

Zigzag Integrated Resource Project Aquatic Resources Overview

Overview of Project Area:

The Forest Service has created an interactive map that details the project area and proposed actions within it, and includes a walkthrough with instructions for how to use it. The map can be accessed here: [Zigzag Integrated Resource Project Story Map](#).

Your comment should focus on

- purpose and need of the proposed action
- proposed alternatives
- their assessment of the environmental impacts
- proposed mitigation

A substantive/effective comment...

- provides new information about the Proposed Action, an alternative or the analysis
- identifies a different way to meet the need
- points out a specific flaw in the analysis
- suggests alternative methodologies and the reason(s) why they should be used
- makes factual corrections, or identifies a different source of credible research which, if used in the analysis, could result in different effects

Purpose and Need

Riparian habitat in the project area is not meeting the “desired condition” of multi-layer canopy with large-diameter trees, a well-developed understory, more than one age class, and sufficient quantities of snags and down woody debris.

Proposed Action

In riparian areas that lack desired levels of large wood, trees would be felled in adjacent upland areas to create better quality riparian structure. Thinning would be conducted to accelerate and promote desired conditions. Within Riparian Reserves, there are 119 acres of thinning proposed in Mud Creek units, and 175 acres proposed in Horseshoe units.

Explanations of Potential Issues to Comment On

Flooding

Most of the project is in the “transient snow zone”, where sudden snow melt can cause flooding. Open canopy caused by logging increases snow accumulation and therefore increases flood risk, and roads divert runoff to streams. The Forest Service Water Quality Report (posted on Bark’s website) states that the Clear Fork, Mud Creek, and West and East Fork Salmon River are all above the threshold of concern for flooding. This raises concerns because the proposed logging will thin out the tree canopy near these already vulnerable streams, allowing more snow to accumulate on the forest floor. Floods typically occur when rains increase and temperatures

start to warm in the spring, melting snow rapidly and causing a large volume of water to run off into streams all at once. Additional roads in the area can create a “channelizing” effect where water flows along the roads and is diverted to streams in larger volumes than if it was naturally dispersed on the ground.

Points to consider when writing your comment/ reviewing the project documents

- Can you think of any alternatives to logging near these streams?
- Increasing buffer distances around streams that are above the threshold of concern for flooding could help mitigate the above impacts of logging and road building.

Streamflow

The Forest Service only used one study for this analysis: Perry and Jones 2017 [Summer streamflow deficits from regenerating Douglas-fir forest in the Pacific Northwest](#). In this study, they found a reduced streamflow of up to 50% in watersheds that had been at least 50% clearcut. In the Clear Fork watershed, the project would increase the total clearcut percent from 46% to 47%. While the 1% increase is not a lot, this is very close to the 50% threshold found in the Perry and Jones paper where they saw significant impacts on streamflow. The Forest Service’s argument is that 47% is less than 50% so no further analysis is needed. However, common sense tells us that there will surely still be some impacts on streamflow seen at 47% as well. This is a short section in the Water Quality report and it is advisable to go review it and the study linked above and develop your own conclusions as well.

Points to consider when writing your comment/ reviewing the project documents

- Requesting the Forest Service to acknowledge that there will likely be impacts to streamflow even at the 47% clearcut level, and
- Requesting them to do an analysis of the potential impacts on streamflow at levels below 50% clearcut

Sedimentation

The Forest Service states that there has not been a survey for bank stability done at Mud Creek. The analysis of potential impacts is incomplete without this data, because they also stated that Mud Creek is above the threshold of concern for flooding. This means that Mud Creek is significantly susceptible to flooding, and we have no data on how secure its banks are. During a flood event, an unstable bank is more likely to release sediment into the water. Sedimentation negatively affects water quality, and has been shown to increase the mortality rate of salmon and trout eggs. For the Forest Service to accurately quantify potential impacts, it is imperative to know how well the banks of Mud Creek can hold up to a flood event. This issue is compounded by the fact that, as discussed in the section on Flooding above, the proposed logging and road building activities have been proven to increase flood risk. These three factors together indicate that Mud Creek may be more significantly impacted by the project than the Forest Service has concluded.

