Environmental Assessment

Float Bridge Training and Amphibious River Training Exercises

Yakima Training Center, Washington

Prepared by:

Environment and Natural Resource Division
Directorate of Public Works
Yakima Training Center
Building 810
Yakima, WA 98901-9399

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Prepared By:

Damon G. Roberts
Natural Resource Management Specialist
ENRD, Public Works, YTC

Reviewed By:
ARIM Chief

For Ronald F. Diana
Colonel, U.S. Army
Engineer, 70th RRC ARIM

Reviewed By:
Commander, Yakima Training Center

F.J. Nohmer
Lieutenant Colonel, U.S. Army
Commander

Approved By:
Garrison Commander, Fort Lewis

M.K. Stephenson
Colonel, U.S. Army
Garrison Commander

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Chapter 1 Purpose of and Need for the Proposed Action

1.1 Introduction

River crossing and amphibious training operations are an integral part of land warfare. An army's ability to cross significant water obstacles is often a critical component of warfare. The lethality of modern weapons and the capabilities of larger enemy formations have mandated that U.S. Army forces adopt an Air-Land Battle Doctrine that relies heavily upon the ability to maneuver quickly over large areas. The ability of the U.S. Army to cross rivers quickly and efficiently and to conduct successful amphibious operations is critical to the success of the Air-Land Battle Doctrine.

Training facility requirements for Army units are outlined in Training Circular 25-8 (TC 25-8). These facility requirements are designed to ensure each unit maintains a high level of proficiency on its individual unit mission essential task list (METL). TC 25-8 also addresses unit proficiency and readiness by requiring unit commanders to focus training on the sustainability of perishable individual and crew skills. Skills must be maintained at a level that consists of fully integrated combat, combat support, combat service support, and Joint Forces. To meet all skill requirements of TC 25-8, training facilities for river crossing and amphibious operations must provide connectivity between a large training area and a suitable water body that will provide realistic (e.g., large operational and combined activity theater) individual and combined unit training opportunities.

Fort Lewis and its sub-installation Yakima Training Center (YTC) (Figure 1-1) support U.S. Army Active and Reserve Components for a variety of exercises involving maneuvers, range firing activities, river crossing activities, and other required training. YTC and adjacent private and public lands have been used for river crossing exercises for many years. The Army has acquired real estate agreements from private entities and public agencies to support river training activities on the Columbia River at Priest Rapids Reservoir. The original Environmental Assessment (EA) for float bridge training exercises was prepared in 1991. A subsequent programmatic EA was prepared in 1996. Several salmonid species have been listed subsequent to the preparation of this EA.

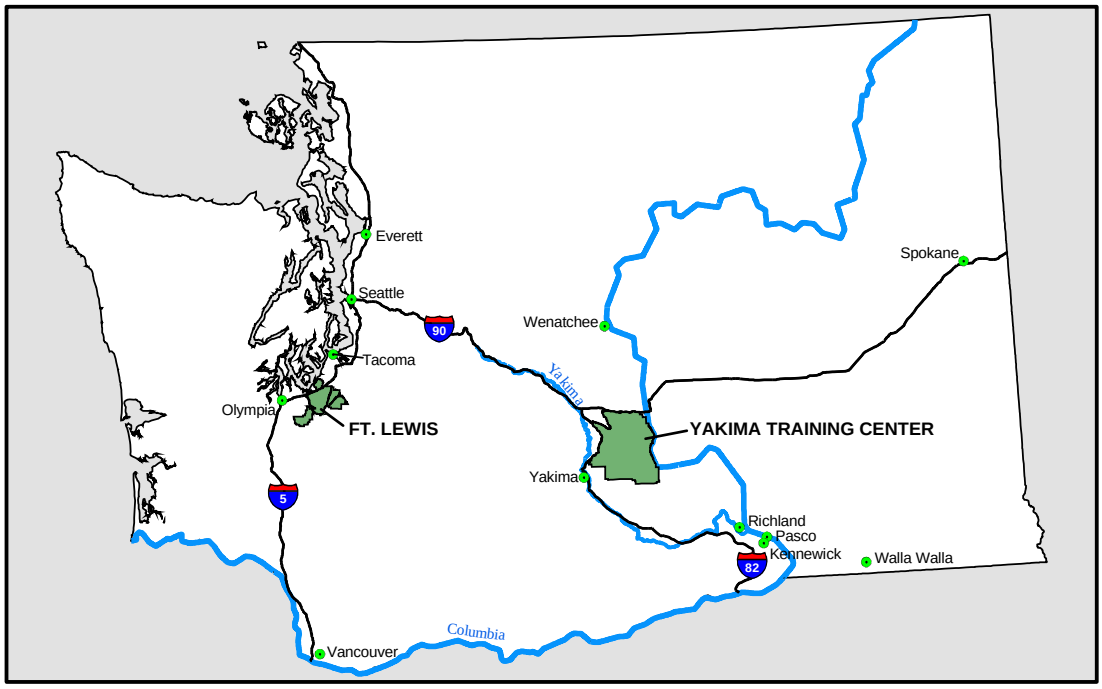

Figure 1-1. Locations of Fort Lewis and YTC

1.2 Purpose and Need

The purpose of the proposed action is to support regional commanders' needs to maintain unit readiness. Consequently, there is a need to provide amphibious and river crossing training opportunities for military units within the region. A number of combat support, combat service support, joint and special operations forces are stationed within the region (both active and reserve components) that are required to maintain readiness of river crossing or amphibious METL skills. Currently, there is no single location within the northwest region where units can practice and maintain all of these unit METL requirements.

A set of site suitability elements have been identified to assist with determining where sites may exist within the region that could satisfy the military training requirements described above. The intent of these elements is to establish criteria of suitable locations that will meet the purpose and need of the proposed action. The six elements used to compare sites are as follows.

- **Connectivity.** Connectivity must exist between an existing military installation within the three state region of Washington, Oregon, and Idaho and a suitable water body that can support both river crossing and amphibious training requirements outlined in TC 25-8.
- **Integrated Training Capability.** The military installation must have the capability (e.g., land mass) to fully support integrated training for combat, combat support, combat service support, and joint and special operations forces over extended distances.

- **Adequate Facilities.** Adequate road networks and staging areas must exist at both the water body and adjacent military installation to support convoy and staging operations.
- **Suitable Water Conditions.** A suitable site must include adequate water depth and current necessary to support realistic river crossing conditions (approximately ½ mile wide and less than three ft per second velocity of current).
- **Shoreline Conditions.** Shoreline conditions must include a firm, gradual incline from water to land to allow the ingress and egress of launching equipment.
- **Compatibility.** A suitable site must include compatible use with existing uses at the water body (including associated access and staging area), and the military installation.

Chapter 2 Description of the Proposed Action

2.1 Introduction

The Army proposes to conduct river training exercises at Priest Rapids Reservoir on the Columbia River (Figure 2-1). The river crossing site (RSC) is located on the eastern boundary of the YTC along the Columbia River (Figure 2-2). Ingress and egress exercises will occur at the YTC RCS on the west side of the river. The eastern shore of the Columbia River at the RCS is owned by Grant County Public Utility District (GCPUD). During training, the Army would bivouac at sites on YTC.

River training exercises would include two types of activities: moving armored and wheeled forces across the river using the ribbon bridge system, and miscellaneous amphibious activities. River crossing training events would last for up to 10 days at a time per event. The frequency of training exercises in a given year may vary, but would not exceed six times a year for each type of training event for a total of 120 days/year.

The proposed action includes connected activities (e.g., bivouacking, driving on improved and unimproved roads) that will occur on YTC that have been described in previous National Environmental Policy Act (NEPA) documents (e.g., Environmental Impact Statement (EIS) for Stationing of Armored and Mechanized Forces at Fort Lewis, WA 1994; and the EA for Interim Brigade Combat Team Transformation at Fort Lewis, WA 2001). While these activities are connected to the proposed action, they are ongoing land use activities at YTC that will continue regardless of the proposed action. Consequently, connected activities that occur outside the footprint of the RCS are considered ongoing actions and will not be discussed further in this document. The need to develop this updated EA was based on three underlying requirements; recent listing of salmonid species Evolutionary Significant Unit's (ESU) on the Columbia River, the need to acquire state and federal water use permits, and the Army's need to provide updated NEPA documentation to secure required land use permits.

The following paragraphs describe the floating ribbon bridge equipment used in river crossing exercises, which are followed by a description of the exercises themselves. In addition, other amphibious training associated with the river crossing exercises is described.

The ribbon bridge currently is the U.S. Army's primary assault floating bridge. It is a floating, modular system with an integral superstructure and floating supports. The floating bridge sections, or bays, are of two types: interior bays and ramp bays. Individual bays can be joined to form rafts or bridges. For training exercises, rafts are used.

