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ENVIRONMENTAL ASSESSMENT COVER SHEET

APPLICANT MONTANA DEPARTMENT OF STATE LANDS, SOUTHWESTERN LAND OFFICE

TYPE OF OPERATION TIMBER HARVEST - SIXMILE TIMBER SALE - 514 ACRES

LOCATION SECTIONS 2, 12, 14, T15N, R22W

PERSON PREPARING EA ROBERT M. RICH

( ) DRAFT EIS
(X) NO DRAFT EIS

DATE PREPARED FEBRUARY 1992 EXPECTED IMPLEMENTATION DATE JULY 1992

REVIEWED BY _____ RECOMMENDATION ( ) DRAFT EIS (X) NO DRAFT EIS

REVIEWED BY _____ RECOMMENDATION ( ) DRAFT EIS (X) NO DRAFT EIS

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ADMINISTRATOR'S SIGNATURE _____ RECOMMENDATION ( ) DRAFT EIS (X) NO DRAFT EIS

SUMMARY OF POTENTIAL IMPACTS

PHYSICAL ENVIRONMENT	SIGNIFICANT		INSIGNIFICANT WITH MITIGATION		INSIGNIFICANT AS PROPOSED	
	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM
1. TOPOGRAPHY					X	X
2. GEOLOGY: stability					X	X
3. SOILS: Quality, distribution			(SEE SOILS REPORT)		X	X
4. WATER: Quality, quantity, distribution			(SEE HYDROLOGY REPORT)		X	X
5. AIR: Quality					X	X

PHYSICAL ENVIRONMENT (continued)	SIGNIFICANT		INSIGNIFICANT WITH MITIGATION		INSIGNIFICANT AS PROPOSED	
	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM
6. UNIQUE, ENDANGERED, FRAGILE, or LIMITED environmental resources					X	X
BIOLOGICAL ENVIRONMENT						
1. TERRESTRIAL, AVIAN, and AQUATIC; species and habitats			(SEE WILDLIFE REPORT)		X	X
2. VEGETATION; quantity, quality, species			(SEE SILVICULTURAL PRESCRIPTIONS)		X	X
3. AGRICULTURE; grazing, crops, production			(IRRIGATION DITCHES SEE ENVIRONMENTAL ASSESSMENT)		X	X
HUMAN ENVIRONMENT						
1. SOCIAL; structures and more					X	X
2. CULTURAL; uniqueness, diversity					X	X
3. POPULATION; quantity and distribution					X	X
4. HOUSING; quantity and distribution					X	X
5. HUMAN HEALTH & SAFETY					X	X
6. COMMUNITY AND PERSONAL INCOME					X	X

HUMAN ENVIRONMENT (continued)	SIGNIFICANT		INSIGNIFICANT WITH MITIGATION		INSIGNIFICANT AS PROPOSED	
	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM
7. EMPLOYMENT; quantity and distribution					X	X
8. TAX BASE; local and state revenue					X	X
9. GOVERNMENT SERVICES; demand on					X	X
10. INDUSTRIAL, COMMERCIAL and AGRICULTURAL activities					X	X
11. HISTORICAL and ARCHAEOLOGICAL			(SEE CULTURAL RESOURCE REPORT)		X	X
12. AESTHETICS			(SEE ENVIRONMENTAL ASSESSMENT)		X	X
13. ENVIRONMENTAL PLANS and GOALS local and regional					X	X
14. DEMANDS on ENVIRONMENTAL RESOURCES of land, water, air and energy					X	X
15. TRANSPORTATION networks and traffic flows			(SEE ENVIRONMENTAL ASSESSMENT)		X	X

SIXMILE TIMBER SALE

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ENVIRONMENTAL ASSESSMENT
SIXMILE TIMBER SALE

I. Project Description

The Montana Department of State Lands proposes to harvest timber from State-Owned Trust Land in Sections 2, 12, and 14, T15N - R22W PMM. This land is located approximately 20 miles west of Missoula, Montana. The timber sale is intended to generate revenue for the School Trust, and to create favorable environments for continued management of the land as commercial forest.

Trust lands were granted by the Federal Government to Montana when it became a State. This grant was made with the understanding that the lands were to be used for the support of public education. The lands are managed by the State Board of Land Commissioners acting through the Department of State Lands (DSL). The Board is to administer the lands "in trust for the support of education and for the attainment of other worthy objects helpful to the well being of the people of this State" and is directed "to secure the largest measure of legitimate and reasonable advantage to the State".

The sections involved in this timber harvest proposal have been classified as forest land - "principally valuable for the timber that is on them or for the growing of timber or for watershed protection".

Most of timber within these sections is overcrowded second-growth Ponderosa pine and Douglas fir. These trees originated around the turn of the century following the last major logging of the area. Sawtimber growth is currently far below potential due in large measure to overcrowding. The principal treatment proposed is commercial thinning. This thinning would improve sawtimber growth, capture tree mortality, and reduce the potential of a serious Mountain Pine beetle epidemic.

Approximately nine percent of the area is mature timber. Here proposed treatment objectives are to harvest mature trees and to restock the area with young trees.

Estimated return from this proposal is $200,000.

II. Issue Development

A. Scoping and Public Involvement

During the early planning stages of this timber sale, public notices (Exhibit B) announcing DSL's proposed timber sale plans were placed throughout the Sixmile area. The notices invited comment and active participation in the design of this sale. All residents who subsequently sent written comments were extended personal invitations to attend public meetings. Four public meetings were presented. Two meeting were held prior to finalizing harvest plans and drafting the Environmental Assessment. One meeting followed the completion of harvest plans and the drafting of the Environmental Assessment. A final informational meeting followed the completion of all field work. Several one-on-one field reviews were held with residents to discuss their specific concerns. See Exhibit B for copies of public responses.

In addition to public comment, specialists within the Department of State Lands (DSL) and the Department of Fish, Wildlife and Parks (DFWP) were

contacted and solicited for their comments regarding the proposed action (Exhibit A).

B. **Issues**

1. The following issues have been generated from public comment:

a. **Clearcutting:** The initial proposal contains one 52 acre clearcut. Local residents expressed concern over the size and location of this clearcut. Their concerns focused on several points; destruction of wildlife habitat, impacts on recreational hunting, cumulative effects of adjacent landowner management activities, and land values. Public comments are generally in opposition to clearcutting.

b. **Protection of Sixmile Creek and Irrigation Ditches:** Sixmile Creek is a third order perennial tributary of the Clark Fork River which flows through section 12. Three irrigation ditches are also located within the sale area. Two ditches are currently used, the third ditch is abandoned. Local residents and ditch owners are concerned about possible damage to these resources as a result of the sale. Sixmile Creek is used for fishing and hiking as well as being a source of aesthetic pleasure.

c. **Weed control:** Local people are concerned about the probable spread of spotted knapweed resulting from a timber sale. Disturbances associated with timber sale activities will provide a suitable seedbed; and vehicle and livestock use of new roads will supply a source of seeds for weed introduction and spread.

d. **Roading:** Local residents are concerned about new road construction. Specific concerns include adverse visual impacts of new roads, the spread of noxious weeds, and the development of access behind their property upon which they have no control. Residents are also concerned about possible deterioration of the Sixmile road surface due to heavy truck use associated with a timber sale.

e. **Mature ponderosa pine stands:** The sale area contains some old ponderosa pine. Mr. George Whittaker has requested that we retain a portion of these trees.

f. **Wildlife:** There is concern that timber harvesting will adversely impact elk and deer habitat within the sale area.

g. **Herbicide use:** Herbicide use is proposed to control noxious weeds resulting from logging and road building. Local residents have expressed concern for offsite movement of herbicides. They feel herbicide movement could result in contamination of non-target areas including Sixmile Creek.

h. **Species diversity:** Mr. David Crabtree suggested the planting of a diversity of tree species in areas where clearcutting is the chosen method of harvest.

i. **Logging slash fire hazard:** Several residents are concerned that logging slash generated by the timber sale will present a serious fire hazard which might endanger their homes.

j. **Decrease in land values:** Marie and Bill Wolff, local residents, expressed concern that the sale might result in a lowering of land values in the area.

k. **Aesthetics:** Several residents believe road building and timber harvest will diminish the aesthetic beauty of the area.

2. The following issues were raised by specialists from DSL and DFW&P:

a. **Archaeology:** DSL archaeologist Dori Passmann expressed a concern for the presence of artifacts within the sale area. See Exhibit A, Archaeology Report for more detailed information.

b. **Hydrology:** DSL Hydrologist, Gary Frank conducted a field review of the sale area during the early planning stages of the sale. His concerns are for protecting the integrity of the watershed. Specific concerns are for controlling surface erosion from roads and landings, irrigation ditch protection, headgate improvement on irrigation ditches, and protection of riparian areas - including Sixmile Creek and other drainages within the sale area. See Exhibit A, Hydrology Report for more detailed information.

c. **Soils:** Soils scientist, Jeff Collins conducted a field review of the sale area during the early planning stages of the sale. His concerns include protection of the soil resource, protection of wet areas, and noxious weed control. See Exhibit A, Soils Report for more detailed information.

d. **Wildlife:** DFW&P biologist Bob Henderson conducted a field review of the sale area during the early planning stages of the sale. His primary concerns are for maintenance of cover for whitetailed deer (winter range cover and hunting season hiding and security cover). See Exhibit A, Wildlife Report for more detailed information.

C. How Issues Have Been Addressed

Upon receipt of responses to initial scoping DSL began addressing issues. Issues have been addressed through a series of telephone conversations, public meetings, and one-on-one meetings with individuals who raised specific concerns. The purpose of these communications has been to gain mutual understanding of concerns, goals, and objectives of all parties regarding the proposed project. Following each meeting DSL has evaluated the concerns expressed, and developed mitigation measures which attempt to address the issues while not compromising timber sale objectives. The following is a listing of the issues and an explaination of how they have been addressed. With the exception of concerns regarding maintenance of the private irrigation headgates and ditches (see page 10-Hydrology) and the comments of Hawthorne and Yashinski (Individual Correspondence-page 46) all issues were considered to be within the scope of the plan. **Unless specifically noted, mitigations have been incorporated into all alternative plans.**

1. Public issues

a. **Clearcutting:** The initial proposal (Alternative A - page 13) includes a 52 acre clearcut. The stand where the clearcut has been proposed is predominately overmature Douglas-fir, western larch, and ponderosa pine. From a timber management perspective the stand is in need of a regeneration harvest. The Douglas-fir and larch are infected with dwarf mistletoe - a parasitic plant which causes growth reduction and eventual tree mortality. Dispersal of mistletoe seeds from overstory trees can infect the understory. An effective silvicultural treatment for dwarf mistletoe infected stands is clearcutting.

As a result of public comment on this issue a second alternative (Alternative B - page 14) has been developed. The second alternative includes two shelterwood harvest units in place of the clearcut, one unit is 9 acres and the second is 5 acres. Approximately 25 trees per acre (trees which visually appear to be free of mistletoe) would be left in each shelterwood unit to mitigate visual impacts. If under this alternative it is later found that leave trees show signs of mistletoe infection they would be removed to prevent infection of young trees. The two shelterwood units are not visible from any existing homes.

b. **Protection of Sixmile Creek and irrigation ditches:** As a result of public comment the group selection units along Sixmile creek in the original proposal have been eliminated in Alternative B. In this alternative no harvesting would take place within the riparian zone on either side of Sixmile Creek. In addition no harvesting would take place within the riparian zones along the West Fork of Sixmile Creek (Section 2).

In both action alternatives it would be necessary to cable yard logs over the two irrigation ditches in Section 12, and to tractor log over the irrigation ditch in Section 14. Individuals holding water rights on these ditches (irrigators) were contacted and provided input for alternatives. Alternatives have also been approved by the DSL Hydrologist and Soil Scientist. It is agreed that any damages caused to the ditches by logging will be repaired by DSL as part of the timber sale.

c. **Weed control:** In order to restrict the establishment of spotted knapweed both action alternatives include provisions that all disturbances associated with new road construction and road improvement would be grass seeded and fertilized as soon as possible following construction or improvement. New roads would be closed after use. All harvesting would be done on frozen or snow covered ground to minimize soil disturbance. One year following completion of the sale the presence of knapweed would be evaluated. Should knapweed be found, a plan of action would be developed that could include spot herbicide treatment.

d. **Roading:** As a result of public concerns the amount of new road has been reduced in Alternative B. In the initial proposal some new roads are visible from residential areas and major access routes. In Alternative B new roads would not be visable from either homesites or access roads.

In both action alternatives all new roads would be closed following completion of the sale. Required winter logging would minimize road dust and road maintenance concerns.

e. **Retention of mature ponderosa pine stands:** Mr. George Whittaker reviewed "leave trees" marked in the locations of special concern to him and said they looked great. He also liked a big larch tree that was marked to leave.

f. **Wildlife:** DFW&P's biologist (Bob Henderson) has reviewed the sale area. Alternative B was developed in part to incorporate his initial concerns. In this alternative portions of cutting units were deleted to provide hiding and thermal cover for big game. Bob feels his concerns have been addressed in this second alternative (Exhibit A).

Whitetail deer are the primary prey species for the Northern Gray Wolf, an endangered species present in the area. Maintaining deer populations is important to insure the wolf an adequate prey base. In both action alternatives no sale activity would be allowed from March 15 to July 1 if a wolf den is found within one mile of the sale area.

In both action alternatives most dead snags and standing green cull trees would be left to provide habitat for cavity nesting species. Snags would be cut in any broadcast burn units and where they pose a significant safety hazard.

No additional wildlife concerns have been expressed by the public.

g. **Herbicide use:** Herbicides if used would be a one time spot application by a licensed applicator in compliance with all label instructions. This spot application would not occur within 500 feet of any wells. It should be noted that the Elk Meadows Subdivision has broadcast sprayed herbicides within 5 feet of the ~~it's~~ community well.

h. **Species diversity:** It is the intention of the timber sale to promote a diversity of tree species. A good species mix is important to buffer the effects of damaging agents. A mix of Ponderosa pine, Douglas-fir and western larch would be encouraged in both action alternatives.

i. **Logging slash fire hazard:** In both action alternatives logging slash in all cutting units; except the clearcut (initial proposal) or one shelterwood unit (Alternative B), and the selection unit (both alternatives); would be tree-length skidded to landing areas and piled for burning. Slash created in the clearcut or shelterwood unit would be broadcast burned. In the selection unit the slash disposal prescription is to lop and scatter slash. There are no houses close to the selection unit.

In both action alternatives all burning would be done the fall following harvesting operations, weather permitting. Some slash resulting from submerchantable trees crushed by heavy equipment during logging would remain within cutting units. To reduce the amount of small material left following cutting, the sale contract would require removal of all trees (excepting leave trees) greater than 15 feet tall.

There could be a short term increase in the fire hazard as a result of logging. After one year there would be a significant reduction in the risk of a major wildfire.

j. **Decrease in land values:** This concern was specific to Marie and Bill Wolff. Other than their initial letter the subject of land value has not been mentioned. They have been contacted and have expressed no concerns with the Alternative B. All proposed alternatives would have negligable impacts to adjacent land values.

k. **Aesthetics:** The partial cuts proposed on the majority of the sale in both action alternatives should maintain the area's forested character from both a far view and near view perspective. Alternative B incorporates shelterwood units instead of a clearcut. In this alternative dominant trees would be left to mitigate visual impacts. These units would not be visible from any existing homes.

2. Specialist Issues

a. **Archaeology:** DSL archaeologist Dori Passmann has completed a review of the sale area for cultural resources. No sites were recorded (Exhibit A). Contract clauses would be added to the Timber Sale Agreement to withdraw any portion of the sale area should cultural resources be found.

b. **Hydrology:** Following a field review of the sale area hydrologist Gary Frank supplied to DSL a list of recommendations (Exhibit A) which, if implemented, would result in no significant hydrologic impacts. All recommendations have been incorporated into all action alternatives. In regards to Gary's concen for irrigation ditch maintenance and headgate improvement, this issue was judged to be outside the scope of the project. The headgates are private property and to confound things - ownership is contested. Should there be major problems with leaking ditches during the sale they will be handled on a case-by-case basis. A letter is being sent to water rights holders expressing our concern for ditch maintenance and headgate control.

A cumulative effects analysis was completed on the Sixmile watershed and there are no cumulative watershed effects constraints for any of the alternatives.

c. **Soils:** Soils scientist Jeff Collins has supplied DSL with a list of recommendations (Exhibit A) which, if implemented would result in no significant soils related impacts in conjunction with the sale. All recommendations have been incorporated into all action alternatives.

III. ALTERNATIVES

Alternative A - This alternative represents the sale as originally proposed. The emphasis is on sawlog timber production. All stands needing silvicultural treatment to increase sawlog growth would be treated. Acres by treatment method are as follows;

Treatment	Acres
Commercial Thin	487

Clearcut	52
Shelterwood	89
Selection (uneven-age)	95
Overstory Removal	11
Group Selection	10
No Treatment	216
New Road	7.13 miles

The cutting of timber on 744 acres constitutes a short term irreversible committment of resources. In the long run trees are a living resource which are constantly changing in response to the environment.

The construction of 7.13 miles of road is an irretreivable committment of approximately 25 acres of forest land. These roads are intended to be improvements to the land and would be used in future management.

Alternative B - Following input from the public, DSL, and DFW&P specialists this alternative was developed with the intention of addressing the issues of clearcutting, stream protection, roading, whitetailed deer habitat, and aesthetics. This alternative strives to strike a balance between revenue production through the sale of timber and mitigating the impacts associated with these five issues. Notable changes adapted in this alternative include the following:

1. A reduction in total acres treated from 744 acres to 514 acres, a decrease of 230 acres,

2. Substitution of 14 acres of Shelterwood harvest for 52 acres of clearcut.

3. A reduction in new road construction from 7.13 miles to 6.15 miles, a decrease of 0.98 miles.

4. Elimination of Group Selection Units adjacent to Sixmile creek.

Acres by treatment method for this alternative are as follows;

Treatment	Acres
Commercial Thin	356
Shelterwood	52
Selection (uneven-age)	95
Overstory Removal	11
No Treatment	446
New Roads	6.15 miles

The cutting of timber on 514 acres constitutes a short term irreversible committment of resources. In the long run trees are a living resource which are constantly changing in response to the environment.

The construction of 6.15 miles of road is an irretreivable committment of approximately 22 acres of forest land. These roads are intended to be improvements to the land and would be used in future management.

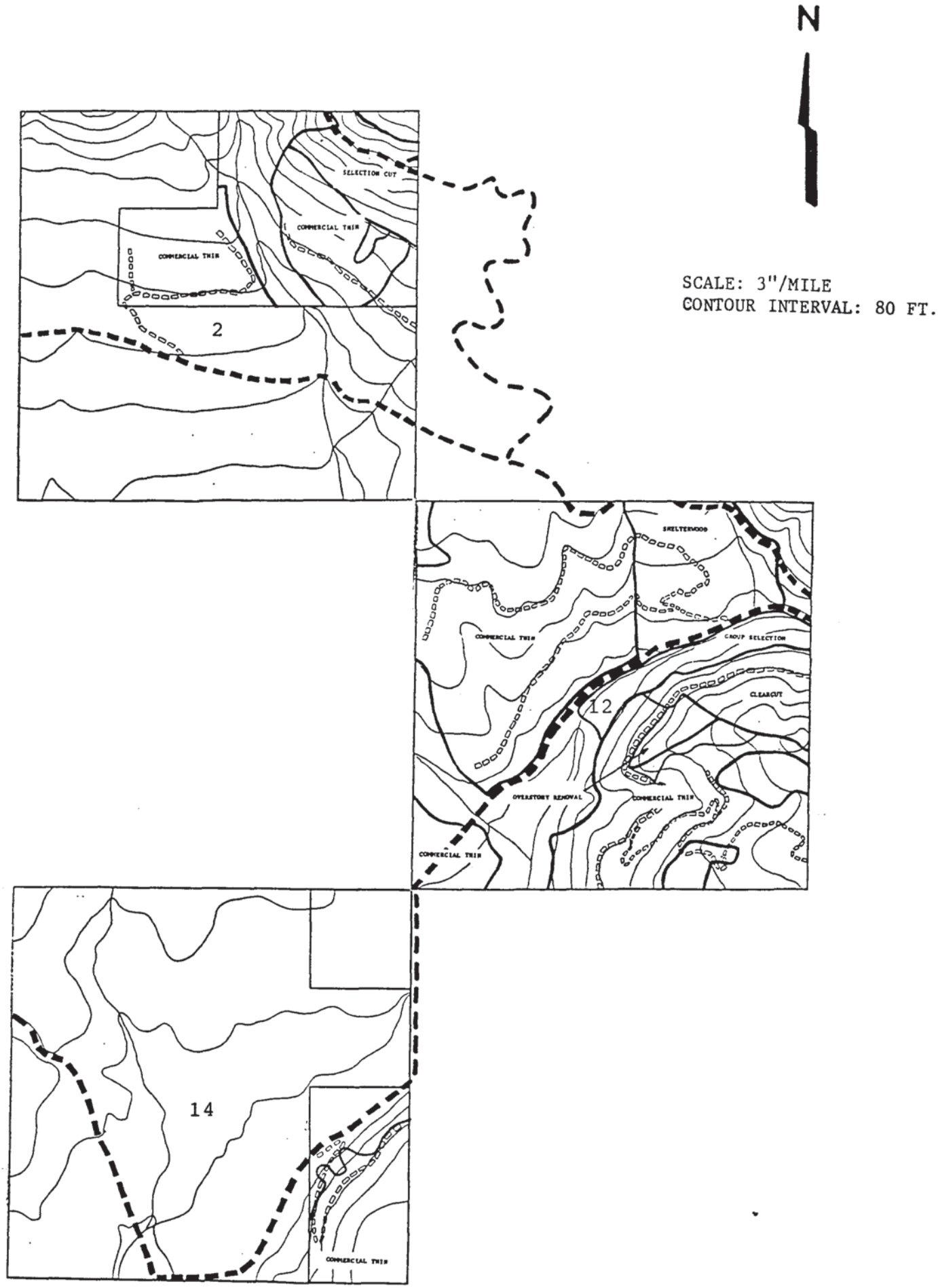
Alternative C - No action. Implementation of this alternative will result in an irretrievable loss of revenue to the School Trust. This loss would be a result of natural tree mortality and retarded growth of trees due to overcrowding and overmaturity. Additionally, overcrowded stands of ponderosa pine are highly susceptible to attack and infestation by mountain pine beetle. Long-term fire hazards would increase from the current high level.

