

9 Resource Synthesis and Definition of Potential Management Units

In order to synthesize information in this Assessment, a total of 22 Potential Management Units (PMUs) have been defined throughout the Clearwater subbasin (Figure 113). The term “Potential” is being used here to clarify that these management units are open to interpretation, and may be altered to some degree during the subbasin planning effort. PMUs are groups of HUCs (either contiguous or noncontiguous) intended to characterize areas which have similar themes regarding species distributions, disturbance regimes, and other characteristics that will influence future subbasin scale restoration or recovery planning. The delineation of PMUs is not intended for direct use in small scale project planning. While the delineated PMUs characterize themes across relatively broad geographic areas, actual project planning will require site specific information.

Definition of PMUs was done in a largely subjective manner. Statistical cluster analysis was not used largely due to uncertainty over its ability to delineate meaningful management units. For the purposes of planning at the subbasin scale, and given limitations in data availability and accuracy based on the broad scale nature of this assessment, subjective PMU delineations are believed to be as valid and more practical than statistical delineations.

In delineating PMUs, 38 variables were considered for their individual and combined influence to potential future management scenarios (Table 66). Due to the large amount of information being synthesized, raw data were often categorized (e.g. ranging from Very Low to Very High) in order to make comparison and interpretation feasible. The following discussion and comparison of individual PMUs relies heavily on these categorical descriptors. All information presented or summarized in this section has been presented in greater detail earlier in this assessment with information on sources, scales, compilation methods, and potential weaknesses pertaining to each dataset. Where applicable, values used to delineate categories for individual variables are included in Table 66.

PMUs were not delineated in a species-specific manner due to a lack of comprehensive distribution and status information for some species, the heavy reliance on landscape level characteristics used to define them, and the potential for altered species distributions in the future (through reintroductions or habitat improvement). Where applicable, notes on the distribution and status of aquatic and terrestrial focal species are provided within the discussion of each PMU.

Although PMUs may have considerable overlap in their overall characteristics, they can typically be differentiated from one another based on either one, or a combination of “distinguishing” characteristics. In order to emphasize major differences in planning concerns, PMUs are presented and discussed individually within three distinct areas of the subbasin: those dominated by private ownership (excluding corporate ownership), mixed ownership (including corporate ownership), or federal ownership. Within the Clearwater subbasin, land use and management strategies differ substantially between these ownership areas, and will likely impact future planning strategies within and between them. Identifiers have been assigned to each PMU which include a prefix and a number. Prefix codes are used to identify the primary ownership area within each PMU. These include PR (private), MX (mixed), or FD (Federal). Number codes are assigned sequentially within each ownership area as a means to differentiate PMUs.

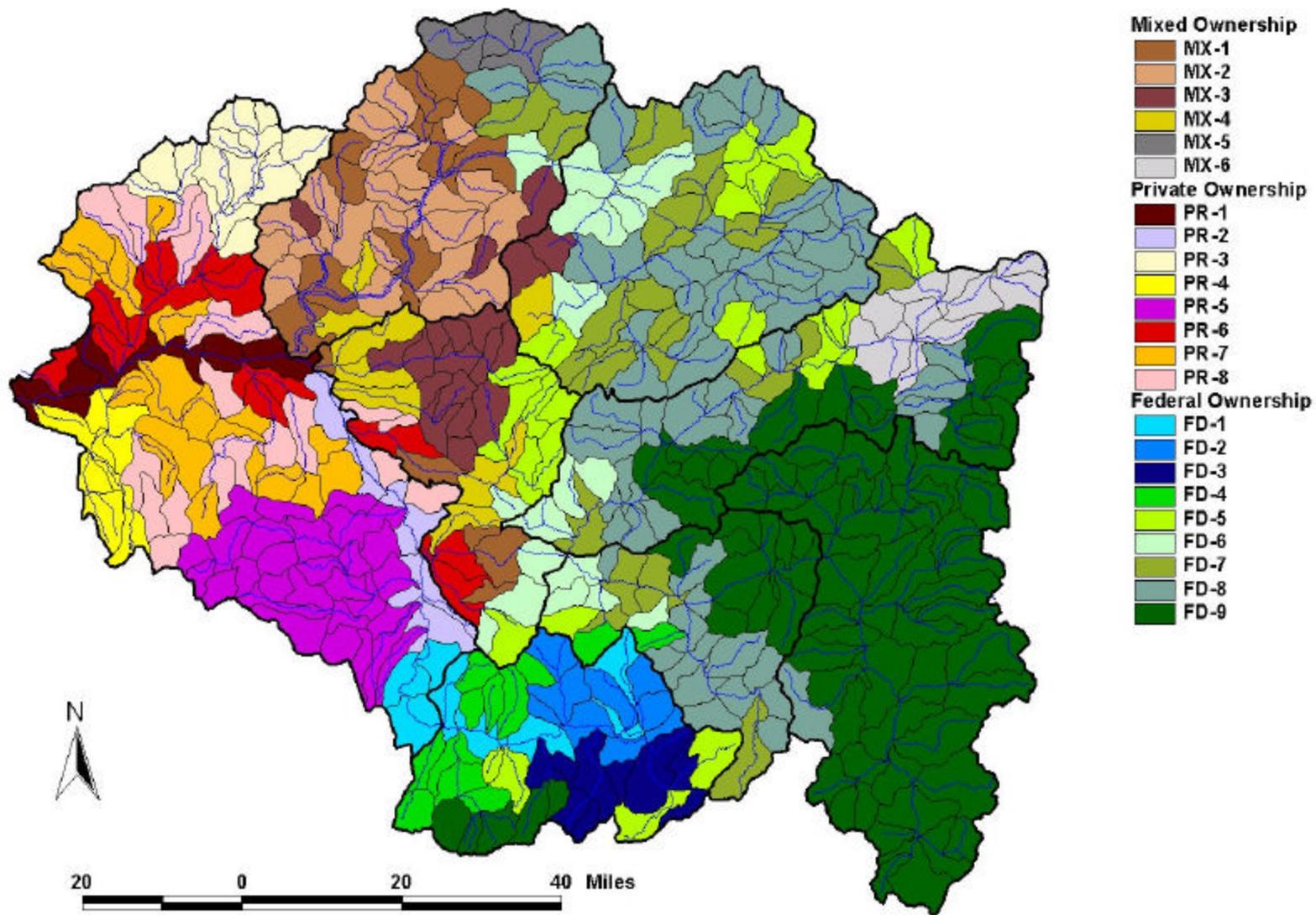


Figure 113. Potential Management Units (PMUs) delineated throughout the Clearwater subbasin.

Table 66. Attributes used to delineate PMUs throughout the Clearwater subbasin, including descriptions of categories used to summarize data

Attributes	Description and comments	# of Variables
Species Attributes		
Distribution and Status	Presence/absence, and relative status if known	1
Life History Types	A run steelhead, B run steelhead, spring chinook, fall chinook, fluvial/resident bull trout, fluvial/resident cutthroat trout	8
Hatchery Influence	Relates to same species influence	1
Exotic Species	Brook trout distribution and status	1
Landscape Level Attributes		
Accessibility	Differentiates areas known to be blocked to anadromous species	1
Existing Protection	Differentiate areas with high degree of protected status (>90% or >75%)	2
Land Use (Dominant and Subdominant)	Forested or Agriculture/Range. Dominant and Subdominant (>25%) classes were considered	2
Ownership (Dominant and Subdominant)	Dominant classes: Federal, State, Private Corporation, Other Private Subdom. (>25%) classes: Federal, State, Private Corp., Other Private, Tribal	2
Habitat		
Habitat Quality	From NPPC database	1
Limiting Factors	From Table 45 and NPPC database	2
Water Quality	Relative amount and distribution of 303(d) listed stream segments	1
Temperature Modeling	As potential limiting factor to species distributions (not related to water quality)	1
Hydrology/Water Use	Runoff Pattern (Lipscomb 1998) and Water Use	2
Disturbances		
Vulnerability	Percent of HUC within PSSZ	1
Grazing Potential	Percent of HUC defined as grazable: >50 High ; 20-50 Moderate; <20 Low	1
Road Density	Used USFS designations and added class delineating "Very High" density: Very High >5 mi./sq. mi.; High >3 mi./sq. mi.; Moderate=1-3 mi./sq. mi.; Low <1 mi./sq. mi.	1
Road Density in PSSZ	Designations based on USFS streamside road density designations with added class delineating "Very High" density: Very High>4 mi./sq. mi.; High=2-4 mi./sq. mi.; Moderate=1-2 mi./sq. mi.; Low<1 mi./sq. mi.	1
Mine Hazard (mines)	Sum of "Ecological hazard ratings" delineated by ICBEMP: Very High>100; High=50-99; Moderate=25-49; Low=10-24; Very Low<10	1
Mine Hazard (claims)	Estimated number of claims: Very High >500; High=200-500; Moderate=100-200; Low=50-100; Very Low <50	1
Sediment Regime	Major source(s) - Mass wasting, surface erosion, or both	1
Landslide Hazard	Used % of land area defined as Moderate-High Hazard: Very High>20; High=10-20; Moderate=5-10; Low=2-5; Very Low <2	1
Surface Erosion Hazard	Based on relative ratings developed by ICBEMP. Values assigned as quantiles with 20% of HUCs in each category: Very High, High, Moderate, Low, Very Low	1
Hazard Combinations	Road Density/Landslide Hazard; PSSZ Road Density/Landslide Hazard; Grazing Potential/Surface Erosion Hazard; Landslide/Surface Erosion Hazard	4

In the following textual descriptions of each PMU, information is presented regarding attributes that will influence future planning strategies. In most cases, no discussion is presented for factors not believed to impact aquatic resources within a PMU unless the notable absence of that activity (e.g. grazing) is thought to have a potential influence on planning strategies. Textual descriptions are intended to represent the overall character of the PMU, and do not necessarily directly reflect the characteristics of every HUC within it (e.g. road densities throughout a PMU are characterized as High, although densities in one or more HUCs may individually be characterized as Moderate or Very High).

Characteristics are typically discussed in a singular fashion within each PMU, with little attempt to discuss interrelationships between them, or direct impacts of characteristics on aquatic resources. The ability to discuss interrelationships between variables is minimal at this scale due to the often site specific nature of such relationships (e.g. the relationship of road density and landslide hazard is dependent on road age and construction techniques, placement on slope, localized climate, etc.). In a similar sense, it is not possible to discuss actual impacts of landscape level characteristics to aquatic and terrestrial resources since impacts also tend to be site specific.

In broad scale planning, higher degrees of disturbance (e.g. higher road densities) are likely to have more substantial impacts on resources, and combined disturbances (e.g. high road density and high landslide hazard) are likely to have cumulative impacts. However, interpretation the cumulative impacts within each PMU to impact aquatic and terrestrial resources remains speculative, and therefore is not discussed here.

9.1 PMUs Predominated by Private Ownership

A total of eight PMUs have been delineated which are predominated by private ownership and unique (or very nearly so) to the Lower Clearwater AU (Figure 114). To signify the predominance of private ownership, PMUs within these areas are designated by the prefix “PR”. Of the eight PMUs defined, two are used to delineate portions of the mainstem river corridor used by all aquatic focal species. The remaining six PMUs delineate tributary watershed areas which are utilized primarily by A-run steelhead trout.

Primary characteristics used to differentiate PMUs within the Lower Clearwater AU include aquatic species presence, dominant ownership and land cover, and natural and induced disturbance regimes. Table 67 summarizes differences in primary characteristics between the eight PMUs in this area. Textual descriptions are provided below, and include discussion of additional details regarding conditions within each PMU as they relate to aquatic species and habitat.

These PMUs are displayed separately (Figure 114) to emphasize the substantial differences in management concerns in areas dominated by private ownership and agricultural land uses relative to other areas of the subbasin. PMUs within this area were defined with the following distinctions in mind, and, unless noted, these characteristics apply to all PMUs defined in this area

1. The mainstems of the Clearwater and South Fork Clearwater rivers function as migration and overwintering habitat for all aquatic focal species considered in this assessment and contain the entire known spawning and rearing distribution of fall chinook salmon within the Clearwater subbasin
2. Tributaries to the mainstem Clearwater and South Fork Clearwater Rivers support only one aquatic focal species: A-run steelhead trout. Populations are considered “depressed” throughout the Lower Clearwater AU, and are not directly influenced by hatchery production
3. Citations or occurrences of aquatic focal species (other than steelhead trout) in tributaries are sporadic and likely indicative of migrating individuals rather than populations
4. With limited exception, ownership is predominantly private, and land cover is predominantly nonforested and highly influenced by agricultural and rangeland uses
5. The entire Clearwater subbasin is within the Nez Perce Tribe Ceded Territory, and the majority of the Nez Perce Indian Reservation and related Tribal land holdings exist within PMUs defined within the Lower Clearwater AU.
6. Sediment regimes are dominated by surface erosion processes throughout much of the Lower Clearwater AU, although landslides/mass wasting processes may be important in limited areas.