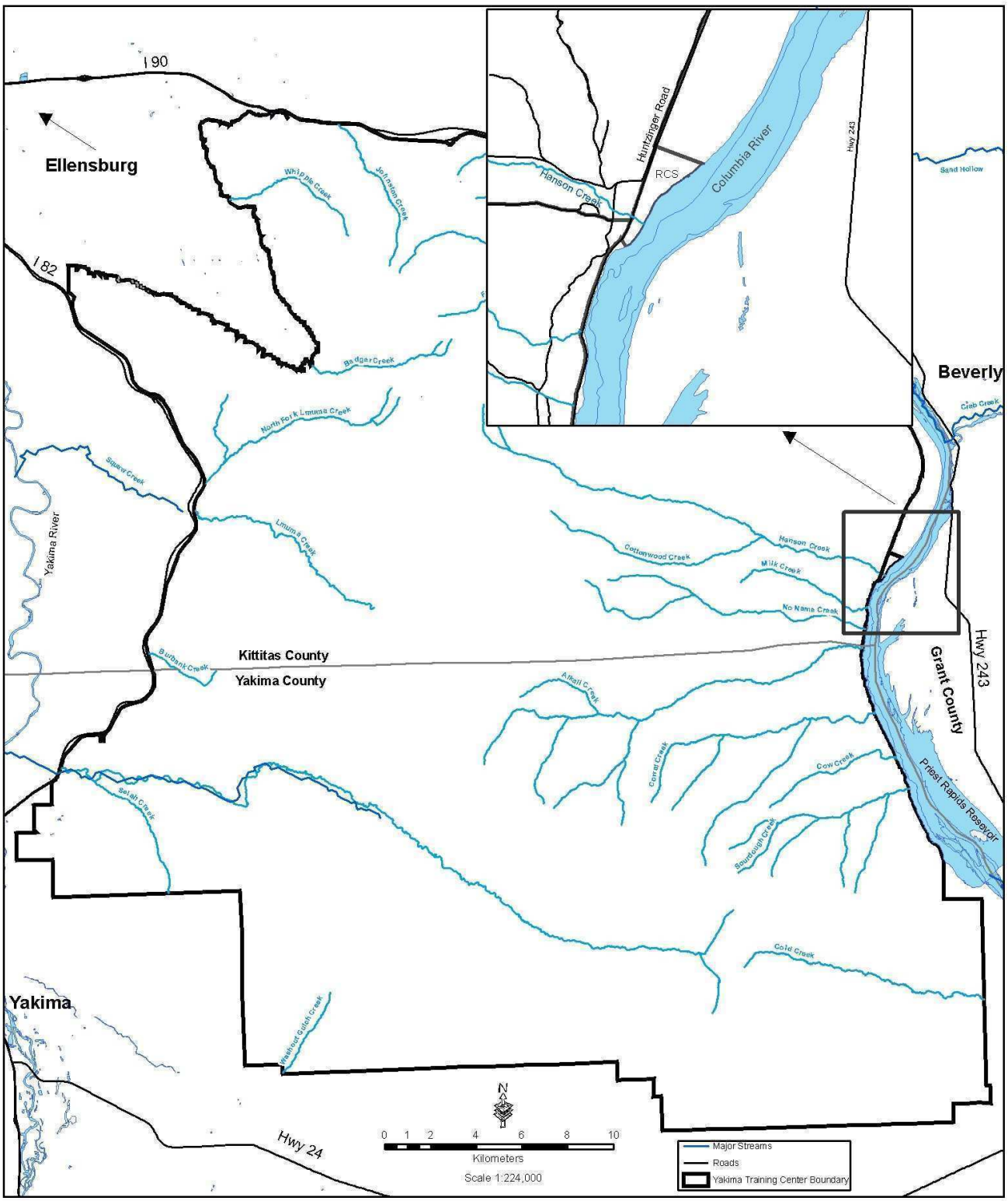

Figure 2-1. Yakima Training Center River Crossing Site

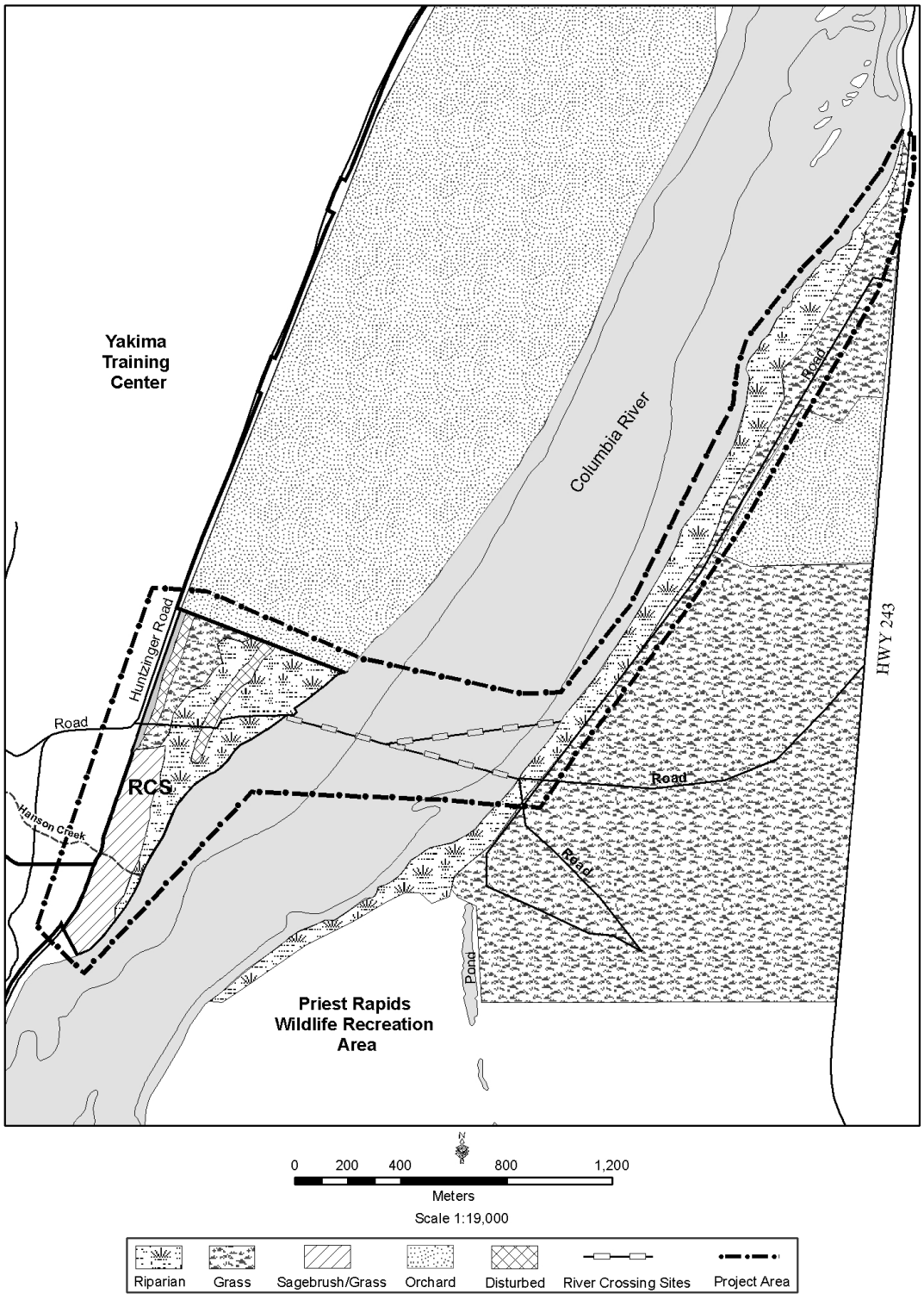

Figure 2-2. Location of River Crossing Sites

The ramp bays are 7.7 meters (m) (25 feet [ft] 4 inches [in]) long, 8.1 m (26 ft 8 in) wide, and weigh 5,473 kilograms (kg) (11,700 pounds [lbs]). Each ramp bay is made up of four pontoon-folding sections consisting of two roadway pontoons and two bow pontoons joined by hinges and pins along adjacent sides (Figure 2-3). The road pontoons are the main load-carrying members, and bow pontoons provide additional flotation and a personnel walkway. The shore end of the ramp bay is tapered, and two approach ramps are hinged to the roadway pontoons. A hydraulic system located within the ramp bay permits the ramp to be raised or lowered to accommodate bank heights up to 1.1 m (3.5 ft).

