



Caribou National Forest & Curlew National Grassland

Hydrology Specialist Report for Environmental Assessment

Lower Portneuf Cooperative Vegetation Management Project

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/s/ Brad Higginson
Signature

2/13/2025
Date

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Project Information

Proposed Action

The proposal includes several treatments of prescribed fire, mechanical treatments mixed with prescribed fire, timber harvest and stand tending, and trail and roadside treatments.

Recommended Project Design Features (PDFs)

Water quality protection from nonpoint source pollution is achieved through Best Management Practices (BMPs). Project BMPs include the following:

- Revised Forest Plan direction (USDA FS 2003; *RFP direction is in italics below*): Implementation direction is discussed in this section while broader planning direction is discussed in the NFMA–RFP Consistency section.
- National BMPs for Water Quality Management on NFS Lands (USDA FS 2012)
- USDA FS timber sale contract provisions
- Idaho Forest Practices Act (IDL 2025)
- BMPs for Silvicultural Roads (33 CFR 323.4)

The following BMPs emphasize or expand on the above direction:

BMP#1 – Aquatic Influence Zone Protection (AIZ) Protection Measures

The Forest AIZ GIS layer is shown below and may be updated per field reviews of new AIZs or evaluations of flow regimes (perennial, intermittent, & ephemeral). The layer is located at:

T:\FS\Reference\GIS\r04_ctf\Data\CTNF_CorpData.gdb\FLRMP_Caribou_AIZ

Figure: Map of AIZs and proposed treatments.

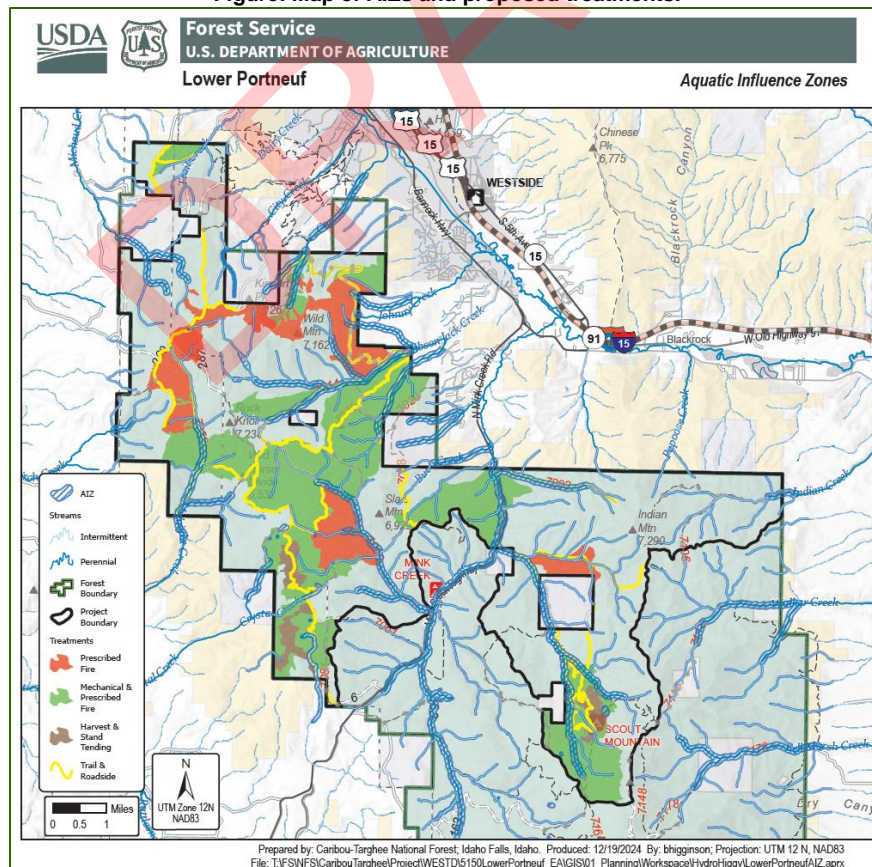


Table: AIZ boundary widths.

Water Type & Relevant Waterbodies	AIZ slope distance, each side*
Fish bearing streams	300 feet
All other perennial streams or ponds, lakes, reservoirs, & wetlands > 1 acre	150 feet
Seasonally flowing or intermittent streams and wetlands <1 acre	50 feet

*AIZ width may be greater if any of these parameters are greater: inner gorge width, riparian width, two site-potential tree heights, 100-year floodplain widths, or extent of seasonally saturated soils (RFP 4-45 & 46).

All treatments in AIZs:

- Coordinate with a hydrologist or fisheries and wildlife biologist during treatment design and layout. Maintain adequate buffers to minimize connected disturbed treatments in drainages with total maximum daily loads (TMDLs; Rattlesnake, Birch, Michaud, second order Portneuf trib's/City/johnny, and East Fork Mink Creek & trib's). Maintain sufficient trees and shrubs for shading and large woody debris (LWD) recruitment into streams.
- Equipment operation (e.g., masticator, skidder, temporary road construction) off-of existing routes shall be coordinated with the fisheries biologist or hydrologist. Work may include crossing at designated point(s), temporary road/stream crossings (see road BMPs below), aspen regeneration, or to do restoration work. Avoid crossing streams if practicable. Use previously disturbed areas to the extent possible. Do not skid or forward logs in or through live streams. Ensure at least one-end log suspension.
- Work with hydrology, recreation, engineering to design treatments to protect the Scout Mountain Campground water system, spring source and intake.

Fire/Fuels Guidelines in AIZ (RFP page 4-48):

- *Locate... bases, camps, helibases, staging areas, helispots, & other activity centers outside of AIZs... An exemption may be granted following a review and recommendation by a fish biologist or hydrologist.*
 - Suitable areas for some of these activities may exist in developed areas or on existing roads. A hydrologist or fisheries biologist may approve the use of existing developments (e.g., parking areas, roads, etc.) to minimize or avoid new disturbances.
- *When taking water from fish-bearing streams..., intake hoses should be screened, considering the fish species, life stages, and streamflow present at the time.* Wash all intake hoses prior to and after use to prevent transfer of aquatic nuisance species.
- *Allow wildland fire, prescribed fire, and mechanical fuel treatments to meet the desired future conditions (DFCs) of the AIZ (RFP page 4-47).*
 - Avoid mastication or mechanized treatment of live cottonwoods or willows unless approved by a hydrologist or fisheries biologist.
 - Masticate, pile burn, or broadcast burn only where necessary to move the AIZ towards the DFCs (see RFP page 4-47). Where topography allows, do not pile burn in the AIZ. If practicable, pull material outside of the AIZ to pile burn or masticate. Pile material and masticate as far from the stream channel as practical given local terrain. Treat fuels in the following priority order, unless approved by a hydrologist or fisheries biologist:
 - Lop and/or scatter as much material as possible while still providing for an effective fuel treatment, e.g., lop and scatter material that is less than 2 inches in diameter.
 - If excessive material still exists, move that material outside of the AIZ if feasible to scatter, masticate, burn, or otherwise treat.
 - If it's not feasible to move excessive material outside of the AIZ, move the material as far from streams as practical given the local terrain and fuel loading to burn, masticate, or otherwise treat.
 - Do not remove existing dead & down material unless approved by a hydrologist or fisheries biologist.
 - Do not pile slash in stream channels, ephemeral draws, or road drainages (e.g., ditch).
- *Design... strategies, practices, and actions to minimize disturbance of riparian ground cover & vegetation.*
- *Avoid mixing and delivery of chemical retardant, foam, or additives to surface waters.*