This alternative would have little immediate environmental or aesthetic impacts. An exception is a particularly bad section of existing road which is next to a stream and where there is excessive erosion and sedimentation. In both Alternatives A and B this problem would be addressed. Alternative C does not address this issue.

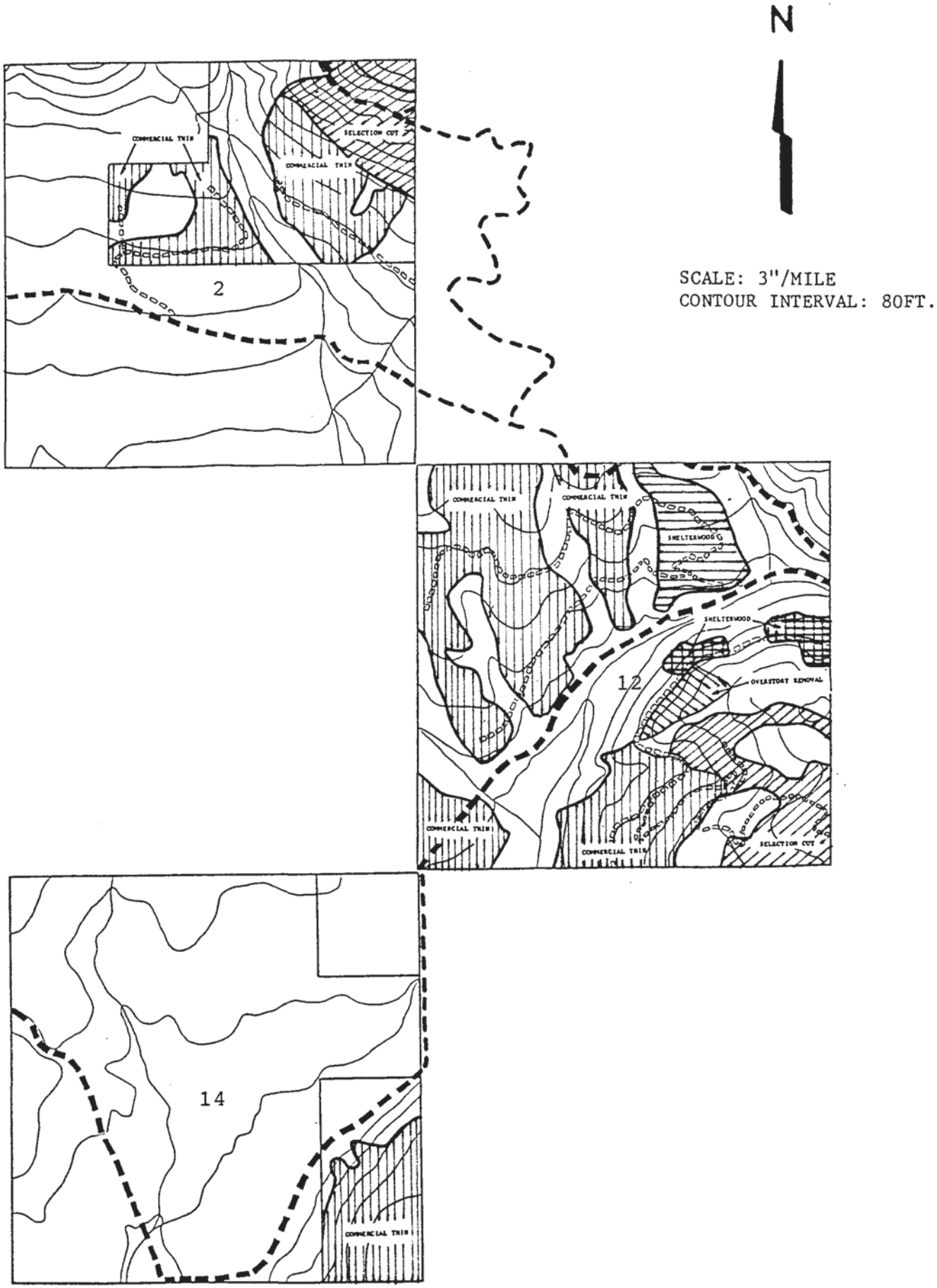
IV. Recommendations:

Alternative B is recommended as the preferred alternative.

ALTERNATIVE A



ALTERNATIVE B



SIXMILE TIMBER SALE

RECORD OF DECISION

I have decided in favor of implementation of Alternative B. This alternative does the best job of both meeting land management objectives and addressing environmental issues associated with the timber harvest proposal. The alternative will not create any significant environmental impacts as proposed.

3/27/92

CHARLES E. WRIGHT DATE
SOUTHWEST LAND OFFICE MGR.
DEPT. OF STATE LANDS

EXHIBIT A

SPECIALISTS REPORTS

AND

PERMITS

SOILS REPORT

January 8, 1990 552

TO: CHUCK WRIGHT, Area Manager, Southwestern Land Office
RAY ERICKSON, Field Supervisor, Missoula Unit
BOB RICH, Forester, Missoula Unit
PAT FLOWERS, Supervisor, State Land Management Section

FROM: JEFF COLLINS, Soil Scientist JC

SUBJECT: SIXMILE T.S. Section 2,12 and 14, T15N, R22W

Soils of the Sixmile sale area range from gravelly loam residual soils (Winkler) to heavy textured, silty clay loam, tertiary age sediments (Crow, Bignell. Brief soils description are attached to map.

The coarse textured Winkler soils are well drained and form good road materials. This soil dries out rapidly and has a long season of use. Main soils concern is minimizing soil displacement of the shallow topsoils.

The deep fine textured tertiary soils include Crow silt loam and Bignell loam which only occur in sections 12 and 14. The fertile Crow soil has the shortest season of use due to ;low gravel contents, high clay content and slow water permeability. Bignell soils have less clay and more gravel than the Crow soils Crow and to a lessor extent Bignell soils tend to remain moist late into spring and are very susceptible to compaction, and road rutting if operated on when wet. Winter logging can reduce soil impacts.

Section 2
Most of the harvest area is located on well drained soils. The proposed commercial thin unit on the East side of the drainage has finer textured soils and remains wet later in the year than the west side.

* PT A on map. Locate equipment restriction boundary around wet area. Trees should be direction felled and winched out of this strip. Alternative is to winter log when there is adequate snow protection to avoid rutting.

* Turnpike road across wet area about 200 ft (PT B on map). This will require blading off the surface 4-6 inches of muck and lifting the road surface at least 1 ft. Additional borrow needs can be drifted from the west side of the wet area.

Section 12
The silvicultural prescription for the southerly aspects is well thought out to maintain shade on shelterwood sites and release advanced regen. on thinning sites. I support the planned cable log clearcuts on the northerly aspect. No significant soils related problems are expected on these soils with the proposed cable logging of steeper sites. Harvest units are generally well located to avoid steep slopes and wet areas.

* Unit C (on map) is located on moderate to steep slopes with irrigation ditches traversing cross slope. Plan is to clipper bunch timber and cable skid up to road to limit impacts to ditch and site.

* Portion of selection, tractor harvest (area D on map) has steep slopes into draw. Designate skid trails in this area to avoid skidding down draw. Skid across draws only at locations approved by Forest Officer.
Equipment restriction zones should be marked around wet areas, and trees winched out of these areas.

Section 14 parcels
The NE 1/4, NE 1/4 has fine textured soils which have a shorter season of use than other units. Watch soil moisture and use available roads and skid trails where possible.
E 1/2, SE 1/4 Small area of short steep slopes. Do not skid slopes over 45%, fell and winch to trail.

GENERAL RECOMMENDATIONS:
Equipment operations should be limited to periods when soils are dry, frozen or snow covered. Brush piling operations should be done only on dry soils. Planned tractor logging on snow will reduce potential for weed introduction.

Grass competition will be strong in the shelterwood unit. I expect at least 30% bare mineral soil will be needed to encourage tree regeneration. Chemical treatment of grass with Pronone would be easier on the land than mechanical scarification.

I believe weed control along roads and at landings would encourage prompt revegetation and be most effective after hauling operations. Herbicide application should follow guides of the manufacturer and Dept. of Ag. for safety and proper handling. Ground application would reduce the potential for drift.

I do not expect any significant soils related problems with this sale if BMP's and recommendations are applied.

	Soil Depth	Topsoil	Subsoil	Permeability	Erosion Hazard	Compaction Puddling	Road Bearing Capacit
176 C Crow silt loam Slope 5-15% Clay in subsoil	80"+	silt loam 0-6"	silty clay loam 0-6"	slow	Mod. High ER INDEX 70	Severe when wet	low
583F Winkler gravelly loam Slope 30-60% Rocky, residual	20-40"	gravelly sandy loam 0- 8"	very gravelly sandy loam 20-40"	Droughty Mod. Rapid	Moderate ER INDEX 40	low	good
265F Bignell/Winkler Complex Slope 30-60% slope	40-60" less on ridges	gravelly sandy loam 10-15"	gravelly clay loam 15-60"	Mod. slow	Moderate ER INDEX 50	Mod. severe for when wet	mod
165D Bignell gravelly loams Slope 8-30%	60"	gravelly loam 10-15"	very gravelly clay 15-60"	Mod./ slow	Moderate ER INDEX 60	Mod. severe	mod.

SECTION 12, T15N, R22W

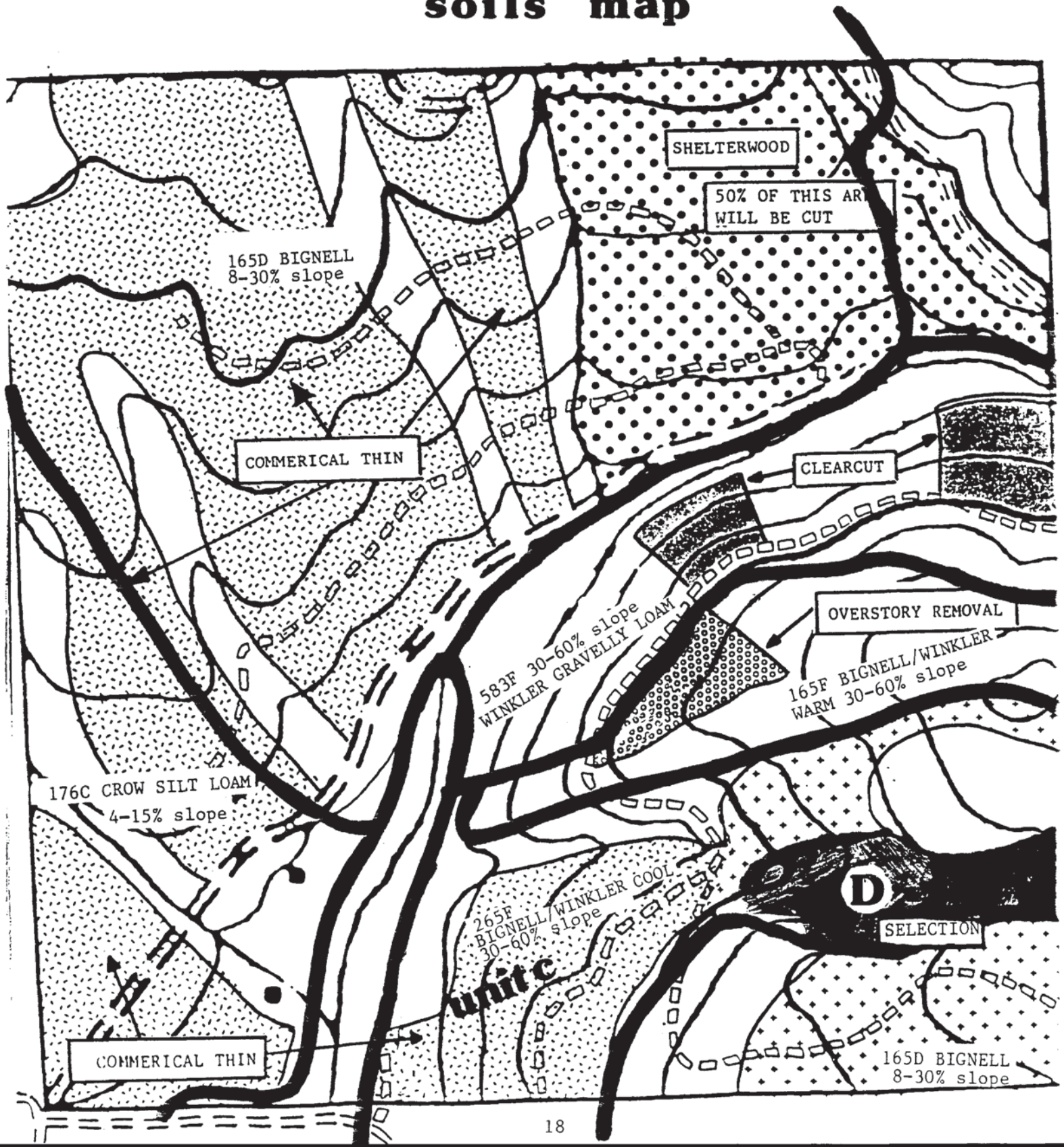
Scale: 8" = 1 mile

Contour Interval 80

AREA TO LOCATE DESIGNATED SKID TRAILS

EXISTING ROAD
NEW ROAD

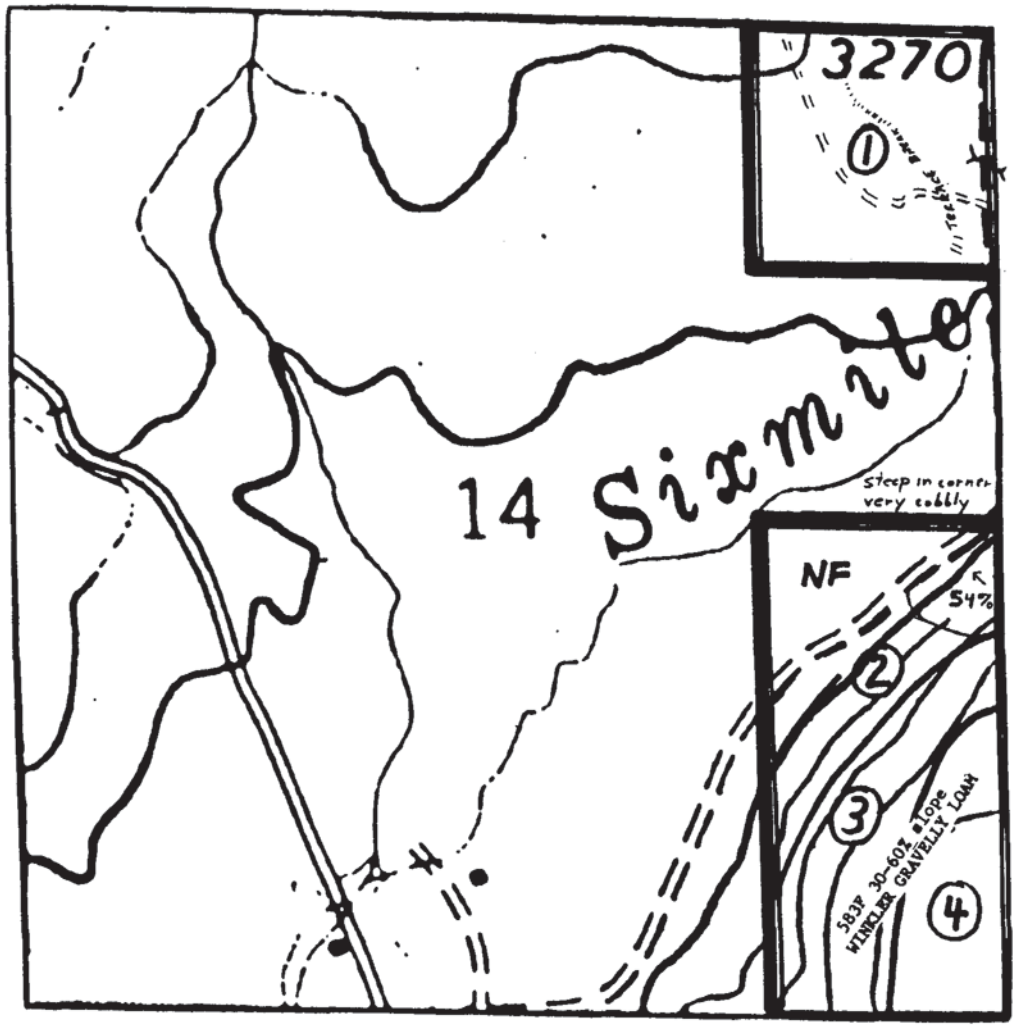
soils map



SECTION 14, T15N, R22W

Scale: 8" = 1 mile

Contour Interval 80

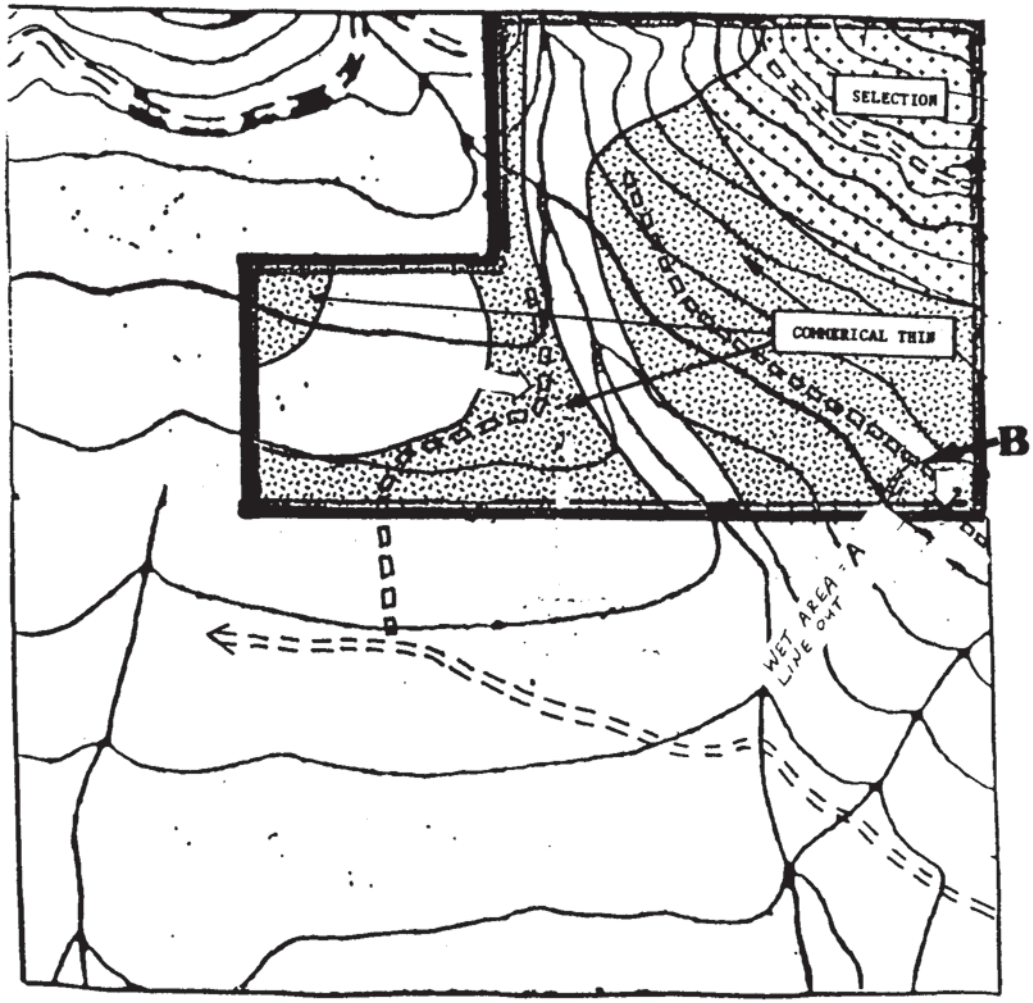


SECTION 2, T15N, R22W

Scale: 8" = 1 mile

Contour Interval 80

EXISTING ROAD
NEW ROAD



HYDROLOGY REPORTS

December 4, 1990

562

TO: RAY ERICKSON, SUPERVISOR, MISSOULA UNIT
PAT FLOWERS, SUPERVISOR, STATE LAND MANAGEMENT
CHUCK WRIGHT, MANAGER, SWLO

FROM: GARY FRANK, HYDROLOGIST

SUBJECT: SIXMILE TIMBER SALE
SECTION 2,12,14 15N 22W

NOTE: This sale was field reviewed on 11/14/90 with Bob Rich and Jeff Collins. The sale was still in the early stages of preparation and these comments should be considered preliminary. An additional field review is recommended after road and harvest unit locations are determined.

WATERSHED: The proposed timber sale lies in the Sixmile Creek watershed. Sixmile Creek is a 3rd order perennial tributary of the Clark Fork River. Precipitation in the drainage ranges from 18 to 50 inches annually. Ownership in the watershed is mixed. The upper watershed is comprised of U.S. Forest Service land and private industrial forest land. Ownership in the lower watershed is primarily private land with subdivisions and agricultural use, and Department of State Lands.

