

CHAPTER 10 - DATA GAPS, INVENTORY, AND MONITORING NEEDS

The data gaps identified within this analysis were produced by the team members' ability to answer the critical questions identified for the watershed (see Chapter 4). In some cases, the question was not able to be answered specifically due to lack of area specific information, and professional interpretation and judgement were used to derive the logical answer or outcome. In other cases, no answer could be developed but, insight was gained into some of the factors that are important in the question.

Data Gaps

Erosion and Sediment

Methods to identify potentially unstable areas (landslide areas) are evolving, and work/research need to continue to improve these methods. Two levels/scales of research should continue to enable better prediction of potentially unstable areas. The first scale deals with identification of areas at the watershed level; currently digital terrain models with modules to model groundwater routing and other factors are evolving. The second scale involves research investigation of specific factors that influence slope stability (e.g., soil depth, water routing, contribution of root strength, etc.).

Surface erosion has been intensively studied for agricultural lands. However, less data are available for forest land soils and related management practices. Intensive research plots established on typical forest soils under differing forest management practices are needed to quantify the amount of erosion and related sediment production. Monitoring should occur on selected sites and management actions that are suspected to produce erosion.

Erosion and sediment production from roads have been investigated. However, data are lacking relating to sediment routing from roads in the Oregon Coast Range. To help determine which segments of roads are contributing to stream sediment load, more information is needed on how far sediment travels from lead-off ditches and cross-drains. Monitoring for sediment production and water routing should occur on decommissioned roads.

Total sediment rates are a wild guess at best. We have no actual sediment data for Wolf Creek and the relationship between natural and human caused sediment cannot be determined.

Hydrology and Water

Flow - Flow data is accurate for the years 1968-1971; however, there is no way to estimate if there have been any changes since then. The only way to relate flow changes to management is to have a continuous record. A temporary station that measures continuous flow for two years would give the data needed to determine present flow regimes and to compare them to 1968-1971.

Water Temperature - There is very scattered water temperature data. There is not enough to track trends or to determine temperatures in important subbasins. A series of recording thermographs throughout the basin would give us the data to determine water temperature flows and sources of the higher temperatures.

Channel Morphology - The channel morphology data, and the hydrologic function data for the streams and riparian areas were based on a very small sample. The data used to develop this very important section has no statistical significance. A well designed survey of channel morphology would not only increase reliability, but would also give information on the spacial relationships of the various morphological channel types. This information is essential to the understanding of the hydrologic processes, aquatic (fish) habitat, and opportunities for restoration.

Stream Classification - We have not classified the streams according to the ROD classification of permanently flowing and intermittent. A third classification of channel needs to be added to account for all streams. An updating of the HYD theme that includes ROD classifications is still needed. This needs to be done on a district wide basis.

Fisheries

There is an adequate amount of data being gathered by fish biologists and technicians on the District to aid in the analyses of fish species and habitat in the watershed. Some of this data is in the form of historical records yet to be entered into the existing database, and other data is currently being collected and entered. The amount of data available for watershed analysis depends on where these data have been collected. Habitat surveys were done on Public Lands over the course of several years, but were limited primarily to reaches with anadromous fish.

There is little information on the current distribution, numbers, trends and habitat for non-game fish in the watershed, as well as, macroinvertebrates.

Vegetation - Upland and Riparian

Current Vegetation - One of the major data gaps currently facing BLM's watershed analysis teams is the development of a "current vegetation" layer. Due to the checkerboard ownership pattern, BLM's data covers only a portion of the watershed, and little information is available from neighboring landowners. Historical vegetation information, primarily maps, is another data gap. However, given enough staff time and research, sources were located for Wolf Creek watershed. This is a watershed specific task and can be quite time-consuming.

Fire History and Disturbance Events - There has been limited research on fire history in the Coast Range. Sources of information are very general and broad and tend to be of limited value to a specific watershed. Our ability or inability to develop a good disturbance picture for Wolf Creek watershed did not allow us to develop a sense of the Range of Natural Conditions for the basin. Knowledge of large disturbances and the successional pattern and stand structure that resulted are not available and limit our understanding of both succession and disturbance as change elements within a watershed.

Species Specific Information - Historical population information and current distribution are not known for the variety of plant/fungal species. Historical and current distribution information is lacking or nonexistent from adjacent private lands. Coupled with the lack of population and distribution information is the lack of habitat requirement information. What are the habitat requirements for each of the plant/fungal species listed in the ROD or Special Status species? Noxious weed information and special forest products data were also lacking and the same data requirements for these species exist as for the survey and manage and Special Status species.

