Kootenai River White Sturgeon Example Conservation Measures 2025

This is a list of example conservation measures for Kootenai River white sturgeon (KRWS). This list is provided upon request or when an official species list is received from IPaC/the Service that includes KRWS as potentially present. Conservation measures are optional techniques or activities that can be utilized by action agencies or action proponents when developing their proposed actions to proactively avoid or minimize impacts from action activities. The Service does not require the adoption of these measures. Conservation measures should be selected as appropriate and implementable for each proposed action. While this list contains conservation measure suggestions, it should be noted that this list is not exhaustive and there may be additional conservation measures that are applicable to your project. Although these conservation measures may help avoid or minimize impacts from certain activities, activities or structures may still result in adverse effects on KRWS. This is a living document, and we will update it with new science and information, as needed.

Conservation Measures by Project Type

Almost all of these optional conservation measures will be relevant to any activity or structure occurring in KRWS habitat. Exclude measures that are not relevant to the specific project. For example, habitat buffers are likely relevant to any project whereas fish passage measures may not be relevant to every project.

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Attend Training

- **Have Spill Response Plans and Materials on Hand**

  Projects using equipment, fuel, oil, or other hazardous materials should have spill response and cleanup kits on site. All appropriate staff should be aware of their location and the spill response plan. The spill response plan should include notification procedures, specific cleanup and disposal instructions for different products, quick response containment and clean up materials that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

  For spillage on land, earthen berms or other suitable barricade material of sufficient size can be constructed to contain the spill and keep it from spreading. For spillage on water, the spilled material should be isolated and contained using commercial booms or other suitable materials, which should be kept on site for use in these situations. Any barges used, such as for debris containment, should be outfitted with spill containment kits to contain 125 percent of the volume of materials aboard.

  Proper spill responses will minimize the chemical contamination of waterways or the environment. Chemical contaminants can injure or kill aquatic food organisms or sturgeon.

  → This conservation measure will be relevant to most activities, including but not limited to those that are occurring in or near water (e.g., bridges, roads, culverts, stream crossings, piles, pipelines, rocks, drilling, heavy equipment use, etc.).

- **Fish Handling for Work Area Isolation**

  Fish should be removed or deterred from a work area. Seines, dip nets, or electrofishing can be used to capture and remove fish from the work area. Block nets can be installed upstream and downstream of a dewatered work area to prevent fish from reentering the work area. Methods to isolate, capture, and move fish should comply with the USFWS "Recommended Fish Exclusion, Capture, Handling, and Electroshocking Protocols and Standards." Individuals removing and handling fish should be properly trained to conduct these procedures.

  These conservation measures will minimize the number of Kootenai River White Sturgeon injured or killed through contact with in-water construction equipment or work area dewatering.

  → This conservation measure will be relevant to most activities, including but not limited to those that are occurring in or near water (e.g., bridges, roads, culverts, stream crossings, piles, pipelines, rocks, drilling, heavy equipment use, etc.).

Clean and Maintain Equipment

- **Equipment Inspection and Maintenance**

  All equipment used for in-channel work should be cleaned of external oil, grease, dirt, mud, plant material or other debris, which may harbor invasive plants or animals; and leaks repaired; prior to arriving at the project site and before use. All equipment should be inspected before unloading at the site and daily. Vehicles operated within 150 feet of any

stream or wetland should be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks or accumulations of grease on any equipment or vehicle should be repaired and cleaned in the staging area before entering streams or areas that drain directly into streams or wetlands. The staging area should also include measures to prevent construction vehicles from tracking sediment offsite or onto roadways where it may wash into waterways or wetlands. These may include gravel access pads, wheel wash stations, or other effective methods.

Inspection and maintenance of vehicles and equipment minimizes the amount of chemical contaminants – which can injure or kill aquatic food organisms or white sturgeon, or alter their habitat – entering waterways. It also prevents the introduction of invasive plants or animals to waterways or wetlands.

→ This conservation measure will be relevant to most activities, including but not limited to those that involve using equipment in or near water (e.g., bridges, roads, culverts, stream crossings, piles, pipelines, rocks, drilling, heavy equipment use, fire suppression etc.).