CUMULATIVE EFFECTS: A large portion of the watershed has undergone development from commercial timber harvest, road building and residential subdivision. A water yield analysis was recently completed on the drainage. The results indicate that the cumulative effects status is below prescribed threshold levels. Water yield thresholds are approximately 12 %. Current Water yield increases were calculated at approximately 7% above natural levels. Activities proposed for 1991 on both State and Plum Creek land will increase water yield by an additional 1% . There are no cumulative watershed effects constrains for this sale as proposed.

WATER USE: The Missoula Unit has acquired a list of all existing water rights effected by the sale from the Dept.of Natural Resources. Downstream uses include irrigation, stock water, domestic, fish and wildlife and flow thru fish ponds.

ROADS: The sale will utilize existing Forest Service, county, and private road systems to access the sale sections. Existing roads will require minimal reconstruction to provide for adequate road drainage. Approximately 5 miles of new road construction is proposed.

Site specific recommendations are as follows (locations are referenced on the attached map):

Section 12

Site #3 Road to be constructed on abandoned irrigation ditch R/W.

Site #5 Road crossing dry draw with no defined channel. Install an 18" CMP with approximately 30 ft. of lead ditch.

Site #9 Existing 36" CMP is of sufficient capacity and condition.

Site #10 Existing road with a 48" CMP at stream crossing. Stream channel is braided at road crossing. A majority of the stream flow is carried by the 48" pipe, while flow from a small side channel is diverted in to the road ditch where it flows for some 300' before it drains into an 18" relief pipe. Install an 18" CMP at road crossing to eliminate use of ditch to carry channel flow. Utilize location agreed on during field review.

Site #11 Proposed road crossing of a broad ephemeral draw with a poorly defined channel. Install an 18" CMP.

Site #12 Proposed draw crossings that need to be evaluated in the future once preliminary road locations are identified in the field.

Section 2

Site #1 Install an 18" CMP at proposed draw crossing.

Site #2 Construct a dive thru drain-dip where proposed road crosses swale

Site #3 Move road location downslope adjacent to section line. This will minimize the number of drainage structures necessary to cross this braided reach of stream channel. Install two 18" CMPs at location discussed in the field.

Site #4 Active irrigation ditch with no headgate control (year round flow). Downstream uses include flow thru fish ponds. I recommend that the use of a temporary bridge as originally proposed.

HARVEST UNITS:

Section 12

Unit #1 This unit is traversed by 3 different irrigation ditches. Two of the ditches are active (Site #1 and Site #2) and one is abandoned (Site #3). The abandoned ditch will be obliterated and the right away will be utilized as a road location. The two active ditches are to remain intact but will be crossed by cable yarding corridors. Precautions should be taken to maintain the integrity of these active ditches and any damage incurred during harvest operations should be repaired before completion of the sale.

Establish and mark equipment restriction zones on several draws within Unit #1 (Site #4 and Site #6). Merchantable trees maybe removed by directional felling them out of equipment restriction zone. Do not remove shrubs or submerchantable trees from draws. An equipment restriction is not necessary above Site #7 where the draw broadens into a swale.

Locate landidng and lower harvest unit boundry as discussed in the field (Site #8).

Unit #2 This harvest area contains several Streamside Management Zones that will require marked equipment restrictions. I will make site specific recommendations following ground review of a more completed sale plan.

Section 2 and 14

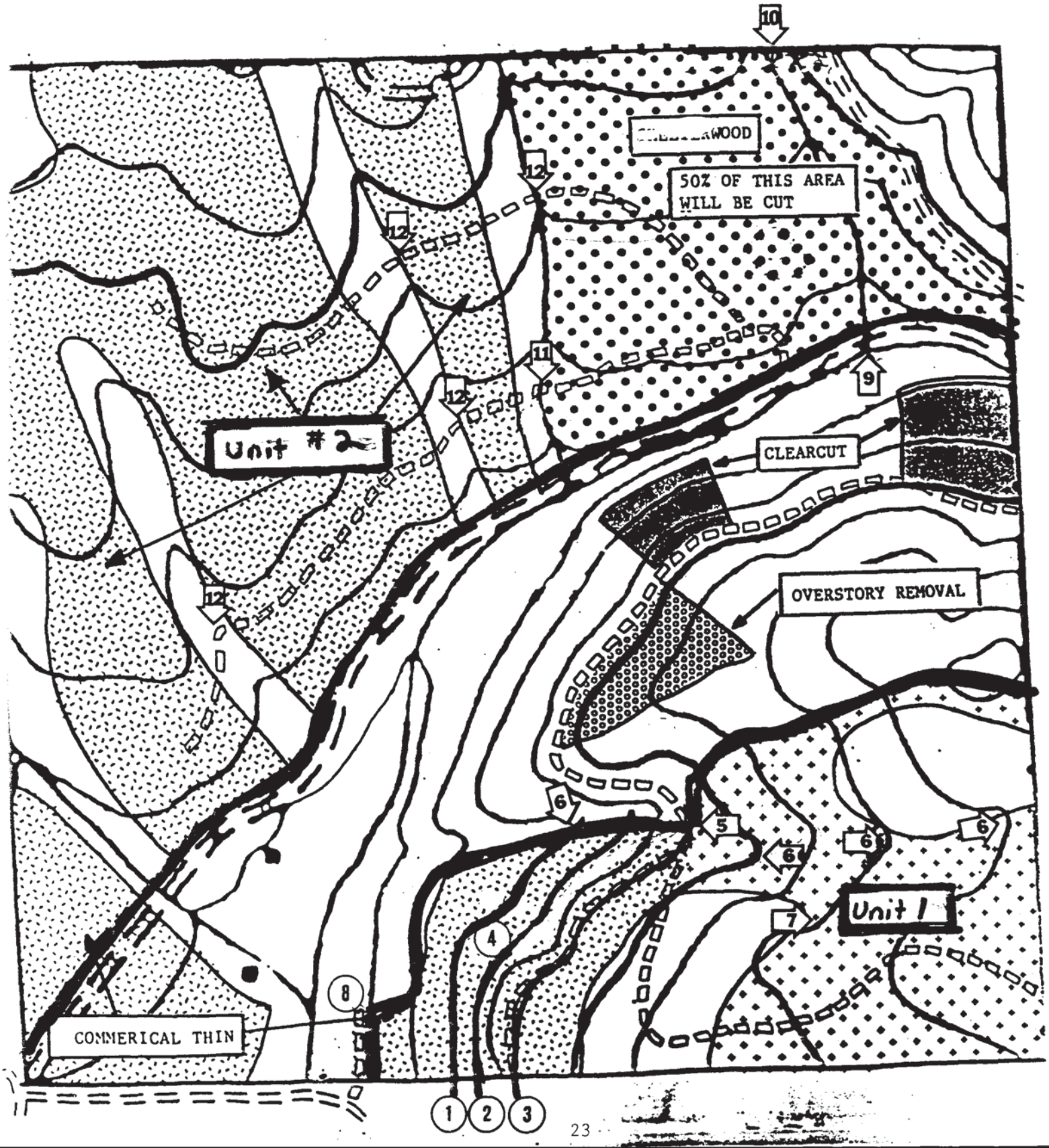
Harvest Units to be reviewed at a future date.

SECTION 12, T15N, R22W

Scale: 8" = 1 mile

Contour Interval 80

EXISTING ROAD
NEW ROAD

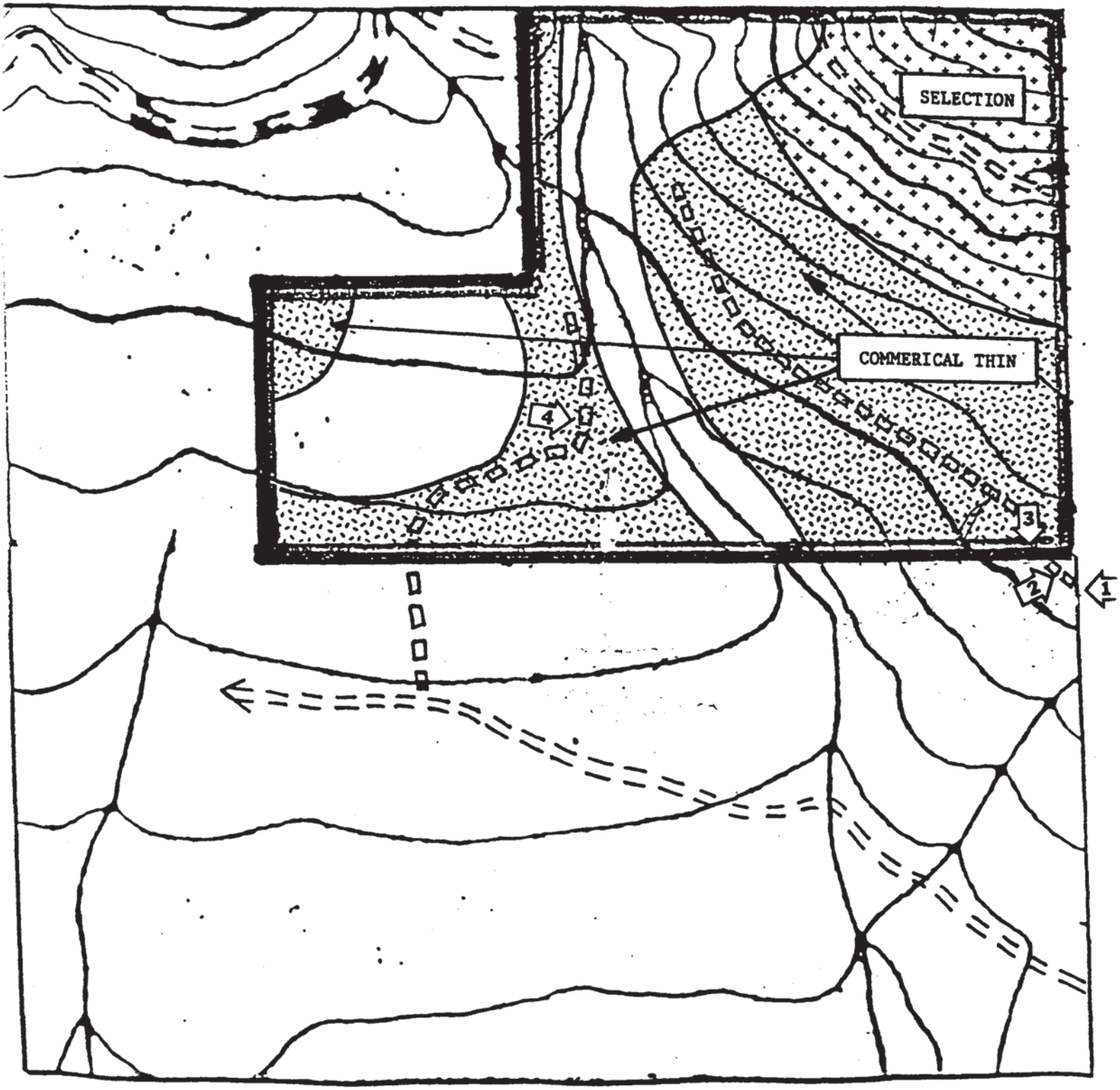


SECTION 2, T15N, R22W

Scale: 8" = 1 mile

Contour Interval 80

EXISTING ROAD
NEW ROAD



SOUTHWESTERN
LAND OFFICE

June 24, 1991

562

TO: CHUCK WRIGHT, MANAGER, SWLO
RAY ERICKSON, SUPERVISOR, MISSOULA UNIT
PAT FLOWERS, SUPERVISOR, STATE LAND MANAGEMENT
BOB RICH, FORESTER, MISSOULA UNIT

FROM: GARY FRANK, HYDROLOGIST

SUBJECT: SIXMILE TIMBER SALE UPDATE
SECTION 2,12,14 15N 22W

NOTE: This sale was first field reviewed on 11/14/90 and a reported on 12/04/90. The sale was then in the early stages of planning. A second review was conducted on 5/14/91 to look at SMZ considerations and final road locations.

WATERSHED & CUMULATIVE EFFECTS: A complete narrative describing the watershed, water uses and a water yield analysis completed on the drainage is contained in the report sent on 12/04/91. There are no cumulative watershed effects constraints for this sale as proposed.

WATER QUALITY I do not anticipate any water quality impacts if all recommedations and prescribed BMP's are fully implemented. Irrigation ditches with return flows to natural stream channels need to protected. This concern has been addressed in the field and the recommended BMP's should be adequate enough to prevent water quality impacts from these ditches.

HARVEST UNITS: The proposed sale area contains several active stream channels and numerous ephemeral draws. To insure compliance with House Bill 731 "Forest Practice for Streamside Management Zones", I have assisted the Missoula Unit in determining where SMZ are required and how to apply the new restrictions. In every case where a stream channel has been identified a minimum SMZ width of 50 ft. must be maintained. The operation of wheeled or tracked equipment is prohibited within the SMZ, except on established roads. The law also specifically forbids broadcast burning, clearcutting and the construction of new roads with in the SMZ, except at stream crossings. I would also recommend against the practice of locating slash piles from road R/W clearing within the SMZ near stream crossings. The exception being the use of slash for the construction of slash-filter windrows at the base of fills slopes.

In defining the SMZ the law states that the SMZ should extend beyond the minimum 50 foot width "to provide additional protection in zones with steep slopes or erosive soils." Unfortunately, the rules and regulation have not been drafted yet so we do not have specific direction on how to adjust widths for steep slopes and erosive soils.

Recently, the Montana Riparian Association released it final recommendations on determining SMZ widths. The Forestry Division has proposed a similar method of calculating SMZ widths in the Draft of the Department's Watershed Management Standards and Guidelines. I have used the procedure outlined in the Standard and Guidelines to determine the SMZ widths included in my recommendations.

HARVEST UNITS

Section 12 - (see Figure 1).

Stand 1 - Establish and maintain SMZ with equipment restriction adjacent to several braided overflow channels as flagged in the field. Use designated locations to cross road ditch. Reshape ditch upon completion of crossing.

Stand 2 - Maintain equipment restriction on steep ephemeral draw as flagged in the field.

Stand 3 - Establish and maintain equipment restriction on steep ephemeral draw. Use bench topographic feature for boundary as discussed in the field.

Stand 4 - Establish a SMZ with equipment restriction on the perennial stream channel. Use bench feature or maintain a minimum SMZ width of approximately 100 feet.

Stand 5 - Unit 5 is a small clearcut with Timbco clipper harvest and cable yarding proposed (see Figure 2). There are two irrigation ditches traversing the lower end of the unit. I suggest the headgate control on these ditches be improved to insure dry ditch conditions during operations. Repair any damage to ditches that might occur during yarding. I also recommend that you use conventional harvest methods in the area that lies between the two ditches. This will eliminate the need to continually cross over the upper ditch with a mechanized harvester.

Sixmile Creek is located immediately downslope of the harvest unit. Using the following formula (erosion factor of 3 x avg slope of approx. 35 %) the minimum SMZ distance recommended is 105 ft. The SMZ distance, equipment restrictions, and other SMZ requirements are adequately satisfied by using the lower ditch as a unit boundary.

Stand 6 - Unit 6 is a small clearcut with proposed clipper harvest, cable yarding and broadcast burning (see Figure 3). There are three irrigation ditches traversing the lower end of the unit. The lower of the 3 ditches is abandoned and serves as the lower unit boundary. The avg. slope within the lower unit is approximately 55 %. Using an erosion factor of 3(x the avg. slope) the minimum SMZ width required is 165 feet.

The proposed harvest unit lies within the required SMZ. Changes in the unit boundary are not necessary if we modify harvest plans to include: 1) Provide for 165 ft equipment restriction. This would preclude use of a mechanized harvester in the area that lies between the ditches. Use conventional felling in this area. 2) Do not clearcut stand with-in the SMZ. Select and remove merchantable sawlogs. 3) Do not broadcast burn SMZ (no burning within 165 feet of the stream channel). Utilize

upper irrigation ditch as a firebreak to prevent burn from entering SMZ.

Stand 8 - Use designated skid trail location for crossing steep draw as discussed and flagged in the field.

Stand 9 - Do not skid up and down draw bottoms. Establish equipment restrictions (25 ft. min.) surrounding isolated washouts and slope failure caused by leaking irrigation ditches. Lower unit boundary is located several hundred feet from Sixmile Creek so no SMZ is required.

Section 2

Stand 5 - Establish an SMZ with painted equipment restriction a minimum distance of 50 feet on both sides of a small perennial stream flowing through the stand. Establish 25 ft. equipment restrictions on several wet swales and isolated wetlands as discussed in the field.

Use bench (slope break) above main stream channel to establish the harvest unit boundary. If harvest unit boundary is to extend into the SMZ use the slope break as an equipment restriction zone boundary. In areas were the bench is poorly defined, use a minimum distance of 100 ft. for the equipment restriction.

Stand 3 - The irrigation ditch that flows through stand 3 is in need of maintenance and headgate control. When I last visited the site the ditch was breached and overflowing. Most of the overflow is intercepted by an adjacent Forest Service road. The water flows down the road surface for a several hundred yards before draining off. Although the road is located on Forest Service ownership, the origin of the problem is on State land. The situation is unacceptable from BMP standpoint and the potential for water quality impacts is high. I recommend that some arrangements be made with the ditch operators or through the sale contract to resolve the problem.

Establish a 25 ft. equipment restriction on the irrigation ditch. I have reviewed the plan to use a temporary bridge to cross the ditch at several locations and find it to be adequate.

Section 14 - (see Figure 4).

Stand 2 - Establish an equipment restriction at lower end of draw as discussed and flagged in the field. The irrigation ditch traversing the top of the unit does not have headgate control. Bob Rich has assured me that the ditch is dry during low flow conditions. Since this unit is to be logged duering the winter, it is assumed that the ditch will be dry duering the harvest operations. Use designated crossings to skid across the ditch and repair any damage incurred before spring runoff.

ROADS:

Section 12 - (see Figure 1).

Site #1,2,4,5 & 6 - Install 5 - 18" CMP.

Site #3 - Construct drive-thru drain dip for swale crossing.

Site #7 - Install 18" CMP at crossing to eliminate channel diversion into road ditch. See previous report 12/04/90.

Site #8 - Road Crossing of dry draw with no defined channel. Install an 18" CMP with 30 ft. of lead ditch.

Section 2 - (see Figure 3).

Site #9 - New road crossing of deep draw with intermittent channel. Install a 24" CMP at location flagged in the field.

Site #10 & 11- Install two 18" CMP's at locations identified in the field.

Site #12 & 13- Road crossing of active irrigation ditch with questionable headgate control. Downstream uses include flow thru fish ponds. I support the planned use of a temporary bridge during sale operations.

Site #14- Construct a drive-thru drain dip at swale crossing.

Section 14 - (see Figure 4).

Site #15- Construct a drive-thru drain dip at swale crossing.

Figure 1.

