U.S. Fish & Wildlife Service

Bull Trout Emergency Measures 12Aug2025

Bull Trout

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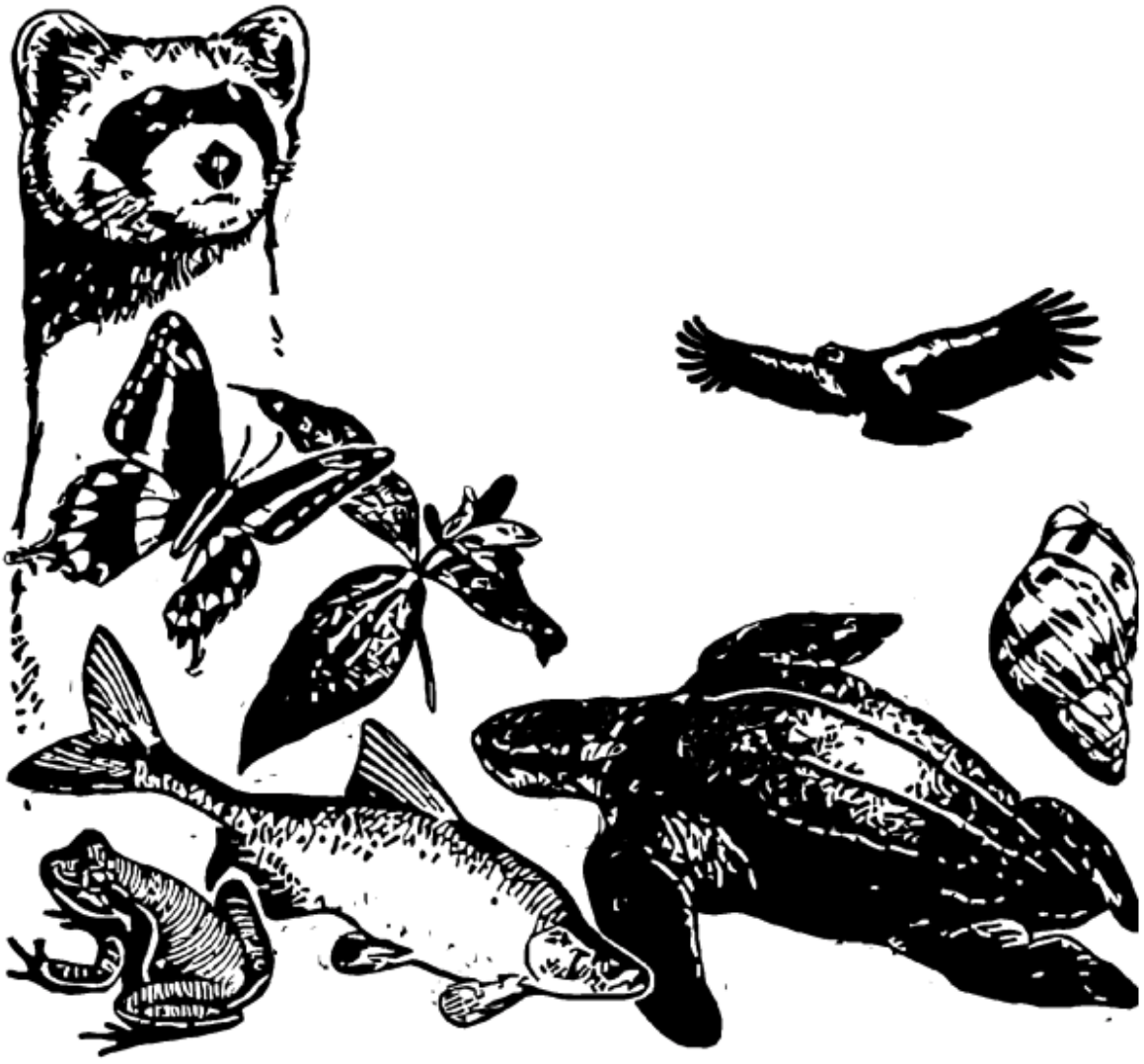