General Riparian Area Management AIZ Guidelines (RFP page 4-50):

- *Felled trees should remain on site when needed to meet woody debris objectives & desired AIZ attributes.*
- *Use herbicides, pesticides, and other toxicants and chemicals only as needed to maintain desired AIZ attributes. No new herbicide or pesticide use is proposed.*
- *Avoid storage of fuels and other toxicants or refueling within AIZs unless there are no other alternatives. Any refueling sites within an AIZ should have an approved spill containment plan.*

Roads in the AIZ-Guidelines (RFP page 4-51):

- *Avoid constructing roads in the AIZ unless there is no practical alternative. Avoid temporary roads in the AIZ to the extent practicable. If temporary roads are necessary, consult a hydrologist or fisheries biologist during temporary road layout, If stream crossings are necessary, consult hydrologist or fisheries biologist to designate crossings in stable areas and cross stream/AIZ at right angles.*
- *Culverts (permanent & temporary) should be sized so that the probability of flow exceedance is 50% or less during the time the culvert is expected to be in place. Consider bedload and debris. Temporary stream crossings may be allowed if temporary crossings will be constructed and used in such a way as to minimize sediment input and provide for fish passage. They will be maintained during use and removed and rehabilitated as soon as they are no longer needed. Consult a hydrologist or fisheries biologist for structure type and size.*
- *Avoid placing drainage outlets where they may discharge onto erodible slopes or directly into streams.*
- *Where feasible, install cross-drainage above stream crossings to prevent sediment from entering streams*
- *Avoid making channel changes on streams or drainages.*
- *Design and install drainage crossings to reduce the chances of turning stream flows down the road prism in case of a blocked or overflowing culvert.*
- *Road drainage patterns should avoid disruption of natural hydrologic flow paths.*

Apply the BMPs for Silvicultural Roads (33 CFR 323.4):

1. Permanent roads, temporary access roads, and skid trails shall be held to the minimum feasible number, width, and total length consistent with the purpose of specific silvicultural operations, and local topographic and climatic conditions.
2. All roads, temporary or permanent, shall be located sufficiently far from streams or other water bodies (except for portions which must cross water bodies) to minimize discharges into waters.
3. The road fill shall be bridged, culverted, or otherwise designed to prevent the restriction of expected flood flows.
4. The fill shall be properly stabilized and maintained during and following construction to prevent erosion.
5. Discharges of dredged or fill material into waters of the U.S. to construct a road fill shall be made in a manner that minimizes the encroachment of trucks, tractors, bulldozers, or other heavy equipment within waters of the U.S. (including adjacent wetlands) that lie outside the lateral boundaries of the fill itself.
6. In designing, constructing, and maintaining roads, vegetative disturbance in the waters of the U.S. shall be kept to a minimum.
7. The design, construction and maintenance of the road crossing shall not disrupt the migration or other movement of those species of aquatic life inhabiting the water body.
8. Borrow material shall be taken from upland sources whenever feasible.
9. The discharge shall not take, or jeopardize the continued existence of, a threatened or endangered species as defined under the Endangered Species Act, or adversely modify or destroy the critical habitat of such species.
10. Discharges into breeding and nesting areas for migratory waterfowl, spawning areas, and wetlands shall be avoided if practical alternatives exist.
11. The discharge shall not be located in the proximity of a public water supply intake.
12. The discharge shall not occur in areas of concentrated shellfish production.
13. The discharge shall not occur in a component of the National Wild and Scenic River System.
14. The discharge of material shall consist of suitable material free from toxic pollutants in toxic amounts; and
15. All temporary fills shall be removed in their entirety and the area restored to its original elevation.

Timber Management in the AIZ (RFP page 4-53):

- *Timber harvest, including fuelwood cutting, is generally not allowed unless... silvicultural practices are necessary to achieve desired vegetation characteristics and desired AIZ attributes (G).*
- *Mechanized slash piling and burning should be minimized within the AIZ (G).*
 - *Timber harvest, stand tending, mechanical treatments, and prescribed fire may occur in AIZ to regenerate aspen, improve beaver habitat, or to meet other desired AIZ attributes. Focus on areas capable of regenerating aspen (e.g., within 100 feet of existing aspen).*

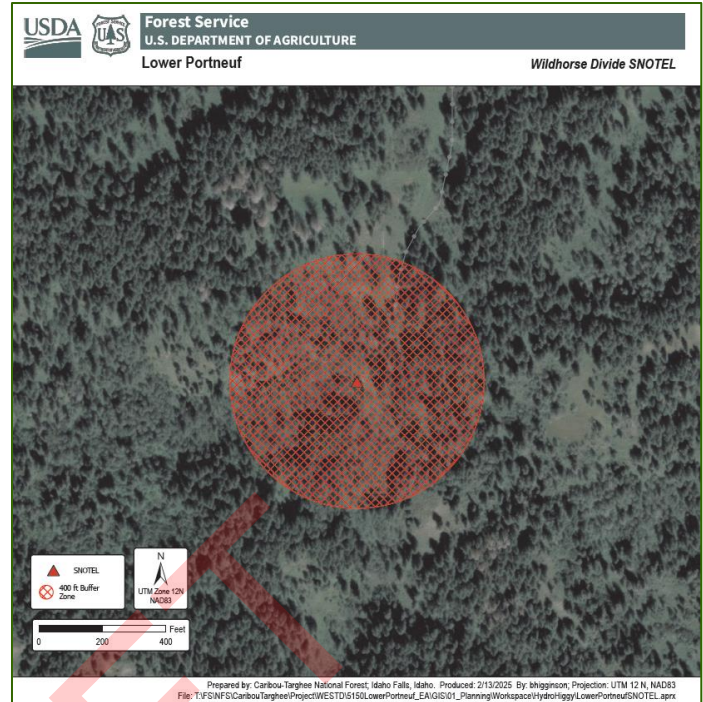
BMP#2 - Protection of NRCS SNOTEL Site

Vegetation Standard (RFP page 3-20): Do not conduct management activities that may alter canopy vegetation within 400 feet of a NRCS snow measuring site without first contacting NRCS. The Wildhorse Divide SNOTEL site is in a mechanical treatment and prescribed fire unit near FST 70028. SNOTEL site information page:

<https://wcc.sc.egov.usda.gov/nwcc/site?sitenum=867>.