Control Invasive Species

- **Equipment Inspection and Maintenance**

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Design Projects that Minimize and Reduce Impacts to Habitat

- **Riprap Limitations**

  The use of stone riprap should be limited. It should not further constrict a stream channel, and the elevation of the rock should be limited to the top of the bank. It should be keyed into the toe of the bank as well. Stabilization activities should not exceed 300 linear feet per

continuous run of material and should not exceed one cubic yard of riprap per linear foot below the ordinary high-water mark. The portion of the bank above the rock should also be vegetated with native trees, shrubs, grasses, and forbs according to an approved revegetation plan.
These conservation measures will minimize negative effects of riprap. Excessive or poorly installed riprap can alter streambanks and degrade fish habitat.

→ This conservation measure will be relevant to activities involving the placement of riprap in or near water (e.g., bridges, roads, culverts, stream crossings, streambank stabilization, pipelines, etc.).

- **Stream Crossing Guidelines**

  Temporary stream crossings should be perpendicular to the watercourse and should be located where there are gentle and/or hardened banks. They should be designed to allow unimpeded natural stream flow and movement of existing streambed material. If the crossing location is soft, lay 6 to 8-inch diameter trees in the stream and walk or drive (if absolutely necessary) equipment across them. When crossing with a dozer, the blade should be lifted. The number and width of stream crossings should be minimized. Utility steam crossings should be designed in the following priority: (1) directional drilling, boring and jacking; and (2) dry trenching or plowing. If trenching or plowing are used, all work should be completed in the dry and backfilled with native material, and any large wood displaced by trenching or plowing should be returned to its original position wherever feasible.

  These conservation measures will minimize the effects of stream crossings on sturgeon habitat. Stream crossings can alter the rocky substrate and the inter-gravel spaces that are crucial for sturgeon egg and free embryo development, as well as the surrounding stream habitat.

  →This conservation measure will be relevant to any activities requiring stream crossings. (e.g., bridges, roads, culverts, stream crossings, heavy equipment use, fire suppression etc.).

- **Staging and Storage Locations to Minimize Disturbance**

  Staging areas, waste areas, and other storage areas should be the smallest size possible and in areas that minimize erosion and disturbance to existing vegetation. If available, existing paved areas or existing disturbed areas, such as road prisms, should be used. Staging and storage areas should be clearly marked with orange plastic fencing, flags, or similar methods.

  Minimizing erosion and disturbance to vegetation minimizes sediment flowing into the Kootenai river and sediment deposition on the rocky substrate and in the inter-gravel spaces that are crucial for sturgeon egg and free embryo development. This is especially important during the spawning season from May to the end of June.

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- **Soil Compaction Minimization**

  Removable pads, mats, timber mats, plywood, or other materials can be used to prevent soil compaction by equipment or foot traffic in temporary site access points, staging areas, and work sites.

  Soil compaction can negatively impact the growth of vegetation, and a lack of vegetation can lead to increased erosion and sediment being deposited into waterways. Minimizing soil compaction minimizes sediment flowing into the Kootenai river and sediment deposition on the rocky substrate and in the inter-gravel spaces that are crucial for sturgeon egg and free embryo development. This is especially important during the spawning season from May to the end of June.

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Erosion and Sediment Control

- **Sediment Barriers**

  Sediment barriers should be used for work outside of water by placing them around a disturbed area or on disturbed soil to prevent sediment from entering a body of water. This may include the use of straw bales, straw logs, coir logs, vegetative strips, berms, fiber blankets, bonded fiber matrices, geotextiles, mulches or compost, wattles, or plastic sheeting. This can also include surrounding stockpiles of material with compost berms or covering the piles with imperious materials. All temporary or permanent stockpiles should be located outside of the 100-year floodplain or greater than 300 ft from fish-bearing streams. Sediment barriers should also be used for work in the water. Work in the water should occur within the August 1 to April 1 work window for Kootenai Sturgeon. Barriers may be placed in the water around the work area to prevent sediment from entering open or flowing water. These can include silt curtains, sandbags, silt fence, filter bags, or cofferdams. When cofferdams are used, the work area within the cofferdam will be dewatered using a pump.

  Erosion control materials should be certified weed free in order to prevent the spread of noxious weeds. Sandbags and similar controls should be canvas or another approved non-synthetic material capable of decomposing under normal conditions into carbon dioxide, water, and other naturally occurring materials. Sediment should be removed from control devices once it has reached 1/3 of the exposed height of the control.

