

Road Network Monitoring

The CPC road network contributes sediment to the region 's stream system, and needs regular inspection, maintenance, and review of mitigation.

1. Review of newly reworked roads (associated with harvests) during fall, prior to snow, following operations;
2. Review of the same cohort of roads during the subsequent summer.
3. Review by aerial photo or on-the-ground analysis of road segments not presently used or accessible; and commitment by CPC to train field personnel in identification of road problems to create a consolidated queue for road repair.

Useful monitoring of the road system needs to be the responsibility of all the CPC staff that use the road system on a regular basis. Field people need to understand long-term road drainage, the role of natural stream courses and critical dips, of undersized or likely-to-plug culverts, and of non-CAF road inputs to the sediment system, and the importance of equipment operators to understand the principles of erosion and sedimentation as a regular part of their training. This education will also include learning techniques of assessing and describing erosion events, so observed field conditions can be queued into regular maintenance of the road system. With this educational change, every trip onto CAF land becomes a potential review of erosion from the road system.

Landings failing into streams did not appear to be a significant problem within either the stream reach inventory or the sub-watershed analysis. Because of the potential significance of landing failures, however, landings should be considered during future road evaluations.

Some eroding road sites need both monitoring and restoration, preferably with stable and long-lasting remedies. In some instances, there is no present access to those sites. CPC will begin inventorying those areas 'off the grid ' by aerial photos and on-site analysis, to ensure that no persistent sores are reducing water quality in untraveled areas.

Harvest Areas Monitoring

Because uneven-age management is the primary silvicultural system employed by CPC, harvest areas were not found to be significant sources of erosion when considered separately from roads. However, yarding methods will be further limited to control erosion on those areas which appear to be most problematic: steep slopes and naturally erodible soils. Continuing reduction of impacts from harvest areas may be achieved by:

1. Conducting in-field surveys following harvest to 'check off' the implementation of erosion controls.
2. Walk-through on the year following harvest, also with a document able protocol, to see where mitigation was more and less successful.
3. Consolidation of data to determine which erosion control methods work best over time; and evaluation of representative areas presently out of the harvest schedule, to be assured that no

problems are developing out of sight. Emphasis should be given to broken down water routing structures.

Watercourse and Buffer Areas Monitoring

In the preparation of our Plan, the watershed assessment highlighted the importance of having regional standards against which to evaluate stream habitat components and riparian buffer characteristics. In addition, field research was often limited in its conclusions by the time of year in which data were taken, the amount of stream which could reasonably be surveyed, and the ever-present trade-off between detail (intensive survey) and scope (extensive survey). Clearly, it is important that the following take place:

1. Land managers understand the methods, tools and vocabulary to describe the quality of the resources they manage.
2. State and Federal agencies agree upon resource issues and share the most useful and timely protocols with which to assess those resources.

Reasonably, CPC commits to evaluation of selected stream reaches of high sensitivity--both geomorphic and biologic--for elements of habitat, sedimentation, particle size, pool formation, canopy and biotic integrity. These reaches can be revisits of previously identified sites, or in the form of a new inventory of sites determined by regional authorities or agencies. Our goal is to add to the quality of the regional data base.

In return, CPC hopes to work with a consortium of the regional land management agencies to determine what is important, what consistent methods may be applied, and at what levels 'thresholds' exist. Again, our goal is to work within the regional database and evaluate the quality of our streams and erosion mitigation in a constructive manner.

In developing a monitoring program, it is important to revisit and share some of the lessons learned from our earlier reviews of literature and field data, to know what we may get out of these studies. Some of the limitations found to this point are:

1. Impacts of different nature travel very different distances, so no stream assessment method will necessarily pick up causal relationships with the watershed.
2. Pool filling and substrate evaluations function poorly on alluvial planes because (1) the pools are built on and in a substrate of sediment, (2) it is very hard to measure for relative pool filling because the pool bottom is sediment also, and (3) the pools are less affected by high energy winter flows than upstream sites because winter flows cover the whole valley.
3. Meadow stretches, while they may add diversity and food sources to fishery habitat do not reflect well in standard indices and may deserve a more careful ecological evaluation.
4. The importance and abundance of pools in steep, boulder covered reaches may be undervalued.
5. The high energy level of some streams moves materials around significantly, and these streams may require re-measurement on a regular basis, as they change.

6. It is important to have a set of tools with which to evaluate streams, so that it is possible to conduct 'quick and dirty' stream health evaluations within meaningful protocols.

7. Using a variety of stream evaluation systems may serve to better compare these streams. There is no definitive methodology to evaluate streams and salmonid habitat.

