegetation

1. **STANDARD:** Increase plant and structural diversity of forest communities through appropriate management practices as measured by diversity indices of species richness, relative abundance, and pattern.

Species Richness: Maintain the existing species richness of the Region by providing for the perpetuation of the following plant associations: Yellow pine forest; Red fir forest; Subalpine forest; Shrub association; Sagebrush Scrub association; Deciduous riparian; Meadow associations (wet and dry meadow); Wetland associations (marsh vegetation); and Cushion plant association (alpine scrub).

Relative Abundance: Of the total amount of undisturbed vegetation in the Tahoe Region:

 1. Maintain at least four percent meadow and wetland vegetation.
 2. Maintain at least four percent deciduous riparian vegetation.
 3. Maintain no more than 25 percent dominant shrub association vegetation.
 4. Maintain 15-25 percent of the yellow pine forest in seral stages other than mature.
 5. Maintain 15-25 percent of the red fir forest in seral stages other than mature.

Pattern: Provide for the proper juxtaposition of vegetation communities and age classes by:

 1. Limiting acreage size of new forest openings to no more than eight acres; and
 2. Adjacent openings shall not be of the same relative age class or successional stage to avoid uniformity in stand composition and age.
2. **INDICATOR (UNITS):** For species richness and relative abundance, the area of plant associations as determined by the Forest Service vegetation inventory. For pattern, the size and location of forest openings as described in federal forest management plans (acres).
3. **MONITORING SUMMARY:** Within the Tahoe Basin the existing vegetation map was last updated in 2004 by the Center for Spatial Technologies and Remote Sensing (CSTARS) at the University of California, Davis. Both the USDA Forest Service has classified the vegetation based on 1997 aerial photographs and TRPA are using this map in currently planning efforts. These maps have been placed within a Geographic Information System (GIS) and form the basis

of the monitoring for this threshold. In addition, public agency records and documented personal communication have also been used to evaluate this threshold. TRPA's Project Review Division records shall be used to assess if there have been impacts to native deciduous trees, wetlands, and meadows.

4. **ATTAINMENT STATUS:**

Species Richness: Attainment

Relative Abundance: All common vegetation types for which targets are specified are in non-attainment. There are an insufficient number of acres of meadow and deciduous riparian vegetation. Acreage of shrubs, mature yellow pine, and mature red fir exceed the standard. Non-attainment for yellow pine forest (high acreage) and red fir forest (high acreage).

Pattern: Attainment
5. **TARGET DATE:** 2106 2020
6. **EVALUATION INTERVAL:** Five-10-20 years
7. **INTERIM TARGETS:** 6% of the yellow pine forests will be in seral stages other than mature by 2005, and 6% of red fir forests will be in seral stages other than mature by 2005. Measurable progress toward meeting the threshold is projected to be small with <3% of red fir or Jeffrey pine moving stands being converted to stages of stand development other than mature within the next five years. The same rate of conversion is projected for wetland, deciduous riparian, and shrub types. Changes this small will be difficult to detect with current monitoring methods. Measurable progress toward achieving the relative abundance threshold could be made within the next 25 years.
8. **COMPLIANCE MEASURES:** (See Appendix A Section II for inventory)
 - a. **MEASURES IN PLACE: VEGETATION** 13, 14, 15, 37, 39, 127, 128, 129, 130, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 454
 - b. **EFFECTIVENESS OF MEASURES IN PLACE:** The measures in place are generally effective, but not wholly effective as the threshold standard is not being met. Recommendations and additional programs will be needed to assure the attainment of this threshold.