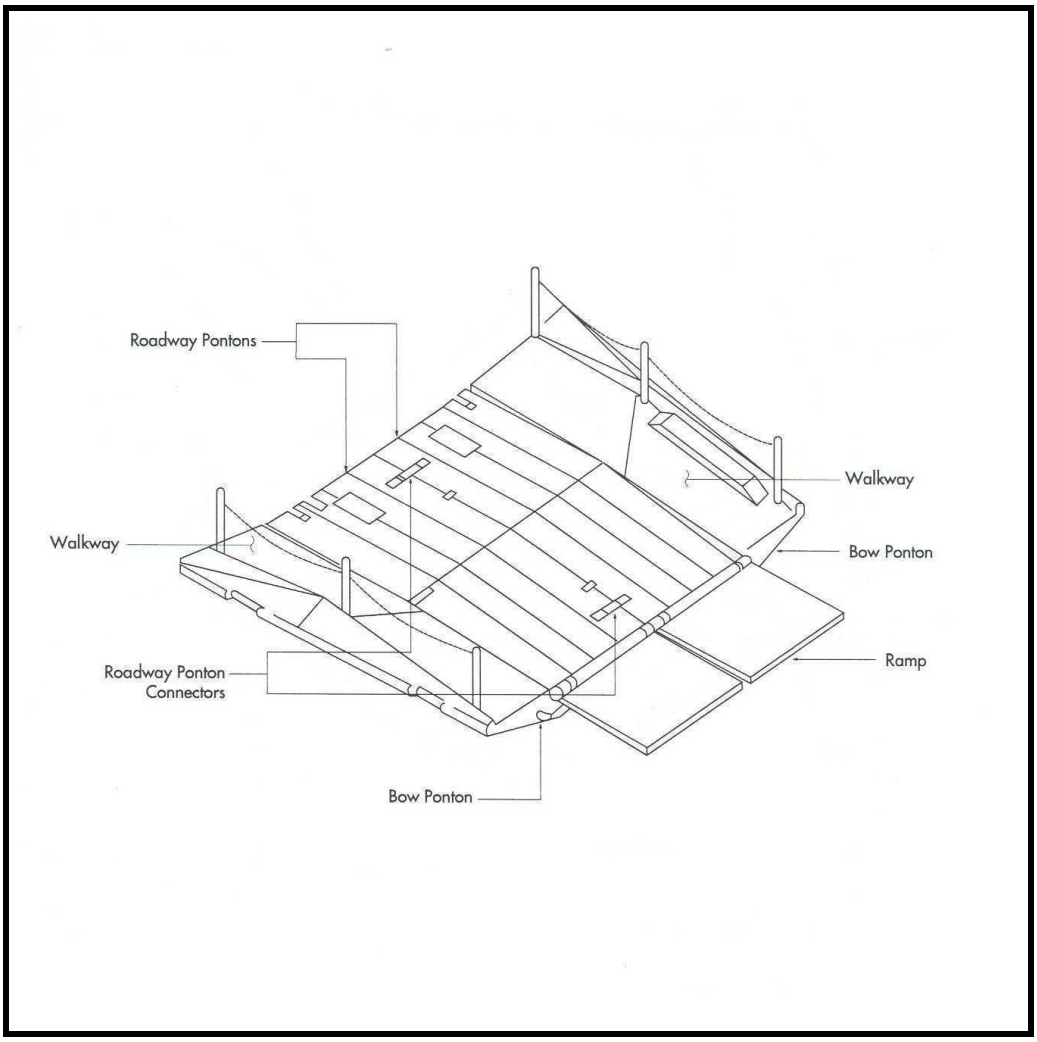

Figure 2-3. Ribbon Bridge Ramp Bay

The interior bays are 6.9 m (22 ft 8.5 in) long, 8.1 m (26 ft 8 in) wide, and weigh 5,579 kg (12,000 lbs). As with the ramp bays, the interior bays are made of four pontoon folding sections consisting of two roadway pontoons and two bow pontoons that are joined by hinges and pins (Figure 2-4).

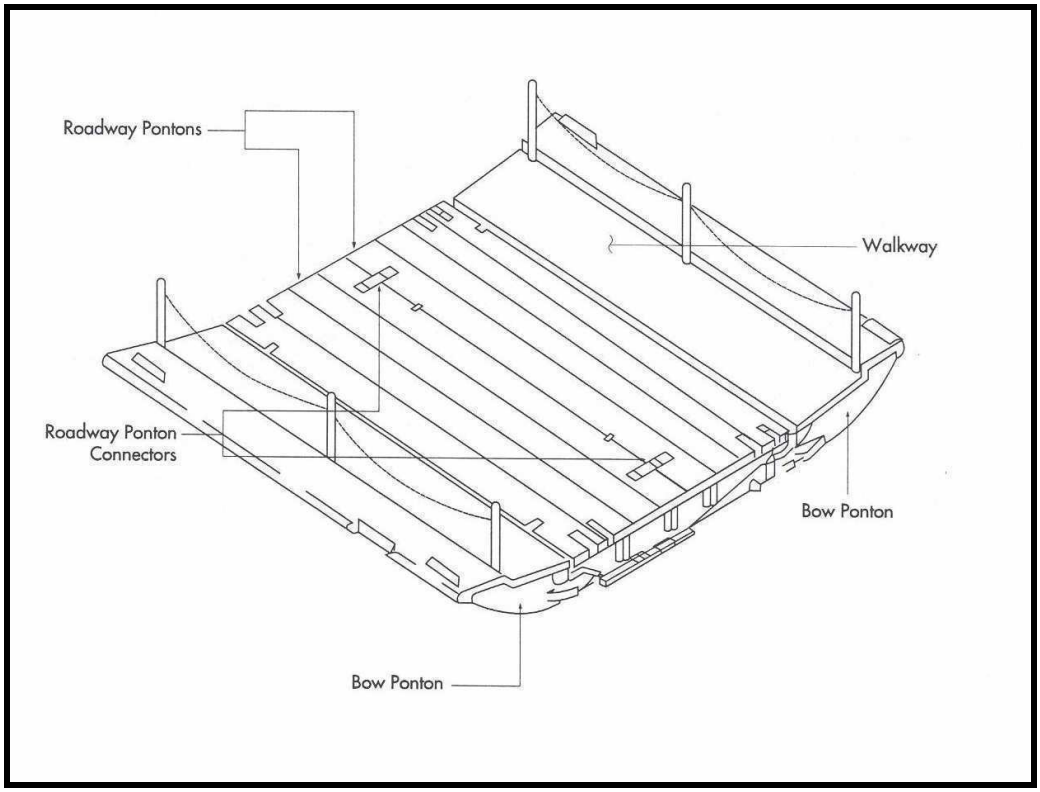

Figure 2-4. Ribbon Bridge Interior Bay

In addition to interior and ramp bays, the vehicle that transports the bay sections is an integral part of the ribbon bridge equipment. The transporter, as it is called, is either a modified U.S. Army M812 or M945 truck chassis, which serves as a self-contained unit for transporting, launching, and retrieving the bridge bays.

Although not considered a component of the floating bridge, Bridge Erection Boats (BEBs) are required for assembly, propulsion, and anchorage of the floating bridge. BEBs are transportable, hydrojet propelled, aluminum hull boats designed to maneuver components of the floating bridges. The boats are approximately 8.2 m (27 ft) long with a draft of 0.7 m (26 in). They are equipped with two 6,050 cubic centimeters (cm) (363 cubic in), 212 horsepower, six-cylinder, water-cooled, diesel engines.

The BEBs are propelled and steered by hydrojet propulsion units that provide thrust by drawing water through grilles in the underside of the boat and expelling through nozzles at the back of the boat. The maximum forward thrust is 3,600 lbs, and the maximum reverse thrust is 2,200 lbs (Figure 2-5).

