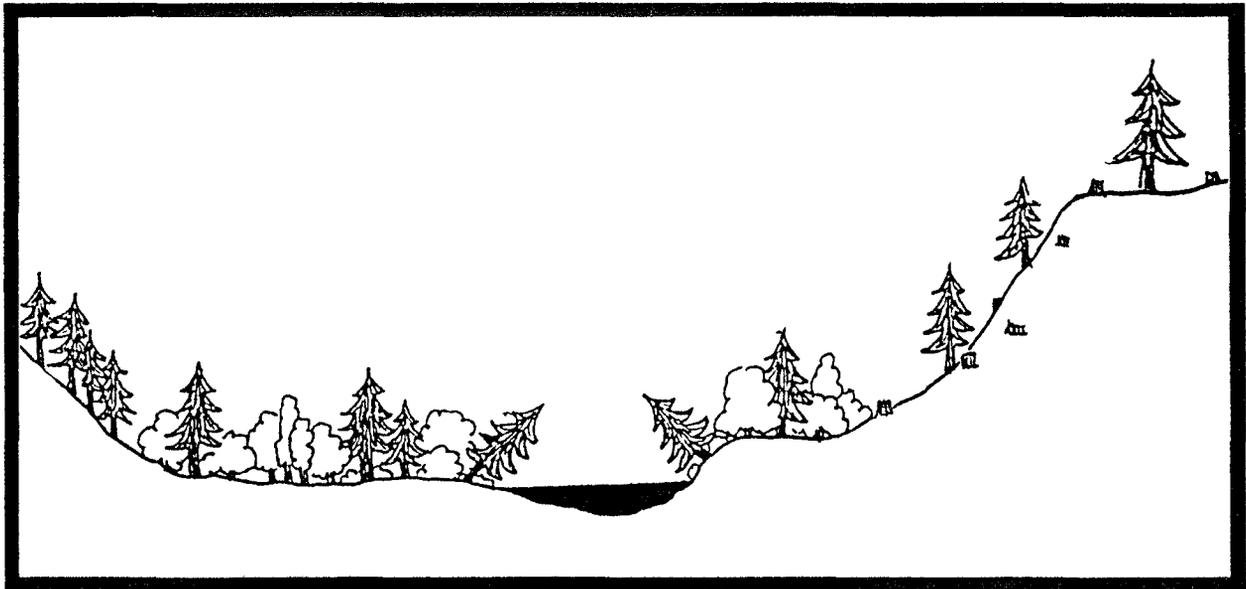


# Riparian Area Guidelines

## Timber Harvest Guidelines Within Streamside Management Zones (SMZ's)



KOOTENAI NATIONAL FOREST PLAN

APPENDIX 26

U.S. Department of Agriculture  
Forest Service  
Kootenai National Forest

1/25/91



United States Department  
Of Agriculture  
Forest Service  
Kootenai National Forest

# RIPARIAN AREA GUIDELINES

## PROTECTING RIPARIAN ZONES DURING TIMBER HARVEST

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## INTRODUCTION

The purpose of the Kootenai National Forest (KNF) Riparian Area Guidelines is to provide information so that streamside timber harvest-related activities are conducted in such a manner that important stream and riparian values, functions and conditions are maintained. The intent is to provide information to be applied in all instances where an Interdisciplinary Team (IDT) recommendation is made to harvest timber along or beside a waterbody. Ground implementation is accomplished through use of special contract provisions (Appendix 3).

## OBJECTIVES of the RIPARIAN AREA GUIDELINES

1. Provide further implementation guidance for the KNF Riparian Area Standards and Guidelines.
2. Clarify terminology, objectives and definitions as discussed in the KNF Plan for riparian area management.
3. Strengthen and emphasize the issue of woody debris recruitment for stream channel and streambank stabilization into the existing Forest Plan guidelines.

## SCOPE OF GUIDELINES

1. Management guidelines and treatments recommended in this document apply to all instances where timber harvest or related activities are specified on or near a stream or riparian zone.
2. As discussed in the Forest Plan, in suitable timber Management Areas (MA's 11, 12, and 14-17), timber harvest may occur both in and adjacent to riparian areas with appropriate resource protection constraints.
3. Implementation of these Guidelines will meet or exceed the intent of the KNF Plan (Chapter II, pgs. II-28 to II-33); the Forest Service Riparian Area Management Policy as stated in the Manual (FSM 2526.03); and the Best Management Practices (BMPs) for Forestry in Montana (July, 1989).

Where conflicts occur between these Guidelines and the Idaho Forest Practices Act requirements on the Idaho portions of the KNF, the Forest Practices Act requirements will take precedence.

4. The Guidelines are intended to be implemented **only where an IDT recommendation has been made to harvest along or near a waterbody**. It is still the job of the IDT to consider all the other resource values when evaluating such harvest. For example, when harvesting in a drainage with known Bull Trout spawning, the IDT may decide to require buffer strip non-harvest zones along all tributaries rather than using these Guidelines.
5. For circumstances where these Guideline requirements cannot be met, mitigation will be required to negate such effects. For example, in some instances units cannot be burned and still protect the leave trees as desired. In this instance, the IDT may require deciduous and coniferous plantings along the stream, and the dropping of another proposed riparian harvest unit as mitigation for the expected final condition of the first unit. Required mitigation and the reason for deviating from the Guidelines will be identified in the appropriate NEPA document.
6. The requirement for leaving woody debris recruitment trees will apply only to those channels where woody debris can be effectively utilized. Bedrock channels and large-boulder channels will not require the recruitment of woody debris.
7. KNF Stream Classes I-IIIB and riparian zones will be identified and mapped at 2.64"/mile scale prior to activities, the same scale as other Management Areas (MA's). KNF Classes I-III A can be identified and mapped during the inventory phase of NEPA document preparation. Ground truthing of the preliminary identification, and initial identification of other riparian and wetland areas will take place during the alternative analysis phase (i.e, harvest unit location during EA finalization).

## DESIRED FUTURE CONDITIONS FOR RIPARIAN AREAS

### SHORT-TERM (Immediately following completion of a management activity)

Riparian zones in desirable condition contain the leave-trees required for that particular KNF stream class. They also still contain the majority of the existing deciduous trees, brush, and unmerchantable-sized conifers. This was accomplished by directional tree-felling and line yarding from equipment located outside the stream management zone (SMZ), modified slashing requirements, and from careful attention to fire during the slash disposal stage. The leave trees remain alive because of careful underburning using low to moderate burn intensities, and because slash burning in areas adjacent to the SMZ has been planned to ensure protection of the leave trees from heat kill and scorching. The soil surface in the SMZ provides sediment filtering capability because of the above-mentioned practices. Perennial streams still have adequate shading while intermittent and ephemeral streams have reduced shading. There are no concentrations of ash materials within the SMZ (or topographic depression in the case of Class IV channels).

### LONG-TERM: (Taken from Forest Plan, Chapter II, page. II-29)

Riparian zones in a desirable condition have both coniferous and deciduous vegetation of varying age. Vigorous, diversified streamside vegetation contributes to stable soil conditions, and stable channel and streambank conditions. Streamside thermal cover, as a protection against summer heating and winter icing of streams, is present in suitable quantities and locations. Streamside stands of various ages provide for stream debris and log recruitment, cover and habitat for wildlife species, and options for long-term maintenance of old-growth over selected areas of the watershed (See Appendix 2). Water quality is high and sedimentation associated with human-related activities is within acceptable limits and reflective of healthy streamside plant communities and stable channel conditions. Cutting units within the riparian zone are designed to meet the needs of other resources as well as timber.