Despite these constraints, CPC is interested in better understanding the biotic and geomorphic resources of their watercourses. Our intention is to continue using the tools which have shown to be most useful, to add new evaluation methodologies for resource conditions presently un- or under-assessed, and to work with agencies or neighbors whenever possible. Our present plan for continuing watercourse assessment is as follows:

1. Surveys to evaluate spawning habitat during spawning season.
2. Revisits of baseline sites to allow tracking of pools, substrate, woody debris, bank stability, channel stability and cover.
3. Temperature evaluations on streams during hottest, lowest flow conditions.
4. Continued monitoring of riparian forest conditions.

Mitigation of Potential Impacts of Forest Management Activities

CAF will continue to manage its lands in the future much as it has in the past 60+ years. Specifically, it will emphasize uneven-aged management in a way to naturally regenerate harvested areas with a near historic mix of the five major conifer species. Marking and subsequent logging will continue to create small (up to 2.5 acres in size) patches (groups) to facilitate pine regeneration and provide for early seral plant communities.

Future CAF management will continue to place emphasis on large trees, decadent trees, snags and large woody material retention throughout the ownership. Levels of late seral habitat elements that will produce moderate to high populations of wildlife species dependent upon these elements will be retained in functional late seral stands. These future CAF strategies will have a tendency for a moderate increase in functional late seral conditions, especially in WLPZ's, while continuing to provide for some early seral habitat, unless unforeseen large wildfires occur which will create new early seral types.

Major habitat enhancement opportunities on CAF can be divided into three categories. The first being to improve the crown cover density and late seral structure in WLPZ's. The second will be to restore much of the riparian vegetation formally found along the banks of watercourses and in wet meadows. The third is to continue to provide early seral habitat throughout the property. These three categories, each discussed below, will by far be the most effective in enhancing wildlife habitat on CAF.

Late Seral and Other Habitat Elements

A number of species of concern require habitats having dense canopies or large trees (dead or alive) for some portion of their life cycle, especially reproduction. These include the bald eagle, goshawk, great blue heron, osprey, great gray owl, California spotted owl, wood duck, Pileated woodpecker, fisher, and marten. Mitigation for the first six species will involve two steps. The first takes place during timber harvest plan preparation. CAF employees knowledgeable of these species' biology and ecology will make visual observations of stands, trees, and forest floor conditions. Second, any nests found will trigger consultation processes with California Department of Fish and Game (DFG). Mitigation will follow Forest Practice Rule requirements and DFG recommendations, including harvest timing and harvest restrictions.

Large snags and green culls will be left for retention and down debris recruitment, as they are encountered during timber marking and salvage program, unless they pose a safety or fire hazard. On CAF, almost no trees are harvested unless marked by a CAF forester.

For the remaining six species, along with the previous six species, CAF proposes a habitat retention policy throughout its ownership. Large trees, decadent trees, large and small snags, and large woody material retention will continue to occur throughout CAF lands. Dense canopy conditions, with over 60 percent canopy closure, will continue to be provided in the functional late seral stands, in the WLPZ's (or grown towards this level), and in the clumpy pattern resulting from the continuation of CAF's uneven-aged management. At all times, the extent of timber stands with greater than 60 percent canopy of moderate to large-sized trees (CWHR 3D, 4D, and 6 as typed on aerial photos) will be at least 50 percent of CAF lands. If biomass harvests are to be conducted in an area, five percent of the area's dense understory will be retained in clumps from one-twentieth to one acre in size and scattered over the harvest area. Forest carnivores, especially fisher and marten, and deer will benefit from these retention standards. Finally, existing late seral stands will provide additional habitat for these species.

Currently, for Board designated sensitive species, it is estimated that there are about 17 nests on CAF, with osprey accounting for 8, bald eagle having 4, goshawk with 4, and great blue heron with 1. Over the next 10-year period, it is estimated that 20 more sites will be found, while 10 of the existing 17 nests sites will become non-active. Therefore, 10-years from now it is assumed that there will be 27 nest sites, with an average size of 10 acres per site with forest management constraints (including retention of nest tree, screening trees, perch trees, and alternate nest trees). Retention of these features, for the 270 acres involved, is assumed to amount to an insufficient harvest reduction. CAF foresters have been able to salvage most dead trees within these no cut areas, after the time period restrictions, based on field inspections by California Department of Fish and Game personnel, and we would normally not cut many trees in these areas anyway during a normal cutting cycle entry.

A great gray owl habitat management plan was prepared for an area surrounding Deer Creek Meadows, under the Elam Creek Timber Harvest Plan, 2-92-250-TEH (5) and is being applied to other wet meadows on CAF.

Riparian Habitats

On CAF, riparian areas are always within a Class I or II WLPZ. Since they have damp soil with some “free” water, they are always potential amphibian habitat. Therefore, the start of the protection zone width is from the outer edge of these wet soils.