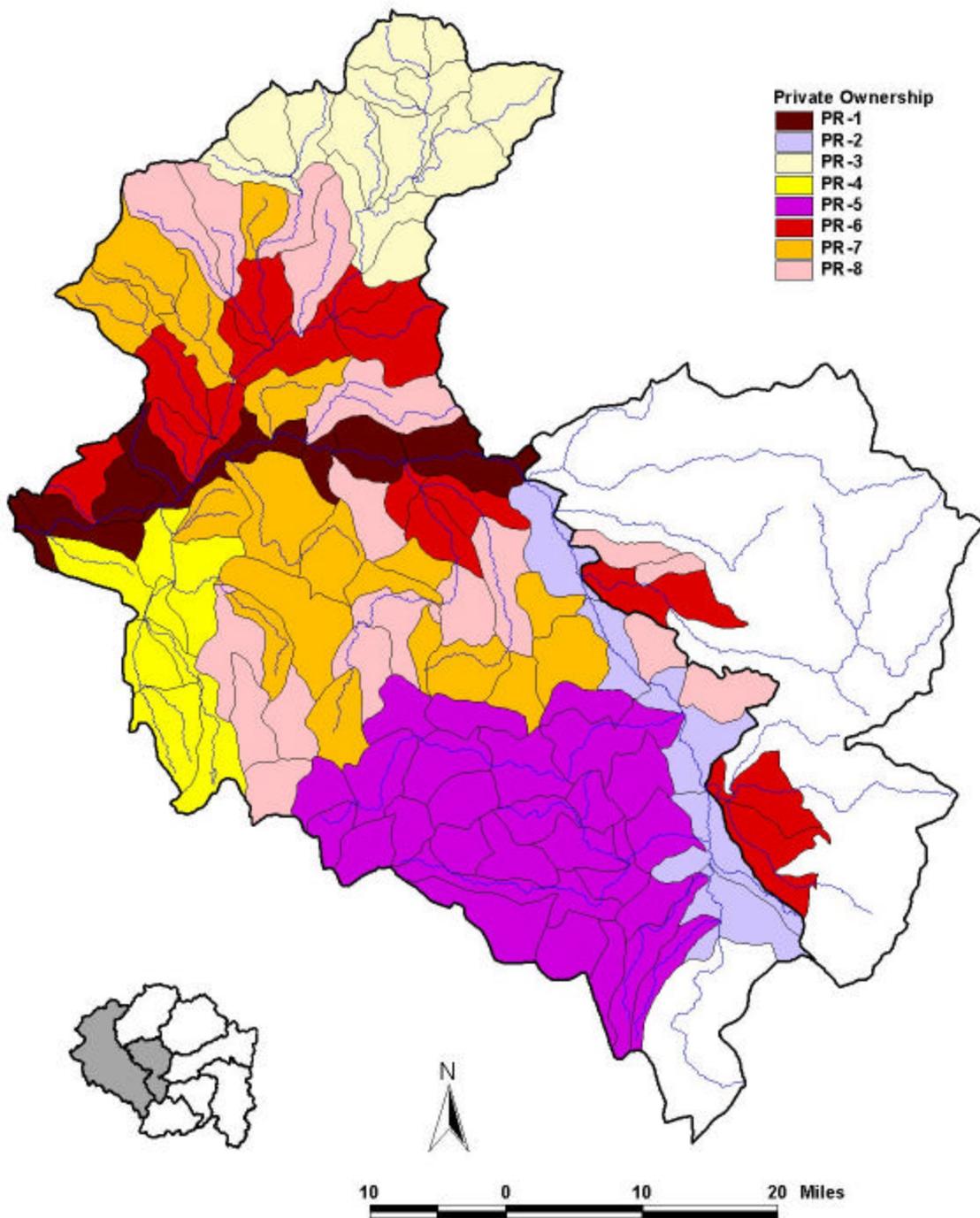


Figure 114. Potential Management Units (PMUs) delineated within areas of predominantly private ownership in the Clearwater subbasin

Table 67. Comparison of primary characteristics used to differentiate PMUs delineated throughout areas dominated by private ownership within the Clearwater subbasin. Characteristics in bold print are primary defining characteristics of each PMU

PMU	Species Present	Dominant Owner	Water Use	Peak Runoff	Land Cover Dominant/Sub-Dom.	Potential Disturbance			Primary Sediment source
						Road Density	Landslide Hazard	Surface Eros. Hazard	
PR-1	All	Private	Moderate	May	Ag./Forest	Mod.- High	Mod.-High	High	Mass/Surface
PR-2	All	Private	Moderate	May	Forest/Ag.	Mod.- High	Very High	Very High	Mass/Surface
PR-3	A-run SH	Mixed	Low	May	Forest/None	High	V Low-High	High-V High	Mass/Surface
PR-4	A-run SH	Private	V High	April	Ag./Forest	Moderate	Low	Very High	Surface Erosion
PR-5	A-run SH	Private	Low-Mod.	March	Ag./None	Moderate	Very Low	High-V High	Surface Erosion
PR-6	A-run SH	Private	Low-Mod.	April	Ag./Forest	Moderate	Mod.-High	Very High	Mass/Surface
PR-7	A-run SH	Private	Low	April	Ag./None	Moderate	V Low-Low	High-V High	Surface Erosion
PR-8	A-run SH	Private	Low	April	Ag./Forest	Moderate	V Low-Low	High-V High	Surface Erosion

9.1.1 PMU PR-1

Primary Distinguishing Characteristic(s)

Eight HUCs make up this PMU, which is distinguishable as the mainstem Clearwater River below its confluence with the North Fork Clearwater River (Figure 114). Reaches within this PMU are highly influenced by Dworshak Dam operations and used by fall chinook salmon for spawning and rearing, and other aquatic focal species primarily for migration and overwintering.

General Description

This PMU constitutes one of only two utilized by fall chinook salmon for spawning and rearing, and is utilized by all other target species principally for overwintering and migration purposes. This PMU may also constitute an important rearing area for juvenile A-run steelhead which are forced to migrate from natal tributary streams during periods of low flow and high temperature, a situation which has been suggested (Kucera et al. 1983; Fuller et al. 1984; and Johnson 1985) but not substantiated.

Habitat quality for fall chinook salmon has not been rated in this reach, but is thought to be relatively high. Fall chinook habitat quality is primarily impacted and limited by operations at Dworshak Dam which alter flow and temperature regimes throughout the spawning and rearing period. Habitat quality for other anadromous species is limited primarily by large stream size which inhibits spawning and early rearing. All aquatic focal species are thought to use this PMU for migration and overwintering purposes, and limited use by resident species may occur throughout the year. Water quality concerns in this PMU listed under §303(d) include only total dissolved gas resulting from the operation of Dworshak Dam.

The terrestrial focal species Jessica's aster, and the culturally important Lomatium have been documented by the Idaho CDC to occur in this PMU. Jessica's aster is a perennial representative of prairie grasslands. All of the locations of Jessica's aster in this PMU are on private property. Threats to this species in this PMU consist of grazing, destruction of habitat, and competition with introduced species. Lomatium is a perennial found in open areas with little herbaceous cover in canyon grasslands. Many locations of lomatium are on private land in this PMU. Lomatium is threatened by roadside disturbance, gravel pit/quarry work and weevil attacks. This PMU may contain high quality ponderosa pine, prairie grassland remnants and wetland habitats in need of inventory, protection and/or restoration.

Ownership is predominantly private throughout this PMU, with limited Federal, State, and Tribal holdings. Protected status of lands within this PMU is minimal, equating to less than 1 percent of any HUC. Land cover is dominated by agriculture and range lands, with interspersed forested areas generally comprising less than 25% of any HUC.

Relatively high surface erosion and landslide hazards combine to create substantial sediment production concerns throughout this PMU. Modeled landslide hazards range from Moderate to High and surface erosion hazard is considered Very High. Mining impacts, based on ecological hazards and numbers of mining claims, are minimal and probably have little influence on sediment production.

Overall road densities are Moderate, with the exception of populated areas where road densities range from High (Orofino) to Very High (Lewiston) due to municipal road networks. Following a similar trend, road densities within the PSSZ are Moderate throughout most of the PMU, and High in the populated areas. Although a combination of relatively high inherent landslide potentials and road densities occurs in this PMU, the overall likelihood of

road related landslides is thought to be low due to the prevalence of well maintained rural and urban (not forest) roads.

Very High surface erosion hazards coupled with predominantly agricultural land use, and Moderate to High grazing potential make surface erosion a potential concern within this PMU. However, the relative impact of localized versus upstream sediment sources to instream fine sediment levels in this PMU is unclear.

9.1.2 PMU PR-2

Primary Distinguishing Characteristic(s)

Five HUCs make up this PMU, which is distinguishable as the mainstem portions of the Clearwater and South Fork Clearwater rivers between Butcher Creek and the North Fork Clearwater River (Figure 114). Reaches within this PMU are used by fall chinook salmon for spawning and rearing, and are not subject to the influence of Dworshak Dam operations.

General Description

This PMU is similar to PR-1: it is utilized by fall chinook salmon for spawning and rearing, albeit to a much lesser extent, and by all other aquatic focal species primarily for overwintering and migration purposes. As is the case with PR-1, this PMU may also constitute an important rearing area for juvenile A-run steelhead, which are potentially forced to migrate from natal tributary streams during periods of low flow and high temperature.

Protected status of lands along the Clearwater River reaches within this PMU is minimal, equating to less than 1 percent of any HUC. In contrast, protected status of HUCs in this PMU along the South Fork Clearwater River each have approximately 10 percent of their area protected through the designation of a Wild and Scenic River reach. Ownership is predominantly private, with limited Federal, State, and Tribal holdings. Dominant land cover is forested, although agricultural/range lands make up at least 25 percent of all HUCs, making consideration of both land uses important in future planning.

Habitat quality for both spring chinook salmon and steelhead has been rated as Poor throughout this PMU, and is primarily constrained by large stream size, high temperatures, and sedimentation. No direct ratings of habitat quality for other aquatic focal species are available within this PMU. Water quality concerns listed under §303(d) impact only the South Fork Clearwater River portion, which is listed for habitat alteration and temperature concerns.

PMU PR-2 has a variety of cover types, but is equally dominated by mixed mesic forests with western red cedar and mixed xeric forests with Douglas-fir. Other significant cover types include agriculture, shrubs, and ponderosa pine.

The terrestrial focal species Jessica's aster and the culturally important lomatium have been documented by the CDC to occur in this PMU. Jessica's aster is a perennial representative of prairie grasslands. All of the locations of Jessica's aster in this PMU are on private property. Threats to this species in this PMU consist of grazing, destruction of habitat, and competition with introduced species. Lomatium is a perennial found in open areas with little herbaceous cover in canyon grasslands. Many locations of lomatium are on private land. Lomatium is threatened by roadside disturbance, gravel pit/quarry work and weevil attacks. This PMU may contain high quality ponderosa pine habitats, prairie grassland remnants and wetland habitats in need of inventory, protection and/or restoration.

The only wildlife focal species documented by the CDC in this PMU is fisher. Fishers prefer complex structure with multiple canopies, understory shrubs and a large amount of

woody debris, and avoids open spaces. Threats to this species include clearcutting and habitat destruction which causes fragmentation.

Grazing potential is considered Low to Moderate, and potential impacts from mining activity are thought to be minimal. Both surface erosion and landslide hazards are generally classified as Very High in this PMU, making both sediment sources important considerations in future management.

Road densities are generally Moderate to High, with high densities associated with municipal road systems in populated areas (Orofino, Kamiah). Road densities within the PSSZ are High throughout the PMU, illustrating the prevalence of streamside roads and highways. Although a combination of relatively high inherent landslide potentials and road densities exists, the overall risk of road related landslides is thought to be relatively low due to the prevalence of well maintained rural and urban (not forest) roads.

Peak runoff is expected during May in this PMU, with low flows during September. Typical of mainstem rivers, flows are relatively stable through these reaches, with average September flows expected to represent between 19 and 27 percent of mean annual discharge. Allowable water use is widespread through HUCs within this PMU, but given the relative stream size, is thought to have minimal influence on aquatic biota. The highest allowable water use by HUC within this PMU is approximately 5,900 AFY (equating to approximately 8 cfs delivered throughout the year).

9.1.3 PMU PR-3

Primary Distinguishing Characteristic(s)

These thirteen HUCs comprise the headwaters of the Potlatch River (Figure 114) and contain the largest contiguous area of forested land cover in the Lower Clearwater AU. Ownership is highly mixed and include substantial percentages of Federal, State, corporate (Potlatch Corp.), and other private holdings.

General Description

Lands contained within this PMU have no protected status designations, and multiple disturbances substantially impact this PMU. Road densities are generally High, and densities within the PSSZ typically range from High to Very High. Grazing potential is High throughout much of the PMU, which is overlapped by numerous grazing allotments managed by the USFS. Additional (unquantified) grazing is known to occur on State and Potlatch Corp. lands, and is presumed to occur on other privately held properties as well. Although adequate records were not available to quantitatively describe impacts, timber harvest activity is known to have been substantial throughout much of this PMU.

Relatively high surface erosion and landslide hazards combine in the eastern half of this PMU to create substantial sediment production concerns. High to Very High surface erosion hazards are typical of lands contained within the entire PMU, which, combined with previously described impacts, may substantially impact aquatic ecosystems. Based on a lack of information available regarding road age and construction, it is not possible to assess the impacts of existing road networks to mass wasting. However, inherent landslide hazards are rated from Very Low to High, with Moderate to High rankings generally associated with the eastern half of the PMU where road densities are highest.

Habitat quality for wild steelhead trout (the only aquatic focal species known to utilize the area) has been rated as fair in the East Fork Potlatch River, and as poor throughout the remainder of this PMU. Sedimentation is the primary defined constraint to steelhead trout use.

Water quality concerns in this PMU listed under §303(d) include thermal modification, habitat alteration, sediment, flow, and pathogens. Modeling suggests that temperature conditions are generally suitable for use by A-run steelhead trout, although they may be marginal in some areas. Brook trout populations are widespread within the PMU, and have the potential to compete with juvenile steelhead trout. Hydrologic modeling suggests that relative discharge from this area (0.80-1.79 cfs/sq. mile of drainage area) is substantially higher than other tributary systems within the Lower Clearwater AU (0.20-0.80 cfs/sq. mile). Runoff is anticipated to be relatively flashy, with base flows expected to represent only 10-18 percent of the mean annual flow. Peak and low flows within this PMU can be expected during May and August, respectfully.

PMU PR-3 has a variety of cover types, but is dominated by forests. The forests of PR-3 include mixed mesic forests that include western red cedar, mixed xeric forests dominated by Douglas-fir, grand fir forests and western hemlock forests.

No terrestrial plant focal species observances have been documented by the CDC for PR-3. The only terrestrial animal focal species documented by the CDC in this PMU is the fisher. Fishers prefer complex structure with multiple canopies, understory shrubs and a large amount of woody debris, and avoids open spaces. Threats to fishers include clearcutting and habitat destruction which causes fragmentation.

9.1.4 PMU PR-4

Primary Distinguishing Characteristic(s)

This PMU is made up of seven HUCs (Figure 114) and is distinguished from other PMUs by potentially substantial impacts of water withdrawals. Withdrawals are associated primarily (not entirely) with the Lewiston Orchards Irrigation District, and may impact HUCs within this PMU either directly or indirectly.

General Description

Ownership throughout the PMU is dominated by private holdings although Tribal holdings are substantial in some HUCs (>25% of the land area). Lands contained within this PMU have no protected status designations, and land cover is predominantly agriculture/range but dominated by forest cover in the headwaters of Sweetwater and Webb creeks. Grazing potential ranges from Low to Moderate.

Surface erosion and landslide hazards throughout this PMU are typically Very High and Low, respectively. Road densities are Moderate, but range from Moderate to High in the PSSZ suggesting a prevalence of valley bottom roads. Existing roads are generally part of rural road networks (i.e. gravel or paved), with the only concentration of forest type roads found in the headwaters of Sweetwater and Webb creeks.

Waterways within this PMU are generally accessible and used by A-run steelhead trout although they are believed to be blocked from the headwaters of Sweetwater Creek and absent from Lindsay Creek. Habitat quality for steelhead trout has been rated as Fair throughout most of this PMU, and as Poor in the lower reaches of Lapwai Creek. Constraints to steelhead trout use within this area include high temperatures, dewatering, passage concerns, sedimentation, and channelization. Water quality concerns in the PMU listed under §303(d) include temperature, thermal modification, habitat alteration, sediment, flow, pathogens, bacteria, pesticides, and synthetic organics. Modeling for this assessment suggests that temperature conditions in this PMU are expected to regularly exceed established standards for use by steelhead trout, and may limit population success. The status of brook trout population(s) within this PMU is unknown.

Allowable water use within this PMU is substantial, ranging as high as 53,000 AFY (equivalent to approximately 73 cfs) within individual HUCs. Water use predominantly impacts surface water resources, and is typically consumptive in nature, with water either withdrawn from the system or stored for later withdrawal. As is discussed earlier in this document, water withdrawal is limited by existing canal structures, and does not generally exceed 40 cfs (See section 4.8). Some HUCs within this PMU experience only indirect influences of upstream water withdrawal(s).