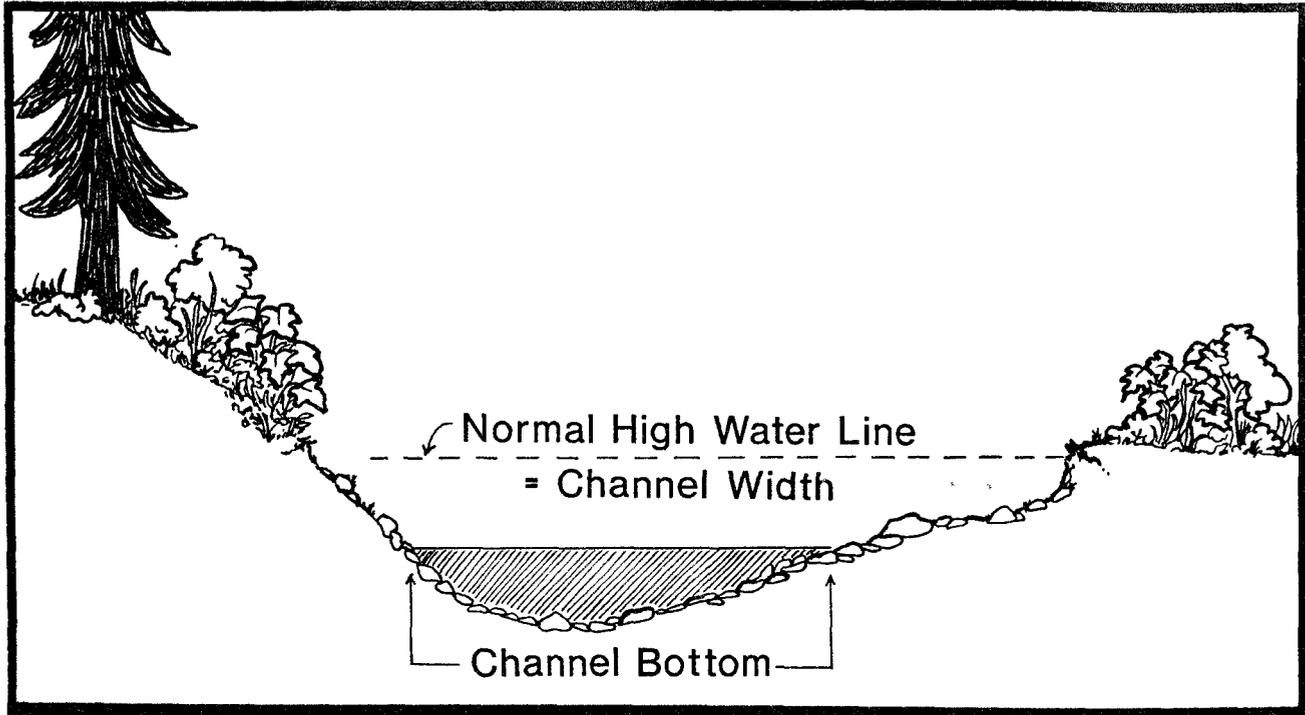
Riparian zone management is "light on the land." All resources, including water, wildlife, fish, and recreation are integrated to not incur any significant losses. Activities enhance the riparian zone to the fullest extent possible.

Riparian zones support timber stands on longer rotation lengths, as well as segments of old-growth which may not be harvested. Scheduling of streamside openings provide adequate debris recruitment for pool formation and organic energy input over time. These openings allow for enough streamside canopy to remain so that summer water temperatures do not violate Montana State Water Quality Standards, and anchor icing in winter does not significantly increase over natural levels. Adequate cover is left to meet wildlife needs.

## DEFINITIONS

The following definitions are appropriate for the Kootenai National Forest:

**Channel Width:** Distance as measured between the channel bank slope or vegetation *breaks*, usually outside of the channel bottom scour zone. These breaks normally delineate the normal high water line, a height above which flow would be considered "flood" (see diagram below):



**Existing (Past) Riparian Harvest:** For purposes of analyzing effects of existing and past harvest activities on Classes I-IIA, where streamside harvest lengths are constrained, any activity or combination of activities, including those on private land, that have removed 25% or more of the original canopy must be included in the past streamside harvest length calculations. Consultation with Hydrology or Fisheries professionals for questions about past non-regeneration harvests may be advisable.

**Riparian Area:** Geographically identifiable area with distinctive resource values and characteristics, identified by soil characteristics or distinctive vegetation communities that require free or unbound water. (FSM 2526.05, 3/86, Amendment #48.)

**Riparian Vegetation:** Distinctive vegetation requiring free or unbound water, i.e., saturated soil conditions during some part of the year. Examples of riparian vegetation found on the KNF include: Devils' Club, Baneberry, Sedges, Redstem, Bullrush, willows, Horsetail, Blue-joint Reedgrass, and Oak Fern.

**Significant Topographic (Topo) Break:** An area on-the-ground where the slope changes very noticeably within a short distance (10-20 feet), particularly where the land changes from a steep, sensitive slope to a gentle, more operable slope. For use in these Guidelines, the top of the significant topo break means that activities outside this point have little or no likelihood of reaching or impacting the streamside.

**Stream:** Natural water course of perceptible extent with definite bed and banks which confines and conducts continuously or intermittently flowing water. Definite beds are defined as having a sandy or rocky bottom which results from the scouring action of water flow (BMP's for Forestry in Montana).

**Perennial Stream:** A stream channel or channel reach with surface discharge more than 80% of the time (approximately 9.5 months). (FSH 2509.17, 4/89, Amendment #3.)

**Intermittent and Ephemeral Stream:** A stream or portion of a stream that flows only in direct response to precipitation or seasonal snowmelt, usually dry for 3 or more months per year. (Resource Conservation Glossary, Soil Conservation Soc. of Amer., 1982.)

**Streamside Management Zone (SMZ):** Includes the stream itself and an adjacent land area of varying width on both sides of the stream where management practices might affect water quality, fish, or other aquatic resources. The SMZ acts as an effective filter and adsorptive zone for sediment; maintains shade; conserves aquatic and terrestrial riparian habitat; protects the stream channel and banks; and promotes floodplain stability (BMPs for Forestry in Montana).

**Swales and Dry Draws:** Low spots in the topography which conduct flow on a sporadic basis, but not often enough to scour an identifiable channel bed or banks. Often identified by vegetative characteristics, but not necessarily by riparian vegetation.

**Woody Debris:** Woody material that is deposited in the stream and stream channels from the adjacent land area (see WDRZ, Woody Debris Recruitment Zone), to meet a variety of objectives such as flow energy dissipation, sediment storage, channel stability, and fisheries habitat development (in the perennial streams). The size of desirable woody material varies from small twigs and branches in small channels to 18-inch-DBH trees in the large perennial streams (KNF Stream Class I, Large Perennial Fisheries).

**Woody Debris Recruitment Zone (WDRZ):** The land area within the SMZ adjacent to both sides of the stream channel that is managed for the continuous recruitment of woody material into the stream channel. For Stream Classes requiring a WDRZ, the width of the WDRZ on each side of the stream varies from 25 to 50 feet, depending on the Class. The goal of WDRZ management is to provide for the continuous availability of adequate amounts of suitably-sized woody material, distributed along the entire length of the stream, to meet channel stability and fisheries needs. "Continuous recruitment" means managing the WDRZ and adjoining lands so that there are no long periods of time (several decades) when there is no, or inadequate amounts of, desirable woody material available to fall into the stream channel. Trees in excess of the number needed for woody debris recruitment are available for harvest if not needed for other resource values such as wildlife habitat, floodplain protection, etc.

## **KOOTENAI NATIONAL FOREST (KNF) STREAM CLASS STRATIFICATION**

Working within the above-stated objectives, definitions and scope, it was necessary to redefine those characteristics which, in a working manner, would differentiate each significant stream-type found on most of the suitable timberland area on the Kootenai Forest. For general guidelines purposes, most of the area appeared to fall into one of the following four general classes:

- KNF Stream Class I - Large Perennial Streams
- KNF Stream Class II - Smaller Perennial Streams
- KNF Stream Class III - Intermittent and Ephemeral Streams
- KNF Stream Class IV - Dry Draws and Swales

In order to further put into perspective the objectives and needs of each stream class, the following statements and objectives were developed:

### **KNF STREAM CLASS I - LARGE PERENNIAL STREAMS**

**Description:** These streams run yearlong, and many of them will display riparian vegetative conditions for at least a 100-foot-wide distance from the stream (each side), especially in the more gentle topography. Many of these streams are not included, or only a portion of them are included, within the suitable timber Management Areas (MA's 11, 12, and 14-17).