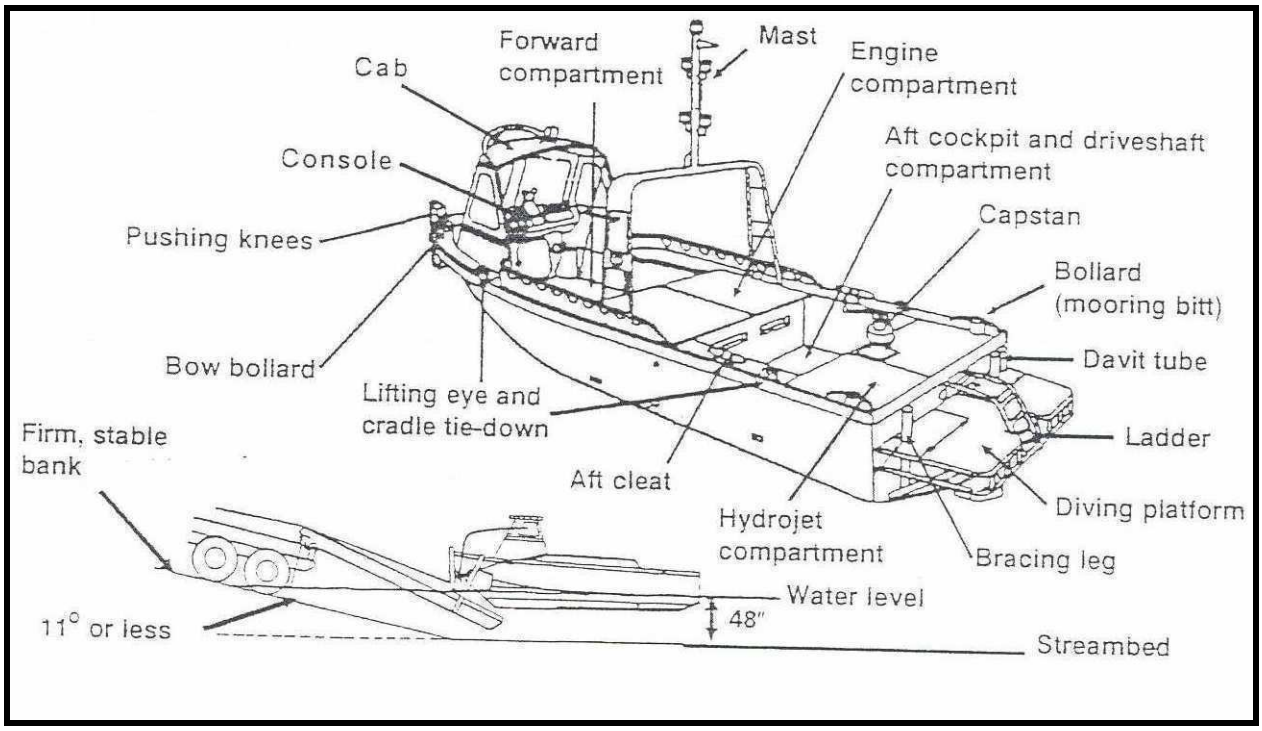

Figure 2-5. Bridge Erection Boat

Float bridge training exercises would take place on the Columbia River at sites shown in Figure 2-1. Crossings would occur between the west bank and the east bank of the river (Figure 2-2). The exercises would use a controlled launch that would involve backing bridge transporters up to the river's edge to launch the BEBs and deploy the interior and ramp bays into the water. Depending on water depth at the launch site, launching can require bridge transporter trucks to be backed into the water. Winches are used to slowly lower the BEBs and bays into the water. On occasion, bridge components, including BEBs, can be lowered by helicopter into the river. Although this would not be the standard launching method during river crossing training exercises, this approach may be used on occasion.

Once bridge components and boats are in the water, soldiers would pilot the BEBs to assemble the bridge bays into rafts. Each ribbon raft includes at least one interior bay and a ramp bay on either side in a three-bay configuration, but ribbon rafts can be constructed in four-, five-, or six-bay configurations. Once the ribbon rafts are constructed, the BEBs are used to guide the rafts to shore and to stabilize them while vehicles are driven onto the rafts. The hinged ramp would be pulled up, and ribbon rafts would then be ferried to the east shore by the BEBs (using two BEBs for each raft) where the hinged ramp would be lowered and vehicles driven off. The BEBs would shuttle rafts back and forth until the entire convoy, which could include up to 60 vehicles, are transported across the river.

2.2 Transport Activities

Vehicles transported during the exercises would range from passenger size High-Mobility Multipurpose Wheeled Vehicle (HMMWV) and Commercial Utility Cargo Vehicle (CUCV) to

5-ton trucks and 20-ton lowboys. Rafting exercises would involve up to four rafts and 14 BEBs. Each raft/BEB combination would cross the river approximately six times during an exercise. In addition to the raft/BEBs, there would be one boat on the river during an exercise for safety and spill response. The safety boat would remain in deeper water for the duration of the exercise.

Following the exercise, vehicles transported to the east bank would form a convoy and travel back to the west bank by road, or remain in a staging area on established roads until they are rafted back to the west bank. At the end of each training exercise, all rafts would be disassembled into component ramp and interior bays, and all bays and BEBs would be pulled out of the river and loaded back onto transporter trucks. No equipment would be left in the river or on the riverbanks after completion of a training exercise.

2.3 Miscellaneous Amphibious Training Activities

Amphibious exercises could occur, but would not necessarily occur, during river crossing exercises. Military personnel who conduct amphibious exercises are specialists (e.g., special operations forces) that support different types of missions than river crossing units; consequently, training activities they perform are less structured than float bridge river crossing training. In general, amphibious exercises would involve Zodiac craft and army Self-Contained Underwater Breathing Apparatus (SCUBA) divers. SCUBA divers would enter the water from Zodiac craft or from the river shore. While in the water, they would perform training to maintain proficiency for their combat mission. These maneuvers would be conducted within the water column, and possibly near the river bottom. Amphibious units would be equipped with all items necessary to accomplish the specific training task (e.g., weapons, training and survival gear). However, activities would not include the use of munitions (e.g., live fire, simulators, or smoke devices) within the RCS. No disturbance of the river bottom would occur.

Zodiac training would also occur at the crossing site. This training could occur in conjunction with SCUBA unit training, but they would not necessarily occur in conjunction. Training would include practice landings along either river shore. These activities would be conducted to simulate infiltration of enemy territory. No disturbance of shoreline vegetation would occur.

Amphibious training exercises also would include the use of helicopters for helicasting. Helicasting involves lowering or dropping rafts and/or divers into the river from helicopters. These types of exercises could be conducted in conjunction with other amphibious training exercises.

Chapter 3 Alternatives

3.1 Introduction

Two other alternatives to the Proposed Action were analyzed in the 1991 river crossing EA, but were rejected because they did not meet the needs of the project and had significant impacts. These alternatives included crossing at a site north of the RCS on the Columbia River, and using a site elsewhere on the Columbia River. The EA concluded that the northern site lacked an adequate staging area on the east side of the river and that impacts to cultural resources could not be mitigated without extensive archaeological work. The 1991 and 1996 river crossing EAs also concluded that an alternative site elsewhere on the Columbia River would not meet the needs of the project to have a training site adjacent to a sufficiently large installation to simulate an actual combat mission in a realistic location. Review of the 1991 and 1996 alternatives did not reveal any changes regarding alternate sites along the Columbia River for this action.

Three alternatives including a No Action Alternative were assessed as part of this EA. In addition, to ensure other potential locations had not developed at other northwest locations since the 1991 and 1996 EAs were completed, other military installations in the region were reviewed to determine if reasonable alternatives existed. A complete discussion about this process and the results of reviewing alternate locations is found in Section 3.5.

3.2 No Action

Under the No Action Alternative, river crossing exercises would continue to occur once a year at the existing training site. Other activities that currently occur on the site, including recreational boat launching on the east side of the river, would continue to occur

3.3 Alternative One – Preferred Alternative

Alternative One, the preferred alternative, is the proposed action described in chapter 2. Under Alternative One, river crossing training and amphibious training exercises would occur no more than six times per year for each type of exercise for a total of 120 days of training. Alternative One satisfies all the training needs required to maintain a realistic training scenario.

3.4 Alternative Two – West Bank Alternative

Alternative Two would use only the west bank of the Columbia River at the existing crossing site. No landing and off-loading of military vehicles would occur on the east bank of the river. This would necessitate bridging units to turn around before reaching the east shore, and return to the west shore. The landing site on the west bank would be in the same area as the launching site. All equipment would be the same, and except for turning around in the river and returning to the west bank, all other activities would be the same. Miscellaneous amphibious training would occur, but there would be no use of the east bank. This alternative, while meeting the essential training needs, would compromise the training objective of simulating a real world river forging.

3.5 Alternative Locations Considered

Six sites were evaluated to determine if additional locations exist within the region that could be included as reasonable alternatives to meet the purpose and need of the proposed action. The six locations were Fort Lewis WA, Vancouver Barracks WA, Umatilla Army Depot OR, Camp Rilea OR, Orchard Training Area ID, and Yakima Training Center WA.

The sites were compared to determine how they would support the suitability elements identified at Chapter 1 (section 1.2). Results of this comparison found that two sites satisfied two or more elements, while the remaining three satisfied one or less. Only the Yakima Training Center satisfied all site suitability elements.

Fort Lewis. This site is located near Tacoma Washington, and does contain water resources within the installation to support some amphibious training activities, and a full range of integrated training (e.g., gunnery and maneuver) activities. However, on-site water resources are too small to satisfy depth, size, and velocity requirements. Adjacent water bodies would provide suitable size and current, however there would likely be conflicts with surrounding land uses. Adequate roads and staging areas would also be available on Fort Lewis. If off site water sources were to be used, conflicts with existing land uses would result. Consequently while it partially or wholly meets some criteria, it does not meet all criteria necessary for the proposed action.

Vancouver Barracks and Umatilla Army Depot. These sites are located along the Columbia River, west of Hermiston, Oregon. Both sites are too small to provide adequate maneuver space to conduct combined training activities, and neither site has connectivity with a suitable water body to support river crossing or amphibious training. Consequently they do not meet the screening criteria for the proposed action.

Camp Rilea. This site is located along the Oregon coast, near Warrenton, Oregon. The site does have connectivity to the Pacific Ocean, but ocean waves and currents are not the same as river currents. The installation is also small with inadequate maneuver space to conduct combined training activities. Consequently, the site does not meet the screening criteria for the proposed action.

Orchard Training Area. Orchard Training Area is located near the Snake River within the BLM's Birds of Prey Resource Management Area, south of Boise, Idaho. The installation contains sufficient training facilities to support most integrated training activities (e.g., gunnery and maneuver training). However, it fails to satisfy elements for connectivity of the installation to the water body, and shoreline conditions for accessing the Snake River. Consequently, the site does not meet the screening criteria for the proposed action.

