

**Environmental Assessment  
for the  
Dad's Creek Watershed Restoration Project**

**OR-110-00 - 12**

**1. Introduction and Need for the Proposal**

The proposed Dad's Creek Watershed Restoration Project is intended to reduce stream sedimentation from existing roads, improve vegetation growth, diversity and structure within Riparian Reserves, restore fish passage, and improve in-stream habitat diversity.

The seventh-field Dad's Creek subwatershed is located approximately 10 miles west of Glendale, Oregon (See Map 1 for location). Most riparian habitat is early seral, the result of past logging and mining. Habitat connectivity for late-successional species is poor. Dad's Creek is devoid of quality pools and large woody debris. Lack of road maintenance due to a shortage of funding for the program is resulting in a build up of sediment in habitat used by several threatened or endangered fish species. Two culverts prevent cutthroat trout from accessing all available habitat. Roads located within Riparian Reserves have removed sources of large wood for stream channels, allowed for salvage of down logs from streams and degraded riparian microclimate and structural diversity.

Watershed restoration is a key component of the Aquatic Conservation Strategy of the Northwest Forest Plan (NFP). The proposal is in conformance with the Medford District Record of Decision and Resource Management Plan (RMP), and the Final Supplement Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (FSEIS), Appendix B1. The Middle Cow Creek Watershed Analysis (1998) p.73-74 supports the type of watershed restoration projects under consideration in this document.

**II. Affected Environment**

**A. Location**

Analytical watershed (5 <sup>th</sup> field):	Middle Cow Creek
Project Area (7 <sup>th</sup> field watershed):	Dad's Creek
County:	Douglas

Physical and biological attributes and current condition of the Middle Cow Watershed are described in the final draft of the Middle Cow Watershed Analysis (1998), available for review at the BLM Medford District Office, Medford, Oregon.

## **B. Threatened, Endangered, Special Species, and Survey and Manage Species**

The following fish inhabit the Dad's Creek watershed within or immediately downstream of the project area and are listed as Threatened, Endangered, or Candidate species under the Endangered Species Act:

Oregon Coast coho salmon - Threatened  
Umpqua River basin cutthroat trout - Endangered  
Oregon Coast steelhead - Candidate

A waterfall near the mouth limits use of the stream by steelhead and coho salmon. There are two known spotted owl habitat sites in this subwatershed. Marbled murrelet surveys were completed in this subwatershed in 1999; none was found.

There are no known aquatic Survey and Manage mollusks within this fifth-field watershed. *Allotropa virgata*, a Survey and Manage plant, has been found in the same section as the proposed action, but not within the project area. *Cypripedium fasciculatum*, a special status plant, has been found nearby (T 32S, R 7W, sec. 33). Surveys for vascular plants were conducted in the project area in June, 1998. No special status or Survey and Manage vascular plants were found. The mosses *Buxbaumia viridis* and *Ulota megalospora* and the fungi *Otidea onotica*, *Otidea leporina* and *Sarcosoma mexicana* could potentially occur in the project area. These species have been found on the Glendale Resource Area in habitats similar to those found in the project area, but are unlikely to occur except in mid-seral to mature forest (i.e., where large trees are to be felled into streams and where thinning of commercial-size trees would occur). Survey and Manage mollusks have been found within the riparian treatment areas.

Surveys for Survey and Manage plant and animal species in riparian areas would be completed before habitat disturbing activities are initiated. If any Survey and Manage species are found, they would be protected according to established Management Recommendations.

## **III. Alternatives Considered but Eliminated From Further Consideration**

The three roads in Riparian Reserves that are proposed for drainage improvement, as well as almost all other roads in the project area, are covered under Reciprocal Road Use Agreements with local land owners. These three roads are needed to access BLM and private lands for forest management purposes. Decommissioning these roads is not an option and was therefore eliminated from this proposal.

#### **IV. Description of the Proposed Action and Alternatives**

The ID team designed the proposed action to meet the following objectives:

1. Reduce movement of sediment from roads to streams.
2. Restore fish passage in Dad's Creek.
3. Improve in-stream habitat structural diversity.
4. Accelerate development of late successional characteristics in Riparian Reserves.