STAND MAP

SECTION 12 T15N, R22W

SCALE: 8" = 1 MILE

CONTOUR INTERVAL - 80'

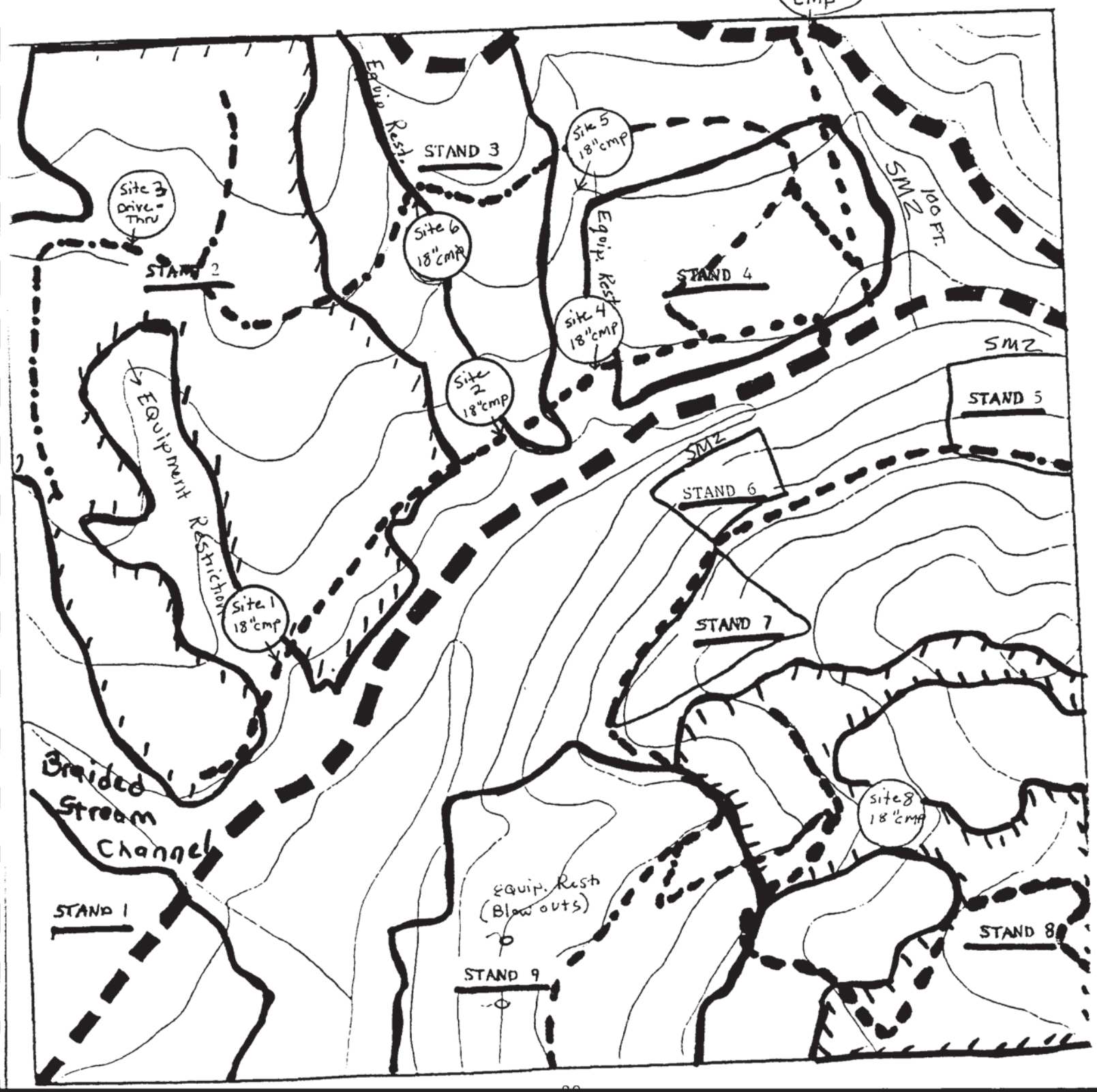
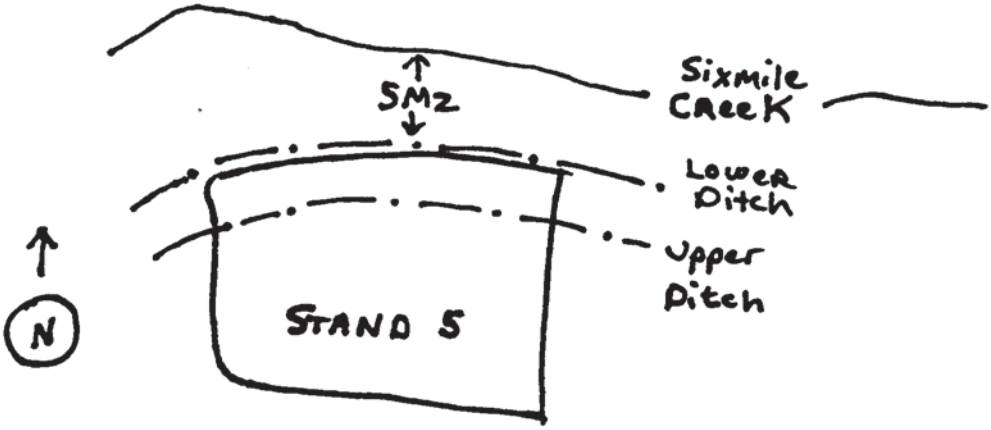


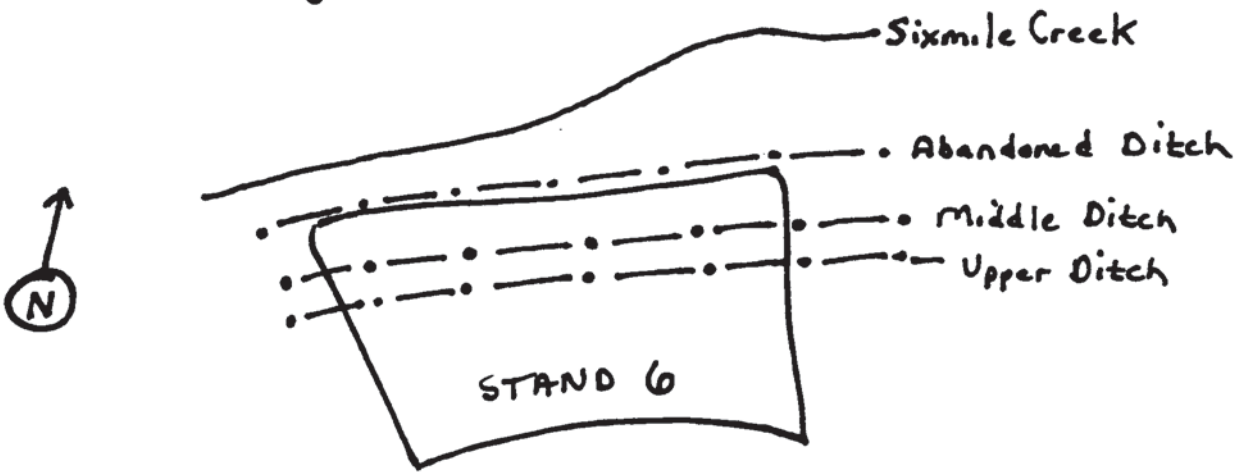
Figure 2.



SMZ Width = Erosion factor 3x Avg. Slope 35%

= 105 FT.

Figure 3.



SMZ Width = Erosion factor 3x Avg. Slope 55%

= 165 FT.

FIGURE # 3

STAND MAP

SECTION 2 T15N, R22W

SCALE: 8" = 1 MILE

CONTOUR INTERVAL - 80'

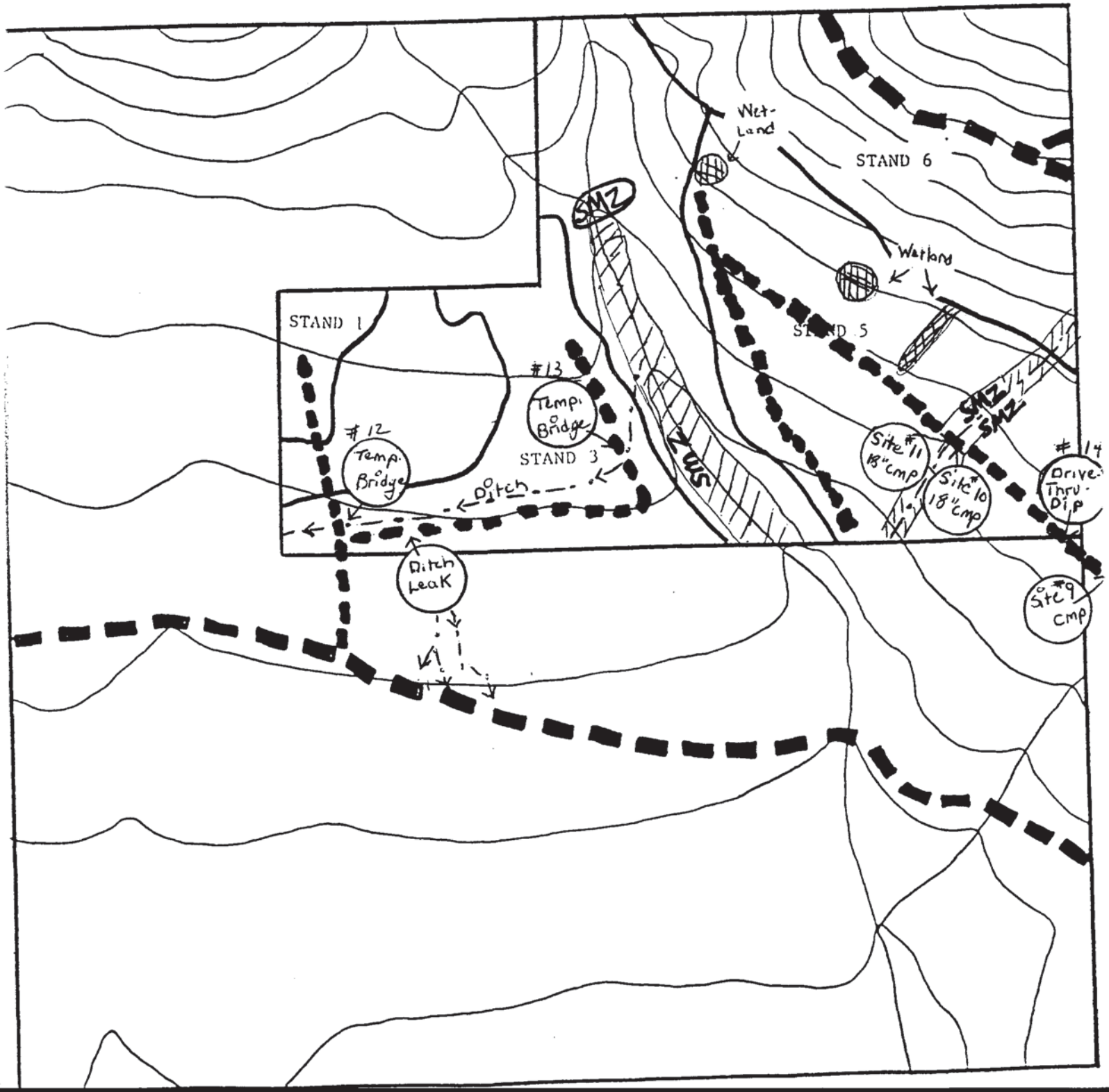


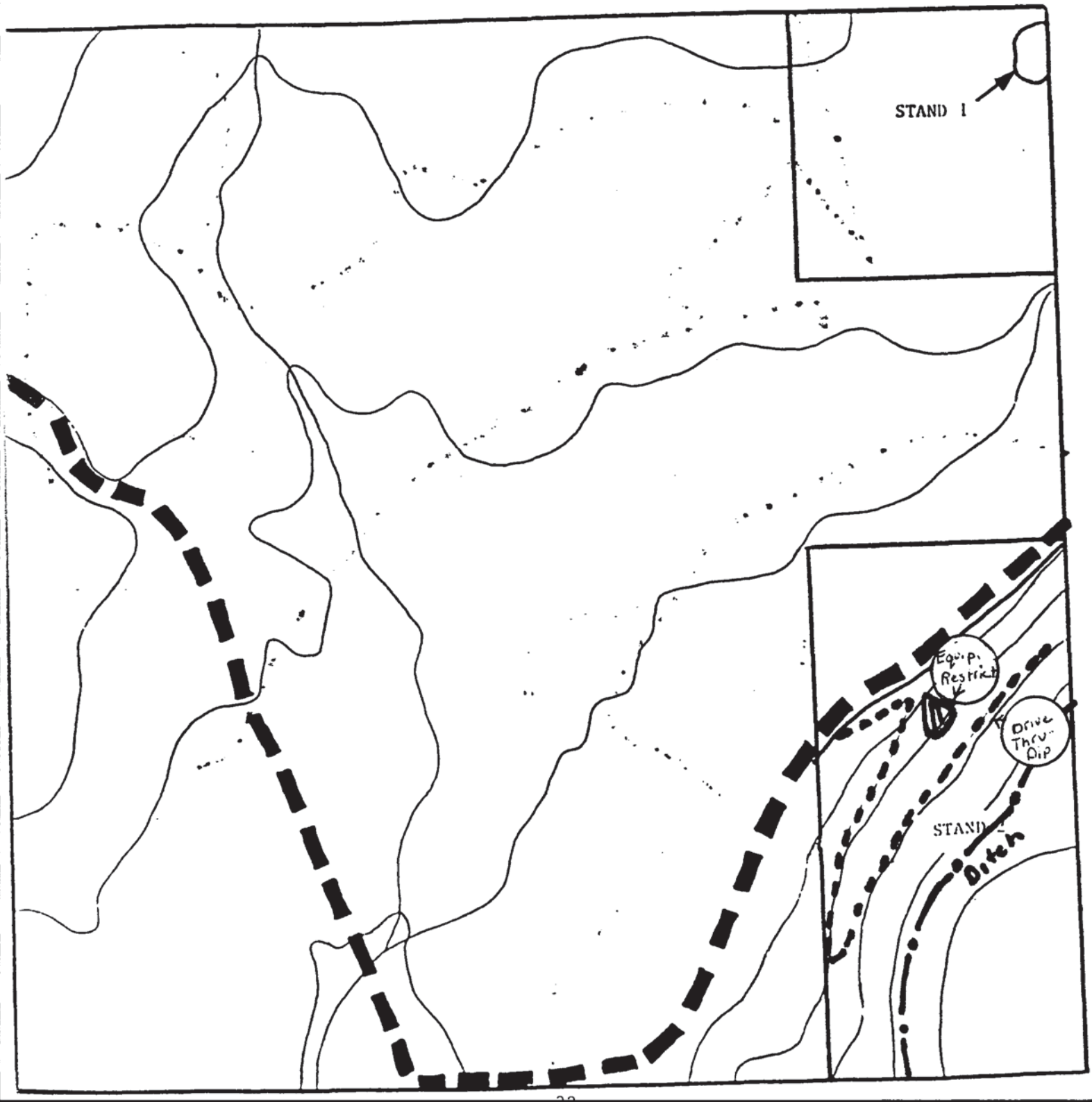
FIGURE # 4

STAND MAP

SECTION 14 T15N, R22W

SCALE: 3" = 1 MILE

CONTOUR INTERVAL - 30'



WILDLIFE REPORT

Montana Department of Fish, Wildlife & Parks

RECEIVED
JAN 16 1991
SOUTHWESTERN
LAND OFFICE

3201 Spurgin Road
Missoula, Montana 59801
January 14, 1991

Bob Rich
Department of State Lands
2705 Spurgin Road
Missoula, MT 59801

Dear Bob:

Thank you for the amount of effort made to include Fish, Wildlife & Parks in the planning of the Sixmile Timber Sale.

As we have discussed so often, the primary concern we have here is the maintenance of whitetailed deer winter range cover requirements. A secondary concern is to maintain hiding cover and security during the hunting season.

This last proposal does a pretty good job of addressing our concerns. There will be some temporary losses of thermal and hiding cover. Those losses should be offset by regeneration and growth of residual trees. Furthermore, many areas have been deferred to protect important sites and create greater diversity and mosaics.

Thank you for your consideration.

Yours,

Bob Henderson

BH/pm

DEPARTMENT OF STATE LANDS

STAN STEPHENS, GOVERNOR

CAPITOL STATION

STATE OF MONTANA

(406) 444-2074

1625 ELEVENTH AVENUE
HELENA, MONTANA 59620

November 16, 1990

MEMORANDUM

TO: Bob Rich, Management Forester, Missoula Unit, SWLO

FROM: Dori Passmann, Archaeologist, Land Management Section

RE: Sixmile Timber Sale
2,12,14-15N-22W

Sections 12 and 14 were examined several years ago. Due to the presence of a drainage in section 2, I reserve the right to examine the sale units after reviewing the sale map.

Several historic irrigation ditches were recorded in all sections of the sale. Active ditches will not be impacted by harvesting activities. The inactive ditch in 12 will be converted into a road.

All activities in sections 12 and 14 are cleared. Section 2 is tentatively cleared pending review of the sale map; a memo will inform you of any decisions. Please let me know if I can be of further assistance.

DP/nn

"AN EQUAL OPPORTUNITY EMPLOYER"

DEPARTMENT OF STATE LANDS

STAN STEPHENS, GOVERNOR

CAPITOL STATION

STATE OF MONTANA

(406) 444-2074

1625 ELEVENTH AVENUE
HELENA, MONTANA 59620

January 7, 1991

MEMORANDUM

TO: Bob Rich, Management Forester, Missoula Unit, SWLO

FROM: Dori Passmann, Archaeologist, Land Management Section

RE: Sixmile Timber Sale
2-15N-22W

I have received and reviewed the sale map for Section 2. Other than the irrigation ditch, there are no known sites in the section. With the buffer zone along the drainage, it appears unlikely that significant cultural properties will be impacted. This section is also cleared.

Please let me know if I can be of further assistance.

DP/nn

"AN EQUAL OPPORTUNITY EMPLOYER"

124 PERMIT

FWP Use Only
_____ Form Letter to Applicant
Water Code: _____
Appl. No. _____

STREAM PRESERVATION ACT PERMIT APPLICATION

"Notice of Construction"
(Please Print or Type)

Address: *(see reverse side)*

To: MONTANA DEPARTMENT OF FISH, WILDLIFE & PARKS

Region 2 Attn: Fish Manager
3201 SPURGIN ROAD
MISSOULA, MT 59801

SPONSORING AGENCY: DEPARTMENT OF STATE LANDS
Address: 1401 - 27TH AVE.
MISSOULA, MT 59801

Contact Person: BOB RICH
Title: LEAD MANAGEMENT FORESTER
Telephone: (406) 542-4345

Official In Charge: BOB RICH
Title: LEAD MANAGEMENT FORESTER
Telephone: (406) 542 4345

PROJECT IDENTIFICATION: Project Name: SIXMILE TIMBER SALE
Project No. _____ Waterbody: UNNAMED TRIBUTARIES TO SIXMILE CREEK

Location: Township 15N Range 22W Section 1,2,12 County: MISSOULA

Location to Nearest Town: _____

Project Features:

X Bridge	X Culvert	X Other IRRIGATION DITCH REINFORCEMENT
X Work Bridge and Removal	___ Dredging	
	___ Hydraulic Structure	
___ Bridge Demolition	___ Channel Change	
___ Core Drill	___ Bank Stabilization	

Project Scheduling: Contract Letting 6 / 25 / 91
Construction Period 6 / 26 / 91 to 12 / 31 / 92

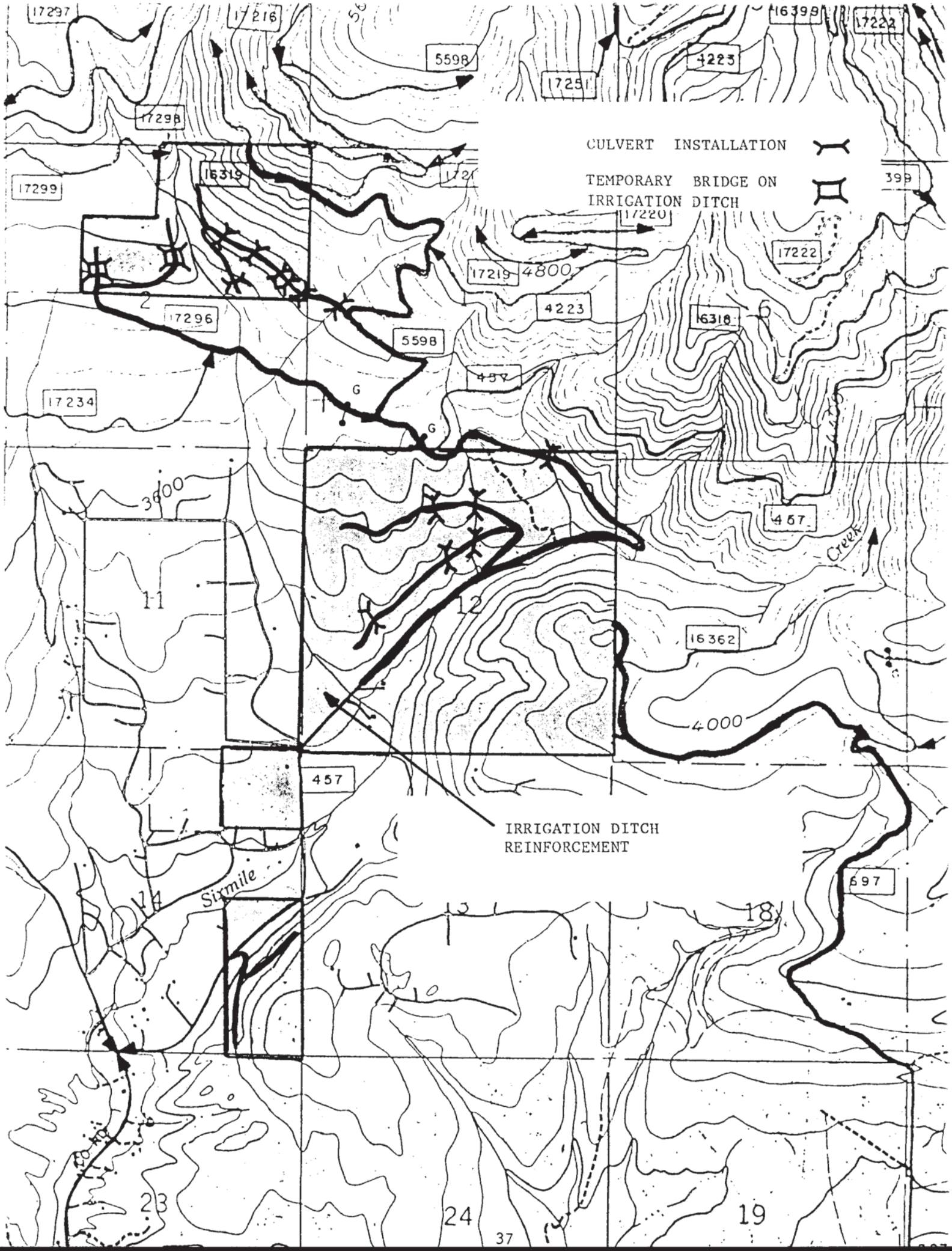
Allow sixty (60) days for application processing. A set of preliminary plans or sketches of the proposed project **must** accompany this application. (NOTE: Dept. of Hwy. sponsored projects require **two** sets of plans sent with this form to Helena FWP address.)

___ Plans ___ Sketches X Other MAPS OF PROJECT LOCATION

Bob Rich
Signature

1-16-91
Date

Distribution: White/Yellow -- Region Pink -- Applicant
Form: 124SPA 5/89


CULVERT INSTALLATION
TEMPORARY BRIDGE ON IRRIGATION DITCH
IRRIGATION DITCH REINFORCEMENT
Sixmile
Creek
4800
4000
3600
17297
17216
5598
17251
4223
17222
17298
16319
17299
17220
17219
17296
16318
17234
457
16362
697
11
12
14
18
23
24
19

Montana Department of Fish, Wildlife & Parks

RECEIVED
FEB 21 1991
SOUTHWESTERN
LAND OFFICE

February 20, 1991

Bob Rich
Department of State Lands
1401 27th Ave.
Missoula, MT. 59801

SUBJECT: Permit No. MISC-1-91 R-2 Waterbody: Sixmile Cr.
Project Name: Sixmile Timber Sale Water Code: 05-6368

Dear Mr Rich:

Relative to the Montana Stream Preservation Act, the Department has completed our review of your proposed project on unnamed tributaries to Sixmile Creek. Your project has been approved with the following special conditions:

1. All in-stream work shall be completed in an expeditious manner to avoid unnecessary impacts to the streams;

2. Extra precautions shall be taken to preserve existing riparian vegetation;

3. All construction activities performed in the stream and immediate vicinity, shall be conducted in a manner to reduce in-stream turbidity along with minimizing disturbances to the streambed and/or streambank;

4. All streambank and adjacent areas disturbed by the construction activity shall be protected with temporary erosion control measures during the construction activities. These areas shall be reclaimed with long-term erosion control measures and revegetated immediately after construction;

NOTE: This permit is valid for **one year** from the date of receipt.