- c. SUPPLEMENTAL MEASURES:
VEGETATION 146
 - d. EFFECTIVENESS OF SUPPLEMENTAL MEASURES: Supplemental measures 146 is expected to be effective at the control of noxious weeds.
9. ADEQUACY OF COMPLIANCE MEASURES:
The compliance measures have not provided for a pro-active approach to forest management and attainment of a healthy forest situation in attainment with desired future conditions. The measures have been a reaction to events in the resources of the Region brought about by fire exclusion and past logging practices. Revisions to the compliance measures in place are recommended to provide management strategies and direction for land managers to restore the health of the Region's forests. Implementation of supplemental measures is recommended. Forest restoration projects, with the goal of attaining desired future conditions, must be supported to achieve the thresholds ~~and—the recommended old-growth threshold.~~

Category: vegetation protection

Parameter: uncommon plant communities

1. STANDARD: Provide for the nondegradation of the natural qualities of any plant community that is uncommon to the Region or of exceptional scientific, ecological, or scenic values. This threshold shall apply but not be limited to (1) the deep water plants of Lake Tahoe, (2) Grass Lake (sphagnum ~~fen bog~~), (3) Osgood swamp, (4) the Freel Peak Cushion Plant community, (5) Hell Hole, (6) Upper Truckee Marsh, (7) Taylor Creek Marsh, and (8) Pope Marsh.
2. INDICATOR (UNITS): Presence of the individual species which comprise the community. Natural qualities of uncommon plant communities as determined by inspection by qualified experts (unitless).
3. MONITORING SUMMARY: The monitoring program consists of periodic inspection of the mapped communities at Grass Lake, Osgood Swamp, ~~and~~ Freel Peak, Hell Hole, Upper Truckee Marsh, Taylor Creek Marsh, and Pope Marsh. In 2004 transects were established in all uncommon plant communities using the Forest Service Region 5 Meadow Monitoring Protocol. These data will provide a baseline for future monitoring.
4. ATTAINMENT STATUS: Attainment. With respect to deepwater plant beds, their status is unknown. It is speculated that the very deepest plant beds may have ceased to exist, due to the gradual loss of Lake Tahoe's clarity. Inshore populations could be affected by invasion of Eurasian water milfoil. The dragging of anchors from fishing boats has disturbed some plant beds.
5. TARGET DATE: Not applicable
6. EVALUATION INTERVAL: Five years
7. INTERIM TARGETS: ~~None By January 2003, TRPA will fund a research program to assess deepwater plants and develop monitoring program.~~
8. COMPLIANCE MEASURES: (See [Appendix A for complete list of compliance measures](#))
 - a. MEASURES IN PLACE: VEGETATION [13](#), [14](#), [15](#), 37, 127, 129, 130, 131, 133, 135, 136, 137, 140, 141

- b. EFFECTIVENESS OF MEASURES IN PLACE: The measures in place are generally effective, but not wholly effective. Recommendations and additional programs will be needed to assure the continued attainment of this threshold.
 - c. SUPPLEMENTAL MEASURES: VEGETATION 147 and 148
 - d. EFFECTIVENESS OF SUPPLEMENTAL MEASURES: ~~Supplemental measures are generally expected to be highly effective~~ measure 148 has been effective in restoring cushion plant communities on Freel Peak. Measure 147, protection of deepwater plants, has not been implemented but is recommended for implementation to protect these unique plant communities.
9. ADEQUACY OF COMPLIANCE MEASURES: Compliance measures in place have been adequate to prevent the degradation of the uncommon plant communities, although there is concern for the long-term health of the deepwater plant community. ~~and the Freel Peak Cushion Plant community.~~ At this point in time, the greatest measure of protection is due to the remoteness of habitat for the uncommon plants, including the deepwater plants, although the in-shore limits of deepwater plants could be out-competed by Eurasian water milfoil. Plants found at the South Shore sea mounds at a depth of approximately 100 feet have been greatly impacted by dragging of anchors from fishing boats. Should future monitoring indicate that any uncommon plant community is, or is likely to be, adversely affected, supplemental measures will be implemented. Funding needs to be obtained to map and further define the deepwater plant community. If it is determined that the spread of Eurasian water milfoil is impacting inshore limits of deepwater plant populations, implementation of water milfoil control or eradication measures should be considered. ~~An increase in use of the Freel Peak area could result in more trails which could result in impacting the cushion plant community.~~

Category: vegetation protection
Parameter: sensitive plants

- STANDARD: Maintain a minimum number of population sites for each of five sensitive plant species.