Habitat Associations - Little or no information, other than professional judgement, was available to assist in the translation of vegetation and stand information to habitat for the variety of species listed in the ROD. Some form of habitat association mapping that links vegetation composition and structure to habitats for a range of species is needed.

Wildlife and Habitat

Through the watershed analysis process, there were data identified that could have improved upon this process had this data been available. Also, there were instances in which data was available, however, it was not specific enough or complete to aid in analysis conducted for the watershed.

There was a need in this analysis for more complete data on snags and down logs in the watershed. The data that were collected did not measure length and average diameter for logs encountered, and only tallied logs that were bisected along a transect. The diameter measured was where the log was crossed during the transect. Additionally, snags were tallied and not measured for height. Both components could be better represented as density figures if variable plots were conducted using a measured scale versus a prism. Data collected in this suggested manner were conducted and described in Spies et al.¹ and conducted in Irwin et al.²

Data were absent on a large number of wildlife species that potentially occur in the watershed and the habitats associated with these species. These species should be more than potentially known for the watershed, thus enabling proper analysis of the watershed and the affects of management activities. The highest priority of these species are the Special Status species. These species could potentially cause a "train wreck" if it were determined that they occupied the watershed and planned projects detrimentally impact those species. Proactive wildlife management will aid in preventing these "train wrecks." Information on the impact from introduced or exotic species within the watershed was absent. Information such as this aids in determining problem areas and areas where management of these exotic species may help in the management of native species that are of concern. The problem of competition between exotic species and endemic species has the potential to escalate with the continued expansion of residential areas into rural areas.

The Wolf Creek watershed was fortunate in having habitat classifications identified for spotted owls. These habitats were generally described for suitability and use by spotted owls; however, habitat components (down wood, snags, tree density, canopy cover, etc.) were not fully described for these habitat types. Microclimate feature information for these habitat types would have provided additional information for species not requiring large amounts of habitat for their home ranges. Further research should go into developing habitat associations for wildlife species potentially occurring in the watershed. This habitat association would have provided a means for determining the limitations of species' occupancy for the watershed.

Habitat is the limiting factor for all wildlife species. With additional and more intensive information on wildlife habitat types within the watershed, more complete analyses can be conducted to determine wildlife and habitat association within the watershed. Riparian habitat information is being gathered during fish surveys. However, this information is not consistently gathered across the landscape and is not being entered consistently into the databases. Additional information and more complete information on riparian conditions along all streams should be gathered to allow for proper analysis of current and future management options and riparian conditions.

The current status of wildlife observations on the District is changing as a result of the need identified for this watershed analysis. However, it is rather important that the wildlife observation database be linked to GIS to provide analysis of habitats associated with wildlife species observed. Furthermore, this type of information must be gathered for each observation, and all observations recorded and data entered into the database should be consistent across the District.

Inventory Needs

For several of the resources analyzed in this analysis there are significant information gaps that can only be filled with inventory. This attempts to identify some of the general areas where inventories needs to be designed, developed, and implemented to improve baseline information available for the next iteration of analysis in the Wolf Creek watershed.

Fisheries and Wildlife

Fisheries/Aquatic - There are several species of aquatic organisms that potentially occur in the watershed that need surveys done to determine their status. These surveys are required for the "survey and manage" species identified in ROD prior to any projects planned in the watershed. There were cursory surveys for macroinvertebrates done in the watershed and these surveys discovered 3 species that are listed in Appendix J2 of the FSEIS.³ It is further emphasized in BLM Manual 6840 - Special Status Species Management, that the Bureau ". . . shall ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species . . ." under the Endangered Species Act of 1973, as amended. Therefore, surveys for these species become even more important prior to the manipulation of the stream channel and structure.

Wildlife and Habitat - Continued surveys and monitoring of northern spotted owls located in the watershed, and throughout the geographic province, will aid in the requirements necessary to meet protocol for surveying for spotted owls in and around planned project sites.