As per the MOU between the Forest Service and NRCS (USDA FS & NRCS 2019), the Forest will comply with the following:

- D. Provide a 400-foot or mutually agreed to buffer zone in all directions from sampling points and sensors at established snow courses and related hydrometeorological data sites. The dimensions of the buffer zone will be depicted and specified on data site maps or exhibits of the MSUP or addendums. Buffer zones will be established to minimize the disturbing influences that road building, timber harvest, or vegetative management may have on natural snow accumulation or measurement. SNOTEL and SCAN data sites are to be identified within applicable Forest Land Management Plans and the Land Status Records System (36 CFR 200.12) through appropriate media.
- E. Conduct any management activities occurring within the designated buffer zone at each site in a manner that will not diminish the value of the site, nor restrict approved access to the site. If impairment of the site or its access cannot be avoided, the NRCS State Conservationist will be notified in advance that, if warranted by the proposed action, an alternative data site can be selected and a statistical correlation can be established with the new site. A minimum of 5-year advance notice is desired. Compatible uses of the site may continue.



BMP#3 - Logging Systems (RFP page 3-46 & 47)

- *Limit tractor skidding to slopes less than 40% and generally prohibit logging on slopes over 60%.*
- *Yarding operations should not take place when ground conditions are wet enough that there is a risk of rutting and compaction as determined by the sale administrator.*
- *Minimize skid trails and temporary roads during logging operations. Identify skid trails and temporary roads requiring construction in the sale planning process and assure appropriate rehabilitation of these trails by the purchaser or in post-sale activities.*

Other Measures:

- *Appropriate drainage features should be installed prior to the end of the season on temporary roads needed for more than one operating year. Stabilize and restore disturbed areas to a more natural state once no longer needed. Decommission constructed temporary roads and landings using techniques such as reducing compaction and placing slash materials over bare soil (>60% cover). Seed if recommended by the Forest Botanist.*
- *Temporary roads & skid trails: Avoid ephemeral draws where practical. If necessary, skid trails and temporary roads may cross ephemeral draws, but they should not run up and down the bottom of ephemeral draws.*

BMP#4 - Protection of Soil & Water Resources

Soil Guidelines (RFP page 3-7 & 8) for All Treatment Areas:

- *Maintain ground cover, microbotic crusts, and fine organic matter that would protect the soil from erosion in excess of soil loss tolerance limits and provide nutrient cycling.*
- *Detrimental soil disturbance such as compaction, erosion, puddling, displacement, and severely burned soils caused by management practices should be limited or mitigated to meet long-term soil productivity goals.*
- *Sustain site productivity by providing the following minimum amounts of woody residue =3 inches in diameter dispersed on the site as outlined below:*

Firelines: If firelines are necessary, build them with rolling grades, waterbars, and minimum downhill convergence. Decommission/rehab firelines to the original contour following operations. Use surrounding organic debris to cover and rehabilitate firelines in lieu of seeding. Avoid fireline construction in or around riparian areas, wetlands or areas highly prone to erosion unless needed to protect life, property, or approved by fisheries biologist or hydrologist.

Burn Plan: Burn prescription elements should include weather, slope, aspect, and soil and fuel moistures, which influence whether a litter layer remains and the development of a water repellent layer. Manage soil burn severity to achieve low/moderate soil burn severities. Implement measures to control soil burn severity (e.g., appropriate soil moisture, short residence times, strip burning).

Masticating: Adjust for a variation of chip depth (maximum depth of 3”) and chip size.

Pile Burnings: Burn when soils are wet from snow or rain to reduce impacts on soil organic matter, physical properties, and soil organisms.

BMP#5 – Hydrologic Disturbance (HD; RFP Page 3-17)

A guideline of the RFP is that “*Not more than 30 percent of any of the principal watershed and/or their subwatersheds (6th HUC) should be in a hydrologically disturbed condition at any one time.*” The greatest potential to create HD areas approaching this guideline is in the Lower Rattlesnake and Gibson Jack subwatersheds. Track treatment implementation, and modify treatments, if necessary, to ensure compliance with the guideline and the analysis assumptions (see HD Appendix A for more information).

Project Screening

Legal and Regulatory Considerations

- NFMA/Land Management Plan Clean Water Act (CWA) Pertinent Executive Orders

Resource Participation in Environmental Analysis Review

Resource	Review Complete	Specialist’s Initial Input on Proposal
Hydrology	1/21/2025 Brad Higginson	Review for draft EA completed 1/21/2025. Available for project analysis, responses, final EA, and implementation as needed.

Environmental Impacts:

Potentially Affected Environment - Hydrology

Scope of Analysis

Aerial Scope: The following hydrology analysis areas were chosen to evaluate hydrologic disturbance.

- Project Work Inventory (PWI) Watersheds 20-Lower Portneuf and 21-Rattlesnake
- The portions of the sixth level/12-digit hydrologic unit codes (170401040403) within PWI Watershed 20 & 21: 170402060902-Lower Rattlesnake Creek, 170402060903-Starlight Creek-Bannock Creek, 170402060904-Michaud Creek, 170402060905-Eagletail Rock-Bannock, 170402080504-Mink Creek, 170402080505-Gibson Jack Creek-Portneuf River, and 170402080507-Trail Creek-Portneuf River.

Technical Scope: Evaluate the hydrology-related aspects of the project to:

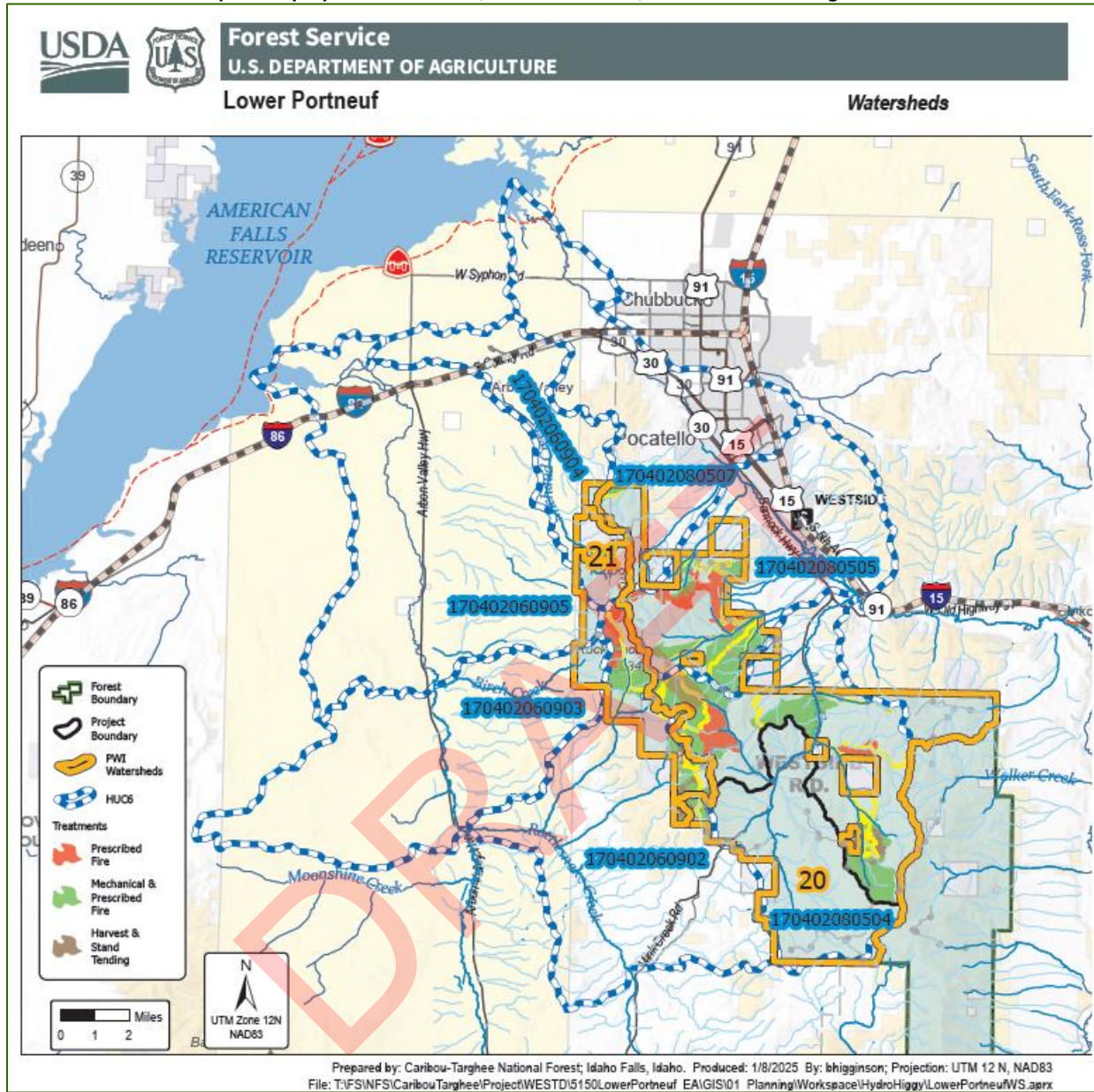
- Provide a hydrology analysis for an Environmental Assessment (EA), with a focus on water quality.
- Evaluate compliance with RFP direction and other pertinent policies, regulations, and laws.
- Identify BMPs to minimize impacts and promote resource improvements.