Sediment barriers minimize sediment flowing into the Kootenai river and sediment deposition on the rocky substrate and in the inter-gravel spaces that are crucial for sturgeon egg and free embryo development. This is especially of concern during the spawning season from May to the end of June.

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- **Sediment Settling**

  Water that is pumped out of cofferdams or other work areas should be placed in a settling pond to allow sediments to settle. Once sediments have settled, the water can be returned to a body of water.

  Letting sediment settle before moving water to a water body minimizes sediment getting into the Kootenai river and depositing on the rocky substrate and in the inter-gravel spaces that are crucial for sturgeon egg and free embryo development. This is especially of concern during the spawning season from May to the end of June.

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- **Vegetative Erosion Control**

  Disturbed soil should be revegetated with native plants similar to the existing plant community in the area to provide long term stabilization and erosion control. Disturbed areas should be rehabilitated to conditions similar to the pre-work conditions. Streambank and shoreline stabilization must incorporate woody vegetation unless the stream experiences altered hydrology from an impoundment. Woody shrubs that need to be removed as part of a project should be excavated with the root mass intact, retained on site, and replanted during site rehabilitation. When shrubs will not be replanted for site rehabilitation, the root mass should be left in the soil to keep the soil stabilized.

  Vegetative erosion control minimizes sediment flowing into the Kootenai river and sediment deposition on the rocky substrate and in the inter-gravel spaces that are crucial for sturgeon egg and free embryo development. This is especially of concern during the spawning season from May to the end of June.

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- **Site Rehabilitation Measures**

  After construction, maintenance, or demolition activities, work sites should be rehabilitated. Site rehabilitation should include establishing long-term erosion protection measures using boulder-sized riprap, native plantings, erosion control fabric, seed, mulch, or other effective measures. Finished slopes should be stabilized as soon as practical to prevent sediment from entering waterways. Avoid seeding and planting with palatable forage species in areas of human development adjacent to grizzly bear habitat. Palatable species vary by location and local conditions. Generally, avoid clovers (Trifolium spp.), fruits, and succulents. Native materials (e.g. substrate, riparian vegetation, rock, woody debris) excavated on-site, should be conserved and stockpiled for later use in channel reconstruction, filling of culverts, or other site rehabilitation, and should be kept separate from other stockpiled material which is not native to the site. Whenever possible, woody shrubs that need to be removed as part of a project should be excavated with root ball intact, retained on site, and replanted as part of the site rehabilitation. Any hazard trees felled in riparian areas should be left in the riparian area.

  These conservation measures will minimize long-term damage to habitat. Long-term damage to habitat can adversely affect its ability to support all the life stages of Kootenai River White Sturgeon and can degrade the capability of sustaining diverse native plant and animal populations and tolerating natural disturbances and altered regimes. For example, sediment entering the Kootenai River may be deposited on the rocky substrate and the inter-gravel spaces that are crucial for sturgeon egg and free embryo development, adversely affecting the survival and productivity of Kootenai Sturgeon.

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- **Precipitation and High Flow Limitations**

  Project operations should cease under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resources damage. They should also cease during precipitation events or when precipitation is imminent. Precipitation events include any rain or snow accumulations that have the potential to discharge to waterways or wetlands. This is especially important for ground disturbing activities, as ceasing operations will minimize the amount of sediment washing into waterways or wetlands. Precipitation events include any rain or snow accumulations that have the potential to discharge to waterways or wetlands. Additionally, all work below the ordinary high-water mark should take place during low flow conditions, unless otherwise unfeasible. Low flow conditions typically occur from late summer through fall.

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Habitat Preservation

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Implement a Spill Prevention Plan

- **Have Spill Response Plans and Materials on Hand**

  Projects using equipment, fuel, oil, or other hazardous materials should have spill response and cleanup kits on site. All appropriate staff should be aware of their location and the spill response plan. The spill response plan should include notification procedures, specific cleanup and disposal instructions for different products, quick response containment and clean up materials that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

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Implement Contaminant Control Measures

- **Staging, Fueling, Maintenance, and Storage Isolation for Pollution Prevention**

  Equipment fueling, maintenance, storage, staging, and fuel, waste, or hazardous material storage should occur in non-wetland areas landward of the ordinary high water mark, at least 150 feet from any stream or wetland. If such an area is unavailable, these activities should occur as far away as possible perpendicular from any water body. Storage should be located away from concentrated flows of stormwater, drainage courses, inlets, and bridge drains, and measures should be in place to ensure contaminants will not enter water because of high water, precipitation runoff, wind, storage facility failure, accidents in operation, or unauthorized third-party activities.