9.1.5 PMU PR-5

Primary Distinguishing Characteristic(s)

This PMU consists of 27 HUCs (Figure 114) distinguishable from other areas in the subbasin by unique hydrologic conditions, including extremely flashy flows, and the earliest occurrence of peak flows (March) in the Clearwater subbasin.

General Description

Lands contained within this PMU have no protected status designations, and ownership is dominated by private holdings. Federal, State, and Tribal holdings within this PMU are limited, and individually comprise less than 25% of any individual HUC. With limited exception, HUCs contained within this PMU are dominated by agricultural/rangeland uses. Forest cover is dominant in only two HUCs in the head of the Lawyers Creek drainage, and subdominant (>25% of land area) in only 3 other HUCs within this PMU (Threemile, Butcher and Lawyers creeks).

Road densities are generally classified as Moderate, with near stream densities (within the PSSZ) ranging from Low to High. Inherent landslide hazards are considered Very Low throughout the majority of this PMU, and surface erosion hazards are High to Very High. Although grazing potential is Moderate near the mouths of Lawyers and Cottonwood creeks, it is considered Low throughout the majority of the PMU. Mining impacts due to mines or mining claims are negligible.

Although peak flows in this PMU are anticipated earlier than other portions of the subbasin (March), timing of low flows (August) is consistent with much of the Lower Clearwater AU. On average, baseflow (minimum monthly discharge) equates to less than 10 percent of the mean annual discharge throughout this PMU, illustrating the extremely flashy nature of runoff from this area. Relative discharge (0.2-0.6 cfs/sq. mi. of drainage area) of subwatersheds in this PMU is low relative to much of the subbasin, but similar to that from other agriculturally dominated areas in the Lower Clearwater AU.

Steelhead trout are absent from the upper portion of the Cottonwood Creek drainage, but present throughout the majority of other drainages in this PMU. Habitat condition for steelhead trout has been classified as Poor throughout the usable portions of Lawyers and Cottonwood creeks, and as Fair in Threemile and Butcher creeks. Primary constraints to steelhead use in this PMU have been defined as high temperatures and dewatering in Lawyers Creek, and passage impediments and sedimentation throughout the entire PMU. Modeling conducted for this assessment suggests that temperature conditions throughout the majority of this PMU are likely to exceed established standards for areas used by steelhead trout, and may therefore limit population success. Water quality concerns, which are widespread in this PMU and listed under §303(d), include thermal modification, habitat alteration, sediment, flow, and pathogens. Pesticides, oil/grease, and synthetic organics are listed under §303(d) as impacting select stream reaches within this PMU.

Terrestrial plant focal species documented by the CDC to occur within PR-5 are Palouse goldenweed and spatious monkeyflower. No wildlife focal species occurrences have been documented by the CDC in PR-5. Palouse goldenweed is a perennial forb representative of prairie grassland habitat. Threats to this species include grazing, herbicide drift, and diminishing habitat quality. Palouse goldenweed is extremely sensitive to disturbance. Spatious monkeyflower is an annual representative of riparian and wet meadow habitats. It is mostly found in microsites of open grasslands and forest openings with enhanced moisture and shade. Threats to spatious monkeyflower include livestock trampling and weedy invaders. This PMU may contain a variety of high quality wildlife habitats, including high quality ponderosa pine, prairie grassland remnants and wetland habitats, in need of inventory, protection and/or restoration.

9.1.6 PMU PR-6

Primary Distinguishing Characteristic(s)

HUCs delineated within this PMU are distinguishable from other areas of the subbasin by a combination of factors with the potential to impact aquatic and terrestrial resources in a cumulative manner. HUCs within this PMU have substantial amounts of agricultural/range lands (dominant or subdominant cover) coupled with Very High surface erosion hazard, Moderate to High landslide hazard, and Moderate to High road densities (both overall and within the PSSZ).

Species Specific Notes

Both A and B run steelhead trout are found within this PMU. B-run steelhead trout utilize portions of this PMU which lie within the Lolo/Middle Fork AU, whereas A-run steelhead trout utilize those portions within the Lower Clearwater AU. B-run steelhead trout within this PMU are influenced by hatchery practices.

Spring chinook salmon are known to utilize those portions of this PMU which lie within the Lolo/Middle Fork AU. Spawning and rearing is known to occur in both the Lolo and Clear creek drainages.

Bull trout are known to utilize those portions of this PMU which lie within the Lolo/Middle Fork AU. No information is available regarding the status of bull trout populations in these areas. However, areas within this PMU which contain bull trout populations are considered to be at the fringes of suitable habitat for the species, and it is unlikely that population levels are high.

Westslope cutthroat trout are known to utilize those portions of this PMU which lie within the Lolo/Middle Fork AU and essentially represent the western boundary of the species' distribution in the subbasin. Populations of westslope cutthroat trout are considered "depressed" where they exist within this PMU.

Brook trout are known to exist in each major drainage within this PMU, although specific information regarding population status is unknown. Although known to exist in the mainstem Potlatch River, no information is available regarding status or distribution throughout most tributaries in the drainage (and in this PMU).

General Description

This PMU consists of 14 HUCs which either lie within, or border along the Lower Clearwater AU (Figure 114). The HUCs within this PMU represent four separate clusters including areas in the lower Potlatch River drainage and Hatwai Creek, and areas near the mouths of Big/Little Canyon creeks, Lolo Creek, and the Middle Fork Clearwater River. Agricultural/range lands

predominate in this PMU, and form the dominant (>50%) and subdominant (>25%) cover in 11 and 3 HUCs, respectively. Ownership throughout these areas is dominated by private holdings, with limited state, Tribal, or Federal properties. Lands throughout this PMU typically do not have any protected status, with the exception of the Middle Fork Clearwater River (Wild and scenic river reach) and the lower reaches of Lolo Creek (area of critical environmental concern). Overall grazing impacts are generally defined as Moderate to Low throughout this PMU, but as is the case with most areas in the Lower Clearwater AU, impacts may be concentrated along steep canyons.

Surface erosion hazards are classified as Very High and inherent landslide potentials range from Moderate to High throughout this PMU, suggesting substantial potential for cumulative sediment impacts from land use and management activities. Overall road densities are Moderate throughout the majority of this PMU and High in HUCs along the Middle Fork Clearwater River and Clear Creek. Near stream road densities (within the PSSZ) range from Moderate to Very High throughout the PMU, and are highest near the mouth of the Middle Fork Clearwater River.

Hydrology throughout the PMU is generally typical of that in the Lower Clearwater AU, with peak runoff during April and lowest runoff generally occurring during August. Like much of the subbasin, flow stability is thought to be low, with the minimum mean monthly discharge representing 10-18 percent of the mean annual discharge. Flow stability may be slightly higher in the Middle Fork Clearwater River (19-27%) and slightly lower in the mainstem Potlatch River (0-9%). Direct water use from HUCs within this PMU is limited, generally representing an average withdrawal rate of less than 2 cfs with the exception of Clear Creek (up to 17,000 AFY; 23 cfs).

Basic modeling conducted during this assessment suggests that temperature conditions throughout this PMU are likely to be marginal, at best, for salmonid use and may limit success of all species. Habitat quality has been rated as Poor to Fair for anadromous species throughout this PMU, and has not been rated for resident species where they occur. Constraints to use by anadromous species include high temperatures, dewatering, and sedimentation. Steep gradient is thought to inhibit use of Lolo Creek by spring chinook salmon, but is not thought to inhibit use by steelhead trout. Concerns listed under §303(d) as potentially impacting beneficial uses throughout this PMU include sediment, thermal modification, habitat alteration, flow and pathogens. Oil and grease, synthetic organics, and pesticides potentially impact beneficial uses in more localized areas, particularly portions of the Potlatch River designated within this PMU.

Terrestrial plant focal and culturally important species documented by the CDC to occur in PR-6 include Palouse goldenweed, lomatium, and Jessica's aster. No terrestrial wildlife focus species occurrences are documented by the CDC in PR-6. Palouse goldenweed is a perennial forb representative of prairie grassland habitat. Threats to this species include grazing, herbicide drift, and diminishing habitat quality. Palouse goldenweed is extremely sensitive to disturbance. Lomatium is a perennial found in open areas with little herbaceous cover in canyon grasslands. Many locations of Lomatium are on private land in this PMU. Lomatium is threatened by roadside disturbance, gravel pit/quarry work and weevil attacks. Jessica's aster is a perennial representative of prairie grasslands. All of the locations of Jessica's aster in this PMU are on private property. Threats to this species in the PMU consist of grazing, destruction of habitat, and competition with introduced species.

9.1.7 PMUs PR-7 and PR-8

Primary Distinguishing Characteristic(s)

These two highly similar PMUs represent agriculturally dominated areas not delineated into other PMUs, and include substantial portions of the Camas Prairie and Potlatch River drainages (Figure 114). Although conditions within these two PMUs are nearly identical, two categories are defined to represent HUCs with >75% agricultural/range cover (PR-7) from those containing 25-50% forested cover (PR-8).

General Description

The 36 HUCs delineated into these PMUs are nearly all dominated by agricultural land cover, and are evenly subdivided to represent the amount of interspersed forest cover: those with only minor amounts (<25%) of forest cover are included in PR-7. Those HUCs with more substantial (25-50%) forest cover are included in PR-8.

Lands contained within these PMUs do not benefit from protected status designations, and ownership is predominantly (>75%) private throughout virtually all HUCs. Relatively small Tribal, State, and Federal holdings exist throughout these PMUs, with Tribal holdings being most substantial.

Surface erosion from agricultural and range lands is presumed to be the dominant source of sediment delivered to stream channels throughout these PMUs. Surface erosion hazards are considered Very High throughout the majority of HUCs in the PMUs. Grazing potential is considered Low, and likely concentrated on steep canyon walls near streams. Inherent landslide hazards are considered Very Low to Low, and associated road densities are typically Moderate (ranging from Low to Very High) throughout the HUCs (both overall and within the PSSZ).

Habitat conditions for steelhead trout are variable throughout these PMUs, having been rated from Poor to Good depending on location. Poor habitat condition is typical of portions of these PMUs contained within the Potlatch River, Little Canyon Creek, and Cottonwood Creek drainages. Fair habitat conditions are found in portions of Lapwai, Jacks, Bedrock, and Pine Creeks, and habitat conditions in much of Big Canyon Creek have been rated as Good for steelhead trout. Major constraints to steelhead trout use throughout these areas include high temperatures, dewatering, and sedimentation. Other concerns affecting limited areas within these PMUs include channelization (Lapwai Creek), streambank degradation (Cottonwood Creek), poor instream cover and lack of quality pools (Jacks, Bedrock, and Little Canyon creeks). Modeling for this assessment indicates that temperatures throughout these PMUs are potentially limiting to steelhead trout population(s).

Stream segments throughout these PMUs are listed for water quality concerns under §303(d). Common factors delineated as potentially limiting beneficial uses include sediment, thermal modification, habitat alteration, flow, pesticides, and pathogens.

Hydrologic regimes within these PMUs are consistent with those throughout much of the northwestern portions of the Clearwater subbasin. Peak flows are expected in April and lowest flows in August. Relative annual discharge ranges from 0.20 to 0.60 cfs/square mile of drainage area, which is consistent with other agriculturally dominated areas in the subbasin. Annual hydrographs are generally unstable, with minimum mean monthly discharge representing only 10-18 percent of mean annual discharge, which is relatively common throughout the subbasin. Allowable water use from these PMUs involves a mix of ground and surface water rights which are not thought to have substantial impacts to aquatic biota. Combined surface and groundwater uses generally equate to an average withdrawal rate of less than one cfs from any HUC.

Terrestrial plant focal species documented by the CDC to occur in PR-7 and PR-8 include Jessica’s aster and Palouse goldenweed. Jessica’s aster is a perennial representative of prairie grasslands. All of the locations of Jessica’s aster in this PMU are on private property. Threats to this species in the PMU consist of grazing, destruction of habitat, and competition with introduced species. Palouse goldenweed is a perennial forb representative of prairie grassland habitat. Threats to this species include grazing, herbicide drift, and diminishing habitat quality. Palouse goldenweed is extremely sensitive to disturbance. No terrestrial animal focal species occurrences have been documented by the CDC in PR-7 and PR-8.

9.2 PMUs Predominated by Mixed Ownership

A total of six PMUs have been delineated with the prefix “MX” to signify areas of highly mixed ownership including Federal, state, corporate, and other private holdings (Figure 115). Areas of highly mixed ownership exist throughout the majority of the Lower North Fork and Lolo/Middle Fork AUs, and in portions of the Upper North Fork and Lochsa AUs. Throughout much of this area, ownership is dominated by state and private corporation land holdings, with Federal and other private holdings being present, but of relatively limited importance. In limited instances where management issues overlap, PMUs delineated here may encompass small numbers of HUCs dominated by Federal (rather than mixed) ownership. This has been done to minimize redundancy in PMU descriptions where the same units have been defined across multiple ownership areas.

Future management options and issues within these mixed ownership areas are distinct in that diverse ownership and land use patterns will presumably result in different planning scenarios from those on other lands in the subbasin. Potlatch Corp. and Plum Creek Timber Company are the two corporations which maintain substantial land holdings in these areas of the Clearwater subbasin. Both corporations will be influential in defining future management strategies and options aimed at maintenance or restoration of aquatic and terrestrial resources in areas within and surrounding their operating areas.

Primary characteristics used to differentiate PMUs within mixed ownership areas include dominant and subdominant owners, natural and induced disturbance regimes, and relative importance of sediment sources.

Table 68 summarizes differences in primary characteristics between the six defined PMUs. Textual descriptions are provided below and include discussion of additional details regarding conditions within each PMU as they relate to focal species and habitat.