Temporal Scope: This analysis considers a time scale that includes relevant past and present activities and approximately 10 years into the future.

Area and Resources

Hydrologic resources in the project area include water quality, overall watershed hydrologic disturbance, aquatic influence zones (AIZs), and municipal watersheds. BMPs are included in the proposal PDFs to maintain water quality.

Map of the proposed treatments, PWI Watersheds, and sixth level/12-digit HUCs.



Consideration of No Action

Excluding future wildfires or other large projects, no considerable changes are expected. Hydrologic disturbance may slightly decrease over time as past disturbances continue to recover. Water quality in the could slightly improve with continued improvements in ongoing management activities (e.g., road & trail improvements, recreation management, and livestock management improvements).

Consideration of the Proposed Action

The Forest Service scientific community has discussed the watershed effects of fuels management activities at great lengths (Elliot et al. 2010 & Dwire et al. 2016). This analysis therefore will focus on the site-specific aspects of the proposal regarding water quality, hydrologic disturbance, AIZs, and municipal watersheds. Potential hydrologic effects are best minimized with the selection, implementation, and monitoring of the proper best management practices (BMPs). BMPs are included in the proposal PDFs.

National Forest Management Act (NFMA) – Revised Forest Plan Consistency

The proposal is consistent with the applicable hydrology-related direction in the RFP (USDA FS 2003), which is incorporated by reference. Relevant hydrology-related direction includes that for Watershed and Riparian Resources Guidelines (RFP page 3-16 & 17); Forest-wide direction (Chapter 3); timber management (pages 3-46 & 47); Basin and Range Transitional Mountains Subsection Management Emphasis (RFP page 4-1 & 2), and management prescriptions 2.1.3(b)-municipal watershed 2.8.3-Aquatic Influence Zones (AIZs; RFP pages 4-45 to 4-51). Applicable direction has been incorporated into the BMPs; consistency with other planning direction is discussed below.

Hydrology: Consistent

RFP Consistency Review

Watershed and Riparian Resources Guidelines (RFP page 3-17):

RFP Guideline: *Not more than 30 percent of any of the principal watershed and/or their subwatersheds should be in a hydrologically disturbed condition at any one time.*

Project Specifics: There is currently very little hydrologic disturbance (HD) in the analysis area. The proposal would generate HD, with the most substantial increases in the Lower Rattlesnake and Gibson Jack subwatersheds. The table below provides a conservative estimate of HD. Actual HD would likely be less for several reasons. First, the analysis assumes all treatments are implemented at the same time whereas the project would occur over several years; initial project treatments and past disturbances may be hydrologically recovered prior to later project treatments occurring. Also, the analysis conservatively estimates the amount of HD produced by the proposal as actual HD would likely be less. The overall HD includes relevant past disturbances and the proposal. Even with a conservative analysis, the proposal would not cause the analysis watersheds to exceed the 30% HD guideline. See Appendix A for the full HD analysis.

Table: Estimates of the hydrologic disturbance (HD).

Caribou PWI Watershed	Current HD (%)	Proposed HD (%): 70% Harvest; 50% Rx- Rx/Mech	Overall HD (%)
20-Lower Portneuf	4%	13%	17%
21-Rattlesnake	2%	17%	19%
Subwatersheds			
170402060902-Lower Rattlesnake Creek	3%	27%	30%
170402060903-Starlight Creek-Bannock Creek	<1%	1%	2%
170402060904-Michaud Creek	1%	1%	2%
170402060905-Eagletail Rock-Bannock	1%	3%	4%
170402080504-Mink Creek	6%	11%	17%
170402080505-Gibson Jack Creek	<1%	26%	26%
170402080507-Trail Creek	1%	6%	7%

RFP Guidelines: *Proposed actions analyzed under NEPA should adhere to the State Source Water Assessment Plan to achieve consistency with the Safe Drinking Water Act, and amendments, to emphasize the protection of surface and ground water sources used for public drinking water.*

Project Specifics: Two public water systems (PWSs) located downstream of the Forest have source water assessment areas (SWAAs) that extend into the project area in the Gibson Jack/Dry Creek, Campbell Creek, (see Figure & Table below). The IDEQ (1999) ensures that source water assessments are conducted for all PWSs by delineating the SWAAs, inventorying potential contaminants, conducting a susceptibility analysis of the potential contaminants, and informing the public. The Figure shows the PWSs and the applicable time of travel (ToT) in the SWAAs.

Potential sources of contamination from the proposal includes sediment and surface water from treatment disturbances, ash/pollutants from prescribed fire, and fuels spills. BMPs are included to protect water quality and minimize risks. The proposal is also designed to reduce the risk of future catastrophic wildland fire within the SWAAs.

Figure: IDEQ Source Water Assessment Map: <https://mapcase.deq.idaho.gov/swa/default.html>.