The Forest Service states that sections of the Muddy Fork already have greater than 10% unstable stream banks (19% - 13%) and sedimentation and embeddedness (12% and 17% respectively) are close to the threshold of concern of 20%. We need further analysis of the potential to increase sediment levels above 20%, which would impair stream function.

The analysis does not adequately address the inevitable reduction in slope stability caused by tree harvest on steep slopes, particularly because they are adjacent to streams. Trees and other vegetation help to stabilize soil and hold it in place. Removing trees exposes the ground to the elements and removes the stabilizing root systems holding soil in place.

Points to consider when writing your comment/ reviewing the project documents

- Requesting Mud Creek be surveyed for bank stability
- Requesting more analysis of slope stability impacts
- Requesting analysis that takes flood potential, bank stability/sedimentation, and streamflow into account as concurrent compounding factors. Currently, their analysis addresses them as separate issues.
- Requesting disclosure of confidence intervals and analysis of potential for variability in the values they produced. Values such as bank stability and sedimentation cannot be quantified at such an exact level, it would likely be a range. These numbers are based on imperfect mathematical models that produce fairly accurate but variable estimations.

Aquatic Species

Higher peak streamflow is associated with higher rates of salmon embryo (egg) mortality. Higher peak streamflow increases sedimentation, which in turn reduces the availability of oxygen by burying and ultimately killing the salmon embryos. As discussed in the Flooding section above, timber harvest and construction of roads have been shown to increase peak streamflow. The Forest Service states that there is a significant reduction in embryo survival for Chinook, cutthroat, and steelhead trout if fine sediment concentration reaches 15-20%. As discussed in the Sedimentation section above, Muddy Creek is already at 12% sedimentation and has greater than 10% unstable banks. These factors together could result in impaired water quality, reducing the quality of habitat for threatened salmon species that inhabit the stream. \

The forest service states that most sedimentation would occur at Clear Fork and Mud Creek while tree harvest and road construction are being conducted. After work is complete, they predict sedimentation levels will return to normal for the most part. This is a good opportunity to request a timing restriction as mitigation for potential effects on salmon eggs during the spawning season. Limiting work to outside of the spawning season would eliminate the possibility of burying and killing eggs.

The Forest Service stated that riparian thinning would not significantly improve desired aquatic habitat conditions vs No Action Alternative. This opens the argument of why they're proposing tree thinning in Riparian Reserves in the first place if there is an insignificant effect on large woody debris recruitment. Large woody debris is one of their main purposes for this project.

No Action Alternative: “With no action, large wood recruitment potential and riparian function would continue to remain low in the short term (< 10 years) and would improve in the mid term (10-100 years) to long term (>100 years).”

Action Alternative: “Timber felling would have an **unsubstantial** effect on large wood debris frequency and recruitment in the short-term (<10 years) and a positive effect on large wood debris frequency and recruitment in the mid-term (10-100 years) to long-term (>100 years) due to accelerated development of late seral characteristics and the production of larger diameter wood than would likely occur under the no action alternative.”

Points to consider when writing your comment/ reviewing the project documents

- Limit work to outside of federally protected salmon spawning seasons
- Where do they intend to get the large “fish logs” they stated they will use to enhance stream habitat? Propose that they do not harvest them within any Riparian Reserves.
- Challenge the fact that they are proposing thinning in Riparian Reserves when their conclusion is that it won’t help them meet one of their main purposes for the project, which is large woody debris recruitment

Definitions of Terms Used in the Environmental Assessment

Aquatic resources

Natural resources such as streams, rivers, wetlands, and riparian areas. Specific plants and animals live in the habitat they provide.

Bank

The sides of a stream channel.

Bank stability

A measure of how likely it is that erosion of a streambank will occur. Physical factors such as temperature, bank material, water movement, and vegetation can affect erosion of a stream bank.

Drainage basin/watershed/catchment

Any area of land where rain water collects and drains into the same outlet, such as into a river, bay, or other body of water.

Buffer

The zone designated around streams in the project area within which certain types of activities are not allowed to occur, such as cutting down trees.

Canopy cover

The amount of the forest floor that is covered/shaded by trees. *E.g.*: less canopy cover would mean there is more sunlight reaching the ground in a forest.