#### **Objectives:**

1. Conduct all streamside activities so that bank sloughing is not activated or increased and to maintain natural resistance to streamflow undercutting. Most of the trees falling into the streamflow are swept to the bank and settle parallel to the channel and serve to protect streambanks and also provide for fishery cover. Desirable woody debris recruitment tree size is 18 inches diameter at breast height (DBH) and larger.
2. Maintain adequate shading. Retain woody debris recruitment trees, riparian vegetation and plant additional vegetation for shading, if needed, to maintain desired water temperatures for beneficial uses.
3. Provide and/or maintain fisheries habitat over the long term through woody debris recruitment and streambank protection.
4. Provide for floodplain protection. Retained woody debris recruitment trees as well as downed woody material that has not fallen into the stream will help dissipate periodic overland flows.
5. Provide for wildlife cavity habitat.
6. Provide for possible timber harvest opportunities within the appropriate management area allocations.
7. Protect recreation and/or visual values as prescribed for management areas in the Forest Plan.

## **CLASS II - SMALLER PERENNIAL STREAMS**

**Description:** These streams usually run at least 9.5 months of the year, and many of them will not display riparian vegetative conditions for a 100-foot-wide distance from the stream (each side). Many of these streams are included within the suitable timber Management Areas (MA's 11, 12 and 14-17). In the Timber Harvest Guidelines, this Class was broken into two types (IIA, and IIB) based on a channel-width distance of greater than, or less than, 10 feet.

### **Objectives:**

1. Conduct all streamside activities so that bank sloughing is not activated or increased and to maintain natural resistance to streamflow undercutting. Most of the trees falling into the stream will settle in a manner that will create a log barrier or dam for sediment storage and pools for potential fisheries habitat. Desirable woody debris recruitment tree size is 12 inches DBH and larger.
2. Maintain adequate shading. Retain woody debris recruitment trees, riparian vegetation and plant additional vegetation if needed to maintain the shading desired for water temperature maintenance.
3. For streams within this Class with perennial flow and a fisheries resource, provide and/or maintain fisheries habitat by providing for pools and insect habitat.
4. Provide for sediment storage and waterflow energy dissipation by retaining the existing down and dead material within the streambanks and identifying adjacent trees for woody debris recruitment.
5. Provide for floodplain protection. Adequate residual woody debris recruitment and shade trees will help dissipate periodic overland flows.
6. Provide for cavity habitat and other riparian-dependent wildlife needs.
7. Provide for timber harvest opportunities as determined within the appropriate management area designations.
8. Protect recreation and/or visual values as prescribed for management areas in the Forest Plan.

### **CLASS III - INTERMITTENT AND EPHEMERAL STREAMS**

**Description:** These streams usually run less than 9.5 months of the year, but still have a definable bed and banks from flow scour. These streams will normally only display riparian vegetative conditions within the immediate streamside or bank. Recent research indicates that conditions in these streams are critical for watershed protection, especially for important sediment storage and streamflow energy dissipation. For these reasons, they warrant increased consideration and management on the KNF. In the Timber Harvest Guidelines, this Class was broken into two types (IIIA, and IIIB) based on a channel-width distance of greater than, or less than, 3 feet.

#### **Objectives:**

1. Conduct all streamside activities so that bank sloughing is not activated or increased and to maintain natural resistance to streamflow undercutting. Most of the trees falling into the streamflow channel will eventually break and settle to create potential sediment storage and energy dissipation barriers. Desirable woody debris recruitment tree size is 8 inches DBH and larger.
2. Tree shading is not required because of the limited duration and timing of the flow periods. Protect and retain the immediate streamside riparian vegetation for stream channel stability.
3. Provide for sediment storage and waterflow energy dissipation by retaining down and dead material within the streambanks and identifying trees for future woody debris recruitment.
4. Provide for floodplain protection. Residual woody debris recruitment trees will help dissipate periodic overland flows.
5. Provide for wildlife cavity and travel corridor habitat where feasible.
6. Provide for timber management opportunities as determined in the appropriate management area designations.
7. Minimize sedimentation potential by applying BMP's within identified SMZ's.

NOTE- Some small perennial streams on the KNF have interspersed surface/subsurface segments, such as where a Class IIB becomes a Class III. For these instances, apply the Guideline Class for the segment that has the adjacent harvest unit planned. For example if the proposed harvest unit is bounded by the perennial stream segment, apply the Class IIB Guidelines; if the proposed harvest unit is beside the intermittent or ephemeral segment, apply the Class III Guidelines.

### **CLASS IV - DRY DRAWS AND SWALES**

**Description:** This Class includes low topographic areas where flow is not sufficient to develop a definable bed or banks, but which still require resource protection guidance to insure soil stability and downstream water quality.

#### **Objectives:**

1. Provide for soil stability and water quality protection by:
  - a. Minimizing mechanically-disturbing activities on the site;
  - b. Allow and encourage winter logging (frozen ground and/or significant snow depth);
  - c. Prohibiting jackpot slash piles in draw bottoms (to protect water quality from slash disposal effects);
  - d. Keep skid trail locations out of draw and swale bottoms and relocate to the toes of the slope;
  - e. Leaving the older dead and down woody debris already existing within these areas, so that the increased flows commonly occurring after activities do not lead to excessive scour and sedimentation effects.
2. Provide for wildlife cavity and travel corridor habitat, where feasible.

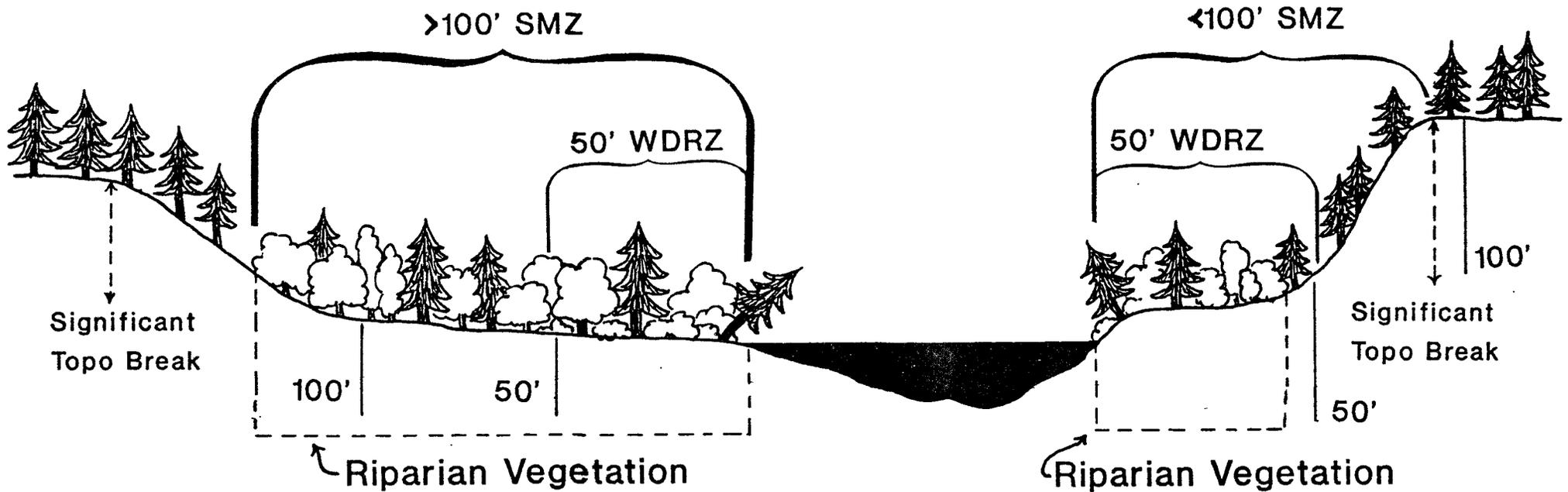
**TIMBER HARVEST GUIDELINES WITHIN STREAMSIDE MANAGEMENT ZONES (SMZS) KNF STREAM CLASSES**