Yakima Training Center. YTC and the adjacent Columbia River satisfy all six screening criteria. The existing RCS at YTC (west shore of the Columbia River), and the east shore access point (available through GCPUD via Real Estate Access Permit) provide a suitable water body that meets all water borne training requirements associated with the proposed action. Immediate connectivity to YTC provides access to integrated training opportunities, existing road networks are in place to support vehicle movement, access points for ingress and egress to the river are appropriate for river crossing equipment, the depth and current of the river are suitable to satisfy METL training requirements, and river crossing and

amphibious training activities are compatible with existing land uses in the area. Consequently, this site meets all the screening criteria, and will be evaluated further.

Results of the screening process found that one of six proposed sites would meet the purpose and needs of the proposed action. Therefore, the remaining five sites have been eliminated from further consideration and will not be further evaluated as a part of this action.

Chapter 4 Affected Environment

4.1 General Area

The location of the river training site is on the Priest Rapids Reservoir where the main stem of the Columbia River forms a reservoir upstream of Priest Rapids Dam (Figure 2-1). Wanapum Dam is located approximately 29 kilometers (km) (18 miles [mi]) upstream of Priest Rapids Dam, and Priest Rapids Reservoir is located between the two dams. Priest Rapids Reservoir is approximately 29 km (18 mi) long with a surface area of approximately 2,833 hectares (7,000 acres). The depth of the reservoir averages 7.3 m (24 ft), with a surface fluctuation of two m (6.5 ft), and a capacity of 245,466 cubic decameters (199,000 acre-feet).

At the crossing site, the reservoir is about 760 m (2,500 ft) wide. Flow rates within the reservoir at the crossing site rarely exceed one m per second (3 ft per second). The river at the crossing site is flanked on both sides by river terraces that are approximately 910 m (3,000 ft) wide on the west and 1,500 m (5,000 ft) wide on the east. The river terraces, in turn, are flanked by relatively steep canyon side slopes that rise approximately 150 to 300 m (500 to 1,000 ft) above the terrace on the west and 60 to 150 m (200 to 500 ft) above the terrace on the east. On the west side of the reservoir, the adjacent uplands lie within YTC.

Land use within the river training area includes military training on the west side of the river, agricultural production (fruit orchards) on both the west and east sides of the river, and recreational use on the east side of the river. A large fruit orchard occupies much of the river terrace on the west side of the river, and comes within 1,500 m (450 ft) of the launch site. On the east side, the river terrace is crossed with unimproved roads utilized by recreational users and military personnel during river crossing training exercises. Recreational users include boaters using the site to launch their watercraft, and unauthorized camping. Many campfire rings, as well as other evidence indicating camping use, are present along the banks of the river within the crossing area. The Washington Department of Fish and Wildlife (WDFW) Priest Rapids Wildlife Area is located south of the river crossing area on the east side of the river. Orchards on the east side of the river are farther north and are not within the immediate vicinity of the training area.

Three established sites are used as landing or launching sites for river training exercises: one site is located along the west bank, and two are located along the east bank. Gravel roads lead directly to each of these sites. On the west bank, the site is located where a road leads down through an excavated cut in the terrace. On the east bank, riparian vegetation has been cleared at the two sites to create openings for access to the river. The southern of the two east bank sites is used more frequently, and the opening in the riparian zone vegetation is wider. The two east bank sites are approximately 200 m (670 ft) apart.

4.2 Geology and Soils

River terraces occur on both sides of the river at the crossing site. On the west side of the river, the terrace edge is abrupt near the river bank. The edge of the terrace may have been eroded by water during reservoir level fluctuations (U.S. Army, 1991). Terraces on both sides of the river are composed of alluvial material, including gravels, sands, and silts.

Soils that have formed in the alluvial material are silt loams to gravelly fine sandy loams (U.S.D.A. Soil Conservation Service, 1985). The subsoil is gravelly, and on the west side of the river, gravels occur on the surface of the soil and soils within 15 cm (6 in) of the surface are very sandy. On the east side of the river, soils at the surface are less gravelly with silt and fine sand being more dominant.

The area comprising the access site on the west side of the river is a moderately to gently sloped gravel beach (Figure 4-1). A road leads down the terrace to the beach through an excavated cut in the terrace edge. The terrace edge varies in height along the beach and is approximately two to three m (7 to 10 ft) high at the launch site. Below the water surface at the launch site, gravels and cobbles that are coated with a fine layer of silt make up the substrate. Figures 4-1 and 4-2 were taken during a period of low reservoir levels. The substrate shown would normally be submerged during river training activities.

Figure 4-1. River Crossing Site - West Bank

On the east side of the river at both access sites, the beach is sloped very gently and there is no abrupt terrace edge (Figure 4-2). The beach is composed of cobbles and gravels on the east side, but upslope beyond the immediate beach area, which is about 12 m (40 ft) wide, soils at the surface are much less gravelly and more silty than those on the west side. Below the water surface at the egress sites, sand, gravel, and cobbles make up the

predominant substrate, with some fine sand and silt also present. The east side of the river is shallower, with slower currents than the west side, and is an area of deposition.

Figure 4-2. River Crossing Site - East Bank During Low Reservoir Level

4.3 Water Quality

The most recent water quality data from the site were collected in 1991, but are likely representative of current conditions. Water quality data were collected at the site for a study on aquatic ecosystem impacts resulting from river crossing exercises (Trout, 1992). Data were collected prior to a river crossing exercise to characterize background conditions. Water quality parameters for which data were collected include: water temperature, dissolved oxygen, specific conductivity, pH, and turbidity. In addition, particle size distribution data were collected. All data were collected within a 50 m by 100 m sampling area immediately adjacent to, and downstream from, the southern east bank access site. Samples analyzed for particle size distribution were collected within the water column, and at the river bottom at the access site. An additional water column sample was taken within the sampling area. Table 4-1 presents water quality data collected on July 18, 1991, at

eight sites within the sampling area and at the access site. Table 4-2 presents particle size distribution data.

Washington Department of Ecology (Ecology) establishes water quality standards for surface waters of the state. Surface waters of the state are classified as follows: Class AA (extraordinary), Class A (excellent), Class B (good), or Class C (fair). For each class, certain water quality criteria must be met or exceeded to protect water quality for specific uses. The Columbia River is given a Class A (excellent) rating by Ecology (WADOE 2004) (Water Quality Standards for Surface Waters, WAC 173-201A [1992]). Table 4-3 lists Ecology's water quality standards for Class A streams.

Table 4-1. Water Quality Data

Site and Time	Water Temp. (°C)	Dissolved Oxygen (mg/L)	pH	Specific Conductivity (µmhos)	Turbidity (NTU)
Site 1: 8 a.m.	17	6.2	7.4	105	3.3
Site 1: 1 p.m.	19	5.8	7.8.	105	2.2
Site 2	18	6.2	7.8	105	-
Site 3	18	5.4	7.8	105	-
Site 4	18	5.4	7.8	105	-
Site 5	18	5.4	7.8	105	-
Site 6	18	5.4	7.8	105	-
Site 7	18	5.4	7.8	105	-

Source: Trout, 1992
mg/L = milligrams per liter; NTU = Nephelometric Turbidity Unit

Table 4-2. Particle Size Distribution

	Particle Size Distribution (%)				
Site	**Clay 0-5 (microns)**	**Silt 6-15 (microns)**	**Silt 16-25 (microns)**	**Fine sand 26-50 (microns)**	**Sand, gravel, cobbles >50 (microns)**
Egress Site:					
Water Column	23	20.6	13.1	32.3	11
River Bottom	18	0.1	1.2	6.7	90.2
Site 1	40	21	7.4	13.3	18.7

Source: Trout, 1992

Table 4-3. Water Quality Standards

Variable	Streams: Class A Freshwater
Dissolved Oxygen (DO)	Shall exceed 8 mg/L
Fecal coliform bacteria	100 colonies/100mL; not more than 10% samples greater than 200/100mL
pH	Shall be within the range of 6.5 to 8.5 with a human caused variation within a range of less than 0.5 units
Temperature increase	Shall not exceed 18^{O}C due to human activities or increase by more than 3^{O}C if naturally above 18^{O}C
Turbidity	Shall not exceed 5 NTU over background when background turbidity is 50 NTU or less. No more than a 10% increase when background turbidity is greater than 50 NTU

Source: Washington Department of Ecology, 1992
mg/L = milligrams per liter
NTU = Nephelometric Turbidity Unit

A comparison of the July 18, 1991, data with the standards shows that water temperature (which is naturally above 18℃), pH, and turbidity ar e within the standards, but that dissolved oxygen values are slightly below standards. In general, however, water quality within the Priest Rapids Reservoir is considered good, and the Columbia River has not been designated as water-quality impaired in the vicinity of the YTC (U.S. Army, Corps of Engineers, 1994).