Species	Number of Population Sites
<i>Lewisia pygmaea longipetala</i>	2
<i>Draba asterophora v. macrocarpa</i>	2
<i>Draba asterophora v. asterophora</i>	5
<i>Rorippa subumbellata</i>	26
<i>Arabis rigidissima</i>	7

- INDICATOR (UNITS): The number of population sites depicted on TRPA official maps that are maintained as suitable habitat for sensitive plant species as determined by field inspection by a qualified expert (unitless).

3. MONITORING SUMMARY: Monitoring of *Lewisia*, *Draba*, and *Arabis* is performed by the Forest Service. Monitoring of *Rorippa* consists of an annual survey and ongoing inspections by TRPA, the Forest Service, and California State Lands Commission ~~and case-by-case inspection by TRPA in project review site visits, of *Rorippa subumbellata* population sites~~ for evidence of disturbance, and case-by-case inspection by TRPA in project review site visits, ~~and annual inspection of sites not otherwise visited. Higher Lake levels since 1995 have impacted some of the mapped *Rorippa* populations and possibly other dominant populations to emerge.~~

Project monitoring which results in any discovery of a TRPA sensitive species or species of interest requires immediate reporting and implementation of protection measures in accordance with the Code.

- ATTAINMENT STATUS: Attainment for *Lewisia*, *Draba*, and *Rorippa* through 2005. *Rorippa* out of attainment in 2006. Status of *Arabis rigidissima* is unknown. ~~Non-attainment for *Rorippa* based upon limited surveys of *Rorippa subumbellata* during 1995. Attainment for *Lewisia* and *Draba* based upon Forest Service inventories and TRPA project monitoring. *Carex paucifructus* is recommended to be removed as a threshold species. This plant has not been observed in the Tahoe Region since early this century and it is now thought that the identification and description may have been in error.~~

- TARGET DATE: ~~2006~~ In attainment through 2005. Threshold for *Rorippa* will be in attainment again when lake levels recede to approximately 6,225 feet.

- EVALUATION INTERVAL: Five years

- INTERIM TARGETS: ~~By September 2002 TRPA will consider for adoption the Tahoe yellow cress conservative strategy. By August 2003 the TYC technical advisory group will facilitate the planting of 4,000 seedlings of Tahoe yellow cress. The threshold has been in attainment since 2001. However, the threshold will be out of attainment in 2006 because of high lake levels and is not expected to be in attainment again until lake levels are low for several years. An interim target cannot be set for *Arabis rigidissima* until the number of populations and their locations are confirmed. This will be completed by August 2011.~~

In light of the important influence of lake level on Tahoe yellow cress populations, the current threshold would more appropriately be a variable number of "threshold sites" that are linked to lake elevation. As an interim target TRPA should examine further the use of the following methodology to establish a new standard for the species. The number of threshold sites in a given year would be determined using the following relationship between lake elevation and number of occupied sites derived from 1979-2003 Tahoe yellow cress survey data: number of threshold sites = -2.4555*(lake elevation) + 15305, r² = 0.53.

- COMPLIANCE MEASURES: (See Appendix A for complete list of compliance measures See Section II for inventory)
 - MEASURES IN PLACE: VEGETATION 13, 15, 37, 127, 129, 130, 131, 133, 134, 135, 136, 137, 138, 141, 142, 145
 - EFFECTIVENESS OF MEASURES IN PLACE: The measures in place are generally effective, but not wholly effective. Recommendations and additional programs will be needed to assure the attainment of this threshold.
 - SUPPLEMENTAL MEASURES: VEGETATION - None proposed at this time.
 - EFFECTIVENESS OF SUPPLEMENTAL MEASURES: None proposed at this time.