Table 68. Comparison of primary characteristics used to differentiate PMUs delineated throughout mixed ownership areas within the Clearwater subbasin. Characteristics in bold print are primary defining characteristics of each PMU

PMU	Ownership		Potential Disturbance			Primary Sediment source
	Dominant	Sub-Dom.	Road Density	Landslide Hazard	Surface Eros. Hazard	
MX-1	Mixed	Mixed	Mod.-V High	Mod.-V High	Mod.-V High	Landslide/Surface
MX-2	Potlatch	Mixed	Mod.-V High	Mod.-V High	Mod.-V High	Landslide/Surface
MX-3	Potlatch	State	High-V High	V Low-Low	Very Low	Limited
MX-4	State/Priv.	State/Priv.	High-V High	Low	High	Surface Erosion
MX-5	Federal	Plum Ck.	Low-V High	V Low-Low	V Low-High	Variable
MX-6	Federal	Plum Ck.	Mod.-V High	V Low-Mod.	Low-Mod.	Variable

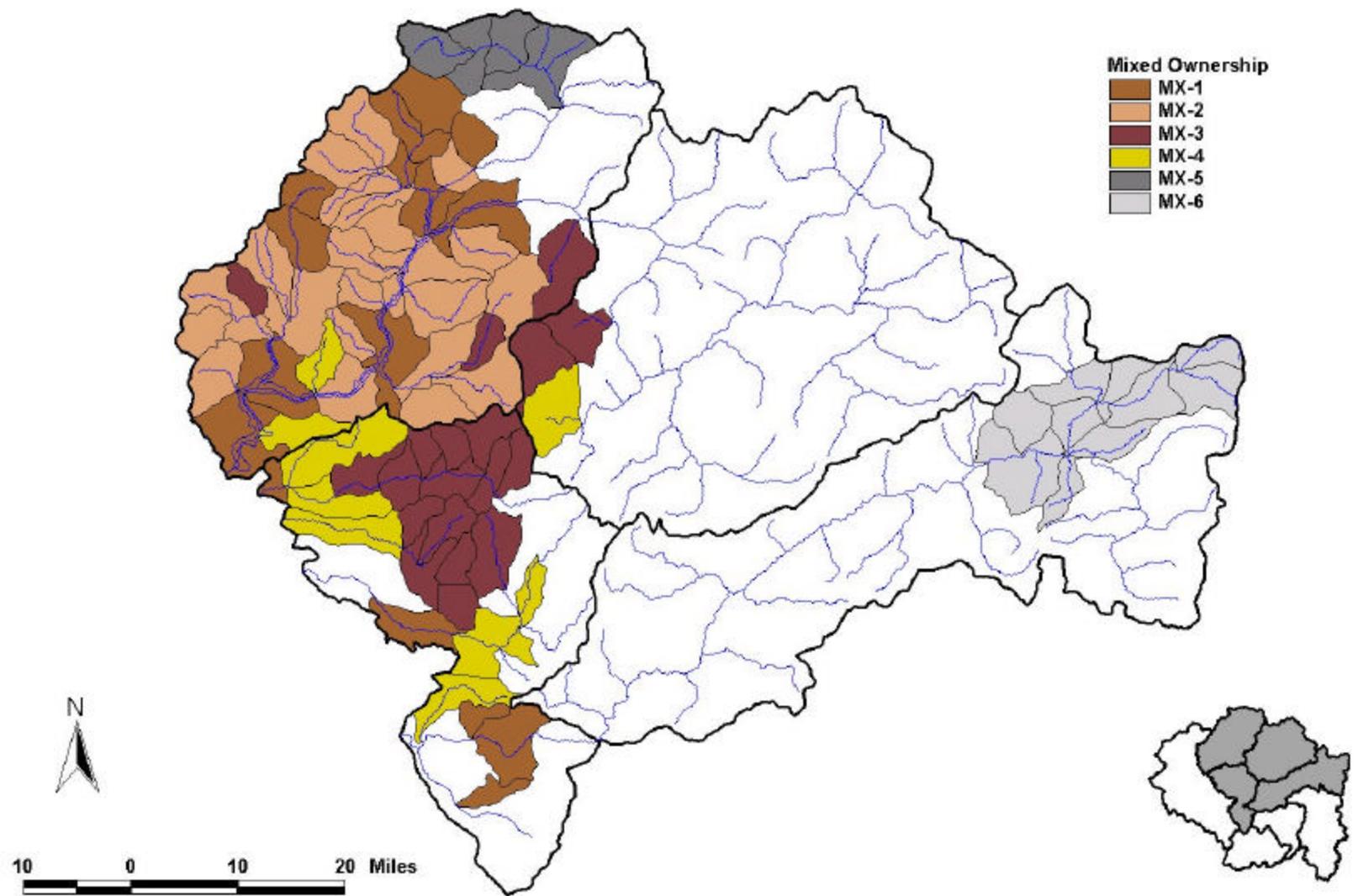


Figure 115. Potential Management Units (PMUs) delineated within areas of highly mixed ownership in the Clearwater subbasin

These PMUs are displayed separately to emphasize the substantial differences in management concerns in areas dominated by mixed ownership patterns relative to other areas of the subbasin. PMUs within this area were defined with the following distinctions in mind and, unless noted, these characteristics will apply to all PMUs defined in this area

1. Anadromous species are excluded from many of the mixed ownership areas within the Clearwater subbasin. Exceptions exist in portions of the Lochsa, Lolo/Middle Fork, and Lower Selway AUs
2. Based on current distribution, historical suggestions, landscape characteristics, and modeled temperature characteristics, much of the mixed ownership area represents, at best, marginal habitat for bull trout. Other aquatic focal species either are, or presumed to historically have been, relatively widely distributed throughout these areas, although no information is available regarding past population levels.
3. Properties owned by Plum Creek Timber Company are intermixed with Federally owned lands whereas those owned by Potlatch Corp. are intermixed primarily with state and privately owned property. This distinction will likely result in different planning strategies within the operating areas of each corporation, and PMUs have been delineated accordingly
4. Land cover throughout these PMUs is predominantly forested with little influence of agricultural and rangeland uses
5. Tribal land holdings within these PMUs is limited or nonexistent. The entire Clearwater subbasin is, however, within the Nez Perce Tribe Ceded Territory.

9.2.1 PMUs MX-1 and MX-2

Primary Distinguishing Characteristic(s)

These two PMUs are distinguishable from other areas of the subbasin by their combination of mixed ownership pattern, high road densities, high landslide hazard ratings, and often times, coincidentally high surface erosion hazards (Table 68). They are distinguishable from one another based on the prevalence of corporate ownership, which accounts for less than 25% of HUCs within MX-1, and is the dominant or subdominant (>25%) ownership in MX-2.

Species Specific Notes

B-run steelhead trout utilize all accessible HUCs within MX-1, with migration and overwintering use of mainstem rivers (Lochsa, Selway, Middle Fork Clearwater), and spawning and rearing use of associated tributary streams in these same drainages. Population status of steelhead trout is “depressed” throughout this PMU. MX-2 exists only in the North Fork Clearwater River drainage above Dworshak Dam, and is not accessible to steelhead trout.

Spring chinook salmon are blocked from areas defined within MX-2, and use in MX-1 is limited to migration through the mainstem Middle Fork Clearwater, Lochsa, and Selway rivers, and spawning and rearing in portions of Clear Creek, Pete King Creek, and lower O’Hara Creek.

Bull trout are found in only a few locations within these PMUs including O’Hara Creek, the headwaters of Clear Creek, portions of the Little North Fork Clearwater River system, and the North Fork Clearwater and tributaries upstream of Dworshak Reservoir. Although not clearly documented in distribution maps, bull trout are also presumed to utilize much of Dworshak Reservoir. No known “stronghold” populations of bull trout exist within these PMUs which, as mentioned earlier, are thought to exist near the outer limits of the bull trout’s natural range within the Clearwater subbasin.

With the exception of the headwaters of the Elk River system, westslope cutthroat trout are distributed throughout the areas defined by these two PMUs. However, few HUCs are defined as having strong populations of westslope cutthroat trout. HUCs in which strong population status is defined typically have a relatively high degree of protected status and are located in the North Fork Clearwater AUs and in Pete King and Canyon creeks in the Lochsa AU.

Little information exists regarding brook trout presence or status in portion of these PMUs in the Middle Fork Clearwater, lower Lochsa, and lower Selway river drainages although the species is known to exist in these areas. Within the North Fork AUs, brook trout are widely distributed throughout these two PMUs although population status is largely unknown. Strong populations of brook trout are known to occur in the Elk Creek, Beaver Creek, and Washington Creek drainages. Brook trout in the Elk Creek system are highly sought after by anglers and are managed differently than other brook trout populations by IDFG.

General Description

9.2.2 PMUs MX-1 and MX-2

Primary Distinguishing Characteristic(s)

These two PMUs are distinguishable from other areas of the subbasin by their combination of mixed ownership pattern, high road densities, high landslide hazard ratings, and often times, coincidentally high surface erosion hazards (Table 68). They are distinguishable from one another based on the prevalence of corporate ownership, which accounts for less than 25% of HUCs within MX-1, and is the dominant or subdominant (>25%) ownership in MX-2.

Species Specific Notes

B-run steelhead trout utilize the limited number of accessible HUCs within MX-1, with migration and overwintering use of the Middle Fork Clearwater, and spawning and rearing use of Lolo Creek. Where they exist, population status of steelhead trout is “depressed” throughout these PMUs. Spring chinook salmon use in MX-1 is limited to migration through the mainstem Middle Fork Clearwater River. MX-2 exists only in the North Fork Clearwater River drainage above Dworshak Dam, and is not accessible to anadromous species.

Bull trout in these PMUs are found only in portions of the Little North Fork Clearwater River system. Although not clearly documented in distribution maps, bull trout are also presumed to utilize much of Dworshak Reservoir. No known “stronghold” populations of bull trout exist within these PMUs which, as mentioned earlier, are thought to exist near the outer limits of the bull trout’s natural range within the Clearwater subbasin.

With the exception of the headwaters of the Elk River system, westslope cutthroat trout are distributed throughout the areas defined by these two PMUs. Status of westslope cutthroat trout populations within these PMUs is not well defined, and strong populations defined in only one HUC (headwaters of Floodwood Creek system).

Within the North Fork AUs, brook trout are widely distributed throughout these two PMUs although population status is largely unknown. Strong populations of brook trout are known to occur in the Elk Creek, Beaver Creek, and Washington Creek drainages. Brook trout in the Elk Creek system are highly sought after by anglers, and are managed differently than other brook trout populations by IDFG.

General Description

A total of 38 HUCs are incorporated into these two PMUs, with 16 delineated as MX-1, and 22 delineated as MX-2 (Figure 115). The two PMUs will be discussed simultaneously since

landscape conditions and impacts are similar between them. However, future planning should consider these two areas as distinct based on differences in management or restoration strategies likely to result from the differing influence of corporate ownership between them.

HUCs within these two PMUs encompass much of the lower North Fork Clearwater River drainage near Dworshak Reservoir, and spotty portions of Lolo Creek, and the Middle Fork Clearwater River and its tributaries. Brook trout are relatively widely distributed throughout both PMUs, and may compete with native species where they co-exist. Protected status of these areas is typically minimal, but ranges from 25-45% in 3 HUCs which have relatively high influence of Federal ownership (2 in upper Floodwood Creek, one on Middle Fork Clearwater River). Protected status is generally associated with designation of wild and scenic river reaches or inventoried roadless areas which border the mixed ownership areas.

Land cover throughout these PMUs is typically forest. Landslide hazards range from Moderate to Very High and although surface erosion hazards are variable throughout these areas, they are most commonly rated as High to Very High. Land use impacts, thought to be related primarily to forest management, are believed to be substantial throughout these PMUs as indexed by relative road densities. Both overall and near-stream (PSSZ) road densities range from Moderate to Very High, with Moderate densities typically associated with those HUCs which have partial protected status. Road densities in unprotected portions of those HUCs are similar to those throughout these PMUs (High to Very High).

Grazable lands are common surrounding the Middle Fork Clearwater River, and the USFS manages grazing allotments which impact portions of these PMUs in the Clear, Yakus, Long Meadow, and Elk creek drainages. Based on information available for this assessment, it is unclear to what degree grazing is allowed on state or corporately owned property within these PMUs.

Ecological hazards associated with mines is thought to be negligible throughout this Management Unit. However, mining claim densities are Moderate in the central Middle Fork Clearwater River. The current status and use of mining claims in these areas is unknown, but will need to be considered during future planning efforts.

Modeling conducted as part of the limiting factor analysis in this assessment suggests that temperature regimes throughout these PMUs are most conducive to use by westslope cutthroat trout and steelhead, with limited potential for chinook salmon or bull trout use. Constraints identified in NPPC databases for spring chinook and steelhead trout (in accessible areas) include sediment and steep gradients in potential spawning and rearing areas, and high temperatures in migration corridors. Streams within these PMUs are commonly listed on the §303(d) list for potential beneficial use restrictions due to sediment. Listed streams are most commonly located in the areas surrounding Dworshak Reservoir, and other common §303(d) concerns include habitat alteration and flow. Many of the streams within the Elk River drainage are listed for additional concerns including nutrients, thermal modification, and pathogens.

Hydrologic regimes in these PMUs is generally typical of much of the Clearwater subbasin, with peak flows occurring in April or May, and base flows in September. Hydrologic modeling conducted by Lipscomb (1998) suggests that annual hydrographs are typically more stable in areas surrounding Dworshak Reservoir than throughout the remainder of the subbasin, with baseflows equal to between 37 and 46 percent of the mean annual discharge.

With few exceptions, water use is not typically a substantial influence on aquatic biota within these PMUs as most HUCs have allowable water use equating to less than 1,200 AFY (1.5 cfs). Substantial water rights (1.1 million AFY; 1,522 cfs) exist at the head of the Middle Fork Clearwater River, but are designated for maintenance of instream flows and intended to benefit

local biota. Substantial water rights are maintained for the operation of both Dworshak and Elk River reservoirs.

9.2.3 PMU MX-3

Primary Distinguishing Characteristic(s)

Mixed ownership generally with either dominant or subdominant ownership by Potlatch Corp. The 19 HUCs contained within this PMU have High to Very High road densities on lands with both surface erosion and inherent landslide hazards which are Very Low to Low.

Species Specific Notes

Both steelhead trout and spring chinook salmon are known to utilize only one HUC (Jim Brown Creek) within this PMU where their population status is defined as depressed for both species. In contrast, brook trout are widely distributed and limited information on population status suggests that populations are strong throughout much of this PMU.

As was mentioned earlier, most of the mixed ownership area exists within the outer limits of the bull trout's natural range in the Clearwater subbasin. Bull trout are known to be present in only 2 HUCs in this PMU, and populations are not thought to be strong in either. Both HUCs containing bull trout are located above Dworshak Reservoir in the North Fork Clearwater River drainage.

Westslope cutthroat trout are widespread in this PMU, but presumed to be absent from the Jim Ford Creek watershed. Only one population stronghold is known to exist within the PMU, in Beaver Creek, a tributary to the upper most reaches of Dworshak Reservoir.

General Description

Lands within this PMU do not have any status designations resulting in their being classified as protected. Ownership is highly mixed throughout this PMU, and generally dominated by Potlatch Corp. although state and private holdings are substantial in some areas. Land cover is typically forested throughout this PMU, and land use activities revolve primarily around forest management. Road densities, both within the PSSZ and overall, are rated as High to Very High throughout these HUCs, illustrating the intensive management commonly realized in these areas. Ecological hazards associated with mining activity are generally minimal throughout this PMU, although Moderate hazards are noted in portions of Orofino Creek and in the Reeds Creek subwatershed.

Both surface erosion hazard and inherent landslide hazards are typically Very Low to Low in these areas, suggesting a potentially more limited impact from intensive management than is realized in surrounding PMUs (MX-1 and MX-2). However, it was not possible to define the relative impact of high road densities on mass wasting or surface erosion during this assessment.

Habitat quality has not been rated for any aquatic focal species within this PMU and the lack of known strong populations suggests that habitat quality may not be optimal for any focal species. Sediment is widely listed under §303(d) as potentially impacting beneficial uses throughout this PMU. Portions of Jim Ford and Lolo creeks are also listed for possible impairment due to thermal modification, habitat alteration, flow and pathogens. Temperature modeling suggests that conditions throughout this PMU are typically likely to be suitable or marginal for use by steelhead and westslope cutthroat trout, but may limit use by spring chinook salmon and bull trout.