			REQUIREMENTS FOR EACH SIDE OF STREAM			HARVEST RESTRICTIONS			RESOURCE GUIDELINES FOR TREATMENT ZONES
KNF STREAM CLASS	DESCRIPTION	DURATION OF FLOW	SMZ WIDTH	WDRZ WIDTH	LEAVE TREE REQUIREMENTS	2 Sided Harvest	Length of Each Unit	TOTAL HARVEST Exist + Proposed Length Per Mile	
I	LARGE PERENNIAL	YEAR ROUND	100' UNLESS EXTENDED BY ERV; LESS IF STB W/IN THE 100' ZONE (Minimum 25')	50'	30 TREES PER 1000' AT LEAST 12" DBH (18" OR MORE DBH IS DESIRED)	NO	600'	1200' per Decade	SMZ:1-4,6,7 WDRZ:1-9 OTHER:1,3,5
IIA	SMALLER PERENNIAL: CHANNEL BANK WIDTH AT LEAST 10 FEET	AT LEAST 9.5 MO'S PER YEAR	100' UNLESS EXTENDED BY ERV; LESS IF STB W/IN THE 100' ZONE (Minimum 25')	30'	50 TREES PER 1000' AT LEAST 8" DBH (12" OR MORE DBH IS DESIRED)	NO	600'	1200' per Decade	SMZ:1-4,6,7 WDRZ:1-9 OTHER:1,3,5
IIB	SMALLER PERENNIAL: CHANNEL BANK WIDTH LESS THAN 10 FEET	AT LEAST 9.5 MO'S PER YEAR	100' UNLESS EXTENDED BY ERV; LESS IF STB W/IN THE 100' ZONE (Minimum 25')	25'	50 TREES PER 1000' 6-8" DBH (12" OR MORE DBH IS DESIRED)	NO	1000'	1500' per Decade	SMZ:1-7 WDRZ:1-9 OTHER:1,3,5
IIIA	LARGE INTERMITTENT/ EPHEMERAL: CHANNEL BANK WIDTH AT LEAST 3 FEET	LESS THAN 9.5 MO'S PER YR	50' UNLESS EXTENDED BY ERV; LESS IF STB W/IN THE 50' ZONE (Minimum 25')	25'	50 TREES PER 1000' AT LEAST 6" DBH (12" OR MORE DBH IS DESIRED)	YES	---	---	SMZ:1,3,6,7 WDRZ:1-7,9 OTHER:1,3,5
IIIB	SMALLER INTERMITTENT/ EPHEMERAL: CHANNEL BANK WIDTH <3 FEET	LESS THAN 9.5 MO'S PER YR	EDGE OF RIPARIAN VEG BUT NOT LESS THAN 25'	NONE	NONE	YES	---	---	SMZ:1,3,6-8 OTHER:1,3,5
IV	DRY DRAWS, SWALES (WITHOUT IDENTIFIABLE CHANNEL)	---	NONE	NONE	NONE	YES	---	---	OTHER:2,4,5
N/A	SMALL PONDS AND BOGS BETWEEN 1/10 AND 2 ACRES	WATER THROUGH SUMMER	EDGE OF RIPARIAN VEG BUT NOT LESS THAN 25'	25'	3 TREES PER 100': 10" DBH OR MORE DBH IS DESIRED	---	---	---	SMZ:1,3,6,7 WDRZ:6,7,9
N/A	PONDS AND BOGS GREATER THAN 2 ACRES	WATER THROUGH SUMMER	FOLLOW <u>IIB</u> REQUIREMENTS						

ERV: EDGE OF RIPARIAN VEGETATION  
SMZ: STREAM SIDE MANAGEMENT ZONE

WDRZ: WOODY DEBRIS RECRUITMENT ZONE  
STB: TOP OF SIGNIFICANT TOPOGRAPHIC BREAK

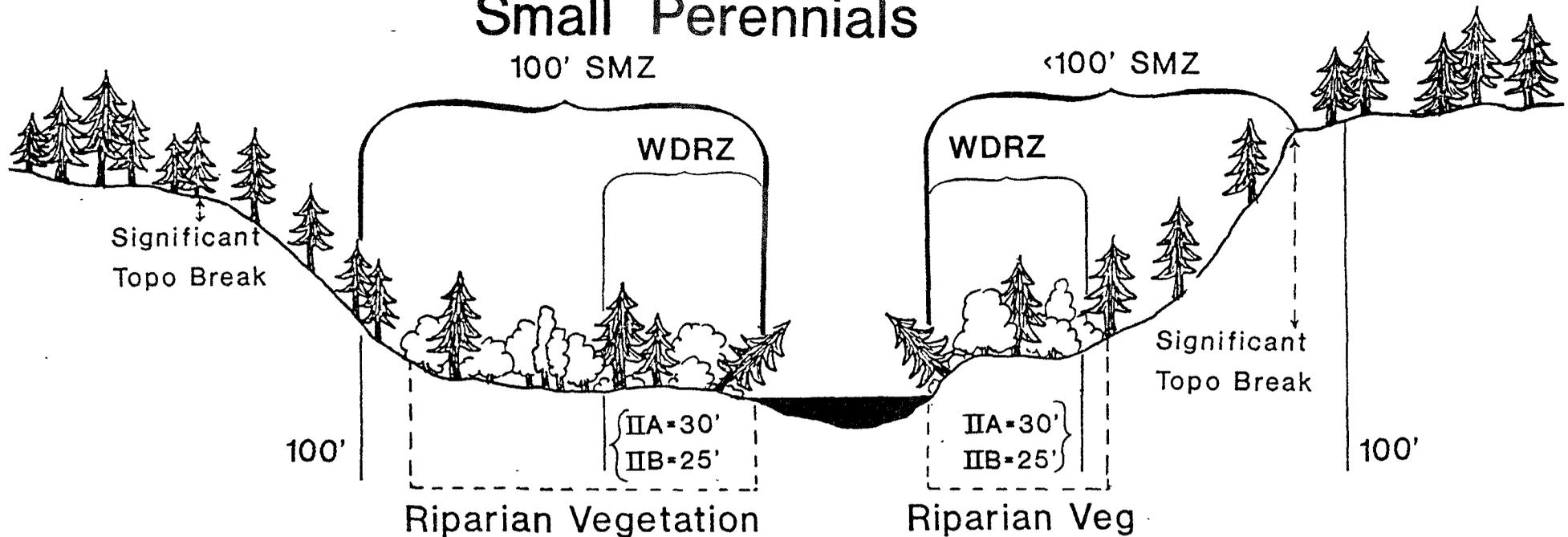
# KNF Stream Class I - Large Perennial



KNF STREAM CLASS I DESCRIPTION AND CHARACTERISTICS	TREATMENT ZONE WIDTHS (see diagram above)	LEAVE TREE REQUIREMENTS IN WDRZ	RESOURCE GUIDES FOR TREATMENT ZONES
<p><b>LARGE PERENNIALS:</b> Contains limited (few or small amounts) of woody materials within stream channel. Most debris falling perpendicular to the streamflow is swept back parallel toward the banks or downstream.</p>	<p><b>SMZ WIDTH</b> is 100' unless riparian vegetation extends beyond 100' (SMZ WIDTH IS THEN RIP VEG WIDTH); significant topo break is within 100' (SMZ WIDTH IS THEN TOP OF THE TOPO BREAK)  <b>WDRZ WIDTH</b> is 50 lineal feet on each side of the stream.</p>	<p>Leave 30 trees per 1,000 feet on each side of the stream, (60 trees total); 12 inches DBH minimum, and 18+ inches DBH desirable.</p>	<p><b>SMZ:</b> 1-4,6,7  <b>WDRZ:</b> 1-9  <b>OTHER:</b> 1,3,5</p>
<p><b>EXAMPLES:</b></p>	<p>D1: Lower Big Cr (No. Fork &amp; below)  D5: Lower Libby Cr (Old Town Bridge &amp; below)</p>	<p>D3: Lower reaches of Grave Cr  D6: Fisher River</p>	<p>D4: Lake Creek  D7: Bull River</p>