##### **Alternative 1**

Alternative 1, the action alternative, consists of two distinct and separate proposals:

- A. Correct drainage problems on existing roads, and
- B. Enhance riparian habitat through vegetation treatments.

These two proposals would probably be implemented separately, under separate contracts, since the work is very different in nature. They are assessed together in this EA because they would occur in the same location, during the same time period and the impacts are better understood if considered together, rather than in separate assessments.

##### **A. Road renovation, drainage improvement and stream connectivity**

Roads in the watershed are contributing sediment to streams. Drainage and erosion problems would be corrected on approximately two miles of BLM roads which are located within Riparian Reserves. Roads 32-7-15.1, 32-7-15.3 and 32-7-21.1 would be treated by constructing armored water dips, replacing or installing additional cross drain culverts or outsloping where possible. Bottom-lay (stream) culverts would be replaced to meet the 100-year flood standard and to facilitate passage of aquatic species. Logs in road fills would be removed and the road beds restored.

Rock material for armoring, pit run, or rip rap would come from the Dad's Creek Quarry (T 32S, R 7W, sec. 21), from existing stock piles, or would be hauled in from private quarries.

The outlets of two culverts in main stem Dad's Creek in section 15 on BLM roads #32-7-21.0 and #32-7-15.1 are two to three feet above the elevation of the stream, creating barriers to upstream movement of cutthroat trout and other aquatic species. The existing structures (70'x6' dia and 66'x5'x4' dia), which are also undersized for the watershed area, would be replaced.

## **Project Design Features For Road Work**

Project design features (PDFs) are specific measures included in the design of the proposed action to minimize adverse impacts on the human environment. Many project design features for projects in the Medford District are specified in the RMP and may not be repeated in this EA. These include Best Management Practices (BMP) as described in Appendix D of the RMP.

If changes to the PDFs are needed during project implementation, they would be analyzed by the Interdisciplinary Team and the Field Manager, and an amended EA would be prepared before the change is implemented.

Surveys for marbled murrelets have been completed; no birds were found. Therefore, temporal and seasonal restrictions on use of power equipment for murrelets are not necessary.

Use of power equipment for road renovation within 1/4 mile of any northern spotted owl nest would be limited to the period between June 15 and February 28 of the following year, or until a Glendale Resource Area biologist determines that young have sufficiently dispersed. This same seasonal restriction applies to blasting within one mile of an active nest.

The work period for road renovation and drainage improvement (unless in-stream work is required) would be from May 15 to October 15 of the same year to ensure that soil-disturbing activities are completed before the rainy season. The instream work period for culvert replacement would be between July 1 and September 15 of the same year, in accordance with Oregon Department of Fish and Wildlife guidelines.

The work period for quarry operations would be June 15 to October 15 of the same year, to minimize potential for generating sediment that could enter Dad's Creek.

Road renovation would include the following actions: out-sloping where feasible, replacing and adding culverts and water-barring.

Excess excavated material generated from culvert removal would either be spread in stable locations within the existing road prism or hauled to a stable designated waste disposal area.

Equipment refueling would be done where there is a minimal chance that toxic materials could enter a stream. Equipment would not be stored in a stream channel overnight. Hydraulic fluid and fuel lines would be kept in proper working condition in order to minimize leakage into streams.

Excessive leakage of diesel, oil, hydraulic fluid and other hazardous materials as a result of equipment failure or human error would be removed from the site and disposed of in an approved site.

Heavy equipment would be washed, off of federal lands before moving into the area, to remove soil and plant parts to prevent the spread of noxious weeds and disease into the project area.

Cutting vegetation on road fill slopes would be minimized in order to maintain slope stability and stream shading.

Work would be temporarily suspended if monitoring indicates that rainstorms have saturated soils in the work area to the extent that there is potential for road damage or for excessive stream sedimentation.

All soil disturbance associated with road drainage improvement and culvert installation or replacement would be within the existing road Rights-of-Way, with moderate to small excavations and fills.

Debris from culvert excavation would be placed along the road at stable locations or in a designated disposal areas. Large logs excavated from the road bed would also be placed in stable locations along roads, or would be placed in streams to provide instream structure.

Bare soil areas would be mulched with material (e.g. straw, bark, wood chips) which is free of noxious weeds.