A large amount of information has been gathered on the spotted owls occupying the Coast Range Province, and cursory information exists for marbled murrelets. Additional surveys for marbled murrelets should be conducted in the western

portion of the watershed in the existing old forests. These areas pose the highest potential for murrelet occupancy. As for the myriad of other wildlife species that potentially exist in the watershed, little, if anything, is known about these species and their habitat needs. Surveys for species listed in the ROD are to be conducted to acquire additional information and ascertain protection and ". . . will be directed to the range of that species and the particular habitats that it is known to occupy." There are several species of arthropods, amphibians, and mollusks on this list that potentially occur within the watershed. These species need to be identified and mitigation measures implemented prior to any project work done in the watershed. Protocol for surveying for amphibians and reptiles on the Eugene District has been completed and work done so these protocol can help to determine abundance, habitat associations, and population ecology for these species. This work can be combined with work done for fish habitat enhancement or riparian conversion work.

The only mammal species of concern that is on the "survey and manage" list, and potentially occurs in the watershed, is the red tree vole (*Phenacomys longicaudus*). This species spends most of its life in the canopy of coniferous trees and eats needles of conifer trees. It is more abundant in late-successional forests than young forests, and appears to be closely associated with older forests. Because of their arboreal habits they are difficult to locate and study. Consequently, abundance, habitat associations, and population ecology of the species is not well understood. The survey and manage strategy for this species determined in the ROD is to "survey prior to activities, and manage sites." Developing a protocol for surveys is the first step. Protocols are currently being developed, unofficially, and could be implemented soon. These protocols should take into account various other data collecting opportunities to assist in providing information on this species, as well as others.

There are several species on the Special Status Species list that have the potential to occur in the watershed. The species that may be the easiest and least expensive to begin to survey are the bats, specifically Townsend's western big-eared bat (*Plecotus townsendii*). This candidate species relies on caves and large old growth trees with large cavities for hibernating, roosting, and nurseries. There was one survey conducted in the watershed during 1994 by the National Biological Survey (NBS); however, this survey was cursory and done on one occasion. There are an additional 6 species of bats (fringed myotis (*Myotis thysanodes*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), pallid bat (*Myotis pallidus*), hoary bat (*Lasiurus cinereus*), and silver-haired bat (*Lasionycteris noctivagans*)) that potentially occur in the watershed and have been listed in Appendix J2³. These species can be surveyed for in the same manner and will provide an opportunity to ". . . acquire additional information and ascertain levels of protection."

As opportunities arise to collect data on the various habitats or wildlife, which exist in the watershed, information should be collected that would benefit a variety of interests. For instance, stand exams that have been conducted for timber sales in the past have not incorporated sufficient information on snags and down logs in the stands where these exams are conducted. This information can be very important to the management of several wildlife species, including cavity nesting birds. Past collection methods involved tallying the number of snags, that fit a specific criteria, within 10 feet of the exam transect. Logs were tallied only if the transect bisected the log. Efforts in the future should incorporate variable plots that measure dbh, height, species, and decay class of each snag within the plot, and length, diameter, and decay class of each log within the plot. Several plots can be laid out in each habitat type to acquire sufficient information for a variety of statistical analyses.

Prior to conducting habitat surveys, objectives on why the surveys are being conducted should be clearly stated. Any data that can be collected during those surveys to aid in acquiring additional information to ascertain habitat associations and protection for various wildlife species should be incorporated.

Vegetation and Botanical Resources

Special Status Plant Species - Inventories need to be ongoing within the watershed. Currently about 10 percent of the BLM lands within the watershed have had a special status plant inventory. Because only a small percentage of this area has actually been looked at, our knowledge of Special Status Plant occurrences is limited at this time. Continued inventory at the project level is mandated. Outside of inventories to support proposed management actions, species specific inventories to determine the distribution and abundance of Federal Candidate plant species have not been fully implemented, but are required under BLM Manual 6840. These inventories should be implemented and should

incorporate other Special Status plant species. This information is needed to identify future constraints and opportunities for the management of these species within the watershed.

Survey and Manage Species - Inventories for these species need to be implemented starting in 1996, and will be based upon guidance provided to the BLM by the Regional Ecosystem Office (REO). The scope, standards, and survey methodologies have not been fully developed; therefore, the inventory needs for Wolf Creek watershed cannot be identified until this information is made available to agencies from the REO.