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- **Equipment Storage Leak Containment**

  Measures such as drip pans or absorbent pads should be placed underneath stored or stationary equipment to catch potential leaks of oil, fuel, or hazardous material. This can help minimize the impacts of leaks that occur in between daily inspections and use, which minimizes the amount of chemical contaminants – which can injure or kill aquatic food organisms or white sturgeon, or alter their habitat – entering waterways.

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- **Stormwater Filtration**

  Sheet flow run-off from paved areas should be directed into vegetated swales or filter strips to remove pollutants. This minimizes the amount of chemical contaminants – which can injure or kill aquatic food organisms or white sturgeon, or alter their habitat – entering waterways.

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- **Stormwater Control/Treatment**

  Stormwater controls should be implemented to infiltrate, retain, or detain runoff to maintain water quality. They should be able to retain the runoff volume produced from a 24-hour, 95th percentile storm event, or they should be able to attain an equal or greater level of water quality benefits as onsite retention from a 24-hour, 95th percentile storm event. Stormwater can also be treated and discharged into surface water or a wetland. One or more of the primary treatment practices found in the ITD BMP Manual, Chapter 5, should be applied. Also, natural drainage patterns should be maintained to the maximum extent practicable. Water quality treatment for contributing impervious area runoff should be completed before commingling with offsite runoff for conveyance. Erosion of the flow path from the project to the receiving water should be prevented and, if necessary, a discharge

facility made entirely of manufactured elements (e.g. pipes, ditched, discharge facility protection) that extends at least to the ordinary high-water mark should be available.

These conservation measures will minimize the amount of chemical contaminants and sediment introduced into waterways and wetlands by stormwater. Chemical contaminants can injure or kill aquatic food organisms or Kootenai River White Sturgeon. Sediment deposition on the rocky substrate and inter-gravel spaces at the bottom of the river can adversely affect sturgeon egg and free embryo development.

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- **Debris Containment**

  Maintenance and deconstruction of bridges and other structures can result in debris being dislodged. Measures to capture this debris before it enters a waterway or the environment should be used to prevent sediment or chemical contamination of the waterway or the environment.

  Airborne dust particles can be contained using an enclosed containment structure. When using a dry-blade concrete saw, dust particles can be captured by the enclosed containment structure, and a shop vacuum can be used to collect the dust for offsite disposal. When using a wet-blade concrete saw, a catch basin should be constructed to collect the water/slurry, and a shop vacuum should be used to collect the slurry for offsite disposal. If a stinger is used to remove piers, then a sandbag barrier or a similar barrier can be placed between the pier and the live water to catch debris. Temporary platforms, a temporary work bridge, or a barge anchored below a work site can be used to catch falling debris from work conducted at the top of a pier.

  These conservation measures will minimize the amount of sediment and chemical contaminants entering the Kootenai River. Sediment can be deposited on rocky substates that are crucial for sturgeon egg and free embryo development, especially during the spawning season from May to the end of June, and chemical contaminants can injure or kill aquatic food organisms or white sturgeon.

  →This conservation measure will be relevant to any activities that produce debris and occur in or near water (e.g., bridges, roads, culverts, stream crossings, piles, drilling, etc.).

Implement Discharge Control Measures

- **Stormwater Filtration**

  Sheet flow run-off from paved areas should be directed into vegetated swales or filter strips to remove pollutants. This minimizes the amount of chemical contaminants – which can injure or kill aquatic food organisms or white sturgeon, or alter their habitat – entering waterways.

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  →This conservation measure will be relevant to most activities, including but not limited to those that are occurring in or near water (e.g., bridges, roads, culverts, stream crossings, piles, pipelines, rocks, drilling, heavy equipment use, etc.).