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Bull Trout Conservation Measures for Emergency Responses

August 8, 2025

The following conservation measures were developed by the U.S. Fish and Wildlife Service's Washington Ecological Services (WA ES) Office to help federal action agencies minimize and avoid adverse effects to listed species and designated critical habitat when responding to emergency situations in accordance with 50 CFR § 402.05. If you have any questions regarding these conservation measures or need additional technical assistance, please contact us at: washingtonfwo@fws.gov

The safety of first responders and the public are the highest priorities during emergency responses. Only those conservation measures that do not create a safety hazard should be employed. Federal action agencies should document how the recommended conservation measures were implemented and the results of the implementation in minimizing effects to listed species and their habitats; as well as the amount or extent of any incidental take that occurred because of the response activities. Section 7 consultation for emergency response actions should be initiated once the emergency response has been completed and human life and property are no longer at risk.

If your federal agency proposes to implement an action that is not part of an emergency response, as defined in 50 CFR § 402.05, and your proposed non-emergency action may affect a listed species or designated critical habitat, please contact WA ES (washingtonfwo@fws.gov) for technical assistance.

Recommended Conservation Measures for Emergency Responses

1. General
    a. GIS layers of bull trout distribution and critical habitat are available at: https://ecos.fws.gov/ecp/species/8212.
    b. When possible, prior to implementing activities, aquatic habitats where bull trout may be affected by project activities should be assessed by a qualified biologist to identify potential bull trout presence, habitat function, sensitive areas to avoid, bull trout life stages likely present, and habitat quality.
    c. Use existing roads and trails and avoid taking vehicles off existing roads in riparian areas.
    d. Minimize disturbance to vegetation, ground cover, canopy cover, soil compaction, and avoid cutting or removal of trees within riparian areas in a manner that will affect riparian function. Maintain large wood material and leave felled trees in the riparian areas to provide for future large instream wood and ensure riparian function is maintained.
    e. Avoid effects on groundwater sources to critical habitat and streams occupied by bull trout.

f. Staging areas, access routes, and stockpile areas should be located outside of riparian areas and be in areas that avoid the potential for sediment delivery or contaminants to water channels.
g. Store, fill, fuel, and service equipment in established staging areas.
h. Avoid in-stream work, stream crossings, and sediment-generating activities in bull trout spawning streams to the maximum extent possible.
i. Avoid trampling bull trout redds, disturbing spawning activity, and generating sediment upstream of spawning habitat, as identified by a qualified biologist.
j. Erosion control devices (e.g., silt fences, straw bales, fiber wattles) should be installed prior to initiating any ground disturbing activities or vegetation removal. Erosion control devices should be maintained throughout the duration of the project or until the site is stabilized.
k. All work areas within stream channels should be isolated from the active stream wherever bull trout may be present and affected by the activity.
l. Avoid activities that create over 183 dB of in-water noise (e.g., impact pile driving, in-water drilling, blasting).
m. Only use aquatic formulations of herbicides in riparian areas and avoid application methods that would allow herbicides to enter a waterway.
n. Ground-disturbing activities within stream channels and along the banks of fish-bearing streams and streams less than 0.25-mile from fish-bearing streams, should be performed from July 15 to September 1.
o. Whenever possible, fish passage should be maintained in the action area during construction and following construction. Following construction, adult and juvenile fish passage should meet NMFS's fish passage criteria for the life of the project.
p. When dewatering a work area is necessary to minimize and avoid effects to bull trout, the flow should be diverted around the construction site with a coffer dam (built with non-erosive materials), taking care not to dewater downstream channels at any time. Flow passed around the work areas should use a by-pass culvert or a waterproof lined diversion ditch. Diversion sandbags can be filled with material mined from the floodplain as long as such material is replaced at end of project. If bull trout may be present and pumps are required to dewater, the intake should have a 3/32-inch fish screen and sufficient screen area to reduce suction velocity and avoid impingement. Flow energy should be dissipated at the bypass outflow to prevent damage to riparian vegetation and stream channel. If the diversion allows for downstream fish passage, the diversion outlet should allow for safe reentry of fish into the stream channel, preferably into pool habitat with hiding cover and lower stream temperatures. Pump seepage water from the de-watered work area to temporary storage area or into upland areas and allow water to filter through vegetation prior to reentering the stream channel.
q. If dewatering of the work area is necessary, the work area should first be partially isolated, and fish should be herded out of the partially isolated work area from the upstream to the downstream, and as feasible, with assistance