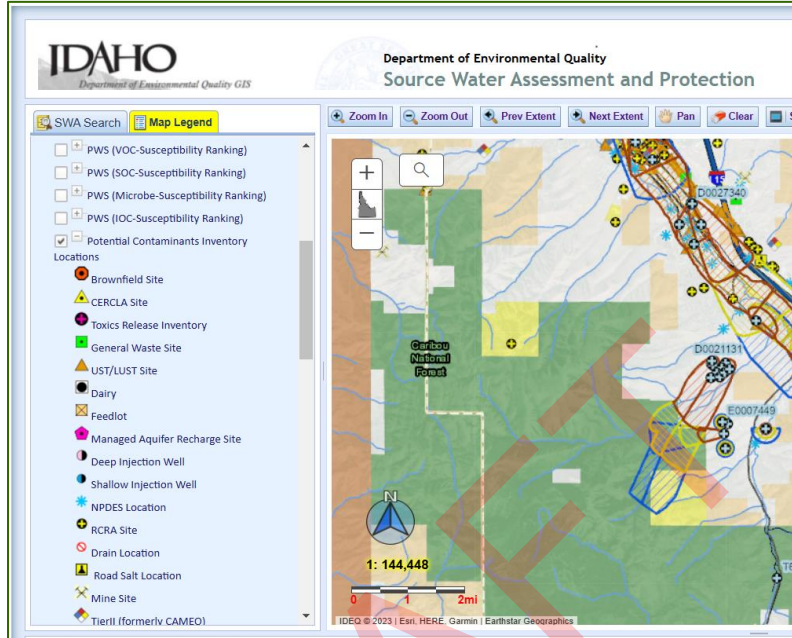


Table: PWSs with SWAAs in the project area and Source Water Assessment Summary Reports (SWASRs):

PWS & Well or Spring	Service	Final Susceptibility Ranking*				Potential Contaminants	SWAS R
		IOC	VOC	SOC	Microbial s		
Wildhorse Ridge Subdivision (PWS# ID6030081) Well #10 E0007741 & WELL 3 E0007745	85 people through 29 connections.	M	M	M	M	Major & minor roads. Surface water.	Link Link
Caribou Acres, Well #3 D0058533							Link

*IOC = Inorganic chemicals; VOC = Volatile organic chemicals; SOC = Synthetic organic chemicals; M = Moderate

RFP Guideline: *Projects in watersheds with 303(d) listed waterbodies and/or delineated Source Water Protection Areas should be supported by scale and level of analysis sufficient to permit an understanding of the implications of the project within the larger watershed context.*

Project Specifics: Analysis of the §303(d) listed waterbodies and TMDLs in the project area is provided in the Clean Water Act section below.

Developing a source water protection plan (SWPP) is a voluntary effort a community can undertake to prevent contamination; it does not appear that SWPPs have been completed by these PWSs (see: <https://www.arcgis.com/home/webmap/viewer.html?webmap=7f060efe0339438690b91f79ff458c70&extent=-126.0742,40.6103,-101.7725,49.8065>). Also see analysis above for SWAAs.

RFP Guideline: *Proposed actions analyzed under NEPA should adhere to the State Nonpoint Source Management Plan to best achieve consistency with both Sections 313 and 319 of the Federal Water Pollution Control Act (also known as the Clean Water Act - CWA).*

Project Specifics: BMPs designed to protect water quality are included in the proposal to achieve consistency with the Idaho Nonpoint Source Management Plan (IDEQ 2020) and CWA. Also see the CWA section below. Work with hydrology, recreation, and engineering to design treatments in the Scout Mountain Campground to protect the water system, including spring source and intake.

Municipal Watershed (2.1.3(b); RFP pages 4-25 to 4-27):

This management prescription applies to the West Fork Mink Creek and Gibson Jack Creek watersheds. The City of Pocatello has municipal water rights and intakes at the mouth of these watersheds. Research Natural Areas (RNAs-management Rx 2.2) are located within the municipal watersheds.

RFP Guidelines: *Management activities should be designed to assure maintenance of high-quality surface water.*

Timber harvesting is only allowed in municipal watershed areas on a site-specific basis for such things as public safety, visual quality, and/or long-term maintenance of vegetation to meet the goals of this prescription.

Project Specifics: BMPs designed to protect water quality are included in the proposal. Research Natural Areas (RNAs-management Rx 2.2) are located within the municipal watersheds. The Gibson Jack and West Fork Mink Creek watersheds total ~8,427 acres (management Rx's 2.1.3(b) & 2.2). Therefore, about half of the municipal watershed area is within a proposed treatment unit.

Table: Summary of treatments in the municipal watershed (management Rx's 2.1.3(b) & 2.2-RNAs).

Proposed Treatment	Area (acres)		
	Proposed Treatment	Trail Treatment within Proposed Treatment	Total
Trail Treatment Only (outside of other treatments)	-	9	9
Prescribed Fire	1,305	9	1,314
Harvest, Standing Tending, & Prescribed Fire	22	0	22
Mechanical & Prescribed Fire	2,660	26	2,686
Totals =	3,987	44	4,031

Aquatic Influence Zone (AIZ; 2.8.3; Fire/Fuels & Timber):

RFP Guidelines: *Allow wildland fire, prescribed fire, and mechanical fuel treatments to meet the desired future conditions (DFCs) of the AIZ (RFP page 4-48).*

Timber harvest, including fuelwood cutting, is generally not allowed unless... silvicultural practices are necessary to achieve desired vegetation characteristics and desired AIZ attributes (RFP page 4-53).

Project Specifics: There are approximately 3,077 acres of AIZ in the project area so about 40% of those acres are within a proposed treatment unit. BMPs designed to maintain or improve AIZ conditions are included in the proposal.

Table: Summary of treatments in the Aquatic Influence Zone (AIZ; management Rx 2.8.3).

Proposed Treatment	Area (acres)		
	Proposed Treatment	Trail Treatment within Proposed Treatment	Total
Trail Treatment Only (outside of other treatments)	-	20	20
Prescribed Fire	275	7	282
Harvest, Standing Tending, & Prescribed Fire	17	1	18
Mechanical & Prescribed Fire	951	27	978
Totals =	1,243	54	1,297

AIZ - General Riparian Area Management (RFP pages 4-50):

RFP Standard: *Within legal authorities, ensure that new proposed management activities within watersheds containing 303(d) listed waterbodies improve or maintain overall progress toward beneficial use attainment for pollutants which led to listing.*

Project Specifics: See Clean Water Act section below. BMPs are included in the proposal to protect water quality.

Other Law, Regulation, and Policy Consistency

Clean Water Act

Through a MOU with the State of Idaho, the Forest is responsible for implementing BMPs during all management activities (USDA FS 2020). The Idaho anti-degradation policy pronounces that the designated uses and the level of water quality necessary to protect those uses shall be maintained and protected (IDEQ 2025). It is also Forest Service Policy to maintain or improve water quality (RFP and FSM 2500 (2520.3)). The State recognizes BMPs as an effective process for protecting beneficial uses and ambient water quality. Project BMPs designed to protect water quality are included in the proposal.

State Water Quality Standards and BMPs: The IDEQ (2025) identifies surface water use designations (i.e., beneficial uses) and the water quality standards necessary to support those uses.

Table: Beneficial uses of relevant waterbodies (IDEQ 2025).

Streams	Beneficial Uses
Midnight, Michaud, Crystal, Clifton, Trail, City, Gibson Jack, Mink, East Fork Mink, West Fork Mink, Kinney, & Indian Creeks, and all other streams	Coldwater Aquatic Life, Primary Contact Recreation, Agricultural and Industrial Water Supply, Wildlife Habitats, and Aesthetics - Protected for all recreational uses and the propagation of fish, shellfish, and wildlife, wherever attainable.