EXHIBIT B

PUBLIC CORRESPONDENCE

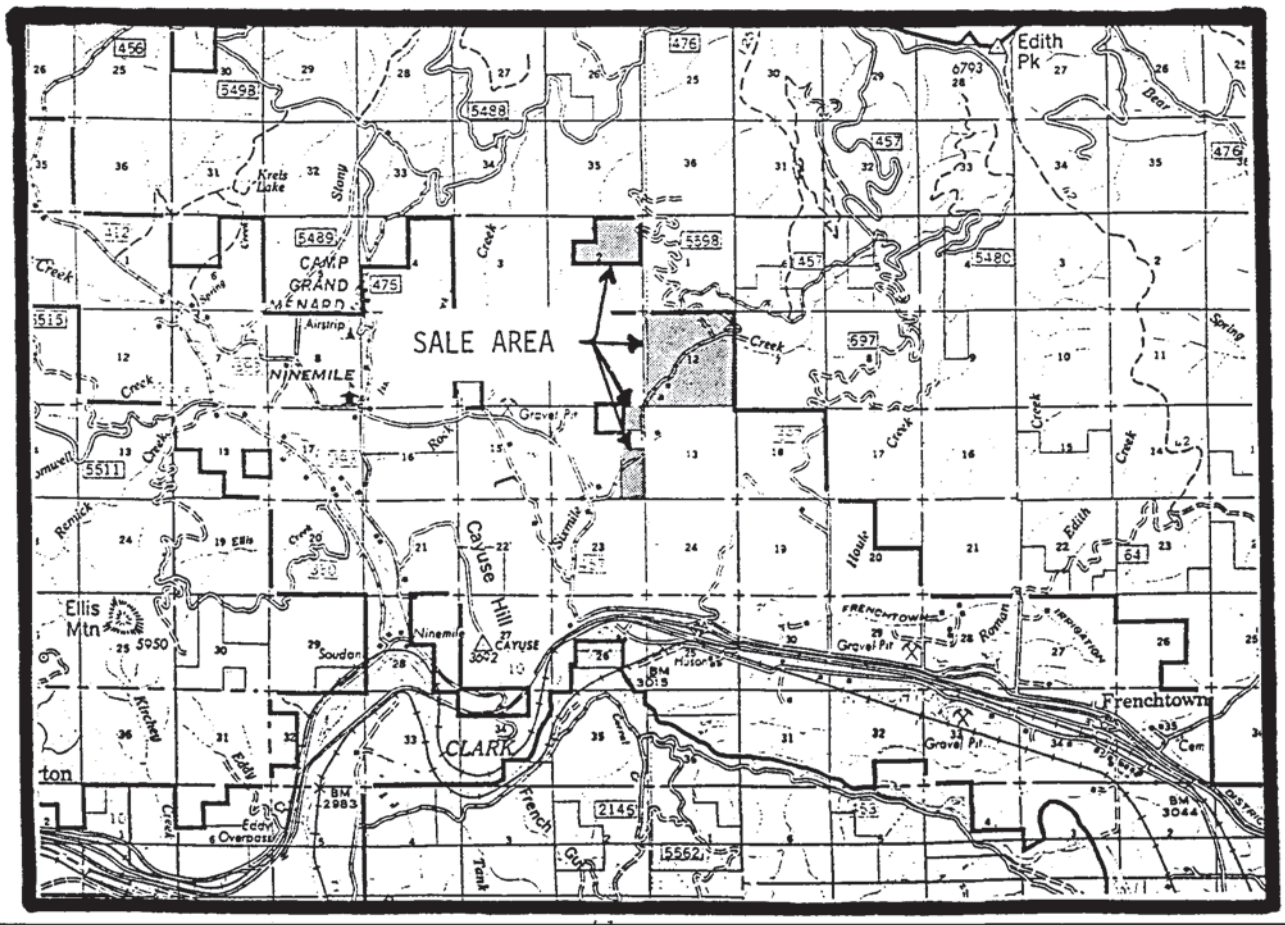
PUBLIC NOTICE

THE MONTANA DEPARTMENT OF STATE LANDS IS CURRENTLY PLANNING THE SIXMILE TIMBER SALE LOCATED IN SECTIONS 2, 12, AND 14; TOWNSHIP 15 NORTH; RANGE 22 WEST. THIS TIMBER SALE IS PART OF A PROGRAM OF MANAGING FORESTED STATE TRUST LAND FOR REVENUE TO SUPPORT PUBLIC SCHOOLS.

WE ARE CURRENTLY INTERESTED IN RECEIVING PUBLIC COMMENT. THOSE INTERESTED SHOULD ADDRESS COMMENTS TO BOB RICH, LEAD MANAGEMENT FORESTER, DEPARTMENT OF STATE LANDS - MISSOULA UNIT, 1401 27TH AVE., MISSOULA , MT. 59801 OR PHONE AT 542-4345.

PRELIMINARY SURVEYS INDICATE A NEED FOR COMMERCIAL THINNING OF OVERSTOCKED SECOND GROWTH TIMBER STANDS AND FOR SOME REGENERATION CUTTING OF MATURE AND DISEASED TIMBER WHICH IS NO LONGER THRIFTY.

FOLLOWING PUBLIC COMMENT AND FURTHER SALE REVIEW, A PUBLIC MEETING IS PLANNED FOR THE SIXMILE AREA.



MEETING INVITATION

DEPARTMENT OF STATE LANDS

FIELD OPERATIONS DIVISION

STAN STEPHENS, GOVERNOR

CAPITOL STATION

STATE OF MONTANA

(406) 542-4200

Southwestern Land Office:
1401 27th Avenue
Missoula, MT 59801

January 17, 1991

Dear Sixmile Area Resident:

The Montana Department of State Lands is currently planning a timber sale in the Sixmile Creek drainage located in Sections 2, 12, and 14, T15N, R22W. Enclosed is a summary of issues that have been previously raised by local residents regarding the proposed sale and how the state plans to address theses issues. This summary is not part of the environmental assessment and is intended only to provide information to interested parties in a concise format. The draft assessment for this sale is available for public review at this time at the Missoula Unit office located at 1500 Tower St. in Missoula.

Public comments on this assessment will be accepted until February 1. If you wish to submit written comments please address them to:

Bob Rich, Lead Management Forester
1401 - 27th Ave.
Missoula, MT 59801
(406) 542-4345

As part of this comment period a public meeting is scheduled for Saturday, January 26, 10:00 a.m. at the Sixmile Fire Station. At this meeting, the sale plan and environmental assessment will be discussed and any additional questions or issues addressed. If you plan on attending the public meeting please bring a folding chair for your own use.

Sincerely,

Bob Rich

Bob Rich
Lead Management Forester
Missoula Unit

"AN EQUAL OPPORTUNITY EMPLOYER"

HARVEST PLAN: The state owns 960 acres in the Sixmile area; 528 acres will be harvested with this sale using the following silvicultural systems.

Commercial Thin	-	366
Shelterwood	-	37
Selection (uneven-age)	-	100
Overstory Removal	-	8
Clearcut	-	17

The two clearcut units will be replanted to a mixture of Ponderosa Pine, Western Larch and Douglas-Fir following broadcast burning site preparation work. All logging will be restricted to frozen or snow covered ground conditions approximately November 25 to March 5 depending on the weather conditions. Road construction will not be restricted to winter months. Pronone Herbicide will be applied experimentally on several sites less than 1/4 acre in size. Total area treated will not exceed 3 acres. If natural regeneration fails broadcast application of Pronone may be done to reduce pinegrass competition and promote tree regeneration in the shelterwood cutting unit.

LOGGING SLASH FIRE HAZARD: Logging slash in all cutting units, except the two clearcut units and the selection unit in Section 2, shall be treelength skidded to roadside landing areas and piled for burning. Slash created in the clearcut units will be broadcast burned. All burning will be done the fall following harvesting operations weather permitting. Some slash resulting from submerchantable trees being crushed by equipment during logging will remain within the cutting units.

AIR QUALITY: Burning of logging slash will have a short-term impact on local air quality. Burning will only be done during periods of good smoke dispersion. However, due to the topography of the area local residents may be impacted by smokey conditions for as long as 2 to 3 days.

AESTHETICS: Partial cuts proposed on the majority of the sale area should maintain the area's forested character from both a far view and near view perspective. The two clearcut units will not be visible from any homes. New roads in Section 12 should be screened from view by standing timber except where the road crosses the clearcut units. A new road in Section 14 near the fire station will be visible from the valley floor. Trees below the road shall be left unthinned to partially screen the road from view. The majority of this sale is leave tree marked, following logging most of the trees left will have a blue paint stripe on them for a number of years.

NOXIOUS WEEDS: Noxious weeds, primarily knapweed, have the potential to spread as a result of ground disturbance that will accompany road building and harvesting activities. The following measures will be taken to limit or prevent the spread of weeds. All harvesting will be done on snow covered or frozen ground to minimize soil disturbance. All roads shall be grass seeded as soon as possible after construction and closed after hauling. Roads may also be sprayed with herbicide if knapweed does become established.

EXISTING ROADS: All timber except for right-of-way logs will be hauled during the winter months. This should reduce road dust and road maintenance problems. Right-of-way timber (approximately 25 truckloads) may be hauled at anytime that road conditions allow.

RIPARIAN AREAS: Streamside management zones and equipment restriction will be applied whenever called for by the Best Management Practices. No harvesting will take place between Sixmile Creek and the Sixmile road or in the riparian zones along the West Fork of Sixmile Creek.

IRRIGATION DITCHES: In order to log portions of Section 12 it will be necessary to cable yard logs over the two ditches in that section. Individuals holding water rights on these ditches have been contacted and are aware of the logging plan. Any damage to the ditches will be repaired by the state.

WILDLIFE: A wildlife biologist from the Department of Fish, Wildlife & Parks has reviewed the sale area. Portions of the area has been deferred from treatment at this time to provide hiding and thermal cover for big game, primarily whitetail deer. Whitetail deer are also the primary prey for the Northern Gray Wolf; an endangered species present in the area. Maintaining deer populations is important to insure the wolf an adequate prey base. No activity will be allowed on the sale area from March 15 to July 1 if a wolf den is found within one mile of the sale area. Dead snags and standing green cull trees will not be cut on the majority of the sale area in order to provide for cavity nester habitat. Snags will be cut in the broadcast burn units or anywhere else that they pose a significant safety hazard.

TOUR INVITATION

September 13, 1991

Field work on the Sixmile timber sale has been completed and the sale package is currently being prepared. Now that the trees and the road locations are marked, it is much easier to envision exactly what the area will look like after logging.

For anyone who is interested in attending a tour of the sale area, I will be at the cattleguard at the entrance to the Elk Meadows subdivision at 10:00 a.m. on Saturday, September 21, 1991. We can tailor this day to see whatever areas the group wishes to, and discuss any aspect of the sale you would like to address. I realize that this is a busy time of the year for many people (i.e. elk to chase, fish to catch, firewood to cut), so please feel free to attend any portion of the tour that you wish.

I suggest that you consider bringing a lunch and be prepared to do some walking through the woods. If you know of anyone who would be interested in attending the tour, and has not received this letter please pass along the details to them and invite them along. Thank you for your interest in state land management.

Sincerely,

Bob Rich

Bob Rich
Lead Management Forester
Missoula Unit

mb

INDIVIDUAL CORRESPONDENCE

11-17-90

Dear Mr. Rich,

We wanted to write a follow-up letter to the tour of the "proposed" timber sale that you will be overseeing in the Six-Mile Area. We realize that nothing we say, or any of the many reservations that other local residents have voiced, will have much of an impact on what will be done. All of the P.R. aside, some all-knowing Proffessional in some office someplace actually picks out what forest areas are going to be chewed up every year to provide jobs for a variety of public and private servants, and cheap chips for Stone Container. We realize that the question of the profitability of a sale is considered silly by the State, and that, carefully analyzed, most sales actually cost the taxpayers money. And if any money is made

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it is given to the ever-holy public school system, along with our property taxes, coal severance taxes, lottery sales, etc. We're all on a mission from God to support that glorified baby-sitting system at whatever cost.

To us, the talk of broadcast spraying herbicides from helicopters, economically clearcutting on slopes, enhancing the spread of napweed through all kinds of site disturbance, etc. — it all sounds like economical and environmental stupidity. Probably no worse than what's been done in western Montana for years, only closer to home.

Mr. Rich, we understand that you are just doing your job and will probably do a good job of it at that. What we question is the job itself.

Sincerely,

Elizabeth Hawthorne*
Dale Yoshinski*

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* We have degrees in environmental sci, wildlife, and resource conserv.

BOB RICH
FORESTRY DIVISION
1400 27TH AVE
MISSOULA, MT. 59801

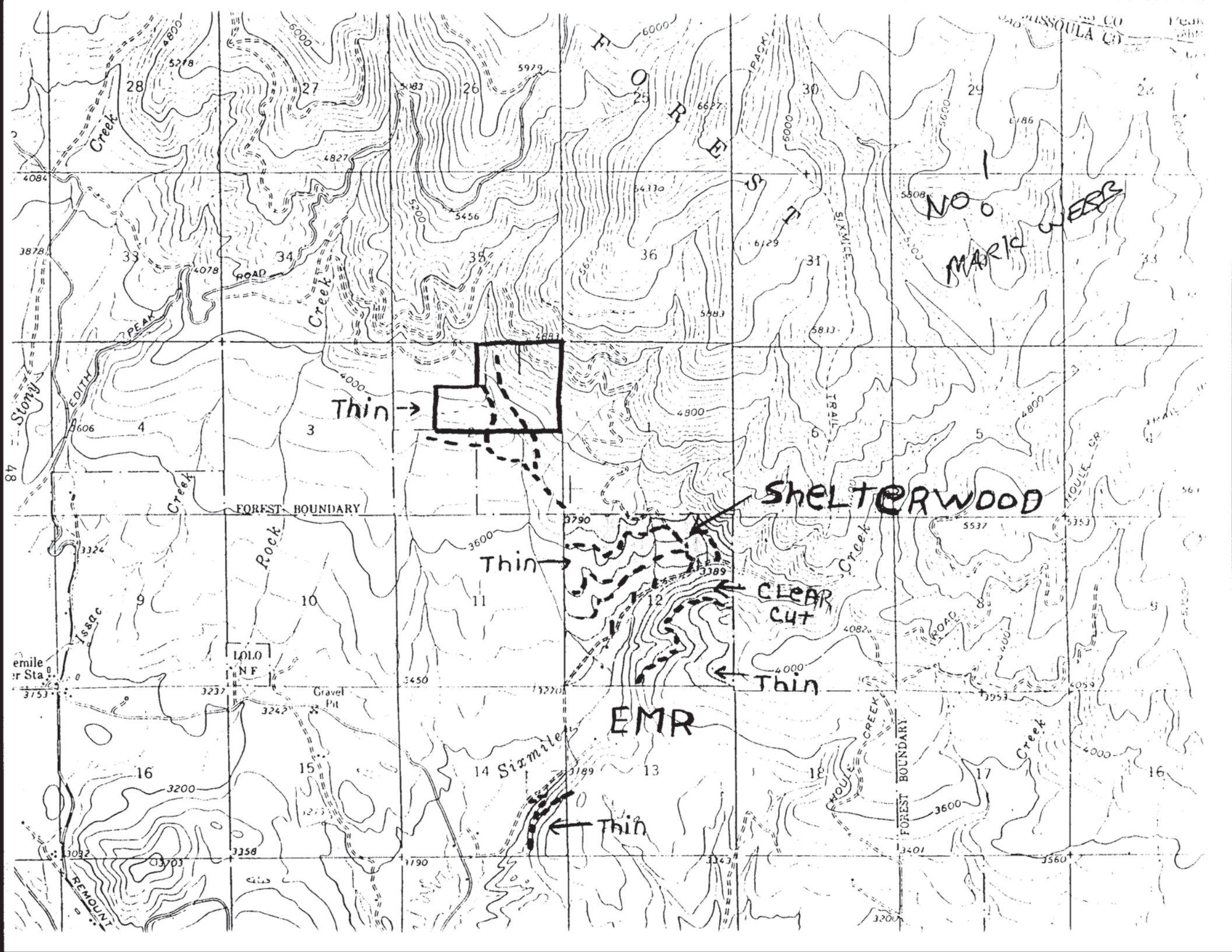
DEAR SIR %

10-1-90

I WORK OUT OF STATE OFTEN, BUT KEEP MY RESIDENCY AND OWN MY OWN HOME IN ELK MEADOWS NEAR LOLO NATIONAL FOREST. I'M SORRY I WASN'T ABLE TO MEET WITH YOU THIS SUMMER TO EXTEND MY TOTAL DISMAY WITH THE MASSIVE OVERCUTTING OF THE LOLO AND OTHER STATE AND FEDERAL LANDS IN MONTANA. IT'S BAD ENOUGH TO LIVE AROUND SO MUCH CLEARCUTTING ON PRIVATE LANDS AND TO SEE ABUSES OF THE PAST, BUT OUR GOVERNMENT LANDS SHOULD BE MAINTAINED MORE FOR WILDLIFE HABITAT, WATERSHED PROTECTION AND RECREATION. THESE ACTIVITIES ARE THE CLEAN FUTURE OF MONTANA AND MUST BE OUR PRIME OBJECTIVE.

THANK,
MARK D WEBB

MARK D WEBB
SR BX 239
HUSON, MT. 59846


Thin
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SHELTERWOOD
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FOREST BOUNDARY
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LOLO NF
Gravel Pit
Stony Creek
Rock Creek
Isaac
Sixmile
Sixmile Creek
Houle Creek
Edith Peak Road
Sixmile Trail
Packer
Remount
Missoula Co
Peak

DEPARTMENT OF STATE LANDS
FIELD OPERATIONS DIVISION

STAN STEPHENS, GOVERNOR

CAPITOL STATION

STATE OF MONTANA

(406) 542-4200

Southwestern Land Office:
1401 27th Avenue
Missoula, MT 59801

October 5, 1990

Mr. Mark D. Webb
Star Route, Box 239
Huson, MT 59846

Dear Mr. Webb:

I have received your written comments regarding the state's proposed Sixmile Timber Sale near your property in Elk Meadows. At this time our sale is still in the planning phase and we are making a continuing effort to inform local residents of our plans and address their concerns.

I intend to hold another public meeting within the next 2 to 3 months to discuss the sale with local residents, if you wish I will add your name to our interested parties mailing list so you will be notified of the meeting.

If you desire any additional information on our sale or wish to share your concerns I will be glad to discuss the subject with you. I may be reached by phone at (406) 542-4345 or at the same address of your first letter.

Sincerely,

Bob Rich

Bob Rich
Lead Management Forester
Missoula Unit

mb

"AN EQUAL OPPORTUNITY EMPLOYER"

July 19, 1990

Cornelia Whittaker
P O Box 25
Huson, Mt. 59846

Bob Rich
Department of State Lands
Forstry Division
Missoula Division
1401 27th Ave
Missoula, Mt. 59801

Dear Bob,

Thank you for the opportunity to express my thoughts on the upcoming timber sale in the Six Mile area. I would like to express my concerns as follows.

1. I have strong reservations about the clearcut that you are considering in section 12. This ridge is prime habitat for elk and white tail deer. This area has also become a favorite hunting area for many of our residents. I am concerned about the destruction of this wildlife habitat, and would like a copy of the wildlife biologist's report on the area.

My second reason for opposition to the clearcut is the need for mitigation for the practices of other land owners in the area. Orville Daniels, supervisor of the Lolo National Forest, and Greg Munther, District Ranger for the Nine Mile District of the Lolo have informed me that they have not scheduled any new clearcuts for the Nine Mile district for this reason. I feel that you should take a close look at the existing clearcuts on forest service land, private land and state land near this ridge in section 12, and give careful consideration to this matter before making a final decision.

2. Special consideration should be given to protecting the Six Mile Creek and three irrigation ditches that run through the areas you are considering logging. Not only are the creek and ditches used for irrigation, but young people from this area also fish in them. The Elk Meadows Ranchettes Homeowners Association has taken special care when grading the roads to avoid disturbing the creek and ditches. As a member of the board for our homeowners association, I would not like to see our efforts wasted because the riparian areas around the ditches and creek were not protected during the logging operation. I would appreciate a copy of the report from the water specialist in this regard.

3. Weed control is of special concern to our landowners. In the preliminary meeting you stated that you were considering

winter logging and reseeding in order to minimize the spread of noxious weeds. I would like to request that you plan a follow up review of the weed control efforts one year after completion of the timber cut. At this time the results of your control efforts should be evaluated and follow up measures could be put into effect if necessary. Herbicide spraying should be considered if necessary at this time. There are homeowners in our area who would welcome the opportunity to participate in this review.