from a qualified biologist. Immediately following fish herding, the work area below OHWE should be completely isolated from the river to prevent fish from re-entering the work area. Following fish herding and work area isolation, fish salvage should be conducted as the work area is slowly dewatered with methods such as hand or dip-nets, followed by electrofishing, to remove any remaining fish stranded in the isolated area.

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2. Forestry Practices
    a. In waterbodies occupied by bull trout or within 0.25 mile and connected to occupied bull trout waterbodies, designate stream protection buffers that are at least one site-potential tree height or >150 feet from the bank full width (whichever is greater). Within riparian buffers, retain full riparian ecosystem function, including bank stability, shading, pollution removal services, contributions of detrital nutrients, and maintain existing and long-term recruitment of large woody material. Additionally, these buffers should account for the 100-year floodplain and the channel migration zone. For further guidance, WDFW recommendations for riparian areas can be found in Riparian Ecosystems, Volume 2: Management Recommendations.
    b. Leave hazard trees that are felled in riparian areas on site.
    c. Avoid decking and/or bunching trees in riparian areas.
    d. Avoid burning vegetation piles that are larger than 4 feet wide and 4 feet tall.
    e. Maintain riparian vegetation or surface roughness to minimize sediment inputs to adjacent streams.
    f. Locate landings and turnarounds outside of riparian buffers. If locating landings outside of riparian buffers is not possible, avoid harvesting the unit. If harvest must occur, landings and turnarounds should be in areas that have the least effect on riparian function and lowest probability for sediment delivery to water bodies occupied by bull trout. Landings sited within riparian buffers should be sited in consultation with a hydrologist and/or aquatic biologist.

3. Water Drafting
    a. Water drafting should be done during daylight hours in accordance with NMFS Water Drafting Specifications found in the NMFS Salmonid Passage Design Manual, which includes using a 3/32-inch screen, a withdrawal rate that is less than 10% of available streamflow, and sufficient screen surface area to reduce suction velocity and avoid impingement.
    b. If there is a choice between streams to draft from, draft from larger stream.
    c. All pumps used near waterways should have a fuel containment system.
    d. Using fold-a-tanks for out-of-stream water storage to minimize de-watering, disturbance, or other impacts to streams and aquatic resources. Maintain adequate stream flow and avoid draining water bodies.

e. If a sump is necessary, use a culvert crossing if available to create the sump. All structures or dams created for sumps should be removed after the incident. Avoid excavation of the stream channel and the use of mechanized equipment to develop sumps.

4. Hazardous Materials
    a. All equipment should be cleaned and inspected to be free of aquatic and terrestrial invasive or nuisance species or chemical leaks.
    b. Equipment should be well maintained when in the field, and containment systems and a spill kit of appropriate size with supplies and instructions should be kept on site when working near water bodies connected to bull trout occupied streams.
    c. Equipment and personal gear (waders, boots, shovels, etc.) should be sterilized between use in new water bodies to reduce the spread of invasive and nuisance species.
    d. Staging, fueling, and storage areas will be located outside of riparian buffers when possible; if not possible, such areas should be located on level ground at least 50 feet from water on normally dry (preferably compacted) soils.
    e. Erosion control materials or fill should be certified weed free to prevent the spread of noxious weeds and non-native invasive species.
    f. No uncured concrete, form materials, or concrete washouts should be allowed to enter live water.
    g. Treated wood should be consistent with National Marine Fisheries Service guidelines for using treated wood in aquatic environments.