- **Turbidity and pH Monitoring**

  When there is a potential for in-water work to discharge harmful levels of sediment or pH elevating pollutants, turbidity and pH levels of the waterway should be monitored. The turbidity and pH monitors should be placed at the same locations, and measurements should be taken simultaneously. Measurements should be taken 100 ft above and 100 ft below the potential discharge points. If work activities result in an increase over background turbidity greater than 50 NTU instantaneously or 25 NTW over ten consecutive days, activities should be ceased until turbidity levels return to below 25 NTU. The pH values of surface waters should remain between 6.5 and 9.0. For any pH values over 9.0, work activities should cease until pH levels return to values less than 9.0.

  Elevated turbidity can temporarily displace or injure sturgeon, or it can lead to sediment deposition on rocky substrates that are crucial for sturgeon egg and free embryo development, and elevated pH can indicate the introduction of chemical contaminants, which can injure or kill aquatic food organisms or sturgeon. Monitoring these conditions helps indicate if contamination is reaching a dangerous level.

→This conservation measure will be relevant to most activities, including but not limited to those that are occurring in or near water (e.g., bridges, roads, culverts, stream crossings, piles, pipelines, drilling, heavy equipment use, etc.).

Implement Fish Passage Measures

- **Fish Screens**

  Fish screens should be installed on water pumps and intakes. They should follow NMFS screening criteria. Screening should follow the appropriate standards for the most vulnerable life stage of Kootenai River White Sturgeon that is likely to be present. These standards take into consideration the swimming ability of the fish, along with the type of screen, structure placement, orientation to the flow, hydraulics, screen material, and other factors.

  These conservation measures will minimize the number of juvenile sturgeon and their prey species becoming entrained in water intakes or pumps, preventing them from being killed or effectively removed from the population.

  →This conservation measure will be relevant to any activity involving water pumps or intakes (e.g., cofferdams, bridges, roads, culverts, stream crossings, piles, pipelines, etc.).

Implement Underwater Sound Reduction Measures

- **Sound Reduction**

  Equipment should be chosen to minimize the noise produced by work activities. When maintaining piles, the smallest size and lowest impact, hand-held equipment necessary to perform the work should be used. When installing piles, pile locations should be predrilled when feasible, and a pneumatic vibratory hammer should be used unless impact hammer pile drivers are necessary due to substrate or load bearing conditions. A wood cushion should be placed between a pile and a diesel hammer to minimize noise levels as well. A bubble curtain, which is places below the water surface around the area that the pile is being driven, can also minimize noise levels.

  These conservation measures will minimize the effects of noise on Kootenai River White Sturgeon. Excessive noise can cause injury and/or mortality and behavioral effects to sturgeon.

  →This conservation measure will be relevant to any pile maintenance or pile installation in or near water (e.g., bridge construction, dock construction, etc.).

- **Sound Timing Limitations**

  There should be at least 12-hours within each 24-hour period where no impact hammer pile driving takes place. This gives fish the opportunity to move through the project area without being subjected to impact pile driving noise. The 12-hours should occur during

early evening, night-time, and early morning hours. All in-channel pile driving should occur within the August 1 to April 1 work window for Kootenai sturgeon.

These conservation measures will minimize the effects of noise on Kootenai River White Sturgeon. Excessive noise can cause injury and/or mortality and behavioral effects to sturgeon.

→This conservation measure will be relevant to any pile maintenance or pile installation in or near water (e.g., bridge construction, dock construction, etc.).

Institute Seasonal Avoidance Measures

- **Sound Timing Limitations**

  There should be at least 12-hours within each 24-hour period where no impact hammer pile driving takes place. This gives fish the opportunity to move through the project area without being subjected to impact pile driving noise. The 12-hours should occur during early evening, night-time, and early morning hours. All in-channel pile driving should occur within the August 1 to April 1 work window for Kootenai sturgeon.

  These conservation measures will minimize the effects of noise on Kootenai River White Sturgeon. Excessive noise can cause injury and/or mortality and behavioral effects to sturgeon.

  →This conservation measure will be relevant to any pile maintenance or pile installation in or near water (e.g., bridge construction, dock construction, etc.).

Maintain Habitat Buffers

- **Fish Handling for Work Area Isolation**

  Fish should be removed or deterred from a work area. Seines, dip nets, or electrofishing can be used to capture and remove fish from the work area. Block nets can be installed upstream and downstream of a dewatered work area to prevent fish from reentering the work area. Methods to isolate, capture, and move fish should comply with the USFWS "Recommended Fish Exclusion, Capture, Handling, and Electroshocking Protocols and Standards." Individuals removing and handling fish should be properly trained to conduct these procedures.