Alder and other vegetation would be removed from ditch lines to ensure proper road drainage. Ditch lines would be pulled and cleared of obstructions where identified in the contract.

Energy dispersal pads would be placed at culvert outlets where necessary to reduce potential for soil erosion.

Culverts in fish habitat would be installed so as to maintain the natural streambed and gradient. The specific design would be also based on expected longevity and economics.

All stream crossing culverts would be designed to pass a 100-year flood.

The culvert on road 32-7-15.0 would be carefully removed and stored on federal land for possible re-use in another location. All other culverts excavated from the road prism would be disposed of in accordance with State and County regulations.

## **B. Riparian and stream habitat enhancement**

Under this part of the proposal large conifers would be felled into streams and approximately 25 acres of mixed sapling and small commercial size conifers would be thinned within one site potential tree height of certain streams (See Maps). Large wood in streams forms pools and traps gravel and cobble, improving habitat for fish, amphibians and other aquatic species. Thinning would accelerate development of late-successional stand characteristics over the long term by releasing the largest conifers from competition for moisture, light, nutrients and growing space. Mature and late-successional forests contribute optimal amounts of large wood to streams. Some of the young trees identified for cutting would be sold, while others would be left on site to provide down wood habitat structures. The action would take place within Riparian Reserves.

The desired future condition for Riparian Reserves is a fully functioning, diverse conifer forest and riparian vegetation which closely resembles natural conditions, including a relatively closed canopy, large snags and large down logs.

### **Project Design Features For Riparian and Stream Habitat Enhancement**

The distance between large (e.g., >24 inches dbh) conifers selected for felling into streams would vary depending on tree availability, slope steepness and channel morphology. The goal is to have approximately nine pieces of large down wood (>24 inches dbh x >25 feet long) per 1/4 mile of stream, which is the National Marine Fisheries Service standard for Klamath Province streams.

Individual large trees selected for falling would be chosen to minimize adverse impacts to terrestrial species and soil stability and to optimize benefits to the aquatic environment.

Slope stability and stream bank stability would be considered when selecting trees to be felled into streams.

Trees would not be felled into stream channels near road crossings in order to minimize the potential for road failure due to plugged culverts.

Falling trees into stream channels would be coordinated with mining claimants to help ensure that the action does not interfere with their ability to work their claims.

Signs would be posted along roads near streams to discourage the public from removing down logs from stream channels for firewood.

All required Survey and Manage surveys would be conducted before ground-disturbing activities are implemented. Species would be protected according to current management direction.

Surveys for non-vascular Survey and Manage plant species (i.e., Lichens, Bryophytes and Fungi) would be conducted before trees are felled into streams, and before thinning in stands of commercial size trees. Non-vascular species which may occur in the project area include *Buxbaumia viridis*, *Ulotia megalospora*, *Otidea onotica*, *Otidea leporina* and *Sarcosoma mexicana* (BLM Instruction Memoranda No. OR-2000-017, OR-2000-018). Any sites found of the above species, except *Ulotia*, would be protected by precluding direct physical disturbance, and retaining favorable microclimatic conditions. This would normally require retaining existing canopy cover within 100 to 200 feet of the population.

The “Draft Management Recommendations for Bryophytes” (USDA-FS, USDI-BLM 1996) suggests that *Ulotia megalospora* is common and widespread enough not to require protection at all sites, but disjunct or localized populations should be protected. The survey protocol (BLM Instruction Memorandum No. OR-2000-017) suggests that the species is well distributed in the area of Northwest Forest Plan and is not considered at risk. This species may be affected by the felling of trees into the creek, and by thinning of commercial size trees. No mitigation measures are necessary, however, as the species has been found to be fairly common and widespread within the tanoak series on the Glendale RA.

Use of power equipment for tree falling within 1/4 mile of any northern spotted owl nest would be limited to the period between June 16 and February 28, unless a Glendale Resource Area biologist determines that young owls have dispersed away from the site.

In stands to be commercially thinned, at least 13 conifers or hardwoods larger than 4 inches dbh would be girdled, where they currently exist, to provide snag habitat for wildlife.

Trees marked for removal would be felled toward the nearest road. There would be no yarding across streams.

Trees within 20 feet of streams would not be cut or removed.