Hydrologic regimes within this PMU are typical of surrounding areas within the Clearwater subbasin, with peak and low flows typically occurring during April and August/September, respectively. Relative discharge and flow stability within the PMU are also

generally consistent with that in the central portions of the subbasin. Allowable water use is widespread throughout this PMU, and is typically very low from individual HUCs (< 724 AFY or 1 cfs). However, the widespread nature of allowable water use, particularly throughout the Lolo/Middle Fork AU, has the potential to result in cumulative impacts from withdrawals in the Orofino, Jim Ford, and Lolo Creek drainages. A single HUC located in the upper reaches of Orofino Creek has water rights for a notable amount of water (11,200 AFY; 15.5 cfs), although it is unclear what the intended or actual use of this water is for.

The only terrestrial plant focal species documented by the CDC to occur in PMU MX-3 is Clearwater phlox. Clearwater phlox is a representative of wet meadows and riparian areas. It is associated with wet grasslands surrounded by forests. Threats to Clearwater phlox include destruction of habitat, grazing, disease, and infection of two different rusts.

Terrestrial animal focal species documented by the CDC to occur in MX-3 include fisher, wolverine and Coeur d' Alene salamander. Threats to the fisher include clearcutting and habitat destruction which causes fragmentation. The wolverine is a scavenger representative of montane coniferous forests. It is associated with subalpine basins with little overhead canopy cover. Threats to this species include habitat fragmentation and loss of ungulate wintering areas. Coeur d' Alene salamander feeds on benthic insects and is found under forest litter, bark and logs. It is associated with seepages, splash zones and streamsides near talus. Coeur d' Alene salamander is threatened by habitat fragmentation, water diversion and pollution, and fire.

9.2.4 PMU MX-4

Primary Distinguishing Characteristic(s)

Within the mixed ownership area, this PMU includes eight HUCs (Figure 115) distinguished by a relatively limited influence of Potlatch Corp. holdings, with state and private holdings generally dominating ownership. Land use impacts are high (road densities are High to Very High), surface erosion hazards are High, and inherent landslide hazards are Low.

Species Specific Notes

B-run steelhead trout utilize all accessible HUCs within this PMU for spawning and rearing purposes, with the possible exception of Maggie Creek which is known to be used by A-run steelhead trout. Population status of steelhead trout is "depressed" throughout this PMU, and all B-run populations within this PMU are influenced by hatchery production.

Spring chinook salmon are found in this PMU only in the Lolo Creek system. As is the case throughout the entire subbasin, spring chinook status is defined as "depressed" and populations are influenced by hatchery production.

Bull trout are known to be present in this PMU only in Lolo Creek, where the population is defined as depressed. As was previously mentioned, most of the mixed ownership area is thought to exist at the outer limits of the bull trout's natural range in the Clearwater subbasin.

Westslope cutthroat trout are widespread in this PMU, but presumed to be absent from the Jim Ford and Whiskey Creek watersheds. Where information regarding status is available, westslope cutthroat trout populations are considered "depressed" throughout this PMU.

Brook trout are widely distributed throughout this PMU although no information is available regarding their presence/absence in Maggie Creek (Lolo/Middle Fork AU) or Cranberry Creek (Lower North Fork AU). Brook trout populations are not thought to be strong in the central portions of the Lolo Creek drainage, and the status of populations elsewhere in this PMU is unknown.

General Description

The influence of protected status on lands throughout this PMU is minimal. State and private ownerships combine to play a more prominent role in this PMU than others in the mixed ownership area. The overall influence of ownership by Potlatch Corp. is greatly reduced in this PMU relative to others in the mixed ownership area.

Land cover is predominantly forested throughout this PMU, and land use activities revolve primarily around forest management. Road networks are composed primarily of natural surfaced forest roads, and road densities both overall and within the PSSZ are rated as High to Very High throughout these HUCs.

While inherent landslide hazards are considered Very Low to Low, surface erosion hazards are generally High suggesting that surface losses may have a more substantial impact to aquatic resources than mass wasting. However, the potential for increased mass wasting impacts related to land use patterns and related road networks throughout this PMU is not clear based on information available.

In the single HUC utilized by spring chinook salmon, habitat quality has been rated Poor to Good, generally increasing moving upstream through Lolo Creek. Habitat quality ratings for steelhead trout range from Poor (Orofino, Whiskey, and Jim Ford creeks) to Good (Lolo and Clear creeks). Habitat quality for other aquatic focal species has not been rated, however the lack of known strong populations suggests that habitat quality may not be optimal for other aquatic focal species.

Temperature modeling suggests that conditions are likely to be suitable or marginal for use by steelhead and westslope cutthroat trout throughout this PMU, and most likely exceed established temperature criteria for use by bull trout and chinook salmon. Sedimentation is a widely recognized factor limiting fish populations throughout this PMU, and sediment is the most widely listed factor under §303(d) as potentially impacting beneficial uses. Temperature, thermal modification, habitat alteration, flow, pathogens, oil and grease, and bacteria are listed as potentially impacting beneficial uses in all or portions of the Lolo, Jim Ford, and Orofino creek watersheds.

Hydrologic regimes in this PMU are typical of the central portions of the subbasin, with relatively low flow stability, peak flows expected in April or May, and low flows during August and September. Allowable water use is typically limited within individual HUCs in this PMU, but is widespread. Due to widespread water use, cumulative impacts of water withdrawals may present an important management concern in the Lolo, Jim Ford, and Orofino Creek watersheds.

The only terrestrial plant focal species documented by the CDC to occur in PMU MX-4 is Jessica's aster. Jessica's aster is a perennial representative of prairie grasslands. All of the locations of Jessica's aster in this PMU are on private property. Threats to this species in this PMU consist of grazing, destruction of habitat, and competition with introduced species.

The only terrestrial animal focal species documented by the CDC to occur in MX-4 is the fisher. The fisher prefers complex structure with multiple canopies, understory shrubs, and a large amount of woody debris. It avoids open spaces. Threats to this species include clearcutting and habitat destruction, which causes fragmentation. Since fishers avoid open spaces, fragmentation causes isolated populations.

9.2.5 PMU MX-5

Primary Distinguishing Characteristic(s)

Four HUCs encompassing the Plum Creek Timber Company operating area in the Lower North Fork AU. Land holdings form a “checker-board” pattern with Plum Creek Timber Company lands interspersed amongst predominantly Federal ownership. Delineation of this PMU is based on ownership maps presented by Hicks et al. (1999) and Sugden and Light (1997), which are thought to more accurately depict corporate ownership than information presented elsewhere in this assessment.

Species Specific Notes

Bull trout are present throughout this PMU with a strong population defined in 1 of 4 HUCs. The PMU is located in the Little North Fork Clearwater River drainage, which contains the only known strongholds for bull trout above Dworshak Dam (defined in a total of 4 HUCs).

Westslope cutthroat trout status and distribution in this PMU is similar to that of bull trout, with presence in all HUCs, and strongholds in 1 of 4 HUCs within the PMU. Although, westslope cutthroat trout populations throughout the North Fork Clearwater River drainage are predominantly defined as strong, the stronghold contained within this PMU is isolated from others in the drainage.

Brook trout are known to be widespread throughout this PMU although no information exists on their population status. Brook trout may compete with both westslope cutthroat trout and bull trout in this area.

General Description

Land cover throughout this PMU is forested, and ownership is predominantly Federal. Protected status of HUCs within this PMU is variable, ranging from 6 to 70 percent of individual HUCs, with the lowest degree of protection in the two central HUCs. Watershed protection is due to a variety of designations including wild and scenic river, wilderness study area, area of critical environmental concern, and inventoried roadless areas. Despite the substantial overlap of protected areas in this PMU, land use activities are thought to be substantial in nonprotected areas, as indexed by road densities. Overall road densities range from Moderate to High, and those within the PSSZ range from High to Very High in all HUCs.

Potential impacts from disturbance are variable throughout this PMU. Inherent landslide hazards are considered Very Low in all except the eastern most HUC (Moderate). Surface erosion hazards range from Very Low to High dependent on the HUC. Grazing is not known to occur within this PMU, and probable mining impacts are believed to be minimal in all except the eastern most HUC which contains a Moderate number of mining claims. The current status or use of claims in this HUC could not be determined.

No direct aquatic habitat quality ratings or information were available regarding this area. Based on elevation and canopy cover characteristics, it is thought that temperature conditions throughout this PMU are suitable for use by both bull trout and westslope cutthroat trout. Overall water and habitat quality is thought to be adequate, as no stream segments are listed as having impaired beneficial uses on the most recent §303(d) list. This area is thought to maintain a more stable hydrograph than most areas in the subbasin, which may be beneficial to use by spawning and rearing salmonids.

No terrestrial plant focal species are documented by the CDC to occur in MX-5. Wildlife focal species with documented sitings in this PMU include fisher and wolverine. Threats to the fisher include clearcutting and habitat destruction which causes fragmentation. Wolverine is

a scavenger representative of montane coniferous forests. It is associated with subalpine basins with little overhead canopy cover. Threats to this species include habitat fragmentation and loss of ungulate wintering areas.

9.2.6 PMU MX-6

Primary Distinguishing Characteristic(s)

Ten HUCs encompassing the Plum Creek Timber Company operating area in the headwaters of the Lochsa AU. Land holdings form a “checker-board” pattern with Plum Creek Timber Company lands interspersed amongst the predominantly Federal ownership.

Species Specific Notes

B-run steelhead trout utilize all accessible HUCs within this PMU for spawning and rearing purposes. Population status of steelhead trout is “depressed” throughout this PMU, and populations within this area are not influenced by hatchery production.

This PMU makes up nearly one half of the current chinook salmon spawning and rearing areas within the Lochsa AU. Spring chinook salmon are found throughout the majority of this PMU, with migration and overwintering use in the mainstem Lochsa River, and spawning and rearing use throughout the tributary habitats.

Although found throughout this PMU, bull trout populations are depressed, as is the case throughout the upper Lochsa AU. This PMU lies adjacent to the only known bull trout stronghold in the Lochsa AU, which is defined in the Fishing Creek drainage.

Westslope cutthroat trout populations are considered strong throughout the majority of the Lochsa AU including this entire PMU. No information is available regarding the distribution or status of brook trout in this PMU.

General Description

Land cover throughout this PMU is forested, and ownership is predominantly Federal although holdings by Plum Creek Timber Company typically comprise at least 25 percent of each HUC. Protected status of HUCs within this PMU is variable, ranging from 0 to 74 percent, with the greatest degree of protection afforded in the two southwestern most HUCs which are substantially overlapped by inventoried roadless areas. Despite the substantial overlap of protected areas with this PMU, land use activities are thought to be substantial in nonprotected areas. Overall road densities range from Moderate to High, and those within the PSSZ generally range from High to Very High.

Grazing is not known to occur, and mining impacts are believed to be minimal throughout this PMU. Inherent landslide hazards are considered Very Low or Low, and surface erosion hazards range from Low to Moderate. The relationship between relatively high existing road densities and sedimentation hazard ratings is unclear, but should be considered during future planning.

Habitat quality for steelhead trout in this PMU has been rated as Good to Excellent, whereas that for spring chinook salmon is more variable, ranging from Poor to Excellent. No direct habitat ratings for nonanadromous salmonid species are available. Based on elevation and canopy cover characteristics, temperature conditions throughout this PMU should be suitable for use by all aquatic focal species. The only stream segment listed as having impaired beneficial uses on the most recent §303(d) list is the mainstem Lochsa River, listed as impaired by high temperatures.

Local hydrology differs from much of the Clearwater subbasin, but is typical of the high elevation mountainous regions in the Lochsa and Selway drainages. Peak and low flows are expected in June and October, respectively. Annual hydrographs are relatively stable, with minimum mean monthly flows expected to represent between 28 and 36 percent of mean annual discharge. Only limited water use is allowed from the mainstem Lochsa River and, if maximized, would equate to an average withdrawal rate of less than 1 cfs over the course of a year.

No terrestrial plant focal species documented by the CDC occur in MX-6. Terrestrial animal focal species known to be found in this PMU include fisher and wolverine. Threats to the fisher include clearcutting and habitat destruction, which causes fragmentation. The wolverine is a scavenger representative of montane coniferous forests. It is associated with subalpine basins with little overhead canopy cover. Threats to this species include habitat fragmentation and loss of ungulate wintering areas.

9.3 PMUs Predominated by Federal Ownership

A total of eight PMUs have been delineated in predominantly Federally owned and managed areas of the Clearwater subbasin (Figure 116) which includes the majority of the Upper North Fork and Lochsa AUs, and all of the South Fork and Upper and Lower Selway AUs. PMUs delineated within these areas are defined with the prefix "FD." Primary characteristics used to differentiate PMUs within this area include natural and induced disturbance regimes and the type and relative degree of protection afforded to land area within each PMU.

Table 69 summarizes differences in primary characteristics between the eight defined PMUs. Textual descriptions are provided below, and include discussion of additional details regarding conditions within each PMU as they relate to focal species and habitat.

Future management options and issues within these areas are distinct from those in other areas of the Clearwater subbasin because less diverse ownership and land use patterns coupled with multiple use management will presumably result in different management scenarios from those on other lands in the subbasin. PMUs within this area were defined with the following distinctions in mind and, unless noted, these characteristics will apply to all PMUs defined in federally owned and managed areas.

1. Land cover throughout these PMUs is generally forested with some areas of mountainous rangelands interspersed, and lands are managed primarily by the USFS in conjunction with cooperating entities (State of Idaho, Nez Perce Tribe).
2. Lands managed by the USFS are typically managed for multiple use, and may therefore require more diverse planning strategies than those managed primarily for forestry (mixed ownership areas) or agriculture (Lower Clearwater AU).
3. Large tracts of land within this area are designated as wilderness or inventoried roadless areas, and have therefore been subject to minimal anthropogenic impacts with the exception of long-term fire suppression.
4. Areas dominated by federal ownership/management typically maintain the highest quality habitat in the Clearwater subbasin for all aquatic focal species. This is influenced by a combination of natural landscape characteristics and past land management patterns within these areas.
5. The entire Clearwater subbasin, including all Federally owned lands, lie within the Nez Perce Tribe Ceded Territory.