Impaired Waters (§303(d) Listed), Total Maximum Daily Loads (TMDLs), & BMPs: The Idaho Department of Environmental Quality (IDEQ) has identified several water quality assessment units (AUs) in the area as not supporting beneficial uses (IDEQ 2022 & 2024; see table & figures below). IDEQ has established TMDLs for the project area in the Portneuf River and American Falls subbasin assessments (Ray & IDEQ 2010 & IDEQ et al. 2012, respectively). E. coli standards are listed in the state water quality standards (IDEQ 2025). As per the MOU (USDA FS 2020), the USFS is the designated agency for NFS Lands. Accordingly, the Forest must ensure that BMPs are properly implemented to protect or improve water quality. BMPs are included in the proposal PDFs to protect water quality.

Figures: Summary of Idaho's 2022 Integrated Report (IDEQ 2022: <https://mapcase.deq.idaho.gov/wq2022>) & 2024 Draft Integrated Report (IDEQ 2024: <https://mapcase.deq.idaho.gov/wq2024/>).

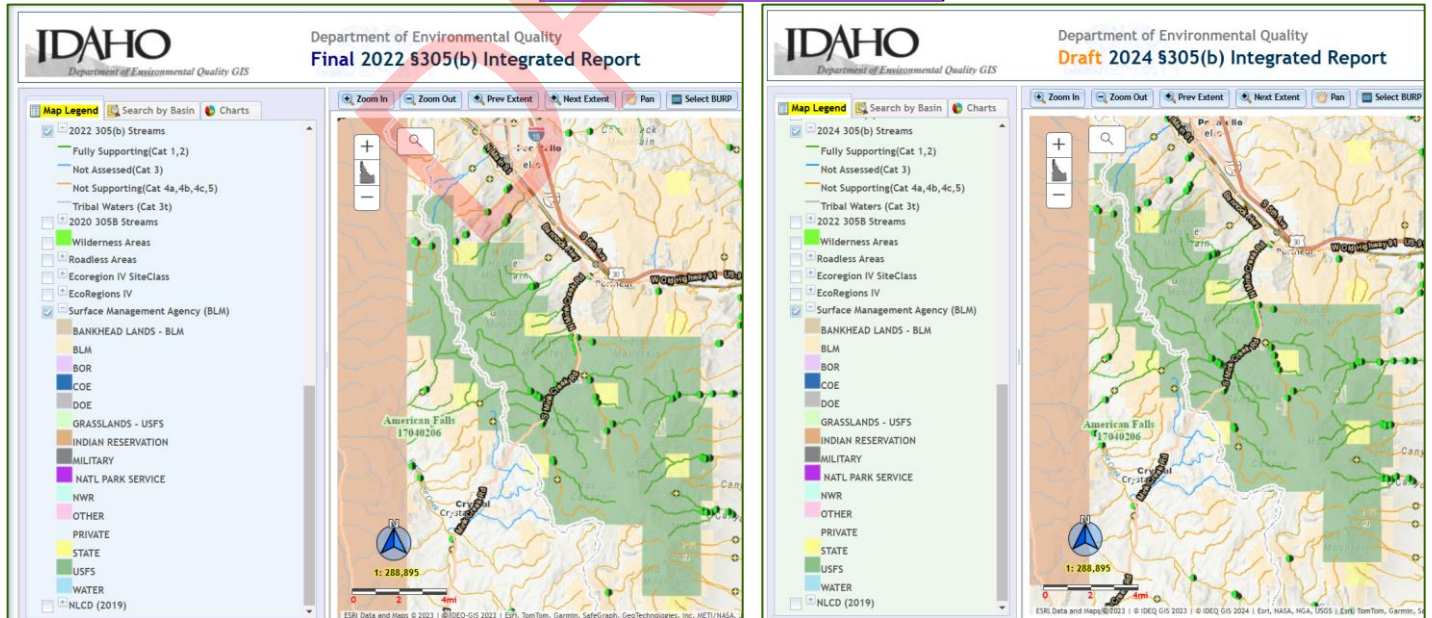


Table: Summary of Idaho's 2022 Final and 2024 Draft Integrated Reports (IDEQ 2022 & 2024).

Assessment Unit (AU) & Relevant Streams*	Beneficial Use Support**	§303(d) Listings, TMDLs, & Comments
AUs with TMDLs or are §303(d) listed and proposed treatments		
ID17040206SK013_02: Michaud Creek & trib's	Fully supporting CWAL. Not supporting SCR.	§303(d) listed for E. coli.
ID17040206SK010_02: Rattlesnake Creek	Not supporting CWAL or SCR.	TMDL for sediment. §303(d) listed for fecal coliform/E. coli.
ID17040208SK001_02: 2 nd order Portneuf River trib's-Johnny	Not supporting CWAL	TMDLs for phosphorus, nitrogen, & sediment.
D17040208SK004_04a: Mink Creek-East Fork to FS boundary	Fully supporting CWAL & SS. Not supporting SCR.	§303(d) listed for E. coli.
ID17040208SK004_02d: East Fork Mink Creek & trib's	Not supporting CWAL, SS, or SCR.	TMDLs for phosphorus, nitrogen, & sediment. §303(d) listed for E. coli.
AUs with no TMDLs and are not §303(d) listed		
ID17040206SK012_02: Midnight Creek & trib's	Fully supporting CWAL or SCR.	-
ID17040208SK001_02a: Cusick Creek & trib's		
ID17040206SK010_02a: Crystal Creek & Trib's	Fully supporting CWAL or SS.	-
ID17040208SK004_02b: West Fork Mink, Chimney, & trib's.	Fully supporting CWAL, SS, & SCR.	-
ID17040208SK003_02a: Gibson Jack Creek, Dry Creek, & trib's		
ID17040208SK004_02: 2 nd order Mink trib's-Campbell, Buck, Doe, & Lead Draw	Fully supporting CWAL	-
AUs in the project area with no proposed treatments		
ID17040206SK011_02: Clifton Creek ID17040208SK001_02b: Trail Creek	Not Assessed.	-
ID17040206SK002_02: Birch Creek & other Bannock Creek trib's	Not supporting CWAL or PCR.	TMDLs for phosphorus & sediment. §303(d) listed for fecal coliform/E. coli.
ID17040208SK002_02: City Creek	Fully supporting CWAL & SS. Not supporting SRC.	§303(d) listed for E. coli.
ID17040208SK004_02a: Kinney Creek	Not supporting CWAL or SCR.	TMDLs for phosphorus, nitrogen, & sediment. §303(d) listed for E. coli.
ID17040208SK001_02c: Papoose Creek	Fully supporting CWAL. Not supporting SCR.	§303(d) listed for E. coli.
ID17040208SK005_02: Indian Creek	Not supporting CWAL or SCR.	TMDL for E. coli. §303(d) listed for biota/habitat bioassessments.

*Trib's=tributaries. **CWAL=coldwater aquatic life; SS=Salmonid spawning; SCR & PCR=secondary or primary contact recreation.