Small diameter (<4 inches) hardwoods in competition with conifers would be girdled or slashed; hardwoods larger than four inches diameter would be reserved.

At least 60 percent canopy closure would be maintained in stands proposed for thinning to minimize changes in microclimate. Multiple entries may be needed to achieve short and long-term objectives.

Cable yarding and hauling would be allowed only between June 1 and October 15 to prevent bark slippage on residual trees and to minimize soil disturbance and compaction.

Logs would be limbed prior to yarding. Log length would not exceed 34 feet. Yarding equipment would operate only from existing roads.

In the thinning units, slash within 25 feet of a road would be piled where necessary to reduce the risk of wild fire. The piles would be burned. Other slash would be lopped and scattered.

## **Alternative 2 - No Action Alternative**

Under this alternative, none of the proposed actions would be implemented at this time. Similar projects to repair roads or do vegetation treatments might be considered in separate environmental assessments in the future.

## **V. Direct and Indirect Effects of the Alternatives:**

The proposed action has been analyzed by an interdisciplinary team. Implementation of the proposed action would result in the following beneficial and adverse environmental consequences.

The proposed action has been screened for compliance with The Endangered Species Act, The American Indian Religious Freedom Act, the Historic Preservation Act, and Bureau of Land Management policies related to the ecosystem objectives and concepts in the Medford District Resource Management Plan (RMP) Forest Plan.

Furthermore, this action has been screened from a landscape perspective and there are no effects anticipated from this action that would foreclose future management options in relation to the watershed management objectives identified in the Middle Cow Creek Watershed Analysis.

Effects on cultural resources would be minimal since the actions would occur along existing roads and areas which have already been disturbed.

### **A. Effects of Alternative 1**

#### **Aquatic Habitat and Soils**

Although improving road drainage would reduce existing and potential stream sedimentation in localized areas, the amount of road that would be renovated under this alternative would be insufficient to measurably reduce stream sedimentation at the sixth-field watershed scale. Reciprocal road use agreements between BLM and adjacent landowners often limit options for BLM to decommission roads that are not needed to manage BLM lands. It will take the concerted effort of all landowners reducing impacts of roads under their jurisdiction to

measurably decrease stream sedimentation across the sixth-field watershed.

Improving road drainage through outsloping, where appropriate, and constructing armored water dips could adversely affect fish, amphibians, and other aquatic species in the short term, but the action would reduce the amount of sediment that enters streams over the long term. Some loose soil that is generated by culvert replacement and road drainage improvement would enter streams during the first major rainstorm of the fall season. The amount of soil that reaches streams would most likely be transitory and minor compared to the amount that would degrade stream habitat by continually eroding or from failure of the road prism during peak stream flows. The proposed activities would reduce the amount of sediment that enters streams over the long term, restore aquatic connectivity and benefit fish, amphibians and other aquatic life.

Replacing culverts on Dad's Creek would restore naturally-occurring aquatic connectivity and allow Umpqua cutthroat trout and other aquatic species to use all stream habitats up- and downstream of the current man-made barriers. It would also reduce the potential for road failure during major storms. Salmon would still not use Dad's Creek to any great extent because of the falls near the mouth.

Feeding success of some aquatic species could be impaired for several hours at a time over several days while culverts are being replaced due to stream turbidity. Some organisms would likely be killed by construction equipment. There would be adverse effects of sedimentation on aquatic insect and algal production for an unknown distance downstream of each culvert replacement until peak flows flush sediment from the substrate; adverse effects would diminish with increasing distance downstream.

The Oregon Department of Environmental Quality has identified Dad's Creek as being water quality limited for temperature. The proposed action would not increase water temperature since treatments would not remove enough shading to affect water temperatures.

Alders and large conifers felled into streams would scour pools, trap bedload gravels and create more diverse, complex stream habitat than currently exists. All of these changes would improve survival of salmonids, amphibians and other aquatic species in habitat that has been degraded by timber harvest, road construction and placer mining.

Effects on microclimate of thinning along the streams would be minor because there are roads within about 50 feet of the channel which have already removed habitat and opened the canopy. The microclimate in Riparian Reserves could become slightly warmer and drier in the short term but the change (if any) would be minimized by maintaining canopy greater than 60 percent.