Management for Water/Lake Protection Zones will meet State Forest Practice Rule requirements with 80 percent of full (potential) canopy closure to be retained in the zones of Class I and Class II watercourses, wet soil areas, ponds, springs and lakes. Large snags and down large woody material retention will assist in creating and maintaining fishery habitat and the WLPZ’s use as wildlife travel corridors. Finally, Class I and II WLPZ’s will have Equipment Exclusion Zones (EEZ’s) covering the zone widths. Species of concern, including the California red-legged frog (potentially), foothill yellow-legged frog, and western pond turtle (potentially), spring-run Chinook salmon, and wood duck will all benefit from these policy decisions protecting riparian areas. Stream temperatures should remain cool due to the canopy cover retention and limitation on equipment use in these areas will minimize sediment movement into watercourses and soil and litter disturbances.

Other species which benefit from the protection measures are butterflies whose host plants are found in this type, the long-tailed weasel, and gray fox which find food in these areas.

Livestock fencing along watercourses has been previously accomplished in Deer Creek Meadows and Fanani Meadows. Fencing along these watercourses excludes cattle grazing to restore the riparian vegetation that used to exist there. Stream temperature measuring devices, called “HOBOS,” have been placed in CAF streams since 1994. Five are in Deer Creek, two in Gurnsey Creek, three in Wolf Creek, one in Solider Creek and four in Butt Creek.

An example is a measurement point on Gurnsey Creek immediately below a six-mile run through a dense to moderate canopy of large conifer trees. Downstream from this point, the Creek flows through a broad, flood plain area, with little stream shade. The Creek flows for about one and one-half miles to the next measurement point. As an example of the temperature difference due to the flow through the unshaded section of the Creek, on June 8th the shaded water temperature was around 61 degrees for the daily high and the unshaded temperature was 64 degrees. Later in the summer, on August 14th the shaded temperature was around 55 degrees while the unshaded temperature was near 67 degrees. Generally, the shaded high daily temperatures for the time period were between 50 to 58 degrees and for the unshaded temperatures they ranged from 59 to 66 degrees. The daily minimum temperatures for both locations were just about the same around 48 degrees.

This would indicate the amount of solar heating of the stream water on the unshaded portion of the Creek is considerable, and, from the analyses of some of CAF’s other locations, the increase in temperature happens very quickly once the water is in direct sunlight.

Wet Meadow Habitat

The willow flycatcher, greater Sandhill crane, and great gray owl nest and forage in the wet meadow or associated riparian habitats. CAF will evaluate potential habitats for these species, prior to individual harvest plan submittal. If these wildlife are located, consultations with California Department of Fish and Game will be initiated. Due to the spatial separation of most

meadow and forest habitats, the presence of these species may constitute a timing constraint but are not expected to result in a reduction of timber harvesting. Meadow habitats are not planned for any future forest management activities.

Early Seral Habitats

The Columbian black-tail deer represents an easily seen and economically-important early seral species. Several previously described CAF policies will help mitigate forest management impacts to deer. First, five percent of all conifer thickets will be retained during biomass thinning. If possible, these areas will be located near meadows, steep breaks in slope, and/or around concentrations of large down logs—places and conditions that are used for hiding cover and favored as fawning areas.

In addition, various-size group selection cuts will provide increases in forbs and shrubs. Wildfires, wet meadows, riparian areas, shrub patches, rocky areas, serpentine areas and rhyolite soils on the plateaus all contribute to early seral habitat areas. Wildfires over the years have created early seral stage types on CAF, ranging from a few acres to over 100's of acres. No doubt, natural fires will continue to burn in the future.

Small natural openings and those created by timber harvesting are very numerous on CAF. These openings, often less than one-half acre in size, can often provide the same early seral stage plant communities as is found in openings much larger in size. While late seral stage areas are best at 40, 80 or more acres in size, the habitat elements for early seral stage wildlife can apparently be satisfied on CAF with the small openings mentioned above. The wildlife species using these small openings are usually small mammals or insects and butterflies which have small home ranges, while the larger species using these openings like birds and deer have the mobility to move from opening to opening with ease. Therefore, this is an interesting situation on CAF where early seral stage openings can be found within a much larger area of late seral stage timber stands.

CAF Water/Lake Protection Zones

CAF is proud of its management in the Watercourse and Lake Protection Zones (WLPZ's) on the property. Portions of some WLPZ's will receive no timber harvest while others will be managed to retain at least 80 percent of full canopy closure at all times. Snag and down woody material retention levels within WLPZ's will, over time, come to the levels required of functional late seral stands, if not already there. At least 3 trees leaning over the watercourse that are at least 16 inches DBH and at least 50 feet tall per 1,600 feet of stream bank will be retained within 50 feet of watercourse edge. Within the zone, there will be no reduction in species composition. If presently deficient, harvesting will be done to increase foliage height diversity.