The primary water uses in the area of the river training exercises are recreational boating, watering of livestock, and irrigation. Recreational boating also occurs within the river crossing area. In association with agricultural uses in the area, agricultural chemicals in the form of fertilizers and pesticides are applied to orchard crops. The chemicals associated with the fertilizers and pesticides applied to orchards include nitrogen, phosphate, potassium, and numerous other organic compounds, applied from one to three times a year (U.S.D.A. and Washington State Department of Agriculture, 1994). Many of the organic compounds are not persistent in the environment and do not present a water quality concern. Some organic compounds and inorganic nutrients such as nitrate do end up in receiving waters such as the Columbia River via erosion of soil particles, surface runoff, or returning irrigation water and can reduce water quality (Hodgson and Levi, 1987). However, because of the volume of water carried by the Columbia River, chemicals that do reach the river from agricultural practices are highly diluted and, as noted above, Columbia River water quality is considered good.

4.4 Vegetation

The river crossing area contains several vegetation zones typical of arid shrub-steppe habitats of eastern Washington and of those influenced by the availability of water. On the west side of the river the launch site is bordered by two rows of Lombardy poplars. These trees are commonly planted around farms, orchards, and residences as windbreaks. These trees have grown to a height of about 20 m (75 ft). An access road leads from YTC through a break in the north-south trending row of poplars. West of the poplars, the habitat is

dominated by big sage and antelope bitter brush, with a thin understory of cheat grass and occasional rabbitbrush.

East of the poplars, little woody vegetation is present. The primary herbaceous species is cheat grass with scattered bluebunch wheatgrass and sand dropseed. Cheat grass is an invasive annual that dominates in disturbed areas. Cheat grass is considered less valuable habitat than native bunch grasses and is more susceptible to fire because it cures earlier in the season and creates a continuous layer of fine fuels. Another invasive plant, knapweed, is present in this vicinity; only limited numbers of big sage plants are present at the launch site on the west side of the river.

At a distance of three to nine m (10 to 30 ft) from the river shoreline on the west bank, the soil moisture is adequate to support a narrow band of riparian vegetation. This riparian vegetation zone is dense, contains a number of plant species, and includes herbaceous and woody species. The dominant herbaceous species is alfalfa, which has become established from seeds carried from surrounding agricultural sites. Several clumps of willow are present on the north side of the road leading to the shoreline; south of this access road little riparian vegetation is present. Several birch trees are present along the shoreline in the northern portion of the launch area, and along an old unused road a large riparian zone occurs, dominated by willow.

Habitats on the east side of the Columbia River are different from those on the west side. The east side has a broad riparian zone that ranges in width from 12 to 23 m (40 to 75 ft). It is dominated by a cottonwood overstory and, in places, by clumps of willow. A band of rushes and horsetail is present along the shoreline where there is constant saturation. On the upslope side of the riparian zone, several juniper trees are scattered along the margin.

Beyond the riparian zone, upland sage habitat is dominant. Big sage and antelope bitter brush are the primary shrubs, and cheat grass is the primary herbaceous cover. The area has been heavily affected by prior land uses, as evidenced by the dominance of cheat grass and the low shrub cover. A road adjacent to the upland side of the riparian edge connects to numerous spur roads that lead to State Route 243. The southern extent of the area is fenced, and beyond this boundary is the Priest Rapids Wildlife Recreation Area, managed by the WDFW.

On both sides of the river, the access sites have existing roads that lead down to the shoreline. On the west side of the river, the road cuts through the two to three m (7 to 10 ft) high terrace edge and leads to a substrate dominated by cobble and gravel. On the east side of the river at the southern site, a nine-m wide (30 ft) break in the riparian zone leads to the shoreline, which also is used to launch recreational boats. The northern landing site on the east shoreline is about 6 m wide and appears to be used less by recreational boaters than the southern site. The substrates located at the northern and southern sites, on the east bank of the river, are similar.

4.5 Wildlife

Although much of the general vicinity has been altered by human activity, habitat at the RCSs support a variety of wildlife. Mule deer is the large mammal most likely to be found in

the project area and tracks of this species were observed at the west RCS. Deer and other mammals can access the river from the adjacent YTC on the west side of the river. Coyote tracks and scat were evident on both sides of the river indicating frequent use by this species. Other species, though not observed, that probably use the general area of the crossing sites include badger, striped skunk, raccoon, river otter, mink, and bobcat (Battelle, 1989). Beaver cuttings were frequent in the woody riparian zone on the east RCSs.

Bird species observed in the vicinity of the RCS include red-tailed hawk, great blue heron, osprey, red-shafted flicker, and pheasant. The reservoir on the Columbia River formed from the Priest Rapids Dam is extensively used by migrating and wintering waterfowl. Species observed on the river include common loon, white pelican, coot, gadwall, mallard, widgeon, greater scaup, and American merganser. Large numbers of wintering waterfowl have been observed in previous studies. During waterfowl studies of the 29-km (18-mi) length of the Priest Rapids Reservoir during the winter of 1987-1988, the number of waterfowl using the vicinity of the RCS averaged around 500 per day. Higher waterfowl usage was observed both upstream and downstream of the crossing sites (Battelle, 1989). Although Canada geese have been observed using breeding sites in other portions of the Priest Rapids Reservoir, the lack of islands in and around the river crossing vicinity likely reduces the suitability of this area for nesting.

Limited site-specific surveys have been conducted for reptiles and amphibians in the vicinity, but several common species including gopher snake, yellow-bellied racer, and Pacific chorus frog probably use the area (Battelle, 1989).

4.6 Fish

Previous fish surveys in the vicinity of the river crossing indicate that no suitable salmonid spawning habitat is present, and no smallmouth bass spawning occurs in the crossing area (Battelle, 1989). Aerial surveys of the Priest Rapids Reservoir indicate that no fall Chinook spawning occurs in the vicinity of the RCSs and that the nearest spawning area is just below Wanapum Dam, approximately 6.4 km (4 mi) upstream. Upstream migration of Chinook, Coho, Sockeye, and Steelhead through the area generally occurs from late April through November (Trout, 1992; Battelle, 1989).

Out-migration surveys for 0-age fall Chinook were conducted by seining at the RCSs (Battelle, 1989). These near-shore sampling efforts indicate that out-migrating fall Chinook salmon use the near-shore area from mid-April through mid-June. Surveys in late June indicated that out-migrating fall Chinook were no longer in the vicinity, which is consistent with other habitat use surveys (Dauble, et al., 1984).

In conjunction with the fall Chinook surveys, surveys were conducted to determine the level of use of near-shore habitat by spawning smallmouth bass. No evidence of smallmouth bass spawning was detected in the vicinity of the river crossing area (Battelle, 1989). However, both smallmouth bass and largemouth bass fry were observed along the shoreline areas. In addition, pockets of suitable habitat for smallmouth bass spawning were observed along the eastern shoreline of the crossing site and consisted of a mixture of cobble, boulders, and gravel. In contrast, the west shore has a greater slope angle, a faster current,

and a substrate of packed cobble or sand and silt that is unsuitable for smallmouth bass spawning.

Other species common to the Columbia River that were observed during these sampling efforts include redside shiner, northern pikeminnow, chiselmouth, mountain whitefish, prickly sculpin, and carp. Bluegill, crappie, and walleye are other game species reported to use the river crossing area (Trout, 1992). Asiatic clams also were noted during the fish surveys.

4.7 Threatened and Endangered Species

Several resource agencies were contacted for data concerning the use of the river crossing area by federally and state listed or proposed threatened or endangered species. These agencies include U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration, Fisheries (NOAA Fisheries), WDFW, and the Washington State Department of Natural Resources Natural Heritage Program (WDNR). In addition, the USFWS and WDFW websites were queried for species of conservation concern (May 2004).

4.7.1 Plant Species

Eight sensitive plant species have been documented within the Hanson watershed occupying 2,672 acres (Table 4-4). These species include two status classifications: State Sensitive, and State Threatened. None of these species are currently listed under the Federal Endangered Species Act (ESA) as endangered or threatened. *Artemisia campestris ssp. Borealis var. wormskjoldii*, a federal candidate species, has been found upstream of the project area. A botanical survey will be conducted in April of 2005 to determine distribution of this species within the project area. If the species is documented within the project area it will be considered further per Army Regulation 200-3.

Table 4-4. Special Status Plant Species within Hanson Watershed

Species	Common name	Status	Acres
Artemesia campestris	Northern Wormwood	C	-
Astragalus columbianus	Columbia milkvetch	SS	2587.8
Camissonia pygmaea	dwarf desert primrose	SS	3.08
Carex hystricina	porcupine sedge	W	0.28
Collomia macrocalyx	bristle-flowered collomia	SS	40.36
Cryptantha rostellata	beaked cryptantha	ST	0.76
Eatonella nivea	white eatonella	ST	0.07
Lomatium tuberosum	Hoover's desert-parsley	SS	22.82
Minuartia nuttallii ssp. Fragilis	Nuttall's sandwort	ST	13.69
Oenothera cespitosa var. cespitosa	desert rockrose	SS	2.75
Total			**2671.61**

SS= state sensitive ST= State threatened W=State Watch Species C=Federal Candidate Species
Sources: USFWS (2004) and Washington Natural Heritage Program (2004).

4.7.2 Fish species

According to NOAA Fisheries and the USFWS, there are four federally listed fish species that occur in the vicinity of YTC (Table 4-5). The upper Columbia River ESU of spring-run Chinook salmon and the upper Columbia River ESU of steelhead trout are listed as endangered, and the mid-Columbia River ESU of steelhead trout and the Columbia River DPS of bull trout are listed as threatened.