# KNF Stream Class II A, II B

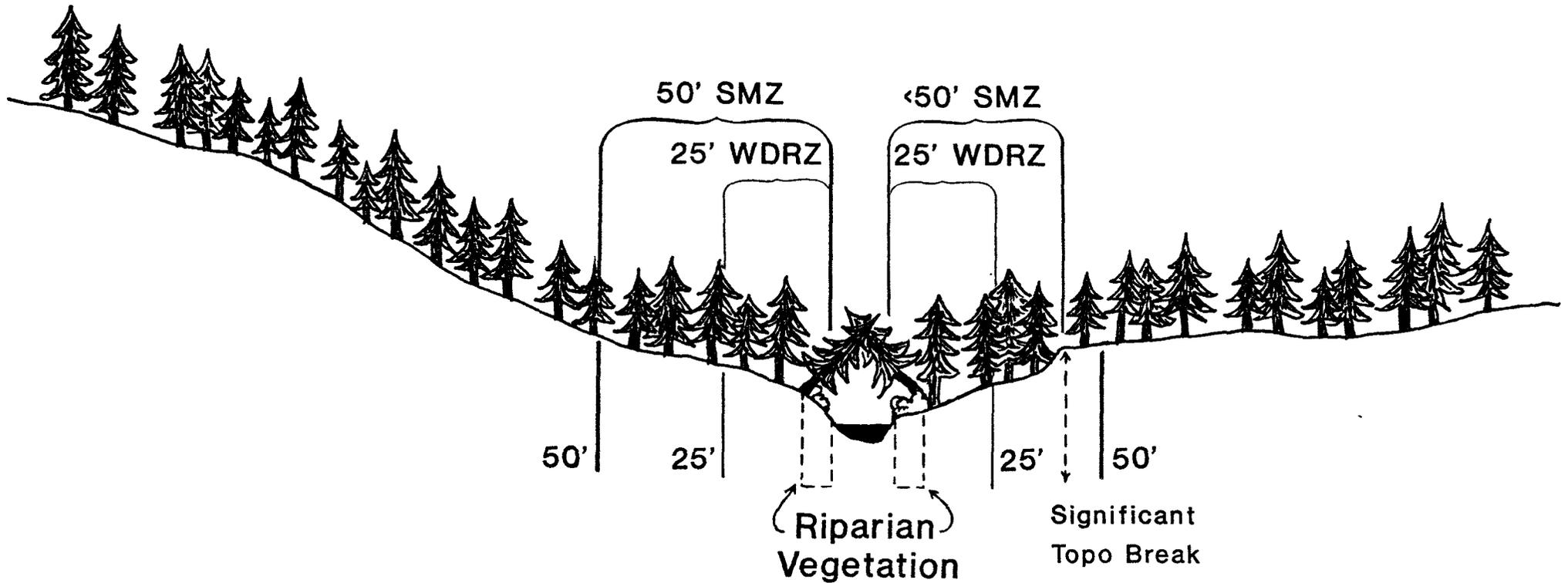
## Small Perennials



KNF STREAM CLASS II DESCRIPTION AND CHARACTERISTICS	TREATMENT ZONE WIDTHS (see diagram above)	LEAVE TREE REQUIREMENTS IN WDRZ	RESOURCE GUIDES FOR TREATMENT ZONES
<b>IIA - SMALL PERENNIALS:</b> Includes streams that flow at least 9.5 months of the year, with a <b>channel bank width of at least 10 feet</b> . In-channel woody debris perpendicular to flow path is abundant, creating sediment traps and potential fish habitat.	<b>SMZ WIDTH</b> is 100' unless the riparian vegetation extends on each side of the stream. 100' - SMZ WIDTH IS THEN RIP VEG WIDTH; or significant topo break is within the 100' - SMZ WIDTH IS THEN TOP OF THE TOPO BREAK <b>WDRZ WIDTH</b> is 30 lineal feet on each side of the stream.	Leave 50 trees per 1,000 feet (100 trees total); 8 inches DBH minimum, 12+ inches DBH desirable.	<b>SMZ:</b> 1-4, 6,7 <b>WDRZ:</b> 1-9 <b>OTHER:</b> 1,3,5
<b>EXAMPLES:</b> D1: Sutton or Boulder Cr. D5: East Fork Pipe Cr.	D3: Lake, Lower Davis Cr D6: Bristow, Cripple Horse	D4: O'Brien Creek D7: S. Fork of Bull River	
<b>IIIB - SMALL PERENNIALS:</b> Also includes streams that run at least 9.5 months, but has a <b>channel bank width of less than 10 feet</b> . In-channel woody debris perpendicular to flow path is abundant, creating sediment traps, flow energy dissipation, and fish habitat.	<b>SMZ WIDTH</b> is 100' unless the riparian vegetation extends past 100' - SMZ WIDTH IS THEN RIP VEG WIDTH; or a significant topo break is within the 100' - SMZ WIDTH IS THEN TOP OF THE TOPO BREAK. <b>WDRZ WIDTH</b> is 25 lineal feet on each side of the stream.	Leave 50 trees per 1,000 feet on each side of the stream (100 trees total); 6-8 inches DBH minimum acceptable, 12+ in DBH desirable.	<b>SMZ:</b> 1-7 <b>WDRZ:</b> 1-9 <b>OTHER:</b> 1,3,5
<b>EXAMPLES:</b> D1: N.Fk Parsnip Creek D5: Crazyman Creek	D3: Upper Davis Creek D6: Butler Creek	D4: Grizzly Creek D7: Snake Creek	