Confidence Interval

Statisticians use a confidence interval to express the degree of uncertainty associated with a result. You can also think of it as the margin of error, though they are technically different from a statistics perspective.

Critical habitat

An area designated by the U.S. Fish and Wildlife Service under the Endangered Species Act that contains the physical or biological features that are essential to the conservation of endangered and threatened species and that may need special management or protection.

Embeddedness

The extent to which rocks (gravel, cobble, and boulders) are surrounded by, covered, or sunken into the bottom of a stream.

Erosion

The process of physically wearing away earth material such as rock and soil over time. Natural processes like wind and water movement cause erosion.

Existing conditions (also referred to as baseline or background conditions)

The current state of the environment in a particular area. In the Environmental Assessment, we need to know the current conditions in Mt. Hood National Forest to be able to understand how the project might impact the area.

Federally listed species

A species that has been recognized by the federal government to be at risk for survival. Species can be listed as threatened, endangered, at-risk, or imperiled. This designation gives the species official protection by the government under the Endangered Species Act. The U.S. Fish and Wildlife Service is the agency responsible for designating species to be listed, and for managing listed species.

Fine sediment concentration

The amount of small particles like sand, silt, and soil that are suspended/floating in the water. Usually expressed as a percentage.

Freshet

The spring thaw resulting from snow and ice melt in rivers and streams. Contributes to peak streamflow.

Habitat

The natural home or environment of an animal, plant, or other organism. An area that contains the conditions that a particular living creature needs to survive.

Large wood debris recruitment potential

A measure of how likely it is that wood will naturally fall off of trees and into streams. Large woody debris would be things like big branches or even entire trees. Younger trees produce less woody debris than older trees.

Large woody debris

Things like big tree branches and logs that fall into streams and provide habitat for fish and other aquatic species. A factor in good riparian habitat quality within Mt. Hood National Forest includes woody debris in streams.

Late seral characteristics

Seral refers to the development stage of the forest. The diversity of plants and animals, as well as tree size and structure, change as a forest ages from young/early seral to older/late seral. A "late seral forest" will have characteristics of a mature forest, with a greater diversity of plant species and older trees. Forests in the late seral stage produce more woody debris, which is desirable for healthy riparian habitat.

Mitigation

An action that lessens the severity of the impacts of an action.

Mortality

The frequency of death in a population.

Peak streamflow

The highest volume of water flowing in a stream at a given time. Annual peak streamflow typically occurs in spring when snow is melting and rainfall is highest.

Regeneration harvest/Clearcut

A term for cutting down all of the trees in a given area.

Riparian zone

The immediate area surrounding a stream or river that is directly influenced by it, such as the bank. Certain types of plants and animals can only live in the riparian zone.

Riparian Reserve

A special management area/land allocation designated by the Northwest Forest Plan. It is defined as lands along streams and unstable and potentially unstable areas where specific standards and guidelines direct land use.

Sedimentation

The process by which particles of sand, dirt, silt and other materials enter a stream. Sedimentation increases turbidity.

Snags

The name for dead trees that are left upright to decompose naturally. When a snag falls down it becomes a log.

Streamflow

The volume of water flowing in a stream or river.

Threshold of Concern

A numerical value assigned to an environmental factor such as sedimentation, above which a significant effect is anticipated. For example, say the threshold of concern for the amount of sediment in a stream is 20%. If a bunch of dirt falls into the stream due to road construction causing the total amount of sediment in the stream to increase to 21%, then the water quality is considered to be significantly impaired. If such an effect was predicted to happen in the Forest Service's analysis of project impacts, then some additional measures would likely be required to mitigate the impacts of road construction on the stream's water quality.

Thinning

The selective removal of trees in an area, leaving a large proportion uncut.

Timing restrictions

A type of mitigation that limits when work can be done. For wildlife, timing restrictions are typically implemented during a species' breeding season to protect them while they breed and raise their young. This can significantly help to reduce the impacts of project actions.

Turbidity

A measure of the cloudiness of water due to the amount of suspended sediments in it.

Understory

The community of plants that grow on the forest floor.