Over the long term, larger diameter conifers are expected to develop at a faster rate than if left unthinned. Thinning is expected to accelerate late-successional characteristics in treated areas. This would lead to development of larger snags and improved delivery of larger coarse wood to streams and the forest floor.

Work in the Dad's Creek quarry would contribute little or no sediment to Dad's Creek because there is very little soil in the quarry. Activity would be confined to the dry season and most runoff from the quarry would collect in the floor of the quarry before percolating into the subsurface.

### **Special Status and Survey and Manage Species**

The Proposed Action would produce short-term noise disturbance but not during the critical breeding and nesting seasons. Currently, there are two northern spotted owl sites in the project area. No suitable northern spotted owl habitat would be removed by thinning pole-size conifers or by falling select large trees in Riparian Reserves. Effects on the two occupied sites and on spotted owl habitat would be minimal.

Surveys for marbled murrelets were completed in 1999; no birds were found. This project would not affect this species since it is highly unlikely they would occur within the project area.

No populations of Special Status or Survey and Manage vascular plants were found, and no effects are anticipated.

Retaining existing canopy cover within 100 to 200 feet of the any non-vascular plant population would adequately protect those populations, especially since the treatments being proposed are relatively light thinnings, retaining more than 60 percent canopy closure. Similarly, effects on other Survey and Manage species (e.g., salamanders, molluscs, red tree voles) would be minimal since the thinning would retain much of the ground cover and moisture at the ground level.

Formal consultation for federally listed Threatened and Endangered terrestrial wildlife and plant species has been conducted as called for by the Endangered Species Act. This proposal is covered by the Biological Opinion from the US Fish and Wildlife Service (dated 18 October 1996). For listed fish species, the road work portion of the proposal is covered by the Biological Opinion from the National Marine Fisheries Service (dated 26 September 1996). Thinning within Riparian Reserves is not covered by that Biological Opinion, so consultation on effects of this part of the project on federally listed fish species would have to be conducted before that portion of the proposal is implemented.

### **B. Effects of Alternative 2 - No Action Alternative**

If no action is taken, culverts would continue to block movement of fish and other aquatic species. Pool quantity and quality in Dad's Creek would remain below optimum. Growth and natural thinning of pole-size conifers in Riparian Reserves would proceed more slowly than with human intervention. The length of time required for vegetation in Riparian Reserves to begin to contribute to large snags and down logs on the forest floor and in stream channels would take longer than with active management

The short-term addition of sediment to streams as a result of road renovation work would not occur. On the other hand, the beneficial long-term effects of decreasing stream sedimentation would also not occur. The net effect would be to allow the present levels of erosion and sedimentation to continue and increase over time, causing increasing adverse effect on aquatic habitat.

### **C. Cumulative Effects**

Many of the cumulative effects associated with this watershed have been addressed in the RMP/EIS for the Medford District, the Supplemental EIS for the Management of Habitat for Late-successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. This analysis tiers to those documents. In addition, the watershed analyses for the Middle Cow Creek watershed located in the Medford District BLM office describes additional cumulative effects. More site specific effects for this project area are discussed here.

Past and foreseeable future projects in the fifth-field watershed include:

- High 5 timber sale - sold in 1995, logging completed in 1998.
- McCollum timber sale - sold in 1997, logging completed in 1998.
- McLawson timber sale - sold in 1998, logging to be completed summer 2000.
- Bonnie and Slyde timber sale - sold in 1998, not awarded.
- Wildcat Thin timber sale - sold in 1998, not awarded.
- Cottonsnake timber sale (draft) - planned for sale in 2003.
- Papa Cow timber sale (draft) - planned for sale in 2003 - located in the same 6<sup>th</sup> -field watershed as the proposed action. Includes 1.7 miles of road decommissioning, 24.3 miles of road renovation and maintenance, 0.5 miles of temporary road construction and 1.3 miles of permanent road construction (ridgetop).
- Soukow timber sale (draft) - planned for sale in 2002 - located in the same 6<sup>th</sup> field watershed as the proposed action. Includes 0.3 miles of road decommissioning, 10.3 miles of road renovation and maintenance and 0.8 miles of temporary road construction.
- Cow Creek Road Rehabilitation FY1999 Project - 0.7 miles of road decommissioning
- Glendale Resource Area Road Decommissioning Project FY2000 (draft) - 4.0 miles
- Extensive logging and some road building on private lands.