# KNF Stream Class IIIA

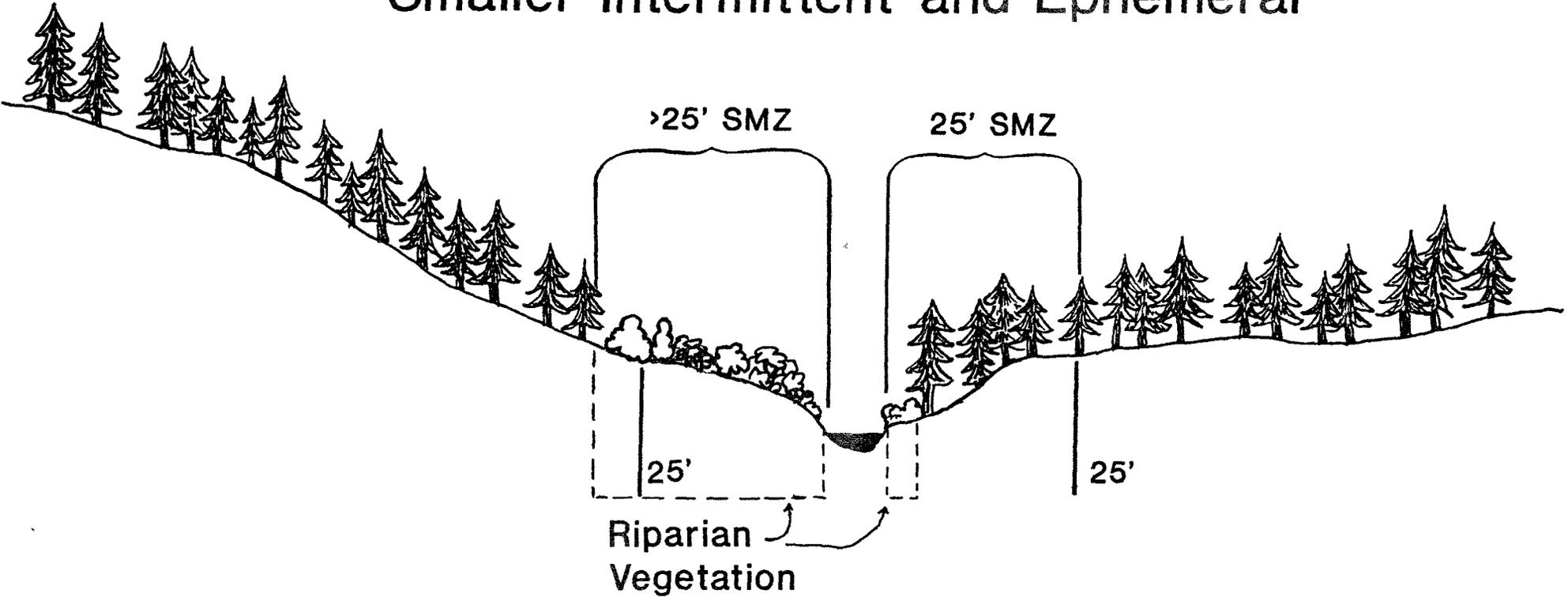
## Large Intermittent and Ephemerals



KNF STREAM CLASS IIIA DESCRIPTION AND CHARACTERISTICS	TREATMENT ZONE WIDTHS (see diagram above)	LEAVE TREE REQUIREMENTS IN WDRZ	RESOURCE GUIDES FOR TREATMENT ZONES
<p><b>LARGE INTERMITTENT AND EPHEMERAL:</b> These are channels that flow less than 9.5 months of the year, but have a <b>channel bank width of at least 3 feet</b>. Downed woody materials are common and important in these channels for flow energy dissipation, sediment storage, and protection of downstream, larger channel conditions.</p>	<p><b>SMZ WIDTH</b> is 50' unless the riparian vegetation extends beyond 50' (SMZ WIDTH IS THEN RIP VEG WIDTH); or a significant topo break is within 50' (SMZ WIDTH IS THEN TOP OF THE TOPO BREAK).</p> <p><b>WDRZ WIDTH</b> is 25 lineal feet on each side of the stream.</p>	<p>Leave 50 trees per 1,000 feet on each side of the stream (100 trees total); 6-8 inches DBH minimum acceptable, except it is desirable to leave larger (12+ inches DBH) cull trees in steep draws and where it will be difficult to protect from burning.</p>	<p><b>SMZ:</b> 1,3,6,7  <b>WDRZ:</b> 1-7, 9  <b>OTHER:</b> 1,3,5</p>

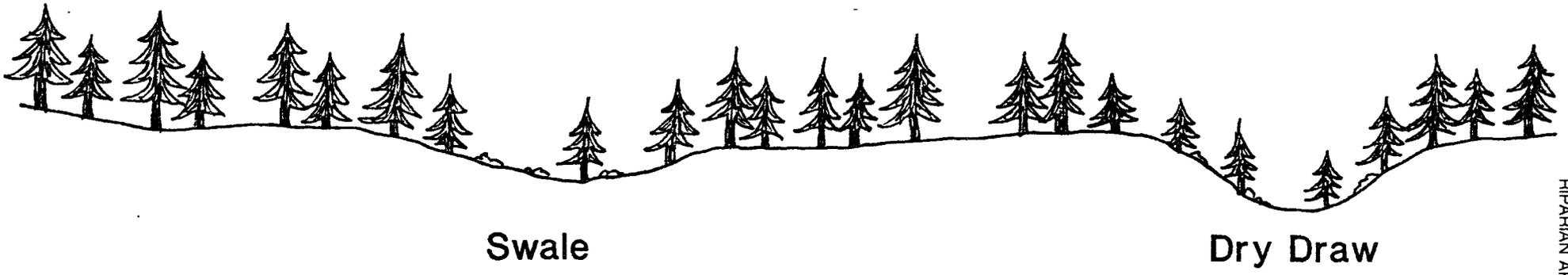
# KNF Stream Class IIIB

## Smaller Intermittent and Ephemeral



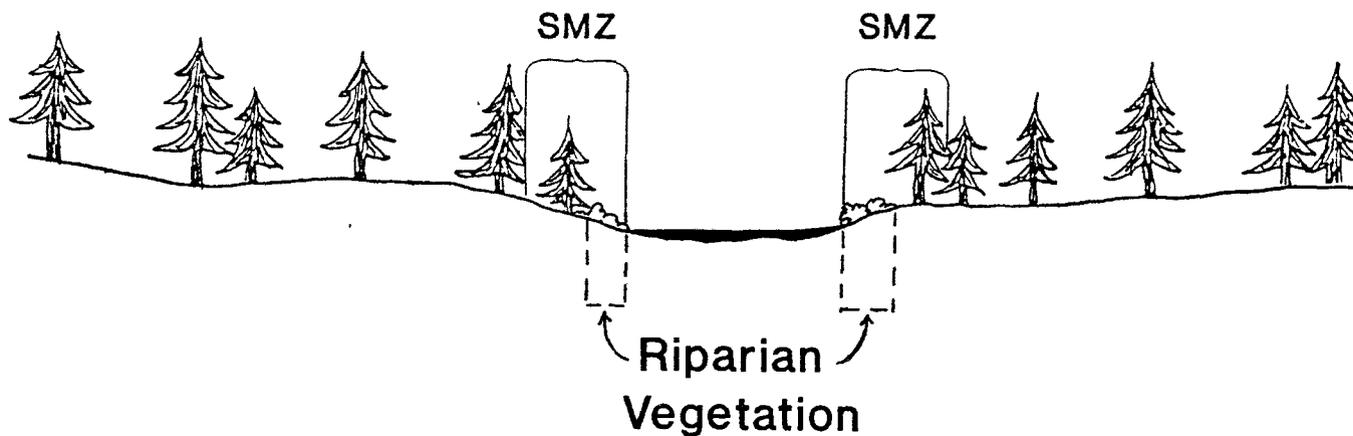
KNF STREAM CLASS IIIB DESCRIPTION AND CHARACTERISTICS	TREATMENT ZONE WIDTHS (see diagram above)	LEAVE TREE REQUIREMENTS IN WDRZ	RESOURCE GUIDES FOR TREATMENT ZONES
<p><b>SMALLER INTERMITTENT AND EPHEMERAL:</b>                      These are channels that flow less than 95 months of the year, but have a <b>channel bank width of less than 3 feet</b>. Downed woody materials are common and important in these channels for flow energy dissipation, sediment storage, and protection of downstream, larger channel conditions.</p>	<p>SMZ WIDTH is the edge of the riparian vegetation but not less than 25'.</p>	<p>None Required.</p>	<p><b>SMZ:</b> 1,3,6,7,8  <b>OTHER:</b> 1,3,5</p>

# KNF Stream Class IV- Dry Draws and Swales (no identifiable channel, no riparian area involved)



KNF STREAM CLASS IV DESCRIPTION AND CHARACTERISTICS	TREATMENT ZONE WIDTHS (see diagram above)	LEAVE TREE REQUIREMENTS IN WDRZ	RESOURCE GUIDES FOR TREATMENT ZONES
DRY DRAWS AND SWALES: without identifiable channel.	None specified.	None specified.	OTHER: 2,4,5

## Small Ponds and Bogs (between 1/10 and 2 acres)



KNF STREAM CLASS DESCRIPTION AND CHARACTERISTICS	TREATMENT ZONE WIDTHS (see diagram above)	LEAVE TREE REQUIREMENTS IN WDRZ	RESOURCE GUIDES FOR TREATMENT ZONES
<p><b>SMALL PONDS AND BOGS:</b> Contains water throughout the summer season and is between 1/10 of an acre and 2 acres in size at maximum height.</p>	<p><b>SMZ Width:</b> provide for a 25-foot-wide special treatment zone around the water body.  <b>WDRZ Width:</b> is the same as the SMZ and overlaps.</p>	<p>Leave a minimum of 3 trees per 100 feet of perimeter (30 trees per 1,000 feet); 10 inches DBH minimum and 12+ inches DBH desirable. For shade tree considerations, leave all deciduous vegetation and sub-merchantable conifers.</p>	<p><b>SMZ:</b> 1,3,6,7  <b>WDRZ:</b> 6,7,9</p>
<p>For POND and BOG greater than 2 acres in size, follow the Guidelines for Stream Class IIB.</p>			