Table 4-5. Special Status Fish Species on or Near Yakima Training Center

Species	Scientific Name	Federal Status	State Status
Bull trout	*Salvelinus confluentus*	T	C
Chinook salmon-spring (Upper Columbia)	*Oncorhynchus tshawytscha*	E	C
Steelhead trout (Mid-Columbia)	*Oncorhynchus mykiss*	T	C
Steelhead trout (Upper Columbia)	*Oncorhynchus mykiss*	E	C

Source: U.S. Fish and Wildlife Service (2004), NOAA (2004), and Washington Department of Fish and Wildlife (2004).
E = Endangered; T = threatened; C = candidate.

Bull Trout

The Columbia River Distinct Population Segment (DPS) occurs throughout the entire Columbia River basin. The mid-Columbia River area includes watersheds of four major tributaries of the Columbia River in Washington, between the confluence of the Snake River and Chief Joseph Dam, with multiple subpopulations within these tributaries.

The upper Columbia River geographic area includes the main stem Columbia River and all tributaries upstream of Chief Joseph Dam in Washington, Idaho, and Montana. Historically, bull trout were found in larger portions of the area. Numerous dams, and degraded habitat have fragmented bull trout habitat, isolating them into multiple subpopulations.

Chinook Salmon

Spawning areas for Upper Columbia-spring Chinook salmon include portions of the Columbia River above Rock Island Dam, and the Wenatchee, Entiat, and Methow rivers. Chief Joseph and Grand Coulee dams block access to a substantial portion of the historic Upper Columbia Chinook salmon habitat. These barriers, combined with impacts on habitat related irrigation diversion and hydroelectric development, and impacts by livestock grazing, have all contributed to the significant decline of the population within this ESU.

Steelhead

Steelhead populations within the middle and upper reaches of the Columbia River have been listed under the ESA as threatened and endangered, respectively. The Middle Columbia River ESU extends from above the Wind River in Washington and the Hood River in Oregon, upstream to include the Yakima River, Washington (USFWS 2004). The Upper Columbia River ESU of steelhead includes fish in the Columbia River upstream of the Yakima River, in the Wenatchee, Entiat, Methow, and Okanogan River Basins. Rivers in this region primarily drain the east slope of the northern Cascade Mountain range with streamflow supplied by snowmelt, groundwater and glacial runoff, often resulting in extremely cold water temperatures. These cold temperatures may retard growth and

maturation of juvenile steelhead. Populations within both of these ESUs typically spawn from November (e.g. Yakima River) through as late as July (e.g. Okanogan River).

4.7.3 Wildlife Species

Results of the search and federal and state listing status is displayed in Table 4-6. Direction for use of such lists during NEPA analysis can be found in 32 CFR 651. The four fish species were previously discussed in Section 4.7.2.

Table 4-6. Wildlife Species of Concern

Common Name	Scientific Name	Federal Listing	State Listing
American white pelican	Pelecanus erythrorhynchos	--	SE
Bald eagle	Haliaeetus leucocephalus	FT	ST
Greater sage grouse	Centrocercus urophasianus	FC	ST
Ferruginous hawk	Buteo regalis	--	ST
Golden eagle	Aquila chysaetos	--	SC
Pygmy rabbit	Brachylagus idahoensis	FE	SE
Chinook salmon (spring, upper Columbia R. ESU)	Oncorhynchus tshawytscha	FE	--
Steelhead (upper and mid Columbia R. Basin)	Oncorhynchus mykiss	FE	--
Trout, bull (USA, conterminous, lower 48 states)	Lavenlinus confluentus	FT	--

* Listing Status:
FE = federal endangered species SE = state endangered species
FT = federal threatened species ST = state threatened species
FC = federal candidate species SC = state candidate species
Sources: USFWS (2004), WDFW (2004)

Bald Eagles

The bald eagle is both a federal and state threatened species in Washington State. No known nesting occurs on YTC or within the proposed project area. Portions of YTC and the proposed project area does however provide suitable habitat for both wintering and migrating bald eagles, which are present from October through April. Suitable habitat for migrating and wintering bald eagles consist of diurnal perches close to abundant sources of prey and nocturnal roost areas relatively free of disturbance.

Bald eagles feed on a variety of prey dependent on its availability. A study of bald eagles along the Columbia River indicates that primary prey consists of American coots, carp, and suckers (Stalmaster and Associates, 1992). Diurnal perches consist of trees, rock outcrops, cliffs, shorelines and man-made structures such as telephone poles. Trees, primarily cottonwoods, are the most frequently used perches because of their structure and proximity to the river provide bald eagle elevated perches close to prey in which to hunt from. Bald eagles are regularly observed using perch sites during annual eagle surveys along the east shore of the project area. The lack of suitable perch sites along the west side of the project area and the increased human use (orchards) adjacent to the project area on the west shore likely limits bald eagle use in this area. Annual winter bald eagle surveys indicate

eagles more frequently use the landing area on the east shore. Several nocturnal roost sites consisting of stands of cottonwood trees occur adjacent to the project area in the Hanson Creek drainage and Borden Springs on the west shore and the WDFW Priest Rapids Recreation Area on the east shore.

An Endangered Species Management Plan (ESMP 2001) for Bald eagles has been developed and implemented on YTC to ensure protection of this species. Protection measures included in this ESMP consist of a vehicle restriction between 1500 and 0900 hours along a portion of the Hanson Creek road adjacent to the known nocturnal roost sites from December 8 to March 24. A 24-hour aircraft flight restriction is in effect along Hanson Creek and the Columbia River to reduce disturbance to wintering bald eagles during the same period of time. Military vehicle traffic is restricted within 50 m of Hanson Creek, protection zones have been identified around all known roost sites, and tree protectors have been installed on the lower most Hanson Creek roost to protect these sites and potential future roost trees in their development.

Greater Sage Grouse

The Columbia DPS of Greater sage grouse (*Certracercus urophasianus)* is a state threatened and federal candidate species. The species is a candidate for federal listing because of reduction in range resulting from habitat conversion for development and agriculture, from intensive grazing, and fire. YTC supports one of two distinct populations of the species in the State of Washington, and the largest population of sage grouse left on federally owned land in the state. Research on the sage grouse has been ongoing at YTC since 1989. Annual surveys for leks (communal mating grounds), and lek counts have been conducted to monitor trends and assess population status. Thirteen leks were monitored in 2004 and nine were found to be active. Six of the eight active leks had ten or more birds observed at least once during the season. Most nesting and early brood rearing occur in proximity to leks. The nearest lek to the RCS is located 2.6 km west.

Threats to sage grouse habitat are caused by training and land management impacts from vehicle and foot traffic, wildland fire, noxious weeds and their control, and livestock grazing. Training and land management impacts to habitat and populations within YTC are minimized through restrictions on the use of Sage Grouse Protection Areas (SGPA). These include spatial and temporal restrictions designed to limit impacts within the SGPA related to bivouacking, digging, and maneuver training. The project area is located outside the SGPA and no suitable habitat for sage grouse exists within the project area.

Since the sage grouse is primarily an upland species and is not known to occur near the project area, it will not be considered further in this analysis.

Pygmy Rabbit

The pygmy rabbit is a federal and state endangered species. Habitat for this species consists of sagebrush shrub-steppe with deep loamy soils suitable for digging burrows. Current distribution in Washington is limited to several isolated sites in Douglas County. This isolation and decreasing population trends resulted in this species being emergency listed by the USFWS. As a result of this listing, a captive-breeding program has been established at Washington State University in Pullman, Washington with the goal of producing enough animals that they can be released back into their historic range. There

are no known observations within either Kittitas or Yakima Counties including YTC. Since the pygmy rabbit is not known to occur on YTC and the project area does not contain habitat characteristic of this species, it will not be considered further in this document.

American White Pelican

The American white pelican is a state endangered species. This colonial nesting species is known to both breed and winter in Washington State. Crescent Island, in Walla Walla County, on the Columbia River is the only known nesting site in Washington (WDFW 1995). However, non-breeders are found locally near large lakes and reservoirs throughout the Columbia Basin in summer. The Hanford Reach appears to be a particularly important area during the summer weeks. A small number of wintering pelicans use the Columbia River from the mouth of the Walla Walla River to Priest Rapids, which is immediately adjacent to the eastern boundary of YTC. In recent years, observations of American white pelicans in Yakima County during the summer weeks have increased. It is also thought that Washington State may play an important regional role in sustaining non-breeding summer residents and birds having dispersed from breeding grounds in adjacent states and Canadian provinces. In terms of limiting factors, the USFWS identified three major factors that limit the success of breeding and non-breeding American white pelican populations. These factors include habitat destruction, utilization of wetlands and lakes for other purposes (e.g. irrigation, hydro-electricity), and intentional or unintentional human disturbances of nesting colonies and loafing/feeding sites.