CWA or Stream Channel Protection Permits: Currently, it does not appear that permits are necessary (e.g., Stream Channel Alteration, §404, & §401 permits). Permits are required for any work involving dredge or fill within stream channels or wetlands below the ordinary high-water mark. If temporary roads or other project activities involve stream channel alteration, the Forest should present any regulated actions to the IDWR, USACE, IDEQ, and IDF&G for agency determinations. All necessary permits must be obtained before construction. See the Clean Water Act section above for more details.

Pertinent Executive Orders

EO 11988, Floodplain Management & EO 11990, Protection of Wetlands: The proposal, implemented with the recommended BMPs, is consistent with these Executive Orders. The project would not result in the loss of any floodplains or wetlands. BMPs are included in the design features to protect or improve these resources by moving them towards the desired future conditions for the Aquatic Influence Zone listed in the Revised Forest Plan.

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Appendix A: Hydrologic Disturbance (HD) Analysis

A guideline of the RFP (page 3-17) is that “Not more than 30 percent of any of the principal watershed and/or their subwatersheds (6th HUC) should be in a hydrologically disturbed condition at any one time.” The RFP (page Glossary-15) defines hydrologically disturbed and hydrologically recovered conditions:

Hydrologically Disturbed Condition: *Changes in natural canopy cover (vegetation removal) or a change in surface soil characteristics (such as compaction) that may alter natural streamflow quantities and character. Acres of vegetation within a watershed that are in a non-stocked, seedling, sapling, or first entry category; acres in roads; acres from other types of mechanical treatments and burned acres are included in the calculation of hydrologically disturbed area.*

Hydrologically Recovered Condition: *Vegetative life form where natural canopy coverage is achieved, and subsequent streamflow quantities and character (timing and amount) reflect more natural conditions. Within the forested ecosystem, this equates roughly with the sapling/early pole life form. This life form is achieved at approximately 20 – 30 years of age, depending on cover type and inherent site productivity potentials. Within the non-forested ecosystem, this equates roughly to 80% or pre-fire ground cover, whichever is less, approximately 3-5 years following treatment, depending on inherent site productivity potentials. Roads are considered hydrologically recovered if obliterated or ripped and drained and have 80% or more ground cover.*

Existing HD: The analysis areas are Caribou Project Work Inventory (PWI) Watersheds 20-Lower Portneuf & 21-Rattlesnake and several 6th level/12-digit hydrologic unit codes (HUCs) that intersect the proposed treatments clipped to the PWIs (see Figure - Watersheds). All the watersheds are currently well within the HD guideline.

Table: Estimate of the current hydrologic disturbance (HD) in PWIs & subwatersheds.

Caribou PWI Watershed	Watershed Area (NFS acres)	HD Area (acres)	HD (%)
20-Lower Portneuf	37,384	1,673	4%
21-Rattlesnake	7,335	145	2%

Subwatersheds	Subwatershed Area (NFS acres)	HD Area (acres)	HD (%)
170402060902-Lower Rattlesnake Creek	4,903	151	3%
170402060903-Starlight Creek-Bannock Creek	800	4	<1%
170402060904-Michaud Creek	1,628	20	1%
170402060905-Eagletail Rock-Bannock	423	5	1%
170402080504-Mink Creek	25,869	1,559	6%
170402080505-Gibson Jack Creek	6,821	24	<1%
170402080507-Trail Creek	1,527	18	1%

Proposed HD: The amount of HD generated is proportionate to the area treated and treatment type. For this analysis, I considered the following for estimating the amount of HD generated by the proposal. This criterion provides for a conservative estimate of the proposed hydrologic disturbance given the RFP definition of HD.

- Harvest units with stand tending & prescribed fire = ~70% HD: Most of the area would be treated. Uneven age regeneration harvest would result in multi-age structure with a moderately open forested condition. Two-age regeneration harvest would result in open but stocked forested stands. Stand tending and prescribed fire in the units would likely be mosaic.
- Prescribed fire, mechanical/prescribed fire units, and road/trail treatments = ~50% HD: These units are proposed to be mosaic treatments of various types.

Table: Estimates of the hydrologic disturbance (HD) generated by the proposal.

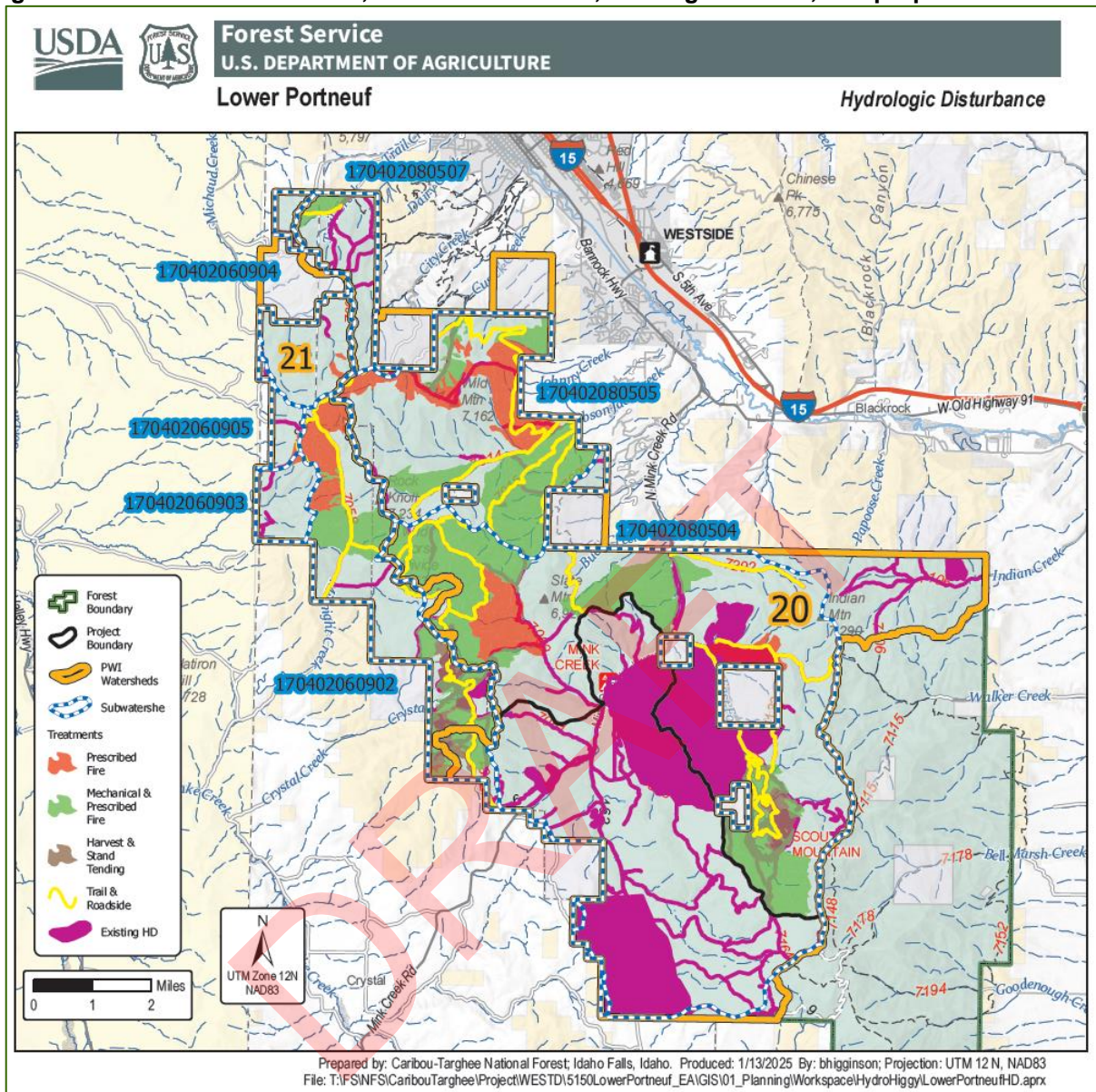
Caribou PWI Watershed	Watershed Area (NFS acres)	HD Area (acres)	HD (%)
20-Lower Portneuf	37,384	4,704	13%
21-Rattlesnake	7,335	1,277	17%
Subwatersheds	Subwatershed Area (NFS acres)	HD Area (acres)	HD (%)
170402060902-Lower Rattlesnake Creek	4,903	1,329	27%
170402060903-Starlight Creek-Bannock Creek	800	9	1%
170402060904-Michaud Creek	1,628	17	1%
170402060905-Eagletail Rock-Bannock	423	12	3%
170402080504-Mink Creek	25,869	2,774	11%
170402080505-Gibson Jack Creek	6,821	1,745	26%
170402080507-Trail Creek	1,527	94	6%