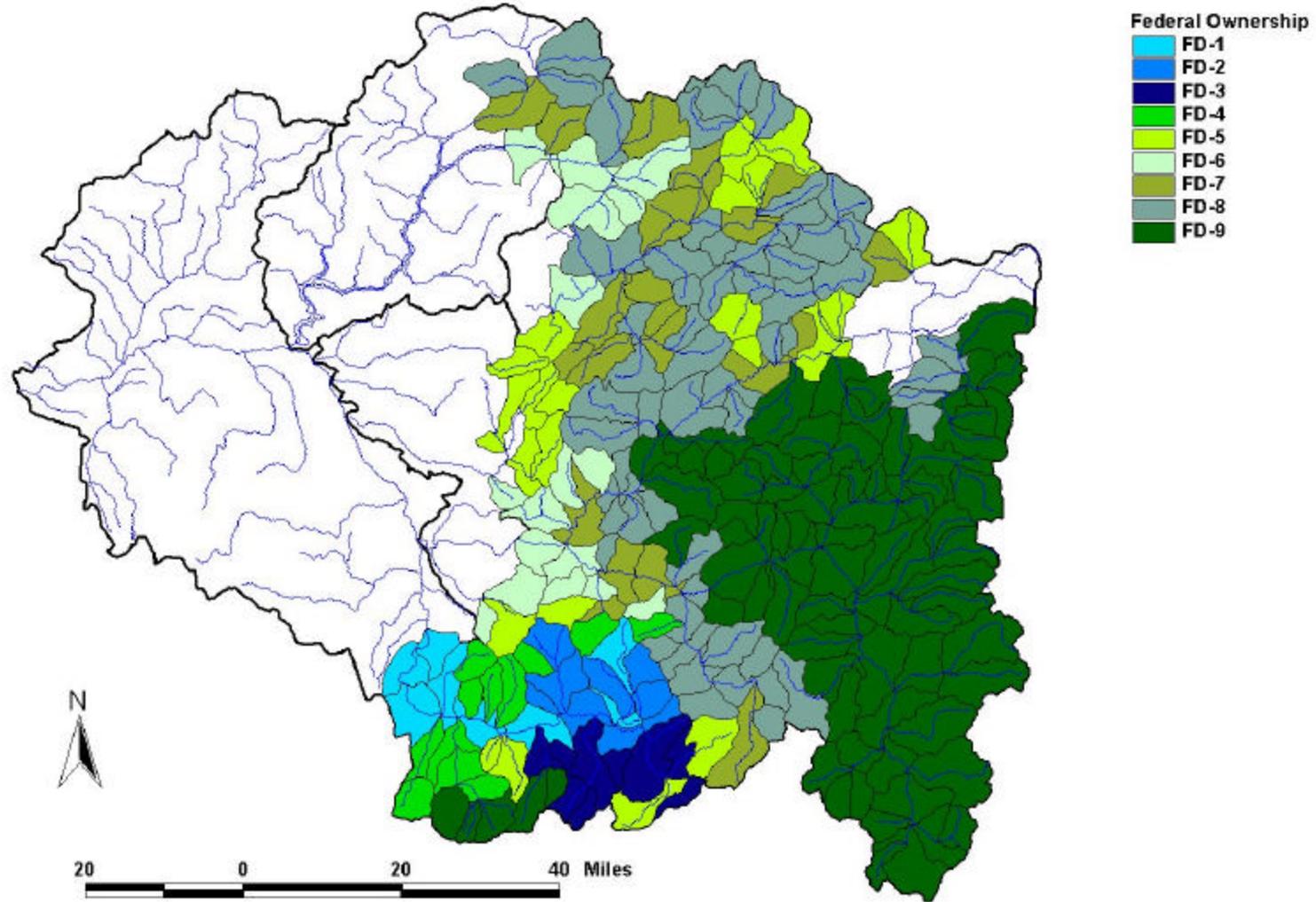


Figure 116. Potential Management Units (PMUs) delineated within areas of predominantly Federal ownership in the Clearwater subbasin

Table 69. Comparison of primary characteristics (or combinations) used to differentiate PMUs throughout Federally owned lands within the Clearwater subbasin. Characteristics in bold are primary defining characteristics of each PMU

PMU	Potential Disturbance			Natural Hazards		Protection
	Mining	Grazing	Road Density	Landslides	Surface Erosion	Type and Degree
FD-1	Mod.-V High	Mod.-High	Mod.-V High	Low	Mod.-High	Minimal
FD-2	Mod.-V High	High	Mod.-V High	Very Low	Very Low	Minimal
FD-3	Mod.-V High	Minimal	Low-V High	Very Low	Very Low	Minimal
FD-4	Minimal	High	Mod.-High	V Low-Low	Very Low	Variable
FD-5	Minimal	Minimal	Mod.-High	V Low-Low	Variable	Variable
FD-6	Minimal	Minimal	Mod.-V High	Mod.-V High	Variable	Variable
FD-7	Minimal	N/A	Low-Mod.	Low-V High	Low-Mod.	Inv. Roadless; >75%
FD-8	Minimal	N/A	Minimal	V Low-Mod	V Low-Mod.	Inv. Roadless; >90%
FD-9	Minimal	N/A	Minimal	V Low-Low	V Low-Mod.	Wilderness; >95%

9.3.1 PMUs FD-1 and FD-2

Primary Distinguishing Characteristic(s)

These PMUs are highly similar and differentiated only by differences in surface erosion hazard ratings (Table 69), and will therefore be discussed simultaneously. Both PMUs are found exclusively within the South Fork Clearwater River drainage (Figure 116), and are highly impacted by multiple land use activities including mining, grazing, and roading. Mass wasting hazards are considered Low throughout both units, and surface erosion is likely to be more substantial in FD-1 (Moderate-High hazard) than in FD-2 (Very Low hazard).

Species Specific Notes

B-run steelhead trout utilize the mainstem South Fork Clearwater River below Mill Creek for migration and overwintering purposes. All other HUCs within these PMUs are believed to provide spawning and early rearing habitats. Steelhead trout population status is defined as depressed throughout these PMUs, and populations within this area are commonly influenced by hatchery releases.

Mainstem habitats in the South Fork Clearwater River below Leggett Creek are believed to provide primarily migration and overwintering habitat for spring chinook salmon. Within these PMUs, tributary habitats throughout the South Fork Clearwater drainage provide spawning and early rearing habitats. Spring chinook salmon are found throughout the majority of these PMUs and population status is considered depressed (as is the case throughout the entire Clearwater subbasin).

Although found in all HUCs contained within these PMUs, bull trout populations are considered depressed throughout. Portions of PMU FD-2 border a known bull trout stronghold defined in the Newsome Creek watershed, which may have implications for future planning. Mainstem habitats in the South Fork Clearwater River and near the mouths of the American and

Red rivers are used by bull trout primarily for overwintering and migration. Habitats throughout the remainder of these PMUs are used for spawning and rearing by bull trout.

Fluvial bull trout populations are considered to be substantially depressed (more so than resident populations) throughout the South Fork Clearwater drainage. Fluvial populations are thought to have been most substantially impacted by sedimentation and associated losses of mainstem overwintering habitats (Paradis et al. 1999b).

Westslope cutthroat trout populations are present throughout these PMUs, but considered depressed. The South Fork Clearwater River below Mill Creek is used by westslope cutthroat trout primarily for overwintering and migration. Habitats throughout the remainder of these PMUs are used for spawning and rearing.

Similarly to bull trout, fluvial westslope cutthroat trout populations are considered to be substantially depressed throughout the South Fork Clearwater drainage, and most substantially impacted by sedimentation resulting in loss of mainstem overwintering habitats (Paradis et al. 1999b).

Introduced brook trout populations exist throughout these two PMUs, and may negatively impact native salmonid populations through direct or indirect competition. Although generally widely distributed, brook trout populations are not currently believed to be particularly strong or well established within these PMUs.

General Description

Protected status of lands within these PMUs is minimal, and the influence of various land uses is substantial. Road densities (overall and within the PSSZ) and mining influences both range from Moderate to Very High throughout HUCs within these PMUs. Potential mining impacts in these areas are typically rated as Moderate to High for both mines and mining claims although the degree to which these ratings are dependent upon one another is unclear based on available data (See section 4.10.9 for discussion of potential differences between mines and mining claims). Grazing potential is also substantial throughout these PMUs, ranging from Moderate to High due to the overlapping of HUCs with grazing allotments managed by the USFS.

Relative surface erosion hazards differ between these two PMUs, and are the primary characteristic for distinguishing them. Surface erosion hazards are rated Moderate to High within FD-1, and as Very Low throughout FD-2. Typical of areas throughout the South Fork Clearwater AU, landslide hazards are generally characterized as Low (FD-1) or Very Low (FD-2) within these PMUs. These characteristics suggest that, with regard to sediment production, FD-1 is more likely to experience impacts related to land use activities than are areas within FD-2, and that those impacts are (in general) more likely to be due to surface erosion than mass wasting events. In general, FD-2 is anticipated to be less likely to realize substantial sediment production due to land use activities.

No direct habitat ratings for nonanadromous salmonid species are available, although detailed description of conditions is available in Paradis et al. (1999b). Habitat quality ratings for steelhead trout in these PMUs range from Poor to Excellent. In general, the best and worst habitat conditions for steelhead trout in these PMUs is thought to occur in the Newsome Creek watershed (Good-Excellent) and mainstem South Fork Clearwater River (Poor-Fair). Spring chinook salmon habitat quality ratings range from Poor to Good, and follow a similar pattern to that for steelhead trout, with the worst habitat conditions in the mainstem South Fork Clearwater River. Good habitat for spring chinook salmon is defined in various reaches throughout the Newsome Creek and American River watersheds.

Sedimentation is the most commonly defined factor impacting use of streams within these PMUs by anadromous species, and the same is presumably true for nonanadromous species. Poor instream cover may constrain fish success in much of the American River watershed, and use of the mainstem South Fork Clearwater River is thought to be constrained by stream size and potentially high temperatures in its lower reaches. Basic modeling suggests that high temperatures may limit use by some species (particularly spring chinook salmon and bull trout) in the lower mainstem reaches (below Silver Creek). Temperatures in the upper mainstem (above Silver Creek) and in tributary habitats throughout these PMUs are thought to be suitable for use by all aquatic focal species throughout the year.

Impairment of beneficial uses (§303(d) listings) within these PMUs are most common in FD-1 (particularly the mainstem reaches of the South Fork Clearwater River) and are related to impacts of sedimentation, high temperature, and habitat alteration. Within FD-2, the only stream segments listed as potentially impaired under §303(d) are within the Newsome Creek watershed, and are listed for sediment impacts.

Hydrology within these PMUs is similar to that within much of the Clearwater subbasin. Peak and low flows are expected in May and September, respectively, and annual hydrographs are moderately stable, with minimum mean monthly flows expected to represent between 19 and 27 percent of mean annual discharge. Water use within these PMUs is most substantial from subwatersheds associated with Leggett Creek, Elk Creek, and the lower American River, although the relative impact that water withdrawals have on aquatic biota are unknown. Allowable water use from each of these areas is approximately 3,000 AFY (approximately 4.0 cfs). Allowable water use from other subwatersheds within these PMUs is thought to have a negligible overall impact to aquatic resources, as it does not typically exceed 235 AFY (0.35 cfs) from tributary systems, or 1,000 AFY (1.25 cfs) from mainstem reaches.

The land cover of both FD-1 and FD-2 is predominantly forested. There is a mixture in both of mixed mesic and mixed xeric forests, along with ponderosa pine, lodgepole pine, grand fir, Douglas-fir and western red cedar.

No CDC documentation of terrestrial plant focal species occur in FD-1 or FD-2. Two terrestrial animal focal species have been documented by the CDC in FD-1: the fisher and wolverine. Threats to fisher include clearcutting and habitat destruction, which causes habitat fragmentation. Threats to wolverine include habitat fragmentation and loss of ungulate wintering areas. Only one terrestrial animal focal species has been documented by the CDC to occur in FD-2, the fisher

9.3.2 PMU FD-3

Primary Distinguishing Characteristic(s)

This PMU includes 9 HUCs (Figure 116) differentiated from others in federally dominated ownership areas based primarily on the relative influence of mining activity as a potential disturbance regime (Table 69). Potential impacts from mining activity are Moderate to High throughout this PMU, whereas those from other potential disturbances are generally low or variable. Road densities are variable throughout the PMU and grazing potential is minimal. Based on relative landslide and surface erosion hazards, impacts of natural disturbance processes are thought to be Very Low throughout this PMU.

Species Specific Notes

B-run steelhead trout utilize all HUCs within this PMU for spawning and early rearing. Steelhead trout population(s) are depressed throughout this PMU, and populations within this area are commonly influenced by hatchery releases.

Spring chinook salmon and populations within this area are commonly influenced by hatchery practices or outplants of excess hatchery adults. Spring chinook utilize all HUCs within this PMU for spawning and early rearing with the exception of Trapper Creek (upper Red River) from which they are absent. As is the case throughout the entire Clearwater subbasin, status of spring chinook salmon population(s) are depressed throughout this PMU.

Bull trout are known to be present in all HUCs within this PMU for which information is available. The status of populations is generally depressed, although a stronghold exists in this PMU in upper Crooked River. In addition, a bull trout stronghold is defined in upper Tenmile Creek which, although not included, lies immediately upstream of this PMU. Bull trout populations in this PMU are likely dominated by resident life histories, as fluvial bull trout populations are considered to be substantially depressed throughout the South Fork Clearwater drainage due to sedimentation and associated losses of mainstem overwintering habitats (Paradis et al. 1999b).

Westslope cutthroat trout populations are present throughout this PMU with strongholds located in Tenmile Creek and upper Crooked River. All areas in this PMU are used by westslope cutthroat trout for spawning and rearing. Similarly to bull trout, fluvial westslope cutthroat trout populations are considered substantially depressed throughout the South Fork Clearwater drainage (Paradis et al. 1999b), and populations within this PMU are likely dominated by resident life history strategies.

Brook trout populations are known or suspected to be present in all subwatersheds in this PMU. Brook trout may negatively impact native salmonid populations through direct or indirect competition, although the degree to which this occurs in this PMU is not known. Even though widespread, brook trout populations are not thought to be strong within this PMU.

General Description

Protected status of lands within this PMU is minimal, and the primary induced disturbance is mining activity (current and/or historic). Mining influences related to both the overall number of mining claims and the ecological hazards of individual mines ranges from Moderate to Very High throughout this PMU. Grazing is not known to occur and road densities are variable throughout this PMU. Road densities (overall and within the PSSZ) are Low in subwatersheds associated with Tenmile Creek and the east and west forks of Crooked River. Overall road densities in other HUCs within this PMU are typically Moderate to High, and those within the PSSZ are generally High, illustrating the prevalence of roads near stream channels in some areas.

Both surface erosion hazards and inherent landslide hazards are rated as Very Low throughout this PMU, suggesting that in the absence of induced disturbance, sedimentation impacts would likely be minimal in these areas. Based on available information, it is not clear the degree the natural sediment regimes have been directly or cumulatively altered by land use activities in this PMU.

No ratings of nonanadromous salmonid habitat quality are available, although condition descriptions pertaining to this area are available in Paradis et al. (1999b). Habitat quality ratings for steelhead trout in this PMU range from Fair to Excellent, with the majority being rated as Good. Excellent steelhead habitat exists in all major drainages within this PMU (Red and Crooked River, and Tenmile Creek) but is most prevalent in Tenmile Creek and those

tributaries to Crooked River which have not been heavily impacted by mining activity. Habitat quality for spring chinook salmon is generally rated as Fair to Good, with no discernable spatial pattern in the distribution of habitat quality.