5. Road Maintenance
    a. Ensure road maintenance activities such as grading, dust abatement, and snow removal avoids adding sediment or chemicals to waterways, or damages riparian vegetation.
    b. Avoid blocking flows (via snow and ice dams) in streams when clearing roads during winter months.
    c. Avoid side casting road material into streams.
    d. Avoid disturbing riparian vegetation near stream crossings.
    e. Road maintenance in riparian buffers should not be attempted when surface material is saturated with water and erosion problems could result.
    f. Avoid road maintenance activities during times when listed fish eggs or alevins are in gravels near enough downstream to the disturbance to possibly be affected by the action (generally September – April).
    g. Minimize brushing in riparian buffers.
    h. Avoid the use of chemicals on road surfaces, other than Magnesium chloride or calcium chloride (MgCl2 or CaCl2) salts or lignin-based chemicals such as lignin sulfonate.

6. Temporary Roads

a. Minimize to the extent practical creating temporary and permanent roads or crossings in riparian buffers and unstable areas to avoid erosion and sediment delivery to streams.
b. Avoid stream crossings whenever possible (see Stream Crossings measures if necessary to cross a stream) and minimize the removal of riparian vegetation when creating temporary roads.
c. Avoid building temporary access roads on >30% slopes or where grade, soil, or geomorphic features suggest instability.
d. Minimize the removal of riparian vegetation when creating temporary access roads.
e. Minimize soil disturbance and compaction whenever a new temporary road is necessary within 150 feet of a stream, waterbody, or wetland
f. All temporary access roads should be obliterated (soil decompaction, stabilized, and revegetated) as soon as possible following needed use.

7. Road Decommissioning
    a. Decommissioning of routes should include removing the former roadway or trail (including any imported road base), re-establish natural topography and drainage to the extent possible.
    b. When a road is decommissioned in a floodplain and future vehicle access through the area is still required, relocate the road as far as practical away from the stream or in a location that minimizes impacts to the stream.
    c. Road relocation should be constructed in a manner that will not increase the drainage network. The project should be constructed to hydrologically disconnect road from the stream network to the extent practical. New cross drains should discharge to stable areas where the outflow will quickly infiltrate the soil and not develop a channel to a stream.

8. Stream Crossings
    a. Ford design should incorporate considerations found in Forest Service low water crossing design guidance (USDA 2006)
    b. Avoid building temporary or permanent stream crossings in bull trout occupied habitat or within 600 feet upstream of designated critical habitat.
    c. Fords should avoid creating low-water barriers to fish passage.
    d. Ford approaches should be graded to ensure long-term stability, minimize the potential for sediment delivery, and avoid disrupting hydrologic connectivity.
    e. Minimize the number and length of stream crossings. Crossings should be at right angles and avoid potential spawning areas to the greatest extent possible. Stream crossings should not increase the risk of channel re-routing at low and high-water conditions. Temporary stream crossings should be restored as soon as possible following intended use.

9. Operation of Heavy Equipment:

a. To protect soil quality in riparian conservation areas, the use of heavy mechanical equipment should be restricted to existing routes within riparian areas.
b. In the event of heavy precipitation events, all project operations should cease when possible, except efforts to minimize storm damage and erosion.
c. To the extent feasible, heavy equipment will work from the top of the bank, unless work from another location (instream) would result in less habitat disturbance, less floodplain disturbance, less sediment in the stream channel, or less damage to the overall aquatic and riparian ecosystem.
d. Thoroughly clean equipment before operation below ordinary high water or within 50 feet of any natural water body or areas that drain directly to streams or wetlands and as often as necessary during operation to remain grease free.
e. Minimize time in which heavy equipment is in stream channels, riparian areas, and wetlands. Complete earthwork (including drilling, excavation, dredging, filling and compacting) as quickly as possible. During excavation, stockpile native streambed materials above the bankfull elevation, where it cannot reenter the stream, for later use.