No aquatic habitat or watershed indicator in the National Marine Fisheries Service Matrix Checklist would be degraded in the long term at the fifth-field watershed scale (Middle Cow Creek). The action alternatives are therefore consistent with Aquatic Conservation Strategy objectives.

Although stream sedimentation at the site scale in the project area would be reduced and aquatic habitat connectivity would be improved under all action alternatives, the level of activity would be insufficient to measurably improve current conditions at the fifth-field watershed scale.

Although riparian treatment would improve habitat conditions at the site level, it would cover insufficient acres to change overall conditions at the fifth-field watershed scale in the long term.

Quality of aquatic habitat is not expected to improve at the Middle Cow Creek watershed scale in the near future. Forest practices and other land uses on private lands (e.g. water diversions, road construction and maintenance, tractor logging and lack of riparian protection) are considered inadequate to protect or restore watershed values, based on the standards contained in the Northwest Forest Plan and the RMP. Nevertheless, multiple projects such as those that are being proposed here on all ownerships could reduce stream sedimentation and improve quality of riparian habitats over the long term.

## **VI. Monitoring**

All roads treated under this proposal would be inspected the first winter following project completion. Evidence of erosion would be documented and scheduled for future maintenance.

## **VII. Persons and Agencies Consulted**

Landowners within 1/4 mile of the proposed action and mining claimants on Dad's Creek have been notified that this management action is being considered and asked for their opinions, concerns and suggestions.

A legal advertisement will be placed in local newspapers to announce to the public that the Glendale Resource Area is requesting public comments on the proposed management action. In addition, notification of this proposal will be sent to the Oregon Department of Fish and Wildlife, the Oregon Dept. of Forestry, county commissioners for the affected county, several environmental groups, and representatives of the timber industry to request their comments. These announcements will be made following completion of this environmental assessment and before a decision is made.

Changes in the preliminary plan as well as the proposed project design features may be based, in part, on information received from the public. The Field Manager will also consider all input before making a final decision concerning this proposal.

**List of Preparers**

<u>Name</u>	<u>Title</u>	<u>Primary Responsibility</u>
Jim Brimble	Forester	Riparian Silviculture
Loren Wittenberg	Hydrologist	Soils/Watershed
Jennifer Sanborn	Wildlife Biologist	Wildlife
Bob Bessey	Fish Biologist	Streams/Riparian/Fish
Deston Russell	Civil Engineering Technician	Roads/Structures
Dave Eichamer	Forester	Special Forest Products
Roger Schnoes	Ecosystem Planner	NEPA Coordination

Reviewed By:

Roger Schnoes

Glendale RA Ecosystem Planner  
for format and adequacy

2-22-00

Date

Lynda L. Boody

Lynda L. Boody  
Field Manager, Glendale Resource Area  
Medford District. BLM

3/9/00

Date

Appendix A. Summary of seasonal operating restrictions - Dad's Creek Watershed Restoration Project Area. **Shaded blocks** are the time periods when activities are **allowed**. For details, see the appropriate Project Design Feature.

RESTRICTIONS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Yarding and hauling						■	■	■	■	■		
Quarry activities in Riparian Reserves (Sedimentation concerns)						■	■	■	■	■		
Yarding - bark slippage	■	■				■	■	■	■	■	■	■
Power equipment operation, including road work, within 1/4 mile of spotted owl sites. Blasting within 1 mile of nest	■	■				■	■	■	■	■	■	■
Instream work period							■	■	■	■		
Road drainage improvement					■	■	■	■	■	■		

This table is intended as an aid in summarizing seasonal restrictions. If there is a conflict between the table and the text, the text should be considered correct.