- ADEQUACY OF COMPLIANCE MEASURES: Compliance measures to date

have been partially effective in preserving habitats of sensitive plant species. These species occur only in the backdrop country not subject to development, except for *Rorippa subumbellata* which grows only along the lakeshore. [TRPA listing and Forest Service staff cooperation on remotely located resource management projects enhances preservation of obscure population sites.](#)

While many of the sensitive species occur in remote and normally inaccessible areas, ~~an increase in resource management projects potentially affects sensitive plant sites~~ [future projects planned for the Heavenly Ski Area on Forest Service land have the potential to negatively impact *Draba asterophera* v. *asterophera*.](#) ~~TRPA listing and Forest Service staff cooperation on remotely located resource management projects enhances preservation of obscure population sites.~~ TRPA staff awareness and ability to identify sensitive species is essential for non-degradation of existing sites as well as identification of new population sites. Staff training should be conducted.

Category: vegetation protection
Parameter: late seral/old growth forests ecosystems

1. STANDARD: Attain and maintain a minimum percentage of 55% by area of forested lands within the Tahoe Region in a late seral or old growth condition, and distributed across elevation zones. To achieve the 55%, the elevation zones shall contribute as follows:

- The Subalpine zone (greater than 8,500 feet elevation) will contribute 5% (7,600 acres) of the forested lands;
- The Upper Montane zone (between 7,000 and 8,500 feet elevation) will contribute 30% (45,900 acres) of forested lands;
- The Montane zone (lower than 7,000 feet elevation) will contribute 20% (30,600 acres) of forested lands.

Forested lands within TRPA designated urban areas are excluded in the calculation for threshold attainment. Areas of the montane zone within 1,250 feet of urban areas may be included in the calculation for threshold attainment if the area is actively being managed for late seral and old growth conditions and has been mapped by TRPA. A maximum value of 40% of the lands within 1,250 feet of urban areas may be included in the calculation.

Because of these restrictions the following percentage of each elevation zone must be attained to achieve this threshold:

- 61% of the Subalpine zone must be in a late seral or old growth condition;
- 60% of the Upper Montane zone must be in a late seral or old growth condition;
- 48% of the Montane zone must be in a late seral or old growth condition;

2. INDICATOR (UNITS): The number of acres of forest mapped in late seral or old growth condition.

3. MONITORING SUMMARY: The ~~USFS~~ [USDA Forest Service](#) classified the forested communities in 1998 and will do so every ~~five~~ [eight](#) years.

4. ATTAINMENT STATUS: This threshold is not in attainment because of the small amount of forest in late seral or old growth condition

5. TARGET DATE:~~2060~~ [2110](#)

6. EVALUATION INTERVAL: 10-20 years

7. INTERIM TARGETS: [Within the next five-year evaluation period measurable progress toward meeting the threshold is projected to be small with <3% of stands being converted to late seral or old growth conditions. This small change will be difficult to detect with current monitoring methods. With widespread implementation of treatments to accelerate the development of late seral and old growth conditions measurable progress toward achieving this threshold could be made within the next 25 years](#)

8. COMPLIANCE MEASURES: (See Appendix A for complete list of compliance measures).

- a. MEASURES IN PLACE: VEGETATION 128, 129, 141, 142
- b. EFFECTIVENESS OF MEASURES IN PLACE: [The measures in place are generally effective, but not wholly effective. Recommendations and more aggressive management will be needed to assure the attainment of this threshold.](#)
- c. SUPPLEMENTAL MEASURES: VEGETATION None proposed at this time.
- d. EFFECTIVENESS OF SUPPLEMENTAL MEASURES: None proposed at this time.

9. ADEQUACY OF COMPLIANCE MEASURES: Protection of large diameter trees should contribute towards attainment of this threshold. Additional measures to encourage silvicultural treatments to accelerate the development of late seral/old growth characteristics in stands throughout the basin will be necessary to attain this threshold.