10. Herbicide Use
    a. Do not spray if precipitation is occurring or is imminent (within 24 hours) or when the soil is saturated.
    b. Do not apply herbicides during temperature inversions, or when air temperature exceeds 80 ºF.
    c. Avoid broadcast spraying in riparian buffers. Do not broadcast spray when wind speeds are below 2 mph or exceed 10 mph, increase droplet size and decrease spray pressure to minimize drift, keep boom or nozzle height as low as possible, be aware of wind direction and what habitats are downwind, use drift control agents when needed.
    d. The following herbicide adjuvants should not be used in riparian buffers: Adjuvants that contain alky amine ethoxylates, i.e., polyethoxylated tallow amine (POEA), alkylphenol ethoxylate (including alkyl phenol ethoxylate phosphate esters), herbicides that contain the prior two classes even if not used as adjuvants; Activator 90, Spread 90, LI700, Syl-Tac, Rl 1, Agri-Dex, Valid, and Hilight will not be used within 50 feet of open water.
    e. Herbicide carriers (solvents) should be limited to water or vegetable oil. Avoid use of diesel oil as an herbicide carrier.
    f. Combinations of herbicides in tank mixes that have not specifically been evaluated for aquatic toxicity should be avoided.
    g. Dyes (e.g., Insight) should be used in riparian areas, and other sensitive locations as appropriate to provide visual evidence of treated vegetation.
    h. Applicators should mix and load herbicides and adjuvants, carriers, and/or dyes outside of riparian buffers.
    i. Maintain a spill cleanup kit whenever herbicides are used, transported, or stored.

j. Avoid the use of picloram, clopyralid, chlorsulfuron, dicamba, imazapic, triclopyr, and metsulfuron-methyl within annual floodplains where the water table is within 6 feet and the surface and soil permeability is high (silt loam and sand soils).

11. Site Rehabilitation:
    a. Site rehabilitation activities should be implemented prior to the end of the season or as soon as feasible.
    b. Finished slopes should be stabilized as soon as practical to prevent sediment from entering waterways.
    c. Areas compacted by project activities such as access roads, staging, and/or stockpile areas should be decompacted and stabilized.
    d. Upon project completion, all temporary work structures, equipment, materials, and debris should be removed from project footprint.
    e. Riparian and floodplain rehabilitation materials should mimic those found within the project vicinity.
    f. Stream bank restoration projects should include the establishing a riparian buffer strip consisting of a diverse assemblage of species native to the local ecosystem.
    g. To the extent possible, non-native fill material should be removed from the floodplain and be moved to an upland site and stablized.
    h. When risk of erosion has passed, the sediment control devices should be removed and sediment should be disposed of outside of the floodplain so that cannot be transported into the stream channel.

12. Electrofishing
    a. If fish rescue is necessary, use electrofishing only when other means of fish capture may not be feasible or effective. If electrofishing is used to capture fish for salvage, NMFS electrofishing guidelines should be followed.
        i. Reasonable effort should be made to avoid handling fish in warmer water. When air temperatures or water temperatures are warm, implement fish salvage first thing in the morning. Electrofishing should not occur when water temperatures >15º if bull trout may be affected.
        ii. If bull trout are observed spawning during the in-water work period, electrofishing should not be conducted in the vicinity of spawning fish or active redds.
        iii. Only Direct Current (DC) or Pulsed Direct Current shall be used.
        iv. Conductivity <100, use voltage ranges from 900 to 1100. Conductivity from 100 to 300, use voltage ranges from 500 to 800. Conductivity greater than 300, use voltage to 400.
        v. Begin electrofishing with minimum pulse width and recommended voltage and then gradually increase to the point where fish are immobilized and captured. Turn off current once fish are immobilized.