Unique Communities and Special Habitats - The inventory utilized for this analysis was a "first generation/approximation" of these unique habitats based upon photo interpretation. These sites need to have "on the ground" verification to improve the classification as well as the spatial location accuracy. Further investigation and site-specific information is needed to determine if any of these sites qualify for Special Area status (ACEC, ONA, RNA) or if they contain important vascular, nonvascular plant species. Additional special habitat inventory is needed to identify any new unique communities and/or special habitats that have not yet been previously identified and mapped. Inventory should identify areas that may be suitable to meet RNA status under The Oregon Natural Heritage Plan.

Noxious Weeds - Inventory and mapping of noxious weed sites needs to become routine. Identification of infestations by species is important. Inventory should include areas that should be contained from further spreading (population centers), smaller populations that can be controlled and areas that should remain weed free. Identification of each species' life cycle, habitat requirements and preferences, response of each species to management (road maintenance) and silvicultural activities, and effective control measures needs to be developed. The tracking of the effectiveness of control efforts needs to be monitored on the project level as well as monitoring the status of the entire watershed for weed species (see Monitoring Needs).

Special Forest Products - Baseline inventory information needs to be acquired for each of these species and products. The distribution, abundance and population status needs to be determined. Coupled with population and abundance information, is the need to learn the species life cycle, habitat requirements, and response to various treatments and disturbances. Information needs to be available that will allow BLM to demonstrate species viability in response to commercial and/or personal use harvest of these various species in LSR. Refined information is needed to track product demand, use, and collection.

Hydrology

Flow - Baseline flow data is needed for any type of analysis. Beside the analysis of peak and base flows, water quality parameters (including temperature and sediment) must have flow data to have any meaning. A water monitoring station at the mouth of Wolf Creek combined with individual measurements throughout the watershed would give all of the needed flow data. The station would not need to be continuously operated. Once a statistical relationship is developed with a permanent station, the Wolf Creek station would only be operated when monitoring is done.

Water Temperature - Water temperature is so critical to fish survival that a constant inventory of many locations throughout the watershed is needed to determine the habitat conditions at all times of the year and between years. This monitoring is relatively inexpensive with digital equipment. Most of the work associated with this inventory would be the storage and maintenance of the data.

Channel Morphology - Two channel morphology inventories are needed. First, a statistically sound sample of the inventory used in this analysis is needed so that there is confidence in the results. These results assume few problems on the smaller channels and many problems in the larger channels. If either of these findings are wrong we could make costly management decisions. The second type of inventory that is needed is baseline data to monitor trends, especially where we plan to do watershed restoration. This inventory/monitoring could be part of the fisheries monitoring. In order to see the hydrologic changes in stream morphology, the inventory/monitoring would consist of permanent plots (morphologic changes happen slowly) that collect information on:

- ▶ riparian ground water levels,
- ▶ cross section of the flood plain and stream channel, and

- ▶ channel morphology rating.

Stream classification - This inventory includes the classification and mapping of streams according to the ROD classification of intermittent and permanently flowing. The need for this inventory is based solely on management needs. The development of a model that can anatomically classify the streams would be extremely useful to make management decisions on a watershed basis, especially about Riparian Reserve widths. To be useful at the project level or subwatershed level, the inventory needs to be on the ground, walking every stream channel.

Erosion and Sediment - Amounts of erosion and sediment produced from road surfaces are greatly influenced by road surface type. Surface types have been inventoried for BLM controlled roads. To improve the reliability of erosion estimates, surface types for roads controlled by other parties should be known. An inventory of culvert location, sizing, and condition would help identify site specific locations of potential sediment production and obstacles to fish passage.

Monitoring Needs

Erosion and Sediment

Due to cover and infiltration and percolation rates of forest soils in Western Oregon, it is assumed that surface erosion is insignificant. Monitoring of surface erosion on areas sensitive to erosion should occur to test this assumption. Also, monitoring should occur on areas that receive management practices thought to increase the risk of surface erosion. The monitoring methods and procedures should be determined on a site by site basis.

Some research shows that roads influence stream flow; research also indicates that roads are a source of sediment. Decommissioning roads has been suggested as one method to mitigate the effects on flows and sediment. Roads that were decommissioned to mitigate their impacts on water and/or sediment routing should be monitored to determine if the mitigation actually occurs. The monitoring should be tailored to the reason for road decommissioning. Monitoring methods should be developed on a road by road basis.