Constraints to fish populations vary spatially throughout this PMU. Sedimentation is thought to be the most widespread constraint to aquatic species, and is cited throughout most of the Red River watershed in the NPPC database. However, sediment impacts are not typically listed as impairing beneficial uses under §303(d) listings within this PMU (the single exception being Dawson Creek in the Red River drainage). Steep channel gradients have been identified as impacting use by spring chinook salmon in portions of the Red River, Crooked River, and Tenmile Creek watersheds. Gradient impacts to steelhead trout are less widespread, and only noted within this PMU in portions of the Red River watershed. Channelization and resultant loss of instream cover/habitat due to past dredge mining activities combine to impact the use of the mainstem Crooked River by all aquatic focal species. Temperature was not cited as a limiting factor to fish populations within this PMU, and modeling suggests that temperatures throughout the PMU should be suitable for use by all aquatic focal species given current canopy cover conditions.

Hydrology within this PMU is typical of much of the South Fork Clearwater River drainage, with peak flows expected during May, low flows during September, and moderately stable annual hydrographs relative to other areas in the Clearwater subbasin (minimum mean monthly flows are 19 to 27 percent of mean annual discharge). Allowable water use within this PMU is most substantial in the central Red River subwatershed (approximately 4,000 AFY; 5.5 cfs) and, when combined with that in the upper Red River subwatersheds (approximately 1,600 AFY; 2.25 cfs), may have the potential to negatively influence aquatic ecosystems in the Red River system. Allowable water use from the Crooked River drainage is relatively substantial for areas within the Clearwater subbasin (approximately 3,000 AFY; 4.0 cfs), and may also have the potential to impact aquatic system function. However, the degree to which water is actually being utilized within this PMU (rather than allowable use), and the relative capacity of these systems to accommodate water uses is not known. Impacts to biota related to water use are therefore speculative, and presented only for consideration in future planning efforts.

The land is predominantly covered by forests in this PMU. Mixed mesic and mixed xeric forests make up a large percent of the land, along with subalpine fir forests, lodgepole pine and grand fir.

There are no CDC documented occurrences of terrestrial plant focal species in FD-3. Terrestrial animal focal species documented by the CDC to occur in this PMU include fisher, wolverine, flammulated owl and black-backed woodpecker. Threats to fisher include clearcutting and habitat destruction, which causes habitat fragmentation. Since fisher avoids open spaces, fragmentation causes isolated populations. Wolverine is a scavenger representative of montane coniferous forests. It is associated with subalpine basins with little overhead canopy cover. Threats to this species include habitat fragmentation and loss of ungulate wintering areas. Flammulated owl is an obligate cavity nester, strongly associated with mid-elevation old growth ponderosa pine forests. Flammulated owl is threatened by the loss of late successional forests, and of secondary roads. Black-backed woodpecker is a cavity nester found in a variety of habitats such as old subalpine fir stands, montane forests and riparian woodlands. Its preferred habitat is old growth lodgepole pine or a recently burned forest with standing dead trees. Threats to the species include anything that reduces the number of snags, including the removal of snags for firewood, salvage logging and fire suppression.

9.3.3 PMU FD-4 and FD-5

Primary Distinguishing Characteristic(s)

These PMUs are highly similar and differentiated from each other only by differences in potential grazing impacts. They therefore will be discussed simultaneously. Both PMUs are distinguished from other areas of the subbasin by the combination of their predominantly federal ownership with minimal protected status, low potential for natural disturbance impacts (inherent landslide or surface erosion hazards), and minimal mining impacts. Areas defined as FD-4 (12 HUCs) are overlapped by USFS grazing allotments and therefore subject to High grazing potential; those defined as FD-5 (22 HUCs) have minimal influence of grazing (Table 69).

Species Specific Notes

B-run steelhead trout utilize all accessible HUCs within this PMU for spawning and rearing purposes (blocked areas exist in the North Fork Clearwater River drainage, Orofino Creek, and Wing-Twenty Creek). Population status of steelhead trout is depressed throughout the PMUs.

Spring chinook salmon and populations within this area are commonly influenced by hatchery practices or out plants of excess hatchery adults. Spring chinook are known to utilize the majority of accessible areas within these PMUs, with exceptions noted in the Lochsa AU. In the Lochsa AU, the Fishing Creek drainage is the only HUC used by spring chinook salmon for spawning and rearing purposes. Elsewhere in the subbasin, HUCs within this PMU are generally used for spawning and rearing by spring chinook salmon except where exclusions exist (North Fork Clearwater River drainage, Orofino Creek, and Wing-Twenty Creek).

Bull trout occur in the majority of HUCs in these PMUs, but are sporadically absent from some for unknown reasons. Where present, bull trout use the HUCs within these PMUs for spawning and rearing purposes. The most notable absence is from the cluster of headwater tributaries in the Lolo Creek drainage.

Population levels are typically depressed although strongholds do exist within each of these PMUs. A single bull trout stronghold is defined within FD-4, located in the Baldy Creek subwatershed (Newsome Creek watershed) and is one of four defined strongholds within the South Fork AU, and the only one not within a wilderness area boundary. The Fishing Creek subwatershed is the only defined stronghold within the Lochsa AU, and is included in FD-5.

Westslope cutthroat trout populations are present throughout these PMUs and spawning and rearing is known to occur in all areas. Within FD-4, population(s) are considered strong throughout the Johns Creek watershed and in the headwaters of Mill Creek and Meadow Creek, and depressed elsewhere. Within FD-5, population(s) are considered strong in all HUCs (except Osier Creek) within the Upper North Fork and Lochsa AUs, and depressed throughout the Lolo/Middle Fork and South Fork AUs.

Limited information exists regarding the presence or status of introduced brook trout populations throughout these PMUs. Brook trout are presumed absent from the Kelly Creek drainage but present elsewhere in the Upper North Fork AU. No information is available regarding brook trout populations in the upper Lochsa AU. Where information exists in the Lolo/Middle Fork and South Fork AUs, brook trout are typically widespread with variable population strengths.

General Description

HUCs contained within FD-4 are located in, or border on, the South Fork AU (Figure 116). Those defined within FD-5 are more widespread, typically forming small clusters of HUCs

within the Upper North Fork, Lochsa, Lolo/Middle Fork, Lower Selway, and South Fork AUs. Both PMUs typically share borders with wilderness or roadless areas, resulting in a variable degree of protected status where HUCs overlap with the protected areas. Individual HUCs within these PMUs have protected status designations applied to between 0 and 72 percent of their land area.

Induced disturbance impacts within these PMUs are related primarily to roads and, in FD-4, grazing. Mining impacts from mines or claims are thought to be minimal, which is an important distinction separating these PMUs from others defined within the South Fork AU. Overall road densities within both PMUs generally range from Moderate to High, with densities in the PSSZ ranging from Moderate to Very High. The primary exceptions to this are in the central portions of Johns Creek (Low densities overall and within the PSSZ) and in Horse Creek (Lower Selway AU; Low density in PSSZ). Potential for impacts due to grazing in FD-4 is considered high due to substantial overlap of HUCs by grazing allotments managed by the USFS.

Inherent landslide hazards throughout these two PMUs are generally considered Very Low or Low suggesting that natural landslides are not likely to substantially impact aquatic resources. Surface erosion hazard ratings are generally Very Low in FD-4, and variable (Very Low-High) throughout FD-5. Within FD-5, surface erosion hazards are highest within the Lolo Creek and Clear Creek watersheds. Based on available information, it is unclear to what degree the natural sediment regimes have been directly or cumulatively altered by land use activities (e.g. high road densities) in these PMUs.

No ratings of nonanadromous salmonid habitat quality are available for areas encompassed by these PMUs. Habitat quality for steelhead trout in these PMUs has been rated from Fair (Eldorado Creek) to Excellent, with the majority being rated as Good to Excellent. Habitat quality for spring chinook salmon is rated as Fair throughout the majority of these PMUs, with Good habitat identified in Eldorado Creek and portions of Lolo Creek.

Sedimentation and, in some areas, steep channel gradients are the principal constraints to fish populations identified throughout these PMUs. Sedimentation has been identified as an issue throughout the Lolo Creek watershed (including all tributaries), and in Mill and Meadow creeks in the South Fork AU. However, sediment impacts are not listed as impairing beneficial uses under §303(d) listings within these PMUs (the single exception being Cougar Creek in the South Fork Clearwater River drainage). Steep channel gradients have been identified as potentially limiting fish use in some reaches within the Lolo, Clear, and Johns creek drainages.

Temperature was not cited as a limiting factor to fish populations within these PMUs, and modeling suggests that temperatures throughout should typically be suitable for use by all aquatic focal species given current canopy cover conditions. In portions of the Lolo Creek drainage however, temperature conditions are expected to exceed established standards for use by bull trout and chinook salmon.

Peak flows throughout these PMUs is typically expected during May, except in the upper Lochsa River tributaries (June). Low flows are generally expected in September and/or October. Within these PMUs, flow stability is lowest in the Upper North Fork AU and Lolo Creek drainage (minimum mean monthly flows are 10 to 18 percent of mean annual discharge), highest in the Lochsa AU (28-36 percent), and intermediate in the South Fork AU (19-27 percent). Water use is not permitted from most areas within these PMUs, and is minimal where allowed (<300 AFY; 0.5 cfs).

The land cover of PMUs FD-4 and FD-5 is mostly forested. A variety of cover types make up these PMUs including lodgepole pine, ponderosa pine, grand fir, Douglas-fir and western red cedar.

No CDC documented occurrences of terrestrial plant focal species were found in these PMUs. Terrestrial animal focal species documented by the CDC to occur in FD-4 include fisher, flammulated owl, and white-headed woodpecker. Threats to fisher include clearcutting and habitat destruction, which causes habitat fragmentation. Flammulated owl is threatened by the loss of late successional forests, and by secondary roads. White-headed woodpecker is an insectivorous cavity nester that prefers soft, well-decayed snags. In this PMU, it almost always is found in large diameter ponderosa pine. White-headed woodpecker prefers open canopy forests with mature trees. Some threats to this species include forest fragmentation through habitat degradation, logging, and road construction.

9.3.4 PMU FD-6

Primary Distinguishing Characteristic(s)

This PMU includes 17 HUCs differentiated from others in federally dominated ownership area(s) based primarily on the combination of mixed ownership pattern, high road densities, high inherent landslide hazard ratings, and variable but often times coincidentally high surface erosion hazards (Table 69). Potential impacts from grazing are typically minimal, but may be of local consideration where Forest Service allotments overlap with this PMU.

Species Specific Notes

Portions of this PMU exist in the North Fork Clearwater drainage above Dworshak Dam and are not accessible to anadromous species. B-run steelhead trout utilize all accessible HUCs within FD-6, with migration and overwintering use of HUCs on the Middle Fork Clearwater and Selway rivers, and spawning and rearing use of all other accessible HUCs. Population status of steelhead trout is “depressed” throughout this PMU. Spring chinook salmon use is limited to migration through the mainstem Middle Fork Clearwater and Selway rivers, and spawning and rearing in portions of Clear Creek, Pete King Creek, and lower O’Hara Creek.

Bull trout use only a few locations within these PMUs for spawning and rearing, including O’Hara Creek and the headwaters of Clear Creek, and the North Fork Clearwater and tributaries upstream of Dworshak Reservoir. The mainstem rivers (North Fork, Selway and Middle Fork) are used by bull trout for migration and overwintering. No known “stronghold” populations of bull trout exist within this PMU.

Westslope cutthroat trout are distributed throughout the PMU, but with strong populations defined only in Pete King and Canyon creeks. HUCs in these drainages have a relatively high degree of protected status relative to other areas within this PMU.

Little information exists regarding brook trout presence or status in portion of these PMUs in the Middle Fork Clearwater, lower Lochsa, and lower Selway river drainages, although the species is known to exist in these areas. Within the North Fork AUs, brook trout are widely distributed throughout the PMU, although population status is largely unknown.

General Description

This PMU is largely comprised of HUCs along the North Fork Clearwater River above Dworshak Reservoir, and of other HUCs surrounding portions of the Middle Fork Clearwater River and the lower reaches of the Lochsa and Selway Rivers. Brook trout are relatively widely distributed throughout the PMU, and may compete with native species where they coexist.

Protected status of these areas is variable, ranging from 0-70% of individual HUCs, with 10 HUCs being more than 20% protected. Protected status is generally associated with designation of wild and scenic river reaches or inventoried roadless areas.

Land cover throughout the PMU is typically forest. Landslide hazards range from Moderate to Very High, and although surface erosion hazards are variable throughout the PMU, many individual HUCs have ratings of High to Very High. Land use impacts, thought to be related primarily to forest management, are believed to be substantial throughout these PMUs as indexed by relative road densities. Both overall and near-stream (PSSZ) road densities range from Moderate to Very High, with Moderate densities typically associated with those HUCs which have partial protected status. Road densities in unprotected portions of those HUCs are similar to those throughout these PMUs (High to Very High).

Grazable lands are common near the Middle Fork Clearwater River, and the USFS manages grazing allotments which impact portions of the PMU in the Pete King, Clear, and Yakus creek drainages. Ecological hazards associated with mines is thought to be negligible throughout this PMU. However, mining claim densities are Very High in the Pete King Creek drainage, and Moderate in HUCs associated with Canyon Creek in the Lochsa AU, and Quartz Creek in the Upper North Fork AU. The current status and use of mining claims in these areas is unknown and will need to be considered during future planning efforts.

Modeling conducted as part of the limiting factor analysis suggests that temperature regimes throughout the PMU are most conducive to use by westslope cutthroat trout and steelhead, with limited potential for chinook salmon or bull trout. Constraints identified in NPPC databases for spring chinook and steelhead trout (in accessible areas) include sediment, steep gradients, and limited gravel quantity in potential spawning and rearing areas, and high temperatures in migration corridors. Although not widely listed on the §303(d) list for potential beneficial use restrictions, some streams in this PMU are listed due to sediment concerns.

Hydrologic regimes in these PMUs is generally typical of much of the Clearwater subbasin, with peak flows occurring in April or May, and base flows in September. Hydrologic modeling conducted by Lipscomb (1998) suggests that annual hydrographs are typically more stable in areas surrounding Dworshak Reservoir than throughout the remainder of the subbasin, with baseflows equal to between 37 and 46 percent of the mean annual discharge. With few exceptions, water use is not typically a substantial influence on aquatic biota within these PMUs, as most HUCs have allowable water use equating to less than 1,200 AFY (1.5 cfs). Substantial water rights (1.1 million AFY; 1,522 cfs) exist at the head of the Middle Fork Clearwater River, but are designated for maintenance of instream flows and intended to benefit local biota.

9.3.5 PMU FD-7

Primary Distinguishing Characteristic(s)

All HUCs within this PMU have between 74 and 90 percent of their land area designated as inventoried roadless area. Although lands are predominantly protected, localized impacts to aquatic and terrestrial resources may occur in unprotected areas. Future planning efforts should consider these areas in relation to surrounding PMUs in order to determine if and where beneficial project opportunities exist and/or where continued protection is important.

Species Specific Notes

B-run steelhead trout in accessible areas within this PMU are not influenced by hatchery production. Populations utilize the mainstem Lochsa and Selway rivers for migration and

overwintering, and are considered depressed in tributary habitats for spawning and rearing purposes in these same drainages.