4. As a resident of the area I am concerned about the amount of roading that you plan in the sale. Roading can impact our subdivision in several ways. First there are the visual aspects of a road on the hills adjacent to our subdivision. Those of us who live in the area live there because of the beauty that surrounds us. Logging roads are not beautiful. My second concern over the roads is one of weed control. New roads mean new weeds. It would be imperative that strict weed control measures be followed. I would like to add that roads invite travel and travel invites weeds. Please take in consideration the fact that weeds will be brought into the area by casual visitors on the roads long after the logging is completed. My third concern over the roads is one of excessive ATV use on the forest service roads surrounding the subdivision. Not only does this excessive traffic bring weeds, but it is distracting to those who live in the area, and it must be minimized. The roads should be oblitereated when the logging is completed.

Thank you for the opportunity to voice my concerns. I would appreciate it if you would keep me abreast of your plans for the sale.

Sincerely,

Cornelia C Whittaker

December 9, 1990

George Whittaker
P.O. Box 25
Huson, Mt. 59846

Bob Rich
Department of State Lands
1401 27th Ave.
Missoula, Mt. 59801

Dear Bob:

Thanks for inviting the residents of Elk Meadows to take a tour of the proposed Six Mile Timber Sale. It was very informative and useful in undersyanding the timber sale and also the parameters under which the Department of State Lands manages state lands.

As the six mile area is our back yard we take akeen interst in any management activities in that area. Although past logging practices on the lands around our area have left a lot to be desired, we are cautiously optomistic about management methods you plan to use on this sale. In particular we are happy that you plan to limit clearcutting to just two small areas of just eight or nine acres each. The fact that you will cable skid instead of tractor skid is also good news.

We do have some concerns about the sale that we would like see addresed by you. These concerns are listed below:

1. Elk Meadows Homeowners Assoc. has a active knapweed control program in place. We are concerned that soil disruption and heavy equipment traffic will cause the spread of knapweed and other noxious weeds.
2. There are several areas in the planned cutting areas that have stands of beautiful old growth ponderosa pine. We would expect that a significant portion of these trees would remain.
3. We believe that the extremly heavy logging activity by the Forest Service and Plum Creek on lands above the six mile area have had serious negative impacts on wildlife habitat. We believe that wildlife, especially deer and elk, have come to depend on the areas that are planned for harvest. It is essential that you do all that is possible to protect the wildlife values of this area, especially in light of the intensive logging this area has already seen.
4. In regards to the use of chemicals to aid in the control of pine grass we ask that you only consider this as an absolute last resort. Please allow the forest a period of 3 or 4 years before you use chemicals to aid in the process of reforestation.

5. Please replant as soon as possible with a diverse mixture of native species that reflect a real forest and not a timber "plantation".

Todays controversy and growing public scrutiny of the way our forests are being managed is a direct result of the poor timber practices that industry and public agencies have embraced. We hope that the Department of State Lands will use the six mile sale as a opportunity to restore the confidence the public has lost inthe agencies that are the stewads of our public lands. We believe that forests are more than tree farms and that forests have values other than commercial timber production.

Thank you for taking the time to listen to our concerns. We would appreciate a written response to our concerns before the final plan for the sale is written.

Sincerly,

George Whittaker

George Whittaker
626-5613

January 18, 1991

Cornelia and George Whittaker
P.O. Box 25
Huson, MT 59846

Dear Cornelia and George:

Enclosed you will find copies of the reports from the Wildlife Biologist, Soil Scientist, and Hydrologist regarding our Sixmile Timber Sale. You requested these in your July 19, 1990 letter to me. You should have also received by now notice of our public meeting on the 26th and availability for review of our draft environmental assessment. Thank you for your continued interest in state forest management.

Sincerely,

Bob Rich

Bob Rich

Enclosure

mb

August 20, 1990

Bob Rich
Department of State Lands
Forestry Division
Missoula Division
1401 27th Avenue
Missoula, MT 59801

Dear Mr. Rich:

My husband an I reside in Elk Meadows, which is off Six Mile Road in Huson, MT. We have recently been informed that there is going to be a timber sale in the Six Mile area and are very concerned about this sale.

From what we have been told and the maps we have seen, the area will be highly visible to many of the residents and will have a definite effect on the value of property as well as the wildlife.

Although we are not adverse to having some trees cut, we do firmly object to clear cutting. Not only does this leave unsightly areas where once there was beauty, it presents a real hazard because rarely if ever is the area cleared of dangerous fire materials. Even thinning and leaving shelterwood, which is what we were told was going to be done, leaves us very uneasy.

We live here, Mr. Rich, and must always be cognizant of the risks of fire. Can you <u>guarantee</u> that because of this cutting an unnatural amount of fire fuel will not be left?

We have been told that the logging will be done during winter months and that the area will be reseeded to minimize the knapweed problem. I find that a ludicrous statement. Please explain to me how reseeding during winter months will keep down the knapweed. Perhaps you should talk to the conservationists who are really having difficulty knowing how to control this noxious weed and exchange your ideas. Spraying with chemicals seems to be the easy way out, but not when the rest of the environment is considered.

Then too, logging trucks have nearly demolished some areas of Six Mile Road and although there have been some attempts to make it passable, the road itself is getting much worse and is in need of real reformation. Who is going to do that? The county? I would like that in writing from them if that is so. It has been my experience that the only way the County takes care of roads is to charge the residents, or to do a cursory grading when the roads are dry - which barely removes the top surface of rocks and definitely does not improve the holes or the washboard effects on the roads.

We are also very concerned about what will happen to the water flow. There are several irrigation ditches that flow through this area which the Homeowners Association has always tried to keep open and free flowing. How will this cutting effect those ditches? Will it cause the natural flow of water to be rerouted?

My husband and I moved to this area five years ago because of it's beauty and what you are requesting is going to destroy much of that beauty. We have spent a considerable amount of money building a much better than average home; have spent a lot of time and money keeping it maintained and feel it is an asset to the community. What you are proposing will make the whole area less desirous for anyone else wishing to build as well as bringing down the value of the property and will create another area where the natural beauty of the forests have been raped by man.

Yes, there is a need for lumber, but there are thousands of acres other than those in the Six Mile area where trees can be harvested that are not populated and are not in plain view of residents. If the purpose of cutting down the trees in Six Mile was to thin them out because of the fire hazards, we could accept that, but admittedly that is not what you are requesting.

As you can tell from the tone of this letter, my husband and I are very skeptical of what you are proposing. Too many times in the past this same scenario has been presented to residents in other areas who have bought it hook line and sinker. Then to their amazement, the land is radically changed and certainly not for the better. Whatever is done should be with the **consent** of the majority of the landowners in the area. It should not be a bureaucratic decision handed down like some kind of decree. We would like to have a response to our questions before any cutting is done.

I am sure that our Homeowners Association would be happy to meet with you or your representative whenever you would like to discuss all of the above. Also, I would like a copy of the reports from the wildlife biologist and the water/soil geologist riparian report which gives their appraisal of this cutting and the effects it will have. Thank you.

Sincerely,

Marie Wolff, William E. Wolff

Bill and Marie Wolff
Star Route 252
Huson, MT 59846

January 18, 1991

Bill and Marie Wolff
Star Route 252
Huson, MT 59846

Dear Mr. and Mrs. Wolff:

Enclosed you will find copies of the reports from the Wildlife Biologist, Soil Scientist, and Hydrologist regarding our Sixmile Timber Sale. You requested these in your July 19, 1990 letter to me. You should have also received by now notice of our public meeting on the 26th and availability for review of our draft environmental assessment. Thank you for your continued interest in state forest management.

Sincerely,

Bob Rich

Bob Rich

Enclosure

mb

D. R. Crabtree
6 Mile Star Rt. Box 238
Huson, MT 59846
June 12, 1990

Bob Rich
State Dept. Lands
2705 Spurgin Rd.
Missoula, MT 59801

Dear Mr. Rich;

In response to your request for input on your plans to develop a timber sale on section 12 and smaller outlying units in the Lower 6 Mile Creek drainage, I submit the following comments and suggestions.

I approve of selective cutting of pulpwood and thinning to enhance the growth of the existing second growth forest. I disapprove of the following:

1. The size of the proposed cut.
2. The location of the proposed cut.
3. Removal of any old growth remnants, large snags, large wolf trees or red cedar.
4. Any logging activity within 100 feet of 6 Mile Creek channel.

I suggest the following course of action:

1. Selective thinning for pulpwood should be emphasized in the sale plan.
2. The sale should be offered in approximate thirds; one each decade over the next 30 years.
3. Allow 100 feet of untouched land on either side of 6 Mile Creek.
4. Retain all timber over 20" dbh.
5. Exempt all red cedar and larch from the commercial cut.
6. Areas infested with douglas fir mistletoe should be cleared and replanted to larch.
7. Logging roads should be promptly revegetated and closed to vehicular traffic after completion of harvesting.
8. All road building and logging operations should be scheduled during January and February.
9. All slash over 1" diameter should be burned, buried or chipped before June 10 of the summer following logging.

The proposed cut has several good aspects, primarily rejuvenation of marginal stand conditions and possible reduction of mistletoe and bark beetle problems. I would like to emphasize that the scope of the proposal is too large in the direct proximity to a residential area, especially in light of the recent heavy logging activity on other lands in the vicinity. Furthermore, the proposed sale sites, especially that portion on section 12, is an important recreational site for hiking, birdwatching, hunting and horseback riding. The recreational and esthetic qualities of section 12 would be irrevocably diminished through removal of the remnant old growth larch, red cedar, and the timbered creek corridor. I would urge you to give high priority to exempting the cedars, old larch, and the main creek corridor from the logging activity.

Yours, David R. Crabtree

David R. Crabtree

November 20, 1990
6 Mile Star Rt. Box 233
Huson, MT 59846

Bob Rich
Missoula Unit
Department of State Lands.
Field Operations Division
1401 27th Ave.
Missoula, MT 59801

Dear Bob;

Regarding your preliminary timber management and harvest plans for the Six Mile Sale on sections 2, 12, and 14 of T.15N, R.22W:

Shelterwood sect. 12:
a) encourage doug fir regen.
b) protect two small drainages from road construction and skidding; do not cut in stream beds and vicinity.
c) do not use broadcast granular herbicides in general and hexaxinone (Pronone) in particular in the management unit. Springtime surface water at risk; potential contamination of irrigation water and damage to cultivated plants.
d) avoid pinegrass problem by promoting natural regen of doug fir. Plant pines in better sites.

Commercial Thin sect. 14:
a) stress minimal visual impact; this is a beautiful hillside and should be managed as a mixed age stand with no large openings; favor larch.

General comments:
a) avoid chlopyralid (Transline), it is extremely persistent soil sterilant often lasting 5-10 years in our climate. It is a threat to irrigation water and cultivated plants, bioaccumulates in range animals. Knapweed control on roads and berms with 2,4-D mid to late May if combined with dormant seeding previous winter.
b) stream and watershed protection looks good as planned.
c) in interest of biodiversity (primarily birds, plants, and amphibians) leave untouched corridor 100-150 ft. wide running generally east-west through shelterwood and commercial thin N side Six Mile Creek sect. 12 (see map). North-south corridors along streams are well concieved and important.
d) clearcut margins should not be staight; break the borders up and plant larch in shadier parts and pine in sunnier parts of mistletoe buffer zone.
e) suggest more emphasis on planting pines in areas where pine regen is preferred but unlikely.

Thanks for your ear, hope these comments are of some use to you.

Yours sincerely,

David R. Crabtree

David R. Crabtree

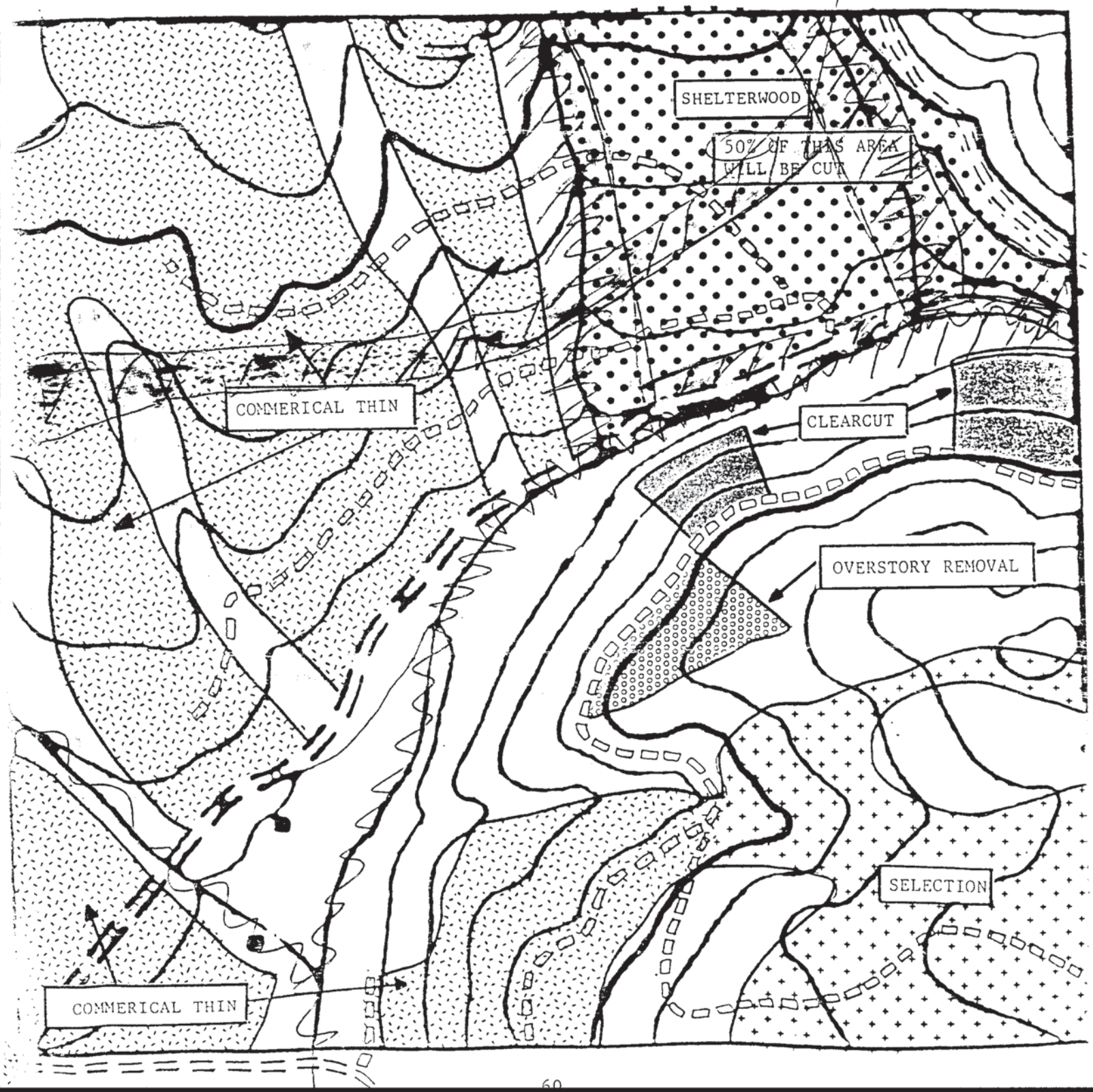
SECTION 12, T15N, R22W

Scale: 8" = 1 mile

Contour Interval 80

map it out
leave creek alone
left stands along
creek & road and
across slope parallel
to road

EXISTING ROAD
NEW ROAD



SOUTHWESTERN
LAND OFFICE

January 28, 1991
David R. Crabtree
6 Mile Star Rt. Box 238
Huson, MT 59846

Bob Rich
Missoula Unit
Department of State Lands.
Field Operations Division
1401 27th Ave.
Missoula, MT 59801

Dear Mr. Rich;

Thank you for keeping me up to date on plans for the DSL timber sale in Sections 2, 12, and 14, T15N, R22W. I am sure your care in planning this cut is appreciated by concerned 6 Mile residents. We have seen the hills surrounding our valley become barer and barer during the last decade and feel somewhat powerless in the process. At least you have attempted to ease the pain on this one.

My only comments on your summary of January 17, 1991 pertain to the use of granular applications of pronone for the control of pinegrass. Again I urge you to allow natural regen of doug fir. You will fight hard and long to buck the natural regen and in the process spend unnecessary funds and introduce potentially damaging herbicides into the watershed. I would once again suggest that planting of young pines in these areas is your most cost effective option if you insist on ignoring the natural regen.

If you insist on fighting the doug fir regen, once again I will point out that a great part of the sale area to the west of 6 Mile Creek in the area of possible pronone use is subject to flooding and overland flow during the months of April, May, June, and sometimes early July as snowpack melts in the adjacent mountains. I would suggest that no granular applications be made during these months.

My own property is directly downstream from spring and early summer ground flow in the 6 Mile watershed just west of the main creek. During May and June water flows through 2 ephemeral streams, runs down both sides of our driveway, innundates the 4 acres of pine and doug fir forest on the north side of our lot and innundates a 3 acre wet meadow area adjacent to 6 Mile Road. On our 11 acre lot, about 7 is under water for 1-2 months. This sort of scene is common in ~~the~~ much of the area west of 6 Mile Creek in the timber sale area.

My domestic and irrigation water wells are within 1-2 feet of the surface in spring and early summer. Depending on the year, the wells drop rapidly in late June or July to a static level of around 14 feet.

I would again encourage you to consider the possible hidden costs of herbicide use in the 6 Mile drainage, especially in light of the several viable alternatives.

Yours,

David R. Crabtree

David R. Crabtree

March 26, 1991

Mr. Dave Crabtree
Sixmile Star Route, Box 238
Huson, MT 59846

Dear Dave:

Enclosed you will find a copy of a letter to me from Charles S. Baer, Registration Specialist with Du Pont Agricultural Products, that address the concerns you expressed regarding the use of Hexazinone. I believe you have also received a letter from Frank Kidd of Dow Elanco regarding your concerns over the use of Clapyralid.

I hope this information is of interest to you and proves useful. Thank you for your comments during the course of our sale planning process on the Sixmile Timber Sale. If you have any additional questions or comments regarding our planned herbicide use or any other aspect of our timber sale please feel free to contact me.

Sincerely,

Bob Rich

Bob Rich
Lead Management Forester
Missoula Unit

Enclosures

mb

AG-4224 REV. 8/89

DU PONT

AGRICULTURAL PRODUCTS
Walker's Mill, Barley Mill Plaza
P.O. Box 80038
Wilmington, Delaware 19880-0038

February 5, 1991

Mr. Bob Rich
Montana Department of State Lands
1401 27th Avenue
Missoula, MT 59801

Subject: Follow-up of Phone Conversation of February 4, 1991

Dear Mr. Rich:

Based on our telephone conversation, I am sending you the information you requested. Enclosed for your use and distribution are copies of Du Pont brochures dealing with VELPAR® Herbicide and forestry. Please note, Du Pont's VELPAR® Herbicide and Pro-Serve's PRONONE® Herbicide contain the same active ingredient, hexazinone. I have also enclosed a copy of the EPA Pesticide Fact Sheet for hexazinone. The Fact Sheet was prepared by EPA prior to the issuance of the 1988 Hexazinone Registration Standard. As such, it identifies the presently accepted study results and additional information the Agency is asking us to supply as a condition of reregistration.

I would like to address some of the concerns you stated on the phone. They are:

- Hexazinone is readily transported through surface and ground water.

- Hexazinone is persistent. It has a long soil half-life.

As part of the reregistration of hexazinone, we are required to run three studies that will address the issue of transport of hexazinone in ground and surface water. The first study, an adsorption/desorption study, is complete. The results from that study indicate that the soil mobility of hexazinone and its major soil degradates ranged from immobile (EPA Class 1) to intermediate mobility (EPA Class 4) on the four different soil types used. The mobility of hexazinone in soil depends on each soils particular physical

Better Things for Better Living

and chemical characteristics. There does not appear to be a correlation between soil organic content and adsorption (Ka), desorption ($1/n_d$) or soil mobility (soil TLC Rf). There appears to be a weak to moderate correlation between pH and these characteristics, and a strong correlation between cation exchange capacity and these characteristics.

The second study is a forestry dissipation study. This study monitors the dissipation of hexazinone in the forest ecosystem. Leaf litter, vegetation, soil and surface water are monitored for levels of hexazinone and its metabolites for one year after application. Our study is being run in northern Alabama. Preliminary results indicate that hexazinone is not persistent and that it was 90% dissipated within 3-6 months. The study is due to be completed early this year. The final report will be sent to EPA by November 1991.

The third study is an aquatic field dissipation study. This study is being run to support our use of hexazinone on ditch banks. It will provide data on the dissipation of hexazinone and movement off-site during rain events. This study will be submitted to the Agency in early 1992.

I think it is important to note that the EPA has not required us to run a groundwater monitoring study. They have withheld this requirement pending the review of our other environmental fate data. We feel this is significant. If EPA had any concerns about hexazinone having a high groundwater leaching potential, they would have required the study in the Hexazinone Registration Standard of 1988. (Please note: this requirement is listed in the Standard, but EPA rescinded the requirement on July 18, 1989.)

The whole issue of movement of hexazinone in surface and ground water is based on concerns due to potential impacts to wetland and riparian communities along affected waterways. I would draw your attention to pages 5 and 6 of the EPA Fact Sheet. In the Agency's own words, when describing the toxicity of hexazinone to birds and aquatic species; it is "practically non-toxic". This indicates that the labeled uses of hexazinone are non-hazardous to freshwater ecosystems.

We have run new fish and daphnia studies as required by the Hexazinone Registration Standard of 1988. The new results agree with the previous results. In fact, the NOEL for daphnia in our new study showed a level of 30 ppm versus the old 10 ppm NOEL value.

In summary, hexazinone, like many other herbicides, can have intermediate mobility in certain soils. However, it does not have the high mobility associated with more notable compounds, like atrazine. Additionally, the presence of hexazinone in surface or ground water poses little concern due to it being "practically non-toxic".