  These conservation measures will minimize the number of Kootenai River White Sturgeon injured or killed through contact with in-water construction equipment or work area dewatering.

  →This conservation measure will be relevant to most activities, including but not limited to those that are occurring in or near water (e.g., bridges, roads, culverts, stream crossings, piles, pipelines, rocks, drilling, heavy equipment use, etc.).

Minimize Impacts to Forage Base

- **Equipment Inspection and Maintenance**

  All equipment used for in-channel work should be cleaned of external oil, grease, dirt, mud, plant material or other debris, which may harbor invasive plants or animals; and leaks repaired; prior to arriving at the project site and before use. All equipment should be inspected before unloading at the site and daily. Vehicles operated within 150 feet of any stream or wetland should be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks or accumulations of grease on any equipment or vehicle should be repaired and cleaned in the staging area before entering streams or areas that drain directly into streams or wetlands. The staging area should also include measures to prevent construction vehicles from tracking sediment offsite or onto roadways where it may wash into waterways or wetlands. These may include gravel access pads, wheel wash stations, or other effective methods.

  Inspection and maintenance of vehicles and equipment minimizes the amount of chemical contaminants – which can injure or kill aquatic food organisms or white sturgeon, or alter their habitat – entering waterways. It also prevents the introduction of invasive plants or animals to waterways or wetlands.

  →This conservation measure will be relevant to most activities, including but not limited to those that involve using equipment in or near water (e.g., bridges, roads, culverts, stream crossings, piles, pipelines, rocks, drilling, heavy equipment use, fire suppression etc.).

- **Have Spill Response Plans and Materials on Hand**

  Projects using equipment, fuel, oil, or other hazardous materials should have spill response and cleanup kits on site. All appropriate staff should be aware of their location and the spill response plan. The spill response plan should include notification procedures, specific cleanup and disposal instructions for different products, quick response containment and clean up materials that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

  For spillage on land, earthen berms or other suitable barricade material of sufficient size can be constructed to contain the spill and keep it from spreading. For spillage on water, the spilled material should be isolated and contained using commercial booms or other suitable materials, which should be kept on site for use in these situations. Any barges used, such as for debris containment, should be outfitted with spill containment kits to contain 125 percent of the volume of materials aboard.

  Proper spill responses will minimize the chemical contamination of waterways or the environment. Chemical contaminants can injure or kill aquatic food organisms or sturgeon.

  →This conservation measure will be relevant to most activities, including but not limited to those that are occurring in or near water (e.g., bridges, roads, culverts, stream crossings, piles, pipelines, rocks, drilling, heavy equipment use, etc.).

- **Staging, Fueling, Maintenance, and Storage Isolation for Pollution Prevention**

  Equipment fueling, maintenance, storage, staging, and fuel, waste, or hazardous material storage should occur in non-wetland areas landward of the ordinary high water mark, at least 150 feet from any stream or wetland. If such an area is unavailable, these activities should occur as far away as possible perpendicular from any water body. Storage should be located away from concentrated flows of stormwater, drainage courses, inlets, and bridge drains, and measures should be in place to ensure contaminants will not enter water because of high water, precipitation runoff, wind, storage facility failure, accidents in operation, or unauthorized third-party activities.

  These conservation measures will minimize the amount of chemical contaminants – which can injure or kill aquatic food organisms or white sturgeon, or alter their habitat – entering waterways.

  →This conservation measure will be relevant to most activities, including but not limited to those that are occurring in or near water, those that require equipment, and those that require storage of equipment, waste, or other materials (e.g., bridges, roads, culverts, stream crossings, piles, pipelines, rocks, drilling, heavy equipment use, fire suppression etc.).

- **Stormwater Filtration**

  Sheet flow run-off from paved areas should be directed into vegetated swales or filter strips to remove pollutants. This minimizes the amount of chemical contaminants – which can injure or kill aquatic food organisms or white sturgeon, or alter their habitat – entering waterways.

  →This conservation measure will be relevant to most activities, including but not limited to those that are occurring in or near water (e.g., bridges, roads, culverts, stream crossings, piles, pipelines, rocks, drilling, heavy equipment use, etc.).