## RESOURCE GUIDELINES FOR TIMBER HARVEST WITHIN STREAMSIDE MANAGEMENT ZONES (SMZ's) ON THE KOOTENAI NATIONAL FOREST

### SMZ'S:

1. Leave all deciduous brush and trees, and snags standing in the SMZ (unless they constitute a safety hazard), and leave all unmerchantable conifers in the WDRZ, to provide for filter strip maintenance, and stream channel stability.
2. In areas with multiple channels, use the *outermost channel bank* as the measurement point under these guidelines (see Appendix 1).
3. The SMZ is a zone of exclusion for heavy equipment and machinery. To keep heavy equipment out of the SMZ, "Protected Streamcourse Designation" signs will be needed and should be placed along the SMZ boundary to maintain the integrity of the filter strip (see Appendix 4).
4. Total SMZ harvest is limited to 1,200 feet per mile per decade with a limit of any individual SMZ harvest to 600 feet maximum stream length. The exception is on KNF Stream Class IB which can accommodate an individual SMZ harvest unit of 1,000 feet and 1,500 feet total harvest per mile per decade. Existing riparian and/or streamside harvest units must be considered in the calculations (see definition of Past Riparian Harvest). Stagger SMZ harvest to provide adequate shading for water temperature maintenance (no harvest in the adjacent or opposite stand for approximately 30 years or until the harvested unit has 8-inch DBH trees) (See Appendix 2 for suggested long-term harvest strategy).
5. When several short streamcourses are encountered in a drainage, add them all together to estimate the total amount that can be harvested.
6. Use directional felling to fall timber outside the SMZ and whole-tree skidding to reduce the amount of logging slash and potential heat kill of the smaller leave trees in the WDRZ (those less than 12 inches DBH).
7. Thinning is allowed in the SMZ but deciduous brush and trees should not be cut.
8. Burning prescriptions for slash treatment in harvest units must include methods to minimize damage to SMZ vegetation left as described in SMZ1. Where necessary, this may require removal of logging-derived slash prior to ignition, use of a sprinkler system, or modified ignition patterns to reduce fire intensity.

### OTHER:

1. Firelines and skid trails will be located away from live water to reduce potential sedimentation and to retain deciduous vegetation.
2. Skidding up-and-down the depression and slash piling within these swales, dry-draws, and small channels should be prohibited where possible. Firelines should be located out of, and all crossings should be made at right angles to, the flow direction in these depressions. Directional felling should be required to preclude skidding or piling within the depression.
3. Do not clean streamcourses of any naturally occurring pre-harvest woody debris. Selectively leave harvest debris if quantities of naturally occurring woody debris are low: suggest 1 piece of debris per 25 lineal feet of channel with a minimum size of 6 inches DBH and 8 feet in length.
4. Leave all deciduous brush and trees to provide for litter fall.
5. All streamcourses 50-100 feet above all culverts and bridges will be inspected to determine potential problems with any naturally-induced woody debris to insure the continued safe functioning of the drainage structure and roadway.

### WDRZ'S:

1. Trees that are either *rooted within the stream bank or leaning towards the channel* are the most desirable to leave and protect.
2. Maintain a mix of species and sizes if possible, but try to meet the desirable DBH sizes as the first priority for marking. Remember that trees 12 inches DBH and larger survive logging debris slash burning better than trees with smaller DBH's.
3. Within reason for safety during burning, leave the existing dead and down trees within the WDRZ, and give priority to cull trees and low-value species for leave trees.
4. Utilize the debris recruitment leave trees as harvest unit boundary trees and/or cavity habitat in the layout process whenever possible.
5. Large woody material that is suspended over a streamcourse should be left. Parts of longer logs may be removed providing the majority is retained for bank stability. If bucking is needed for fire containment, buck at the edge of the channel (not in the stream center) to retain the value of a viable potential sediment trap.
6. Use existing size, species, and location of natural debris for potential debris recruitment and bank stabilization whenever possible instead of marking additional trees (i.e. existing hardwoods or extensive brush cover may be adequate to maintain or enhance stream protection objectives).
7. Natural blowdown is expected and a moderate level is acceptable. However, where severe blowdown appears probable, a modification of the adjoining harvest block should be considered.
8. Leave trees should be evenly distributed along streams, if possible, except for clumps left at the outside of meander bends.
9. Burning prescriptions for the harvest unit must include methods to protect the WDRZ leave trees. Examples of methods to protect leave trees include removal of fuels from the SMZ prior to ignition, running a sprinkler system as needed to reduce fire intensity, foaming leave trees, or modified ignition patterns to reduce fire intensity.

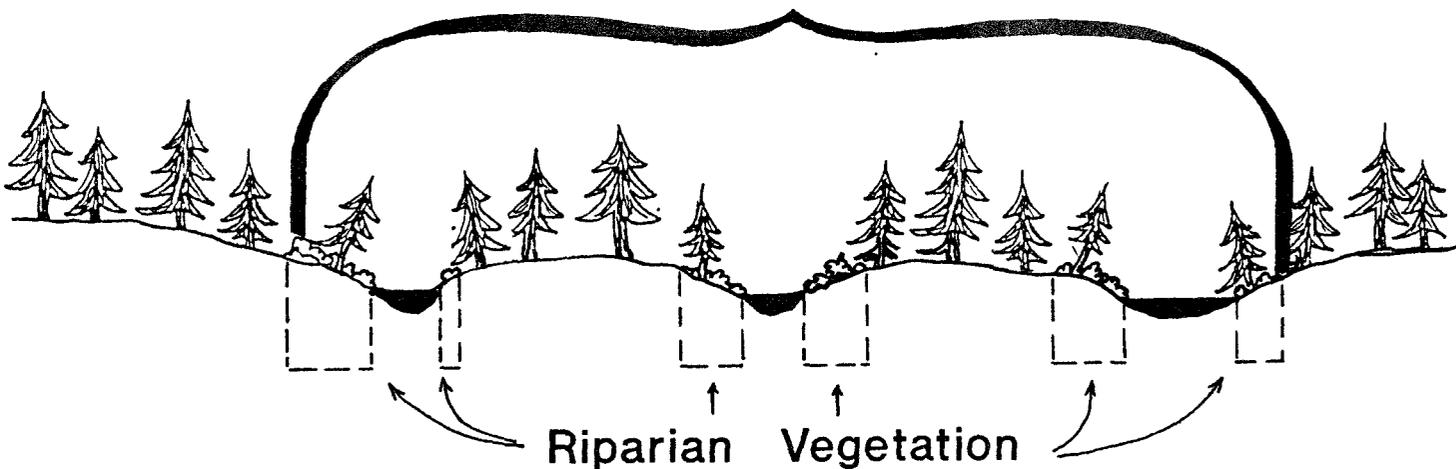
APPENDIX 1

DIAGRAM FOR SMZ DELINEATION IN MULTIPLE CHANNEL STREAMS  
(See Resource Guideline Item SMZ-2)