Overall hydrologic disturbance: The overall HD includes relevant past disturbances and the proposal together (i.e., current + proposed). The proposal, included with the existing HD areas, could cause the Lower Rattlesnake and Gibson Jack subwatersheds to approach the 30% HD guideline.

Table: Estimates of the hydrologic disturbance (HD).

Caribou PWI Watershed	Current HD (%)	Proposed HD (%): 70% Harvest; 50% Rx- Rx/Mech	Overall HD (%)
20-Lower Portneuf	4%	13%	17%
21-Rattlesnake	2%	17%	19%
Subwatersheds			
170402060902-Lower Rattlesnake Creek	3%	27%	30%
170402060903-Starlight Creek-Bannock Creek	<1%	1%	2%
170402060904-Michaud Creek	1%	1%	2%
170402060905-Eagletail Rock-Bannock	1%	3%	4%
170402080504-Mink Creek	6%	11%	17%
170402080505-Gibson Jack Creek	<1%	26%	26%
170402080507-Trail Creek	1%	6%	7%

Figure: Caribou PWI watersheds, the subwatersheds, existing HD areas, and proposed treatments.



Data sources:

The GIS project used to estimate hydrologic disturbance for this analysis is filed at:

T:\FS\NFS\CaribouTarghee\Project\WESTD\5150LowerPortneuf_EA\GIS\01_Planning\Workspace\HydroHiggy\LowerPortneufHD.aprx

Existing HD

1. "T:\FS\NFS\CaribouTarghee\Program\2500WatershedAirMgmt\GIS\WCCF\ct_huc6_wshown_hyddist_NAD83.shp" is a conservative hydrologic disturbance layer from the Forest-wide watershed condition classification framework. I modified the file to reflect current conditions:
 - Union of HUC6_ClipPWI.shp and LP_CaribouPrincipleWatersheds → Created HydroAnalysisArea.shp
 - Clipped ct_huc6_wshown_hyddist_NAD83.shp to HydroAnalysisArea.shp → TempHD1.shp
 - Removed polygons that are not hydrologically disturbed (HUC6_HYDDS = "").
 - Removed unneeded attribute columns (blank or unnecessary).
2. I examined the three FACTS layers: Activity Points, Lines, and Polygons (No points or lines in analysis areas). Clipped ActivityCT_FACTs_CommonAttribute_Polygon_EDW (No Invasives Included) to HydroAnalysisArea .shp to create FactsClip.shp.
 - Within FactsClip.shp: Kept activities that have the potential to create hydrologic disturbance and removed activities that do not (e.g., surveys, pollinator habitat improvement). Deleted duplicate polygons and kept latest treatment. Also deleted polygon greater than 30 years old (i.e., hydrologically recovered): this included timber units from 1988 and 1989.
3. For recent wildfires, I clipped the Forest layer FirePerimeter.lyr to HydroAnalysisArea.shp to create FireHD.shp. Fires = Lead Draw (2013, 2017, & 2020), South Mink and Mink (2016), Indian Creek (2018), Michaud Creek (2020).
4. I did a union of TempHD1.shp, FactsClip.shp, and FireHD.shp to create HD_LwerPortPre.shp for existing HD. I proportioned the amount of HD for each polygon based on activity type:
 - Roads and trails are considered 100% HD
 - Fires were assigned 25%, 50%, or 75% HD based on vegetation type and fire year.
 - The remaining polygons from FACTS were assigned 25% HD based on aerial images, treatment type, and age: Crystal Creek Timber Sale (1998-1999) ~25years old, Clifton Creek piles 2008, Scout Mtn. Chipping 2014, Elk Mdw Rx Fire 2018, Scout Mtn pile burn and chipping (2019), South Fork Rearrangement of fuels (2015), Elk Mdws Fuel Break (2013 & 2018), Blind Springs Fuel Break (2023), Kinney Creek Fuel Break (2015), and Kinney/Lead Draw (2015)
 - The Crystal and East Mink Nordic Areas are estimated at 5%HD
 - I removed (0% HD) the following polygons due to age and treatment type: Rx fire >15 years old (Wildhorse 2007 & Buck Doe Rx 2007); West Fork Broadcast burn (2010), Tree release and weed >10 years old (Bannock GS 2013); thinning for hazardous fuels reduction > 10 years old (Elk Meadows Warming Hut 2010); and pile burning > 15 years old: Clifton Creek Piles (2008), Doe Canyon (2008), Gibson Jack Lower (2008)
5. Did identity of HD_LowerPortPre.shp with HydroAnalysisArea.shp for PWI watersheds and sixth level/12-digit HUCs. Created HD_LowerPortPreWS.shp.
6. I exported to excel spreadsheet titled – HydroLwerPort.xlsx to calculate existing HD.

Proposed HD

7. For the roads and trails treatments, I created buffer layers RoadsTrailsBuf12.shp & RoadsTrailsBuff600.shp. I did a union of these 2 buffer layers with the proposed treatments to create TempHD2.shp, which I did an Identity with the HydroAnalysisArea.shp to create HD_LwerPortProposed.shp & ExistingHD. Calculations of the proposed HD are found in HydroLwerPort.xlsx.

Overall HD

8. I did a merge of HD Existing and HD_LwerPortProposed.shp to create HD_LwerPortCumulative.shp. Calculations of the cumulative HD are found in HydroLwerPort.xlsx.
9. My final calculations are found in the excel spreadsheet = HydroLwerPort.xlsx, located at:
T:\FS\NFS\CaribouTarghee\Project\WESTD\5150LowerPortneuf_EA\GIS\01_Planning\Workspace\HydroHiggy