- **Stormwater control/treatment**

  Stormwater controls should be implemented to infiltrate, retain, or detain runoff to maintain water quality. They should be able to retain the runoff volume produced from a 24-hour, 95th percentile storm event, or they should be able to attain an equal or greater level of water quality benefits as onsite retention from a 24-hour, 95th percentile storm event. Stormwater can also be treated and discharged into surface water or a wetland. One or more of the primary treatment practices found in the ITD BMP Manual, Chapter 5, should be applied. Also, natural drainage patterns should be maintained to the maximum extent practicable. Water quality treatment for contributing impervious area runoff should be completed before commingling with offsite runoff for conveyance. Erosion of the flow path from the project to the receiving water should be prevented and, if necessary, a discharge facility made entirely of manufactured elements (e.g. pipes,

ditched, discharge facility protection) that extends at least to the ordinary high-water mark should be available.

These conservation measures will minimize the amount of chemical contaminants and sediment introduced into waterways and wetlands by stormwater. Chemical contaminants can injure or kill aquatic food organisms or Kootenai River White Sturgeon. Sediment deposition on the rocky substrate and inter-gravel spaces at the bottom of the river can adversely affect sturgeon egg and free embryo development.

→This conservation measure will be relevant to most activities, including but not limited to those that are occurring in or near water (e.g., bridges, roads, culverts, stream crossings, piles, pipelines, rocks, drilling, heavy equipment use, etc.).

- **Debris Containment**

  Maintenance and deconstruction of bridges and other structures can result in debris being dislodged. Measures to capture this debris before it enters a waterway or the environment should be used to prevent sediment or chemical contamination of the waterway or the environment.

  Airborne dust particles can be contained using an enclosed containment structure. When using a dry-blade concrete saw, dust particles can be captured by the enclosed containment structure, and a shop vacuum can be used to collect the dust for offsite disposal. When using a wet-blade concrete saw, a catch basin should be constructed to collect the water/slurry, and a shop vacuum should be used to collect the slurry for offsite disposal. If a stinger is used to remove piers, then a sandbag barrier or a similar barrier can be placed between the pier and the live water to catch debris. Temporary platforms, a temporary work bridge, or a barge anchored below a work site can be used to catch falling debris from work conducted at the top of a pier.

  These conservation measures will minimize the amount of sediment and chemical contaminants entering the Kootenai River. Sediment can be deposited on rocky substates that are crucial for sturgeon egg and free embryo development, especially during the spawning season from May to the end of June, and chemical contaminants can injure or kill aquatic food organisms or white sturgeon.

  →This conservation measure will be relevant to any activities that produce debris and occur in or near water (e.g., bridges, roads, culverts, stream crossings, piles, drilling, etc.).

Minimize In-Water Work

- **Precipitation and High Flow Limitations**

  Project operations should cease under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resources damage. They should also cease during precipitation events or when precipitation is imminent. Precipitation events include any rain or snow accumulations that have the potential to discharge to

waterways or wetlands. This is especially important for ground disturbing activities, as ceasing operations will minimize the amount of sediment washing into waterways or wetlands. Precipitation events include any rain or snow accumulations that have the potential to discharge to waterways or wetlands. Additionally, all work below the ordinary high-water mark should take place during low flow conditions, unless otherwise unfeasible. Low flow conditions typically occur from late summer through fall.

These conservation measures will minimize the amount of sediment entering the Kootenai River. If sediment enters the river, it may be deposited on the rocky substrate and the inter-gravel spaces that are crucial for sturgeon egg and free embryo development, adversely affecting the habitat.

→This conservation measure will be relevant to most activities, including but not limited to those that are occurring in or near water (e.g., bridges, roads, culverts, stream crossings, piles, pipelines, rocks, drilling, heavy equipment use, etc.).

- **Sound Timing Limitations**

  There should be at least 12-hours within each 24-hour period where no impact hammer pile driving takes place. This gives fish the opportunity to move through the project area without being subjected to impact pile driving noise. The 12-hours should occur during early evening, night-time, and early morning hours. All in-channel pile driving should occur within the August 1 to April 1 work window for Kootenai sturgeon.

  These conservation measures will minimize the effects of noise on Kootenai River White Sturgeon. Excessive noise can cause injury and/or mortality and behavioral effects to sturgeon.

  →This conservation measure will be relevant to any pile maintenance or pile installation in or near water (e.g., bridge construction, dock construction, etc.).