vi. Do not allow fish to encounter an anode. Do not electrofish an area for an extended period of time. Remove fish immediately from water and handle as described below. Dark bands on the fish indicate injury, suggesting a reduction in voltage and pulse width and longer recovery time.
vii. If mortality is occurring during salvage, immediately discontinue salvage operations (unless it would result in additional fish mortality), reevaluate the current procedures, and adjust or postpone procedures to reduce mortality.

b. Bull trout specific conditions:
    i. Electrofishing should only occur from July 15 to July 31 in potential bull trout spawning areas. Electrofishing in bull trout spawning and rearing habitat should only be implemented in coordination with Fish and Wildlife Service staff oversite.
    ii. Outside of spawning and rearing sites, electrofishing should occur from July 15 to September 1.
    iii. Electrofishing should be avoided when water conditions are turbid and visibility is poor. This condition may be experienced when the sampler cannot see the stream bottom in 1 foot of water.
    iv. Bull trout should not be handled when water temperatures exceed 15º.
    v. Nets, hands, etc. should be free of insect repellant, sunscreen or any other substance that might harm fish.
    vi. Ice packs should be used to keep the capture water temperature <15º
    vii. If using MS 222, the formulation should be buffered to ensure that the level used does not kill fish.

13. Geotechnical Boring (CLAM)
    a. If geotechnical boring will take place in or over water where bull trout are likely present:
        i. Plastic sheeting will be placed under the drill rig that is mounted on the barge and fixed to a perimeter barrier, such as 4x4 wood posts, surrounding the drill rig to contain any possible spills of hydraulic fluid, grease, or other unnatural fluids so they will not enter the water.
        ii. A “mud tub” should be sealed to the barge deck to contain and collect drilling fluid returns and soil cuttings. Cuttings will be cleaned from the drilling fluid using a screen and shovel and drilling fluid will be recirculated downhole during drilling. Installation of casing into the mud line and sealing the “mud tub” will minimize potential for increases in turbidity in the river or marine zone resulting from the drilling operations.
        iii. The drill rig should be fueled off site prior to being placed on the barge and mobilized to the boring locations. No fueling of the drill rig should occur while the barge is in the water.

b. Spill kits should be stationed at the project site/on the barge to absorb any inadvertent spills of hydraulic fluid or grease.
c. Drill cuttings (soil) and used drilling fluid should be contained in appropriately sized drums and disposed of in an off-site, upland location.
d. The operation of the drill rig should be monitored continuously and inspected to ensure there are no potential incidents that could result in an unforeseen equipment malfunction or leak.

14. Wildfire Response
    a. Avoid bulldozer lines as a fire break through or adjacent to streams (or in riparian vegetation) using a handline as an alternative where feasible.
    b. If bulldozer line is needed through or adjacent to a stream, minimize the number of vehicle tracks if possible. If stream crossings are unavoidable, scout the area and choose locations for crossing with gentle slopes and hardened banks. If a crossing location has soft banks, lay 6 to 8-inch diameter trees in the stream and drive (walk) equipment across them. Lift the blade within 25 feet of the waterway and use a hand crew to tie the line together. Avoid paralleling the stream and cross at right angles. Cut dozer lines to the minimum depth needed to expose mineral soil and minimize berm sizes.
    c. Use waterbodies not occupied by bull trout as water sources wherever possible. Once the immediate threat of the wildfire has subsided, use heli-wells to avoid disturbance to listed fish species, and relocate portable pumps out of occupied habitat wherever possible.
    d. Buckets that have contained fire retardant or foam should not be refilled in open waters. Set up a dip tank that is isolated from natural water bodies for this purpose.
    e. Ensure pumps used to remove water from lakes or streams are fitted with screens to reduce fish entrainment.
    f. Use containment systems for portable pumps to avoid fuel spills. Inspect pumps and all fuel cans daily for leaks, and have a spill clean-up kit (e.g., kitty litter, absorbent pads, and trash bags) at each pump site.
    g. Avoid establishing campsites and/or helicopter landing areas adjacent to lakes or streams, if possible.