Hexazinone has a soil half-life that ranges from three to 10 months depending on soil type. However, hexazinone and its metabolites move into and down the soil column at a moderate rate. Thus, it dissipates quickly. Preliminary data from the forestry dissipation study in Alabama suggests that hexazinone is 90% dissipated in 3-6 months after treatment. Normally, hexazinone is used in forestry site preparation once every 20-30 years. Thus, the potential for hexazinone contribution to groundwater is on the average very small.

Hopefully, I have been able to adequately address your concerns around the use of hexazinone. Additional information will soon be available. The Bureau of Land Management has recently prepared a report on vegetation management programs in the 13 Western states. This report addresses the use of herbicides in this region, in addition to many other topics. This document may be very useful to you. The report is presently in draft form, but it should be final very soon.

If you have additional questions or requests for data, please contact me at (302) 992-6260. I appreciate the opportunity to address your concerns involving hexazinone and hope you will continue to choose either VELPAR® or PRONONE® Herbicide for your forestry needs.

Sincerely,

Charles S. Baer

Charles S. Baer
U.S. Registration Specialist

CSB:DMF
Enclosures

cc: Mr. Larry Boring
Pro-Serve Inc.
400 E Brooks Road
P.O. Box 161059
Memphis, TN 38186-1059

RECEIVED
MAR 1 1 1991
SOUTHWESTERN
LAND OFFICE

DowElanco
9002 Purdue Road
Indianapolis, IN 46268-1189

RECEIVED
MAR 18 1991
STATE LANDS

Post-It™ brand fax transmittal memo 7671	# of pages ▸ 3
To Wayne Stewart	From Bob Stewart
Co. WSLO	Co. DowElanco
Dept.	Phone #
Fax # 509-924-0565	Fax # 503 451 4323

February 20, 1991

DowElanco

Mr. David R. Crabtree
Missoula County Horticultural Extension Agent
126 W. Spruce
Missoula, MT 59802

Mr. Crabtree,

I am the Product Development Manager for DowElanco responsible for Industrial Herbicides. Robert Stewart, the DowElanco Industrial Herbicides Sales Representative for Montana, has requested that I respond to you regarding concerns with use of clopyralid that you expressed in a letter to Bob Rich, dated November 20, 1990.

In the copy of that letter which Bob faxed to me, your comments on clopyralid addressed several topics. I will attempt to provide you a data review of each of your concerns.

Persistence of clopyralid

Clopyralid residues degrade primarily by microbial decomposition and to a lesser degree by photoylsis. Conditions that favor microorganism activity in the soil, e.g. soil moisture, temperature, soil texture, are variable. Thus, published data indicate a range of dissipation half-lives.

There have been literature reports of long half-lifes of clopyralid which are not representative of field conditions under which this product is used. In one instance I am familiar with, degradation was measured after a soil was fumigated. Since soil microbe populations were destroyed in the fumigation, the resultant effect on clopyralid breakdown was to indicate persistence for several years. While these data were scientifically correct, they also must be interpreted in a context of having no relation to labelled uses of this herbicide.

Both laboratory and field dissipation data have been generated for registration of this herbicide. In climates typical of the northern U.S., the half-life of clopyralid is known to be 30-40 days with a range of 10-80 days. For soils that are loamy fine and to fine sand and at an initial application rate of 0.5 lb/acre (the maximum label rate provided on the TRANSLINE* Herbicide label for rights-of-way), the first-order half-life is 23 days. These data are consistent with the statement in the WSSA Herbicide Handbook that "clopyralid degrades at a medium to fast rate with an average half-life range of 12 to 70 days in a wide range of soils across the United States".

*Trademark of DowElanco

Clopyralid Selectivity -- soil sterility

Clopyralid is a selective herbicide which is active on plants that are primarily in the Leguminosae, Polygonaceae, and Compositae families. Grass species, broadleaf plants, conifers, and most hardwood species are tolerant to clopyralid at the labelled use rates. Use directions for STINGER*, a product containing clopyralid for the agricultural market, allows over-the-top applications on Christmas trees for thistle control during a period of active conifer growth.

In contrast, a label for a soil sterilant product such as diuron never specifies in use directions applications similar to those included on clopyralid labels. A general weed killer shows no specificity to certain species of plants.

The selective nature of clopyralid is one reason that its herbicidal use is in areas that include small grains, fallow land, rangeland, sugar beets, canola, mint, and non-crop sites. In this diversity of annual and perennial weeds, clopyralid is often combined in mixtures of 2,4-D and other herbicides to broaden the spectrum of species control. A sterilant product would not be used in this context.

Bioaccumulation of clopyralid in range animals

Clopyralid is a water-soluble molecule which is rapidly excreted in urine and does not accumulate in animals. Metabolic fate studies which were conducted prior to registration indicated that the urinary product was the acid form of clopyralid, unchanged (nonmetabolized) as it passed through the animal. Residues were looked for in milk fat, muscle, and fatty tissues, and amounts were too low (<0.02 ppm) to isolate. Similar results have been reported for birds, with no accumulation of clopyralid in body tissues, egg whites, or yolks.

It has been concluded by EPA from avian and animal studies that clopyralid is not metabolized or otherwise degraded by animal systems, and quantitative results show a rapid excretion in urine and feces.

Use patterns of clopyralid affecting alfalfa

A considerable body of research supports use of clopyralid in both agronomic and non cropland applications. Celestine Lacy of Weed Management Service in Helena has conducted studies in Montana showing that clopyralid will be active against native legumes, but low in effect to non-target legumes.

Clopyralid is sold for crop uses. Intervals for replanting can vary, but the important point is that for sensitive crop species, there is safety to use of clopyralid even when this material is applied directly to tillage areas.

What has also been assessed is the possibility that clopyralid could cause damage to crops from residues contained in runoff or irrigation waters. Work has shown that after a 4 oz/A initial application, only 1 ppb was found in water sampled immediately after application. Water sampling at 2, 4, 8, and 12 hours after application all resulted in non-detectable residues of clopyralid. These data provide for a large margin of safety between the amount of herbicide needed to affect alfalfa and other crops and residues contained in runoff waters.

This has led to an aggressive product stewardship action by DowElanco for users and applicators of this product to become aware of the factors that affect its crop and environmental fate. All products containing clopyralid include an advisory for groundwater protection. In addition, applications on irrigation ditch banks, canals, etc. are not permitted.

Summary

I hope this technical review on clopyralid has been of value to you. As a company, we strive to maintain close working relationships with professionals such as yourself so that technology transfer to the general public is both scientifically valid and clearly communicated.

Clopyralid availability to land managers can be of great value when weed control programs are targeted to selective eradication of thistles, knapweeds, and other noxious plants. When grasses and other desirable species are freed from this competition, rangeland is improved, highway and other rights-of-way are improved, and crops such as sugar beets, mint, etc. become more profitable for growers.

This is accomplished with a product that is low in both toxicological and environmental risk. With labelling and stewardship designed to maintain safety to non-target plants, clopyralid-containing products have defined uses all across the U.S.

If you or others you know have questions about clopyralid that I haven't answered or are not fully addressed in such sources as the WSSA Herbicide Handbook, please contact me or any of the DowElanco representatives in the Pacific Northwest.

Regards,

Frank Kidd

Frank A. Kidd, Ph.D.
Product Development Manager
Industrial Herbicides
North American Specialty Products

cc: R.A. Stewart, Lebanon, OR
V.F. Carrithers, Mulino, OR
D. Gaiser, Spokane, WA

SOUTHWESTERN
LAND OFFICE

April 3, 1991

6 Mile Star Rt. Box 238
Huson, MT 59846

Bob Rich, Lead Management Forester
Missoula Unit, Department of State Lands
Southwestern Land Office
1401 27th Ave.
Missoula, MT 59801

Dear Bob;

Thanks for your letter of March 26, 1991 regarding herbicides hexazinone and clopyralid and their use on the proposed 6 Mile sale.

I received literature from DuPont as well as the material that you sent. I don't know about you but reading the technical details of these two herbicides did nothing to assauge my concerns, indeed it strengthened them.

In a nutshell I am particularly worried about water contamination with hexazinone. Chlopyralid I am most concerned about for its potential damage to the native flora of the area, and secondarily for potential water contamination.

The technical material confirms my earlier statements that both herbicides are persistent and fully capable of contaminating water.

The persistence and mobility in soils of hexaxinone exceeds my earlier expectations. There is no doubt in my mind that if used as a conifer release agent in the sale area, hexazinone will show up in the 6 Mile Creek and associated groundwater, and possibly the irrigation canals. I noted with somewhat morbid interest the 3-10 month half life and the "moderate mobility" in soils. Many of these tests are done in the southeastern United States where the growing season is three times as long and the annual precipitation three time that of the Six Mile area. Thus one can reasonably expect half lives up to three times longer in our area. And many more years until the material is degraded to the point where it is below biological activity concentrations. Also of interest was the very simple statement, which you marked, that "Because hexazinone has been identified as being persistent in water and mobile in soils there is concern for groundwater contamination.". Not very encouraging.

Again, I would like to point out that the sale area is somewhat unusual in that it is a catchment of sorts for spring run-off. In April-July one can walk in the area and be slogging through surface run-off in areas far removed from the creek bed. Thus I am less concerned with leachablilty of the herbicides than I am direct entry of them into the surface water, and hence into the stream, irrigation water, and indirectly, groundwater. Combined with the relatively mobile properties of these herbicides, mobility in soils is just a further concern.

Clopyralid, although perhaps less persistent than hexazinone, is still highly persistent. Of particular interest to me is the potential alterations to the local native flora which this herbicide may cause. Clopyralid has a high

potency towards members of the legume and sunflower families. Since much of the understory forbs in the area are lupines and other legumes, ~~asters, arnicas,~~ balsamroots, etc. I am concerned with the use of clopyralid. This herbicide also has the potential to damage the woody native flora.

My main point, again, is that since there are alternatives to both of your herbicide use strategies, and since there are serious and unpredictable consequences of their use, why not choose the course of action which combines sound management practice with lowest risk ? I encourage you to :

1. Scarify and hand plant P. pine if you insist on working against the natural doug fir regen. Do not use hexazinone.

2. Avoid the use of clopyralid to control knapweed. Native forbs in the Leguminosae and Compositae are a major component of the areas plant community and may be seriously impacted.

3. Avoid all broadcast granular applications of hexazinone in the timber sale area of 6 Mile Creek due to potential widespread introduction of this persistent herbicide into surface runoff during April-July.

4. If herbicides are used at all in the timber sale area, use the non-persistent 2,4-D as spot applications from ground operators along road banks and cuts in mid-May through June of the <u>second</u> year following harvest to control invading knapweed.

5. Thoroughly reseed all road banks and cuts during the dormant season to a mixture of <u>native</u> grasses and forbs.

Bob, I read the technical reports just like you. They only confirm my earlier comments to you. Both these herbicides are persistent, this is why they are used. I feel there are viable and preferable alternatives to their use in the 6 Mile sale.

Yours sincerely,

David R. Crabtree

David R. Crabtree, Ph. D.

P.S. On a less scientific but relevant aside. I recently read a report of clopyralid being used as a summer application to control weeds in a mint field. That fall, during harvest, the mint was processed for oil as it normally is. The waste plant material, or slug, left after oil processing, was spread in a nearby field. The following year the field was planted to potatoes. The crop was a complete economic loss, ie. the clopyralid had contaminated the field through the slug. This makes one wonder what's in our Wrigley's gum. Just an example of what you won't read in the technical reports.

P.P.S. Thanks for your concern. I do appreciate your efforts to keep me informed. I hope you find a way to make a good decision on your timber management plans.

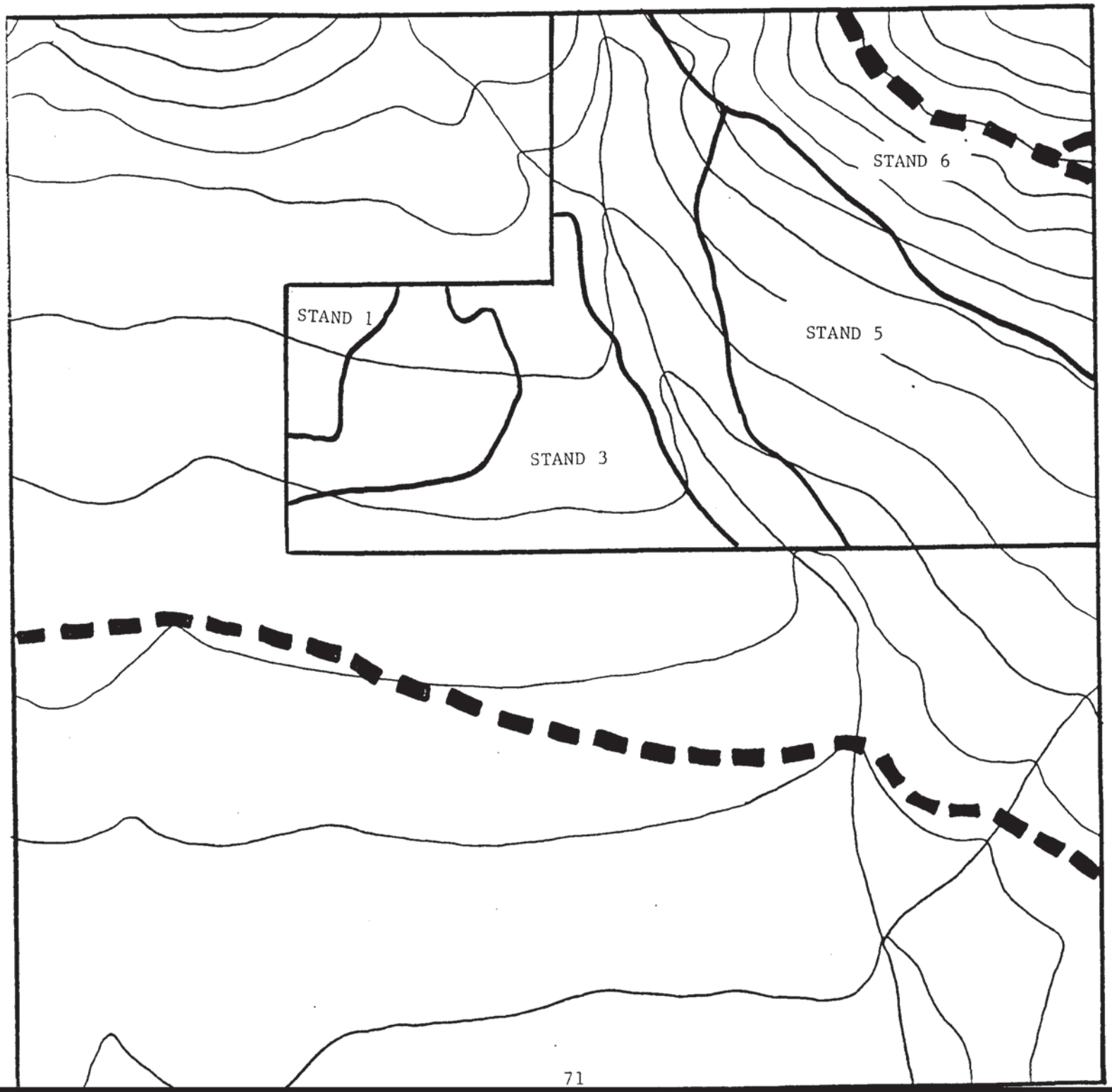
SILVICULTURAL PRESCRIPTIONS

STAND MAP

SECTION 2 T15N, R22W

SCALE: 8" = 1 MILE

CONTOUR INTERVAL - 80'



SILVICULTURAL PRESCRIPTION

SALE NAME: SIXMILE DATE: 5-20-90

TWP: 15N RG: 22W SEC: 2 UNIT: MISSOULA PREPARED BY: BOB RICH

Aspect: VARIES	Stand:	1	Ac: 7	Unit #:	1	Ac:	7
Slope: 0-40%		3	31		2		31
Ave. Elevation: 4200		5	58		3		48
Range: 4000-4400							

Soils/Parent Material: YOURNAME GREENOUGH COMPLEX
Habitat Type(s): PSME/SYAL-CARU, PSME/PHMA-PHMA
Productivity: CLASS II-III
Management Objectives: TIMBER MANAGEMENT

DESCRIPTION OF EXISTING STAND: Second growth stands of PP and DF with small amounts of WL. Age is generally 70-90 years with lesser amounts of old growth and saplings. Vigor is good to fair. Majority of the stand is overstocked. budworm has caused a fair amount of growth loss in DF particularly in sapling size class.

TARGET STAND AND SILVICULTURAL PLAN:

Target Stand Description: 100 to 150 trees/acre at 14" to 18" DBH

Structure: even-aged Species Composition: 90% PP, 5% DF, 5% WL

Silvicultural Objectives: Thin the stand to increase growth on crop trees. Remove old growth to release understory and encourage patches of regeneration. Retain some patches or individuals of yellow pine.

Constraints: Several riparian areas require equipment restrictions or are inoperable.

Regeneration discussion: This prescription is an intermediate treatment and establishment of regeneration is not a goal. However, with removal of clumps of mature timber and thinning of the rest of the stand regeneration is likely to occur.

Management plan: This stand is being treated as an even-aged stand even though portions of the stand have somewhat of an uneven-aged structure. As a result of the current harvest another age class may become established. In 25 years, depending on degree of regeneration and growth potential of overstory, a shelterwood cut, another commercial thin, overstory removal or converting the stand to an uneven-aged trajectory with a selection cut may all be appropriate.

Calendar Year	Rotation Year	Treatment
2016	105	REGENERATION CUT

PRESCRIBED TREATMENTS:

Treatment	Acres	Est Cost Per Acre	Est Total Total
Commercial thin to a 20' x 20' spacing favor WL & PP over DF. Skid all tops to landing. Utilize small material for pulp.	86	--	--
Burn landing piles	86	$ 2.00	$ 172.00

IMPLEMENTATION NOTES:

SILVICULTURAL PRESCRIPTION

SALE NAME: SIXMILE DATE: 5-25-90

TWP: 15N RG: 22W SEC: 2 UNIT: MISSOULA PREPARED BY: BOB RICH

Aspect: SW Stand: 6 Ac: 46 Unit #: 4 Ac: 41
Slope: 45-65%
Ave. Elevation: 4600
Range: 4200-4900

Soils/Parent Material: NEMOTE SOIL ASSOCIATION
Habitat Type(s): PSME/PHMA-CARU
Productivity: CLASS III-IV
Management Objectives: TIMBER MANAGEMENT

DESCRIPTION OF EXISTING STAND: An uneven-aged stand of PP and DF. All age classes are present. Regeneration is primarily DF. Mortality from root rot is present in DF> Some mistletoe is also present. Much of the stand is overstocked pole size.

TARGET STAND AND SILVICULTURAL PLAN:

Target Stand Description: Uneven-aged stand dominated by PP

Structure: Uneven-aged Species Composition: 80% PP, 20% DF

Silvicultural Objectives: Maintain an uneven-aged stand dominated by pine. Reduce DF component due to root rot problems, manage for between 40-80 sq. ft. BA; 150 yr. rotation.

Constraints: Cable logging required

Regeneration discussion: This is a poor site and regeneration will be slow in establishing itself. Low site does not justify any planting. Hopefully, pine regeneration will establish itself in time.

Management plan: Re-enter the stand in approximately 30 years with another selection cut. Assess spread of root rot.

Calendar Year	Rotation Year	Treatment
2202	--	SELECTION CUT

PRESCRIBED TREATMENTS:

Treatment	Acres	Est Cost Per Acre	Est Total Total
Selection cut - favor PP over DF, remove mature trees, commercially thin younger age classes.	41	--	--

Lop and scatter tops.