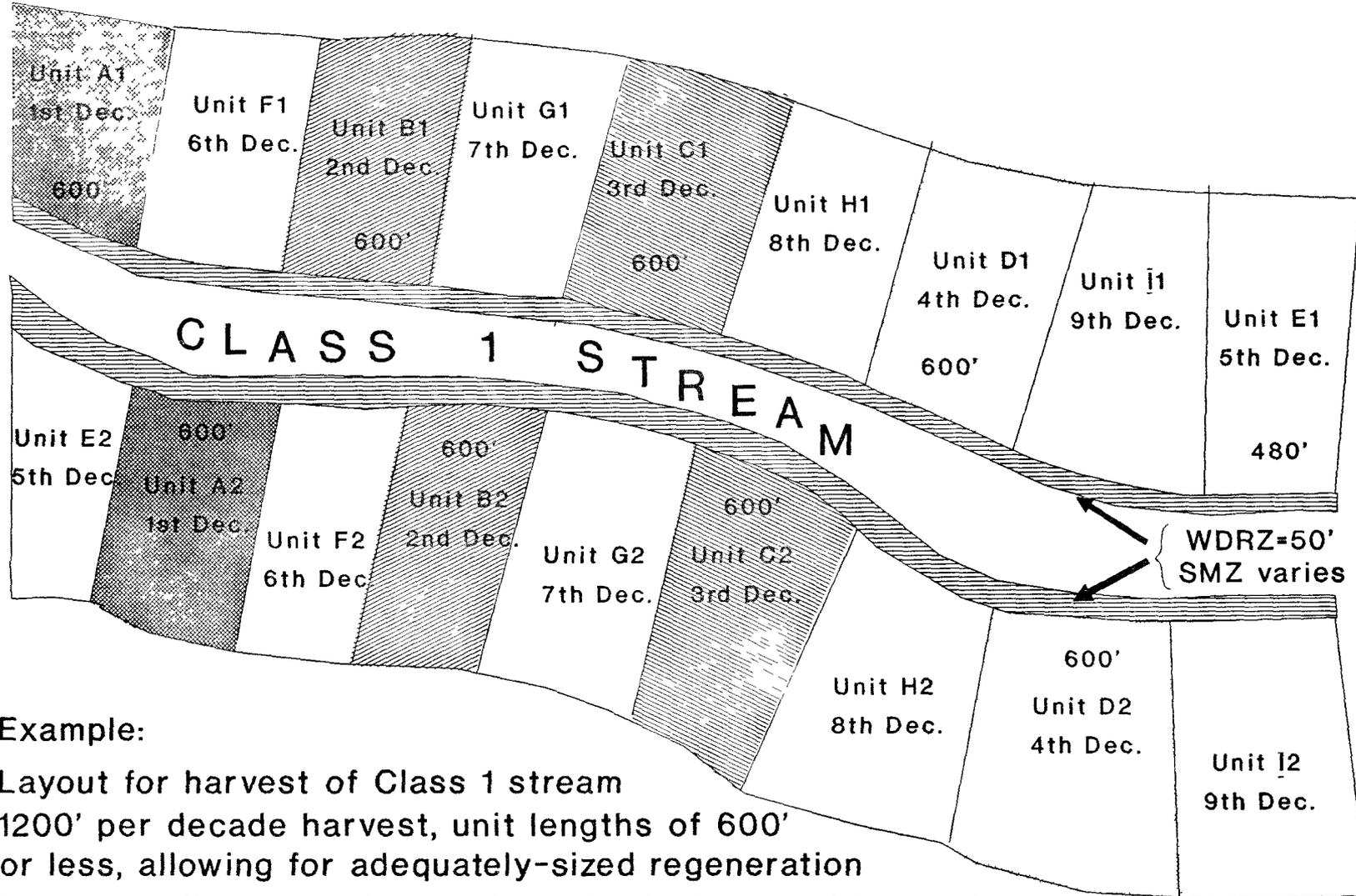
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# Multiple Channels

SMZ



## Timber Harvest Guidelines within SMZ's on the KNF



**Example:**

Layout for harvest of Class 1 stream  
 1200' per decade harvest, unit lengths of 600'  
 or less, allowing for adequately-sized regeneration  
 between adjacent and opposite units before next harvest.  
 (to accompany Resource Guideline Item SMZ-4)

**APPENDIX 3**

**C-Provision and Handbook Supplement** for implementation of Kootenai National Forest Riparian Area Guidelines

C6.50# - STREAMSIDE MANAGEMENT ZONES. (12/90) A Streamside Management Zone (SMZ) is a zone that contains riparian vegetation and other special characteristics. Areas identified as Streamside Management Zones (SMZ's) are shown on the Sale Area Map and designated \_\_\_\_ 1/\_\_\_\_.

Timber designation, conduct of logging, and/or slash treatment may differ in the SMZ from the rest of the unit. Unless otherwise agreed to in writing, and not withstanding the contract requirements otherwise applicable to each cutting unit, the following special requirements apply to the SMZ of the cutting units specified below:

Streamside Management

Cutting Unit Zone Requirements

XXXXXXXX XXXXXXXX

FOREST SERVICE HANDBOOK  
Libby, Montana

TITLE 2409.18 - TIMBER SALE PREPARATION HANDBOOK

Kootenai Supplement No. 1

POSTING NOTICE: Ref. FSM 1135.21

*Page Code Superseded New*  
( Number of sheets)

25.32--1 THRU 25.32-- 0 3

*Digest:*

Provides instructions for use of Streamside Management Zone contract provisions.

JAMES F. RATHBUN  
Forest Supervisor

25.32--1

TIMBER SALE PREPARATION HANDBOOK

*Streamside Management Zones.* Streamside Management Zones (SMZ) are areas identified adjacent to streams and/or wet areas where special treatment is required to protect water quality and riparian features. The streamside management zone identified on the ground marks the outermost limit where special treatment is needed. In most cases, it marks the limit beyond which equipment operations are prohibited, except under specific approved conditions. There are different objectives within the SMZ. The following list of approved requirements is designed to allow contract preparers to select appropriate requirements to achieve various objectives. Select only the requirements necessary to achieve the particular objectives that pertain in each case.

There are numerous contractual provisions that are used to achieve streamside and erosion control measures. None of the provisions by themselves accomplish all objectives. Provision C(CT)(BA) 6.50# shall be used in all contracts with designated and identified Streamside Management Zones. This provision is the vehicle by which management objectives and special treatment objectives are carried through to the contract, to accomplish debris recruitment objectives, filter strip objectives, etc.

This provision does not replace provision B(T)6.5- Streamside Protection, or C(T)6.6 Erosion Prevention and Control provisions.

Streamside management zones will be marked on the ground, and shown on the Sale Area Map. This will be the general procedure for all streams with identifiable channels. It is not feasible to mark SMZ's on all draws, where the primary emphasis from a water and soil quality standpoint is to prevent yarding and skidding directly up and down the depressions. In this situation, these areas need to be identified during presale, highlighted on work maps, and the information needs to be passed on to Sale Administrators via good prep notes. These can be used by Sale Administrators when approving skid trail or corridor locations. These notes are especially critical for winter operations.

*Sale Area Map:*

*Symbol Title Shown in Legend Remarks*

SMZ Streamside Management Zone There may be situations where different requirements are needed for SMZ's within a cutting unit. If so, the SMZ's may be identified by number on S.A.M. and in the "C" provision to identify different situations

25.32--2

*Optional Fill-in Statements*

*Objective:* Designation of trees *to be left* within the debris recruitment zone or entire SMZ, that may be different than rest of the unit.

*Sample Statements:*

All coniferous trees marked with paint above and below stump height shall be left uncut within the SMZ. ( NOTE: paint color may be specified)

All coniferous trees less than DBH shall be left uncut within feet of the streambanks ( NOTE: distances may be specified that correspond to riparian guide woody debris recruitment zone distances. DBH limits can be varied depending on the individual stream situation. )

All coniferous trees marked with paint above and below stump heights, and all coniferous trees less than DBH shall be left within the streamside management zone.

All hardwoods (aspen, cottonwood, etc.) shall be left uncut within the SMZ.

*Objective:* Designation of trees to be removed within the SMZ., that may be different than rest of unit.

*Sample Statements:*

All coniferous trees (less than\*DBH)(greater than \* DBH) (of \*\*\*\*\* species meeting merchantability specifications) (marked with paint) are designated for removal within the SMZ. ( NOTE: select statement in parenthesis that is applicable. Fill in DBH limits, or species identification, or paint color)

*Objective:* Protection of debris recruitment trees from being destroyed in slash /site preparation treatments.

*Sample Statements:*

All logging slash generated within the SMZ shall be endlined, or otherwise removed to a point outside the SMZ.

Slashing requirements, if any, specified in the Slash Treatment Plan do not apply within( of the streambanks), or(within the SMZ). (NOTE:specify distance)

*Objective:* Protection of filter strips, and reduction of soil disturbance within the SMZ.

25.32--3

*Sample Statements:*

Skidding with shall not be permitted within the SMZ, except in places approved in advance by the Sale Administrator. ( specify type of equipment not allowed, i.e. wheeled, track )

equipment will be allowed within the SMZ upon approval, for specific purposes such as designated crossings, or tree removal. ( specify type of equipment that will be allowed, such as horses, flotation, full suspension)

Cable corridors will not be located immediately above and parallel to the SMZ.

Logs or trees shall be yarded from outside the SMZ using winchlines, or other cable systems.

Machine scarification requirements specified elsewhere, do not apply to the area within the SMZ.

APPENDIX 4 (SIGNS)

**MEADOW**



**Vehicles and Skidding  
Equipment PROHIBITED  
behind this sign.**

P24-36 U.S. Department of Agriculture - Forest Service

**STREAMSIDE  
AREA**



**EQUIPMENT  
PROHIBITED  
BEHIND THIS SIGN**

P24-37 U.S. Department of Agriculture - Forest Service

UNICOR Lompoc, CA

## APPENDIX 5

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APPENDIX 6

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