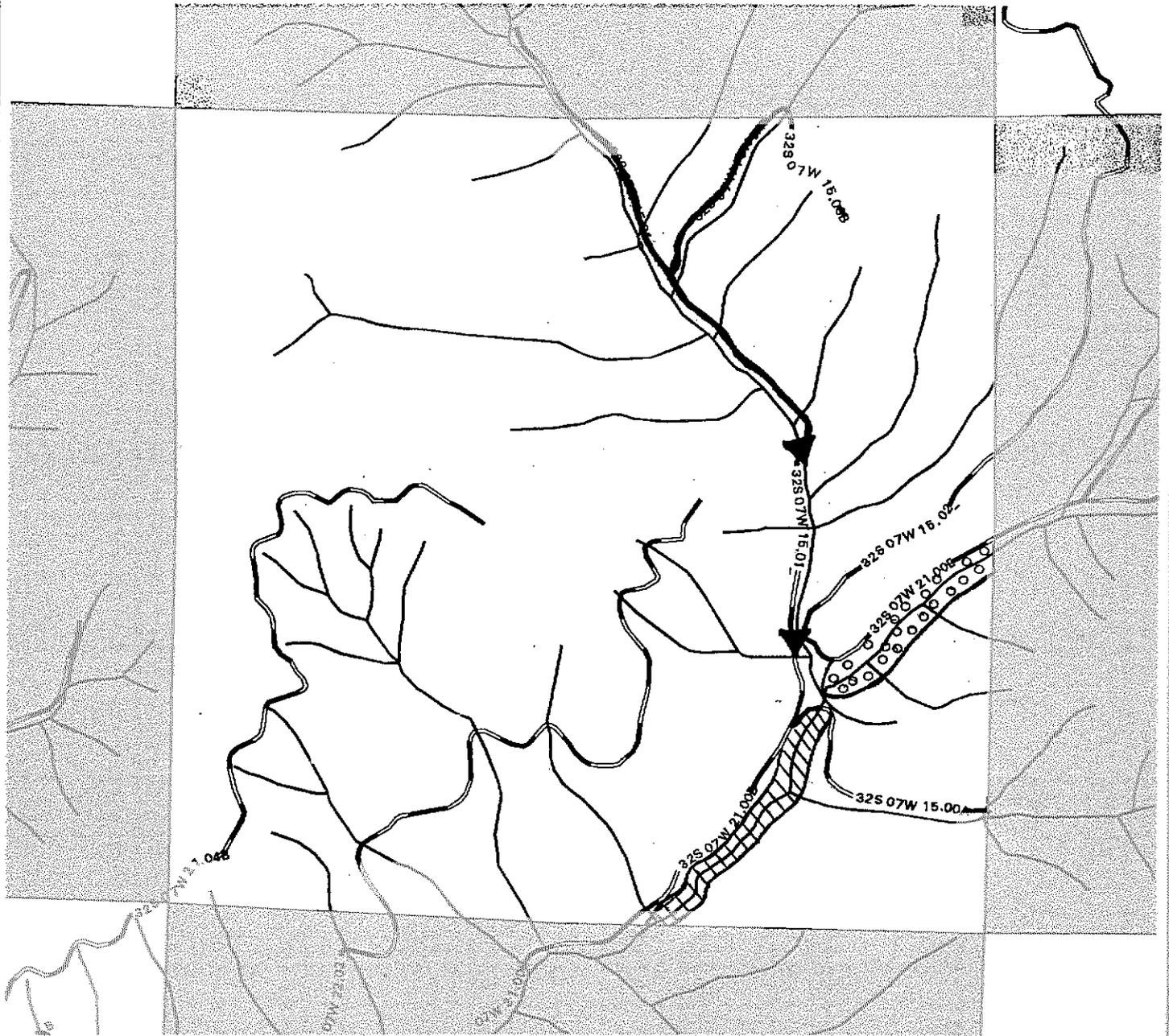
## References

BLM Instruction Memorandum No. OR-2000-017. Dec. 3, 1999. Survey and manage survey protocols - protection buffer bryophytes (v. 2.0).

BLM Instruction Memorandum No. OR-2000-018. Dec. 9, 1999. Survey protocol for seven survey and manage and protection buffer fungi (v. 1.3).

USDA-FS, USDI-BLM. 1996. Draft Management Recommendations for Bryophytes. Installment 1.

T32S R7W SEC. 15



Dads Creek Watershed Restoration

Legend

-  Major culvert replacement
-  Large conifers to be felled into Dads Creek
-  Riparian thinning
-  Road renovation