Botanical Resources

Noxious Weeds - On a periodic basis, evaluate the watershed for noxious/exotic weed populations. The information presented in Chapter 5 comprises the preliminary baseline information regarding weeds in the basin until future inventories are implemented. Information on the percent of the basin occupied by weeds can be evaluated on a periodic basis to assess to what extent weeds are increasing or decreasing in the watershed. Evaluation of species frequency (presence or absence), distribution, and population trends can be measured. Causal mechanisms can then be determined for apparent population increases or decreases such as road maintenance activities, recreation, or timber management actions, etc. This information will also identify when and where weeds might be migrating into the basin from other watersheds and what pathways and mechanisms are supporting the movement of these noxious or exotic species.

Native Species - The floristic diversity within the watershed can be periodically monitored. The purpose of this monitoring is to document changes in species composition over time, to identify trends in habitat conditions within the watershed that support Special Status and Special Attention species, and to assist in identifying when and how plant communities and associations may be changing. The percent species native in the watershed versus those that are exotic or noxious can be used as an index to assess how management activities, natural successional process, disturbance patterns or the lack of, etc., may be altering species diversity in the watershed. This information can also be used to compare the diversity of this watershed to others and the relative importance of individuals species in this watershed versus others.

Silvicultural Treatments

Riparian Reserves - Monitoring of any silvicultural treatment executed within the Riparian Reserves is necessary. The general objectives for these treatments are identified in Chapter 9 - Management Opportunities. The monitoring needs

to focus on species composition changes and height and diameter growth rates. The height growth rates are important to determine how long it will take for the current riparian vegetation to completely shade the channel of main Wolf Creek to help ameliorate the summer temperatures. Diameter growth rates are necessary to determine how long will it take to produce a tree of specified size that can contribute structure to the Wolf Creek system. The FSEIS and RMP have estimates that range from 100 to 200 years. Watershed specific monitoring is the only way to validate these estimates and adjust treatment prescriptions.

Fisheries and Wildlife

Fisheries/Aquatic - As indicated in Chapter 9 (Opportunities), monitoring of the fisheries populations in the watershed is the best method in determining if the objectives stated for habitat improvement projects are being met. This type of monitoring should occur each year as it is difficult to predict when the benefits from habitat improvement projects will be realized. It is very important to continue fish monitoring and spawning counts within the watershed and Siuslaw Basin, which has collected a great amount of data over the course of several years. This valuable information is, by far, the best method of measuring the success of habitat improvement projects that have been, or will be, established in the watershed. Also, evaluating the aquatic projects effects on stream channel, non-anadromous fish, otters and other wildlife use will be helpful in the future to modify projects for the benefit of many fish and wildlife species.

Wildlife and Habitat

BLM Manual 6840 - Special Status Species Management, requires that BLM ". . . manage the habitat to conserve the species by: Monitoring populations and habitat of candidate species to determine whether management objectives are being met." This policy also states that ". . . the BLM shall determine the occurrence and distribution of all T/E species on land administered by BLM, and evaluate the significance of lands administered by BLM in the conservation of those species."

Riparian habitat and Riparian Reserve monitoring should be conducted to determine if this land use allocation is performing to the capacity that was designed. Radio telemetry studies on dispersing spotted owls through the watershed will assist in understanding the role that Riparian Reserves play as dispersal corridors. This is especially true for reserves in the General Forest Management Areas. However, this land use allocation comprises 17 percent of the watershed, and probably does not provide enough area for this determination.

Monitoring should be conducted in the Marbled Murrelet Reserves (MMR) designated in the watershed. It is believed that marbled murrelets will occupy lands located up to 50 miles inland. However, the areas designated as MMRs currently have little or no habitat that is suitable for murrelet occupancy. The development of these stands may take as long as 200 or more years to acquire the components necessary for suitable murrelet nesting habitat. Monitoring these stands for murrelet occupancy, and determining nonoccupancy can assist in the proper assessment of the murrelets' range inland. Continued survey and monitoring of marbled murrelets in habitats suitable within the watershed will also assist in determining the range inland of marbled murrelets.

CITATIONS and REFERENCES

1. Spies, T., 1989, Characterization of Old Growth Douglas-fir Forests of Western Oregon and Washington., Unpub. study plan, US Forest Service, Corvallis, Or. 32 pp.
2. Irwin, L.L., G.P. Miller, and D.F. Rock. 1994. Unpublished data. Spotted owl ecology in managed forests, western Oregon.
3. USDA - Forest Service & USDI - Bureau of Land Management. 1994. Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. Appendix J2 - Results of Additional Species Analysis. 476pp.