Spring chinook salmon populations within this area are commonly influenced by hatchery practices or out plants of excess hatchery adults. Use of this PMU by spring chinook salmon for purposes other than migration and overwintering is highly limited and occurs only in the headwaters of the Lochsa River and Meadow Creek (Lower Selway AU).

Bull trout are found in the majority of HUCs within this PMU, using mainstem habitats for migration and overwintering, and tributary habitats for spawning and rearing. Strong bull trout populations within this PMU are defined in the Little North Fork Clearwater River and in the headwaters of Meadow Creek (Lower Selway AU). Both of these stronghold areas adjoin additional strongholds defined in other PMUs. Bull trout populations in tributary habitats elsewhere in this PMU are depressed.

Westslope cutthroat trout populations are generally considered strong throughout this PMU in areas used for spawning and rearing. As with other species, mainstem river corridors are primarily used by westslope cutthroat trout for overwintering and migration purposes.

Information regarding the distribution and status of brook trout populations within this PMU is limited. Brook trout are known to be present throughout the mainstem North Fork Clearwater River and some of its tributaries (Little North Fork Clearwater River, and Quartz, Skull, and Isabella creeks) and in the headwaters of Meadow Creek (Lower Selway AU). Brook trout are presumed absent from the Weitas and Kelly creek watersheds, and from mainstem habitats in the Lochsa and Lower Selway AUs. No information is available regarding brook trout distributions or status in upper Lochsa AU tributaries.

General Description

This PMU encompasses 21 HUCs distributed throughout the Upper and Lower North Fork, Lochsa, and Lower Selway AUs. Given the highly protected status of lands within this PMU, discussion presented here will focus only on those issues thought to be most important for future management and planning strategies.

Planning and management opportunities related to focal species may be limited and localized in nature due to the predominance of protected areas within this PMU. These areas are often intermixed with other PMUs, and generally form the boundary areas between more heavily protected and more heavily managed areas. Future planning strategies involving this PMU will need to balance the need for both protection and management areas within the subbasin.

Road densities within this PMU are rated Low or Moderate for individual HUCs, both overall and within the PSSZ. However, due to the substantial influence of roadless areas, road networks within these HUCs are often patchy, and densities may be very high in limited areas within individual HUCs.

Surface erosion hazards from lands throughout this PMU are generally rated as Low to Moderate. Inherent landslide hazards are more variable, ranging from Low to Very High and, combined with moderate road densities in some areas, may negatively influence aquatic and terrestrial habitats. Potential impacts due to relatively high landslide hazards coupled with moderate road densities are most likely in HUCs in the lower Lochsa and Selway river drainages, and those which border PMU MX-1 in the North Fork Clearwater River drainage.

Beneficial uses are listed as impaired by sedimentation under §303(d) listings in a variety of streams within this PMU, most typically those associated with areas of increased road density. Listed stream segments include all or portions of Cool, Cold Springs, Cougar, Dog,

Isabella, Swamp, Sugar, and Middle creeks in the North Fork Clearwater River drainage, and Slide and Island creeks in the Lower Selway AU.

Limited information is available regarding habitat quality for aquatic focal species in this PMU. In areas accessible to anadromous species, habitat ratings for steelhead trout range from Poor to Excellent, whereas those for spring chinook salmon ranges from Poor to good. In both cases, the best and worst habitats are delineated in the upper Lochsa River tributaries, and the lower Lochsa and Selway river mainstems, respectively. No information is available regarding overall habitat condition for resident species in the North Fork Clearwater drainage.

There are no CDC documented terrestrial plant focal species occurrences in FD-7. Terrestrial animal focal species documented by the CDC to occur in this PMU include fisher, wolverine, northern goshawk, and Coeur d' Alene salamander. Threats to fisher include clearcutting and habitat destruction, which causes habitat fragmentation. Threats to wolverine include habitat fragmentation and loss of ungulate wintering areas. Threats to northern goshawk include timber harvest, fire suppression, and grazing, which reduce the complexity of community structure. Coeur d' Alene salamander is threatened by habitat fragmentation, water diversions, water pollution, and fire.

9.3.6 PMUs FD-8 and FD-9

Primary Distinguishing Characteristic(s)

Lands within these two PMUs are almost entirely protected, having at least 90 percent of their land area designated as inventoried roadless area (FD-8) or wilderness area (FD-9). Although the level of future protection afforded under these two designations may differ substantially, the two PMUs are presented together as areas which are, to date, largely undisturbed by land management activities other than fire suppression.

Species Specific Notes

B-run steelhead trout in accessible areas within these PMUs are not influenced by hatchery production with the exception of a limited number of HUCs in the South Fork AU associated with the Gospel Hump wilderness area. With the exception of the headwaters of the Upper and Lower North Fork AUs and the White Sands Creek drainage (Lochsa AU), steelhead trout are found in all HUCs within these PMUs. Populations utilize the mainstem Lochsa and Selway rivers for migration and overwintering, and tributary habitats in these PMUs for spawning and rearing. Although steelhead trout population status is depressed or unknown in large portions of these PMUs, all know strong population areas for steelhead trout within the Clearwater subbasin are located within these largely protected areas.

Spring chinook salmon and populations within this area are commonly influenced by hatchery practices or out plants of excess hatchery adults. Spring chinook are widely distributed throughout these PMUs, but are absent from a substantial number of HUCs. Steep channel gradients and passage impediments have been documented as constraints to spring chinook salmon in various areas throughout these PMUs and probably account for their absence from most areas of current absence. As is the case throughout the Clearwater subbasin, spring chinook salmon have been reintroduced following their extirpation, and population levels are currently considered depressed throughout their range.

The distribution of bull trout within these PMUs is widespread, but not contiguous. Most notably, bull trout are absent from numerous subwatersheds in the upper and central portions of the Lochsa AU. Although absent from some HUCs, bull trout are widely distributed throughout all portions of these PMUs in other AUs in the Selway, South Fork, and North Fork

Clearwater river drainages. Of 18 HUCs identified as having strong bull trout populations within the Clearwater subbasin, 14 are located within these highly protected PMUs. Bull trout populations utilize the mainstem Lochsa and Selway rivers for migration and overwintering, and tributary habitats throughout the remainder of these PMUs for spawning and rearing.

Westslope cutthroat trout populations are present in all HUCs within these PMUs, and are considered strong in most areas used for spawning and rearing. Population levels are considered depressed throughout some areas in the Lochsa and Selway river systems, although the reasons for this are unclear. Mainstem river corridors are used by subadult and nonspawning fluvial forms of westslope cutthroat trout for overwintering and migration purposes (respectively).

Introduced brook trout may compete with native salmonids in areas where they coexist. Brook trout are widely distributed throughout the wilderness and inventoried roadless areas in the Clearwater subbasin, with strong populations defined in portions of the Upper and Lower Selway, Lochsa, and Upper North Fork AUs. Although brook trout are widely distributed throughout the South Fork AU, they are currently presumed absent from areas within the Gospel Hump wilderness area. Brook trout are also presumed absent from the largely contiguous expanse of inventoried roadless areas in the Weitas and Kelly Creek drainages in the Upper North Fork AU.

General Description

Aside from the introduction of nonnative species (see notes on brook trout above), fire suppression is the principal land use activity potentially influencing ecosystems within these PMUs. Discussion of the impacts of fire suppression on aquatic systems is beyond the scope of this assessment, but is noted as a potentially important consideration in future planning efforts.

Other impacts related to land uses are typically thought to be minimal in these PMUs. Road densities and potential grazing impacts are typically considered low throughout these PMUs. Mining impacts are typically minimal, with the exception of a few HUCs within the North Fork Clearwater drainage which have had moderate numbers of mining claims established within their boundaries. It is not known, however, the degree of mining activity that has occurred associated with these claim areas, nor how it may have impacted aquatic and terrestrial resources.

Habitat quality for steelhead trout has been rated almost exclusively as Excellent throughout these PMUs, with the exception of mainstem portions of the Lochsa and Selway rivers (Good). Spring chinook salmon habitat quality is more variable, and typically ranges from Fair to Good, with Excellent habitat defined only in limited high elevation (accessible) portions of the Clearwater subbasin. Habitats within the Lochsa and Selway drainages are most commonly rated as Fair and Good, respectively, for spring chinook salmon. No habitat ratings are available for nonanadromous aquatic focal species throughout these PMUs.

The only terrestrial plant focal species documented by the CDC to occur in FD-8 is spacious monkeyflower. Spacious monkeyflower is an annual representative of riparian and wet meadow habitats. It is mostly found in microsites of open grasslands and forest openings with enhanced moisture and shade. Threats to Spacious monkeyflower include livestock trampling and weedy invaders. No terrestrial plant focal species is known to be found in FD-9.

Wildlife focal species documented by the CDC to occur in FD-8 and FD-9 include fisher, wolverine and Coeur d' Alene salamander. Threats to fisher include clearcutting and habitat destruction which causes habitat fragmentation. Threats to wolverine include habitat

fragmentation and loss of ungulate wintering areas. Coeur d' Alene salamander is threatened by habitat fragmentation, water diversion and pollution, and fire.

9.4 Highly Protected Areas of Special Concern

In the Clearwater subbasin, a relatively limited number of HUCs are subject to special circumstances which might influence future planning. These generally include areas with a high degree of protected status, which also face potential impacts from land use activities. Typical potential impacts include mining, roading, or grazing within protected areas (Figure 117).

Potential mining impacts within highly protected areas are noted in five HUCs located in the North Fork Clearwater River drainage. These HUCs incorporate portions of Foehl Creek, the central mainstem and headwaters of the North Fork Clearwater River, and the headwaters of Kelly Creek (Figure 117). Within four of these HUCs, potential impacts are generally related to mining claim densities which range from Moderate to High (100-500 claims per HUC). The relative impact of mining claim activity in these areas will be dependent upon the status of claims and the amount of activity associated with each claim. Neither of these factors is clear based on available information. In the headwaters of the North Fork Clearwater River, mining impacts are considered Moderate, and associated with ecological hazard ratings of existing mines (which may or may not be active). Although six mines exist within this HUC, the relative ecological hazard ratings (as assigned by ICBEMP) are highest associated with the Clearwater Mine (11), and the Hoodoo Pass Mine (9).

Impacts of roads in HUCs with a high degree of protected status are noted in 13 HUCs in the Upper North Fork and Lochsa AUs (Figure 117). These HUCs are most commonly defined within PMU FD-7, in which 75-90% of the HUC is designated as inventoried roadless area. Road densities in these HUCs are considered Low to Moderate, but those within the PSSZ are Moderate to High suggesting a prevalence of near-stream road networks. These ratings likely underestimate the actual road densities which, due to the predominantly roadless nature, are confined to only limited areas within each HUC. Planners are advised to consider the potential impacts of dense road networks in subwatersheds which are primarily protected from disturbance, particularly where those road networks are located in the headwater portions of a subwatershed and have the potential to impact downstream reaches.

In the Lower Selway and South Fork AUs, four HUCs are highlighted for special consideration of grazing potential in areas of otherwise highly protected status (Figure 117). Each of the designated HUCs has over 70% of its land area designated as inventoried roadless. These HUCs are substantially (25-100%) overlapped by grazing allotments managed by the Nez Perce National Forest. The current use or status of these grazing allotments is not known and will require further consultation with the USFS. However, subbasin planners should consider relative impacts of grazing to aquatic and terrestrial resources in otherwise undisturbed areas.

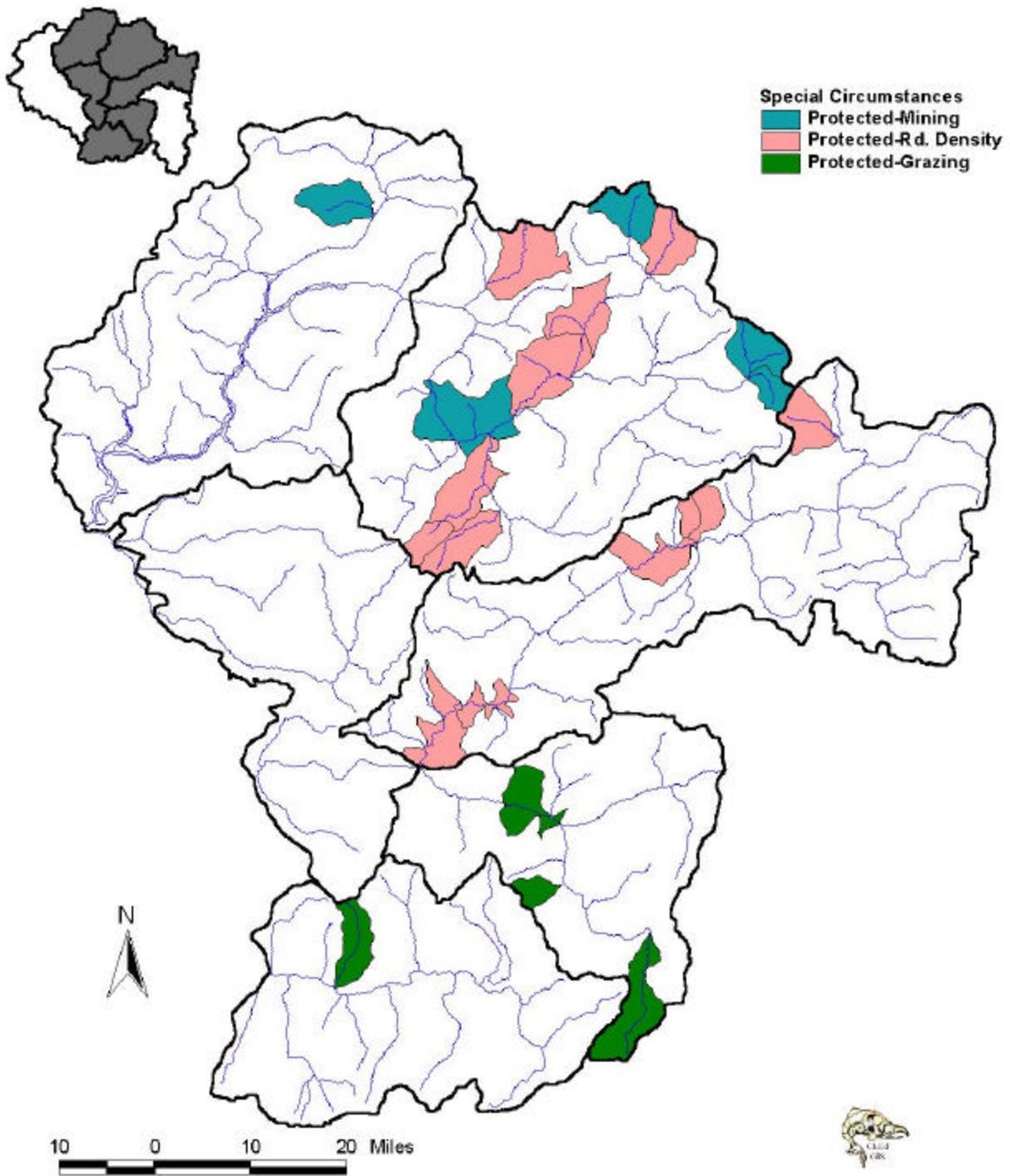


Figure 117. Highly protected areas of special concern within the Clearwater subbasin