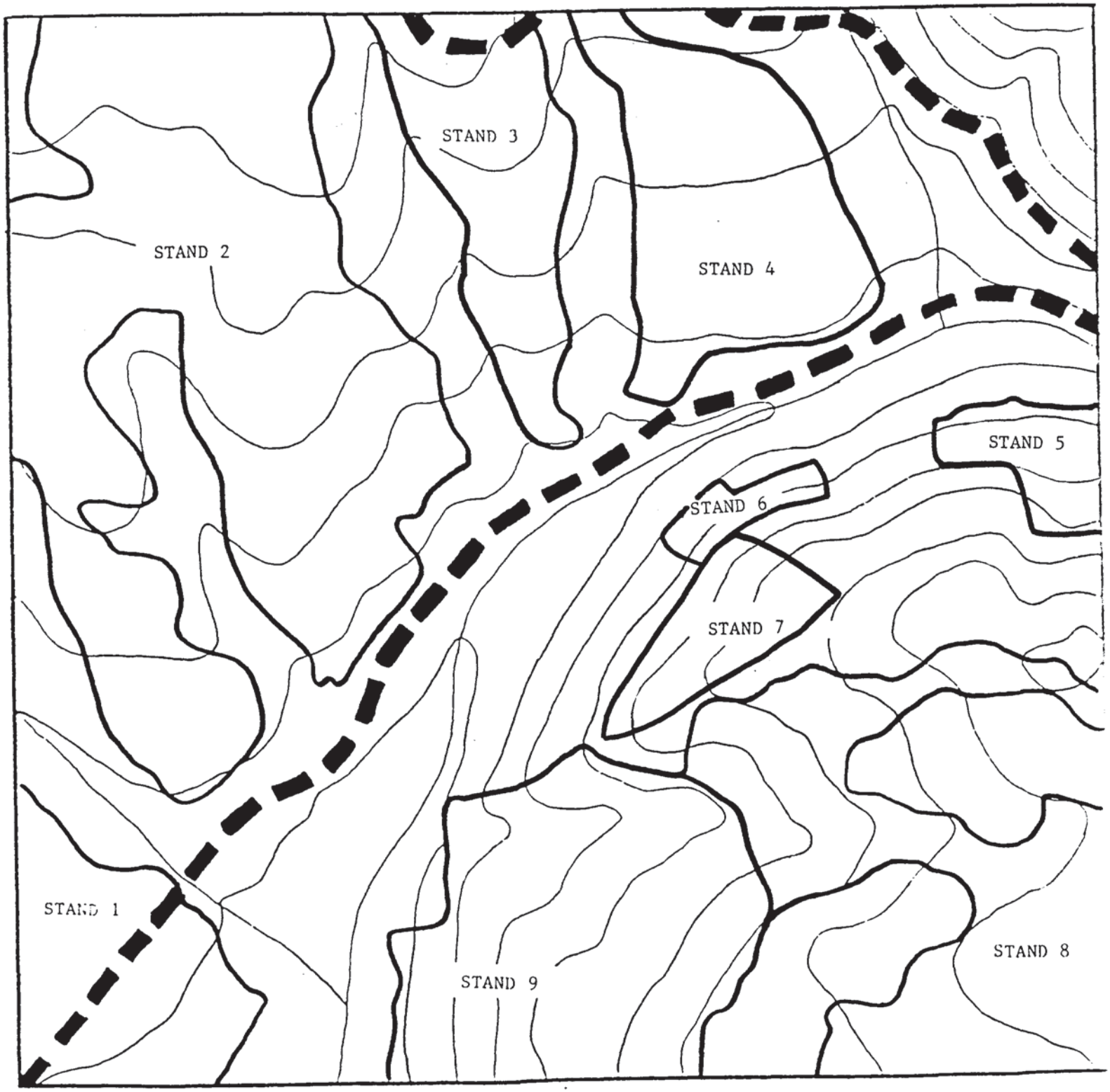
IMPLEMENTATION NOTES:

STAND MAP

SECTION 12 T15N, R22W

SCALE: 8" = 1 MILE

CONTOUR INTERVAL - 80'



SILVICULTURAL PRESCRIPTION

SALE NAME: SIXMILE DATE: 5-4-90

TWP: 15N RG: 22W SEC: 12 UNIT: MISSOULA PREPARED BY: BOB RICH

Aspect: SE-SW
Slope: 0-35%
Ave. Elevation: 3500
Range: 3300-3800

Stand:	Ac:	Unit #:	Ac:
1	27	6	27
2	118	7	118
3	24	8	24
9	50	12	50

Soils/Parent Material: BIGNELL
Habitat Type(s): PSME/PHMA-PHMA, PSME/SYAL-CARU, PSME/CARU-PIPO
Productivity: CLASS III
Management Objectives: TIMBER MANAGEMENT

DESCRIPTION OF EXISTING STAND: Second growth PP and DF, 70-90 years old. The stand is overstocked pole to small sawlog size. Species composition varies greatly within the stand. WL is common in draws. Pockets of pine beetle mortality are common.

TARGET STAND AND SILVICULTURAL PLAN:

Target Stand Description: 100 to 150 trees/acre at 14" to 18" DBH.

Structure: Even-aged Species Composition: 85% PP, 10% DF, 5% WL

Silvicultural Objectives: Thin the stand to increase growth on crop trees. retain some patches of yellow pine particularly where second growth is lacking.

Constraints: Several riparian areas require equipment restrictions or are inoperable. 37 acres of stand 9 requires cable yarding.

Regeneration discussion: This prescription is an intermediate treatment and establishment of regeneration is not a goal. However, with removal of clumps of mature timber and thinning of the rest of the stand regeneration is likely to occur.

Management plan: This stand is being treated as an even-ages stand even though portions of the stand have somewhat of na uneven-aged structure. As a result of the current harvest another age class may become established. In 25 years, depending on degree of regeneration and growth potential of overstory, shelterwood cut, another commercial thin, overstory removal or converting the stand to an uneven-aged trajectory with a selection cut may all be appropriate.

Calendar Year	Rotation Year	Treatment
1992	0	REGENERATION CUT

PRESCRIBED TREATMENTS:

Treatment	Acres	Est Cost Per Acre	Est Total Total
Commercial thin to a 20' x 20' spacing favor WL & PP over DF. Skid all tops to landing. Utilize small material for pulp.	219		
Burn landing piles	219	$2.00	$438.00

IMPLEMENTATION NOTES:

SILVICULTURAL PRESCRIPTION

SALE NAME: SIXMILE DATE: 5-4-90

TWP: 15N RG: 22W SEC: 12 UNIT: MISSOULA PREPARED BY: BOB RICH

Aspect: S Stand: 4 Ac: 38 Unit #: 5 Ac: 38
Slope: 0-30%
Ave. Elevation: 3500
Range: 3400-3600

Soils/Parent Material: BIGNELL
Habitat Type(s): PSME/PHMA-PHMA, PSME/SYAL-CARU
Productivity: CLASS II
Management Objectives: TIMBER MANAGEMENT

DESCRIPTION OF EXISTING STAND: A 10" to 18" sawlog stand, approximately 100 years old. DF is dominant but PP accounts for 30% of the volume with a small WL component. Vigor is generally good but is declining. Mistletoe is patchy in DF.

TARGET STAND AND SILVICULTURAL PLAN:

Target Stand Description: 250 trees/acre at 10 DBH

Structure: Even-aged Species Composition: 80% PP, 10% DF, 10% WL

Silvicultural Objectives: The current stand is even-aged and this cutting is a shelterwood (target 50 sq. ft. BA). However, nearly all the shelterwood crop trees are of good vigor and have good future growth potential. In areas of the stand that are mainly small bull pine the marking becomes a commercial thin. Regenerating the stand is the primary objective. After regen is established, the overwood could be removed or retained and the stand structure converted to uneven-age.

Constraints: Equipment restriction \ones along streams.

Regeneration discussion: Regeneration will be natural from the shelterwood stand. Heavy pinegrass competition may hinder seedling establishment. Herbicide treatment may aid in regeneration if stocking is inadequate. likely

Management plan: After regen is established overwood may be removed or retained if it is increasing in volume and not hindering the understory. The stand could also be converted to an uneven-age structure over time.

Calendar Year	Rotation Year	Treatment
1992	0	SHELTERWOOD CUT
2007	15	REMOVE OVERWOOD
2007	15	PRE-COMMERCIAL THIN
2052	60	COMMERCIAL THIN

PRESCRIBED TREATMENTS:

Treatment	Acres	Est Cost Per Acre	Est Total Total
Shelterwood cut - Leave 40-60 sq. ft. of basal area/acre. Favor WL & PP over DF to leave. Skid tops to landings.	38	--	--
Burn landing piles	38	$2.00	$76.00

IMPLEMENTATION NOTES: Evaluate possible use of herbicide to reduce pinegrass competition if regeneration is inadequate after 5 years.

SILVICULTURAL PRESCRIPTION

SALE NAME: SIXMILE DATE: 5-4-90

TWP: 15N RG: 22W SEC: 12 UNIT: MISSOULA PREPARED BY: BOB RICH

Aspect: N	Stand:	5	Ac:	9	Unit #:	9	Ac: 9
Slope: 20-60%		6		5		10	5

Ave. Elevation: 3600
Range: 3400-3800

Soils/Parent Material: WINKLER
Habitat Type(s): PSME/PHMA-PHMA, ABGR/LIBO
Productivity: CLASS II-III
Management Objectives: TIMBER MANAGEMENT

DESCRIPTION OF EXISTING STAND: Primarily DF sawlog stands with lesser amounts of WL and PP. Mistletoe is generally heavy in DF and patchy in the WL. Parts of the stands have significant amounts of stagnated submerchantable stems.

TARGET STAND AND SILVICULTURAL PLAN:

Target Stand Description: 300 trees/acre at 10" DBH

Structure: Even-aged Species Composition: 40% DF, 30% PP, 30% WL

Silvicultural Objectives: Regenerate the current mature, diseased stands with a shelterwood and plant. A shelterwood overstory will be retained for visual reasons. Mistletoe will be eliminated from the stands.

Constraints: Majority of the stands require cable yarding, irrigation ditches also flow through the cutting units.

Regeneration discussion: The stands will be regenerated by planting. A non-host species will be planted 75' from mistletoe infected leave areas. Leave trees and seed wall will probably contribute natural seedings, however, this natural regeneration is not considered reliable and is not part of the regeneration plan.

Management plan: These stands should be treated silviculturally as clearcuts. Leave trees are primarily for visual purposes. This overwood may be removed when regen is established or it could be retained.

Calendar Year	Rotation Year	Treatment
1992	0	CLEARCUT
2007	15	PRE-COMMERCIAL THIN
2057	65	COMMERCIAL THIN

PRESCRIBED TREATMENTS:

Treatment	Acres	Est Cost Per Acre	Est Total Total
Clearcut but retain leave trees for visual concerns. Leave no mistletoe infected trees.	14	--	--
Hand slash submerchantable in Unit 10	5	$ 50.00	$ 250.00
Spring burn Unit 10 for hazard reduction.	5	$100.00	$ 500.00
Tree length skid Unit 9 for hazard reduction.	9	--	--
Plant 40% DF, 30% PP, 30% WL, 435 TPA	14	$175.00	$2450.00

IMPLEMENTATION NOTES:

SILVICULTURAL PRESCRIPTION

SALE NAME: SIXMILE DATE: 5-4-90

TWP: 15N RG: 22W SEC: 12 UNIT: MISSOULA PREPARED BY: BOB RICH

Aspect: VARIES Stand: 8 Ac: 54 Unit #: 12 Ac: 54
Slope: 0-35%
Ave. Elevation: 3800
Range: 3700-3900

Soils/Parent Material: BIGNELL
Habitat Type(s): PSME/PHMA-PHMA
Productivity: CLASS III
Management Objectives: TIMBER MANAGEMENT

DESCRIPTION OF EXISTING STAND: An uneven-aged stand of primarily PP and DF sawlogs with areas of pole size stems and a patchy sapling understory. Scattered old growth relics are also present. WL is common in the more moist areas.

TARGET STAND AND SILVICULTURAL PLAN:

Target Stand Description: Uneven-aged stand, capable of maintaining regeneration of several species. After logging basal area should be between 40-80 sq. ft./acre. Stand should be mistletoe free. Maintain an old growth component in the stand. Rotation 120 years.

Structure: Uneven-aged Species Composition: 80% PP, 10% DF, 10% WL

Silvicultural Objectives: Maintain an uneven-aged stand using individual tree selection system. The majority of the stand is 70-90 years old this age class will still dominate after logging. Maintain WL and PP in the stand select against DF.

Constraints: Limited areas require cable yarding.

Regeneration discussion: Natural regeneration should result after opening up the stand. No scarification is planned. WL may have difficulty regenerating due to a lack of mineral soil and high amount of basal area in those parts of the stand that are primarily a commercial thin.

Management plan: Re-enter the stand in 20-30 years with another selection cut.

Calendar Year	Rotation Year	Treatment
2022	N/A	SELECTION CUT

PRESCRIBED TREATMENTS:

Treatment	Acres	Est Cost Per Acre	Est Total Total
Selection cut favor PP & WL over DF, tree length skid all trees to landings. Remove all mistletoe.	54	--	--
Burn landing piles	54	$ 2.00	$ 108.00

IMPLEMENTATION NOTES:

SILVICULTURAL PRESCRIPTION

SALE NAME: SIXMILE DATE: 5-4-90

TWP: 15N RG: 22W SEC: 12 UNIT: MISSOULA PREPARED BY: BOB RICH

Aspect: NW Stand: 7 Ac: 11 Unit #: 11 Ac: 11
Slope: 30-45%
Ave. Elevation: 3600
Range: 3400-3800

Soils/Parent Material: BIGNELL/WINKLER
Habitat Type(s): PSME/PHMA-PHMA
Productivity: CLASS III
Management Objectives: TIMBER MANAGEMENT

DESCRIPTION OF EXISTING STAND: A two-storied stand, overstocked DF saplings and poles in the understory with a scattered overstory of clumps and individuals of DF sawlogs. Mistletoe is patchy in the understory. Vigor of the understory is good to fair.

TARGET STAND AND SILVICULTURAL PLAN:

Target Stand Description: 300 trees/acre at 10" DBH, mistletoe free

Structure: Even-aged Species Composition: 95% DF, 5% PP

Silvicultural Objectives: Remove mistletoe from the stand, allow understory to release by removing overstory and pre-commercially thinning understory.

Constraints:

Regeneration discussion: This is not a regeneration cut. The stand will be fully stocked after treatment.

Management plan: Re-enter the stand in approximately 30 years with a commercial thin.

Calendar Year	Rotation Year	Treatment
2022	55	COMMERCIAL THIN

PRESCRIBED TREATMENTS:

Treatment	Acres	Est Cost Per Acre	Est Total Total
Overstory Removal - Favor PP over DF, remove all overstory unless this leaves the stand understocked.	11	--	--
Skid tops to landings	11		
Burn landing piles	11	$ 2.00	$ 22.00
Pre-commercially thin, favor PP over DF. Thin to a 12' x 12' spacing.	11	$150.00	$1650.00

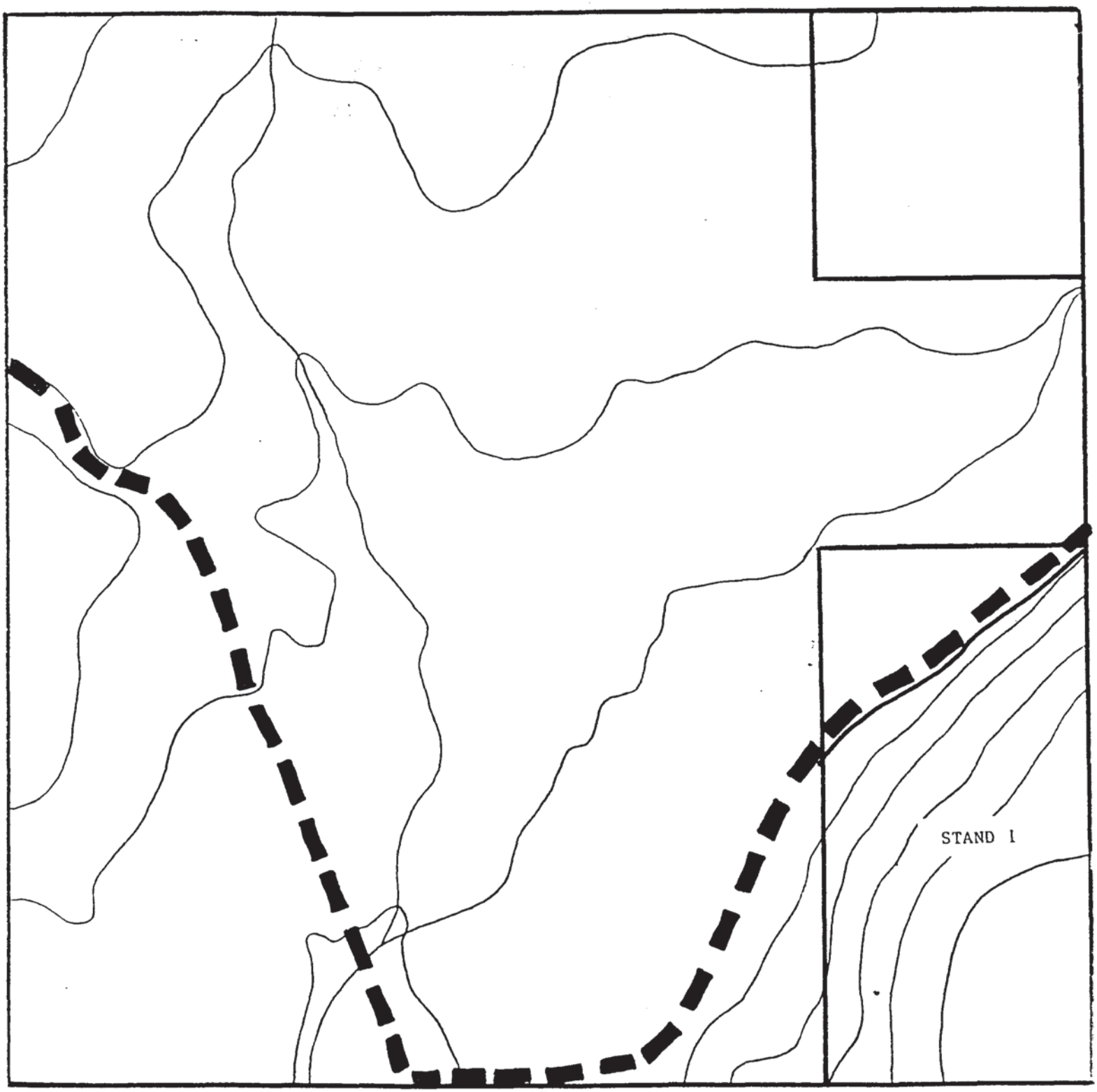
IMPLEMENTATION NOTES:

STAND MAP

SECTION 14 T15N, R22W

SCALE: 8" = 1 MILE

CONTOUR INTERVAL - 80'



SILVICULTURAL PRESCRIPTION

SALE NAME: SIXMILE DATE: 5-4-90

TWP: 15N RG: 22W SEC: 14 UNIT: MISSOULA PREPARED BY: BOB RICH

Aspect: N-W Stand: 1 Ac: 67 Unit #: 13 Ac: 51
Slope: 0-45%
Ave. Elevation: 3400
Range: 3200-3500

Soils/Parent Material: WINKLER
Habitat Type(s): PSME/PHMA-CARU, PSME/CARU-PIPO
Productivity: CLASS III
Management Objectives: TIMBER MANAGEMENT

DESCRIPTION OF EXISTING STAND: Second growth PP and DF, 70-90 years old. The stand is overstocked pole to small sawlog size. Species composition varies greatly within the stand. WL is common in draws. Pockets of pine beetle mortality are common.

TARGET STAND AND SILVICULTURAL PLAN:

Target Stand Description: 100 to 150 trees/acre at 14" to 18" DBH.

Structure: Even-aged Species Composition: 85% DF, 10% DF, 5% WL

Silvicultural Objectives: Thin the stand to increase growth on crop trees. Retain some patches of yellow pine particularly where second growth is lacking.

Constraints: Landing area space very limited. Visible hillside.

Regeneration discussion: This prescription is an intermediate treatment and establishment of regeneration is not a goal. However, with removal of clumps of mature timber and thinning of the rest of the stand regeneration is likely to occur.

Management plan: This stand is being treated as an even-aged stand even though portions of the stand have somewhat of an uneven-aged structure. As a result of the current harvest another age class may become established. In 25 years, depending on degree of regeneration and growth potential of overstory, a shelterwood cut, another commercial thin, overstory removal or converting the stand to an uneven-aged trajectory with a selection cut may all be appropriate.

Calendar Year	Rotation Year	Treatment
1992	80	COMMERCIAL THIN/IMPROVEMENT

PRESCRIBED TREATMENTS:

Treatment	Acres	Est Cost Per Acre	Est Total Total
Commercial thin to a 20' x 20' spacing favor WL & PP over DF. Skid all tops to landing. Utilize small material for pulp.	51	--	--
Burn landing piles	51	$2.00	$102.00

IMPLEMENTATION NOTES:

SIXMILE TIMBER SALE

BRUSH & TSI PLAN

UNIT 9	DOZER PILE	(	)		AC.@		/AC.=
	PILE BURNING	(	)		AC.@		/AC.=
	HAND SLASHING	(	)		AC.@		/AC.=
	BROADCAST BURN	(	)		AC.@		/AC.=
	PCT	(	)		AC.@		/AC.=
	PLANTING	(CONTRACT	)	9	AC.@	$175	/AC.=$1,575
		(	)		AC.@		/AC.=
		(	)		AC.@		/AC.=
UNIT 10	DOZER PILE	(	)		AC.@		/AC.=
	PILE BURNING	(	)		AC.@		/AC.=
	HAND SLASHING	(STATE CREW	)	5	AC.@	$50	/AC.=$250
	BROADCAST BURN	(STATE CREW	)	5	AC.@	$100	/AC.=$500
	PCT	(	)		AC.@		/AC.=
	PLANTING	(CONTRACT	)	5	AC.@	$175	/AC.=$875
		(	)		AC.@		/AC.=
		(	)		AC.@		/AC.=
UNIT 11	DOZER PILE	(	)		AC.@		/AC.=
	PILE BURNING	(	)		AC.@		/AC.=
	HAND SLASHING	(	)		AC.@		/AC.=
	BROADCAST BURN	(	)		AC.@		/AC.=
	PCT	(STATE CREW	)	11	AC.@	$150	/AC.=$1,650
	PLANTING	(	)		AC.@		/AC.=
		(	)		AC.@		/AC.=
		(	)		AC.@		/AC.=
UNIT1-13	DOZER PILE	(	)		AC.@		/AC.=
	PILE BURNING	(	)		AC.@		/AC.=
	HAND SLASHING	(	)		AC.@		/AC.=
	BROADCAST BURN	(	)		AC.@		/AC.=
	PCT	(	)		AC.@		/AC.=
	PLANTING	(	)		AC.@		/AC.=
	BURN LANDINGS	(STATE CREW	)	459	AC.@	$2	/AC.=$918
		(	)		AC.@		/AC.=

BRUSH AND TSI COST APPRAISAL SUMMARY

Timber Sale: SIXMILE

Estimated Volume: 2,836 MBF & 4,558 TONS PULP

BRUSH / TSI

ITEM	SALE AGREEMENT	DOZER RENT	CONTRACTED SERVICES	FTEs		TOTAL
Slashing				250		250
Broadcast Burn				500		500
Planting			2,450			2,450
PCT				1,650		1,650
Burn Landing				918		918
TOTAL			2,450	1,418 1,900		1,418 4,350
					Expected earnings	