American white pelicans require shallow water for foraging. Most feeding occurs between water depths of 0.3-2.5 m (1-8.3 ft). Feeding mostly takes place along lake or river edges, in open areas within marshes, on or below rapids, and occasionally in deep waters of lakes and rivers. American white pelicans feed largely on nongame or "rough" fish, amphibians, and crustaceans. Therefore, an abundant prey base predominantly consisting of warm water fish is essential for American white pelican survival. Although foraging sites close to their breeding area are more advantageous than ones further away, American white pelicans are known to travel 50-80 km (31-50 mi) from nesting colonies to feed (USFWS 1984).

Ferruginous Hawk

The ferruginous hawk is a state threatened species. Ferruginous hawks inhabit arid, open country of the western United States. In Washington, they breed in the Lower Columbia Basin and surrounding arid lands of southeast Washington including YTC. This species winters primarily in Mexico and the southwestern and south central United States. Loss of uncultivated land and the prey base it supports may limit the frequency and success of ferruginous hawk nesting efforts. This species is also sensitive to human disturbance, particularly early in the breeding cycle. Currently, the amount of undisturbed natural habitat within the ferruginous hawk’s range in Washington has been reduced, which may make this population vulnerable to further threats. Surveys of known historically active nest sites during the 2002 and 2003 nesting season did not indicate nesting ferruginous hawks on YTC although a single adult has been observed in both years. The last year of known ferruginous hawk nesting activity on YTC was in 1993 with one active site. There are no known historically active nest sites or recent observations within the project area. In

addition, the project area does not constitute suitable habitat for this species, therefore it will not be considered further in this document.

Golden Eagles

Golden eagles, a state candidate species, occur year-round at YTC with both breeding residents and transitory individuals migrating through the area outside the breeding season. Cliffs, rock outcrops, and large trees are used by golden eagles as suitable nest locations. Pairs may use the same nest year after year or use alternate nests in successive years. Golden eagles prefer cliffs and large trees with large horizontal branches for roosting and perching. Golden eagles will feed on a variety of prey species but typically rabbits and small rodents make up the majority of their diet. Golden eagles generally forage in open habitats where small mammals are available. During the nesting season, golden eagles usually forage within seven km of their nest (Cooperrider et al. 1986). Winter habitat requirements are similar to nesting habitat requirements and consist of suitable perches adjacent to areas with abundant and available prey.

Two pairs have been known to nest on YTC in the past but neither has been active on YTC since 2000. One known nesting territory is located approximately four km north of the project area. This site consists of two nests, one on each side of the Columbia River. This nesting territory has not been active for at least the last three years. Historically, golden eagles wintering on YTC were commonly observed, however due to recent population declines in the western United States observations have decreased.

There are no known observations of golden eagles or their nest within the project area. The river crossing portion of the project area does not constitute suitable nesting or foraging habitat for golden eagles. There is however suitable nesting and foraging habitat immediately adjacent to the river crossing area.

4.8 Cultural Resources

The general area of the river crossing contains numerous archaeological sites; human occupation of the area dates back at least 7,000 years. Archaeological sites within the river crossing area include two prehistoric sites. These sites, which were surveyed in May 1994 (McGuff, 1994), consist of cryptocrystalline flakes scattered over two separate areas. One of these areas is a 1,200 m (3,900 ft) long by 60 m (200 ft) wide by 0.5 m (1.5 ft) deep zone, and the second consists of a 75 m (245 ft) by 20 m (65 ft) zone (no depth was reported). Both areas are traversed by existing dirt roads and dirt boat ramps. Where archaeological features are traversed by existing roads, there has been disturbance, and where they are traversed by boat ramps, there is a cap of stable deposits that protects the features from further disturbance.

4.9 Air Quality

Air quality standards are regulated by federal, state, and regional jurisdictions. Activities associated with river training would occur primarily on the western and eastern shores of the Columbia River in Kittitas County (eastern shore) and Grant County (western shore). The northern portion of the YTC in Kittitas County lies within Ecology's Central Washington

Intrastate Air Quality Control Region (AQCR), while Grant County is part of Ecology's Eastern Washington AQCR.

YTC and the area where river training would occur are in compliance with National Ambient Air Quality Standards (NAAQS), which are set by the U.S. Environmental Protection Agency. These standards specify maximum concentrations for carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, lead, and particulate matter less than 10 micrometers in size (PM10). Pollutants of concern for float bridge training operations are carbon monoxide, volatile organic compounds (VOCs) (ozone precursors) from vehicle operation, and PM10 from soil being disturbed by troop and vehicle movements. PM10 is currently generated on YTC by wind and military vehicle movements, especially during large-scale training exercises.

4.10 Noise

The dominant source of noise on YTC and lands immediately adjacent is military training operations. Weapon fire and explosive-type noise are produced during gunnery and demolition training, and other types of noise are associated with aviation and vehicle (wheeled and tracked) movement.

Off-post noise impacts are controlled several ways. Noise impacts from aircraft operations at YTC are controlled by restricting aviation activities and requiring a minimum elevation of 2,000 ft Above Ground Level when flying off-post. Noise from gunnery activities are controlled so that day-night average sound levels (DNL) averaged over the training year do not exceed 62 decibels (dB) beyond the installation boundaries. Convoy sizes and frequency are also controlled to reduce vehicle and operational noise when they operate off the YTC.

The Leq (equivalent sound level) is used to describe environmental noise. The Leq is a measure of the average noise level during a specified period. No noise measurements were taken for this Environmental Assessment; however, a series of 15, 15-minute Leq noise measurements were taken on October 12 and 13, 1995 as part of the 1995 Yakima Training Center Installation Compatible Use Zone (ICUZ) Study. The measurements were taken off YTC, primarily in residential areas closest to the installation. Leq noise levels ranged from 34.3 to 66.7 dBA, with the majority between 45 and 60 dBA. Noise levels in the range of 50 to 60 dBA are considered quiet; for example, a quiet office environment would be 50 dBA.

Major noise sources originating outside YTC in the area include commercial and private aircraft, aircraft from other military branches passing through the area, agricultural and industrial activities, recreational activities, trains, automobiles, and trucks.

No permanent sensitive noise receptors are located near the areas where river training would occur. Informal recreational users, which may be considered temporary sensitive receptors, may occasionally be found on the east side of the Columbia River in Grant County, or in boats on the Columbia River. The nearest residential area is located less than 1 Km (0.6 mi) north of the river crossing at the orchard. The nearest permanent residential area east of YTC and the Columbia River is in Mattawa, approximately 5.5 km (3.5 mi)

away. Other residential areas are located in Beverly and Schawana, and are within eight km (5 mi) of the river training area. In addition to military activities at YTC, primary land uses in the vicinity of the river training area are apple orchards and the production and transport of electrical energy from the Priest Rapids and Wanapum Dams.

Chapter 5 Environmental Consequences

The following section discusses the direct, indirect, and cumulative impacts of the No Action Alternative, Alternative One (preferred), and Alternative Two. Direct effects are caused by the action, and occur at the same time and place. Indirect effects are foreseeable effects caused by the action, but occur later in time or away from the project area. Cumulative effects, addressed in section 5.10, are those associated with the action and also other past, present, and reasonably foreseeable actions that, when considered in conjunction with the action, may result in additive or synergistic effects.

The following criteria and definitions have been established to identify beneficial and adverse levels of impact for each alternative analyzed. The five qualifiers are high, medium, low, negligible, and positive impact. Impacts are considered significant if rated "high". A comparison of the environmental consequences resulting from Alternative One (preferred), Alternative Two, and the No Action alternative is presented in Table 5-1, at the end of this Chapter.

- High impact: Activities that would negatively impact high priority (protected) resources (e.g., cultural sites, sage grouse leks, SGPAs). Impacts would be long term and not be immediately mitigated (e.g., permanent loss of a high priority resource). Mitigation of the impact would require extensive effort either on or off site to compensate for the permanent loss impact. Recurring actions that would result in long-term negative impacts to high priority (protected) resources that cannot be mitigated.

- Medium impact: Activities that would negatively impact high and non-high priority resources. Long-term impacts would include permanent resource losses (e.g., permanent loss of vegetative cover at the site). Recurring impacts (e.g., noise, access to the site) would be intermittent in nature.

- Low impact: Activities that would negatively impact non-high priority resources only. Only short-term impacts would occur that do not cause long-term permanent degradation or impairment of resources. Short-term impacts would include temporary disturbances that may need repair following a training event (e.g., revegetation of areas disturbed during training). Negative impacts would not cause permanent degradation or impairment to any resources.

- Negligible impact: Activities that would not impact a particular resource at a measurable level above baseline conditions (e.g., a particular resource is not found within the zone of influence of the project or impacts are not measurable due to the limited nature of the activity).

- Positive impact: Activities that would have a positive impact on a particular resource at a measurable level above baseline conditions.

5.1 Geology and Soils

1. No Action Alternative

Under the No Action Alternative, erosion impacts would occur from one annual river crossing training exercise lasting ten days. Due to the frequency and short duration of the event impacts to soil resources would be low and temporary.

2. Alternative One - Preferred Alternative

Impacts from the proposed river training exercises on soils would be related primarily to erosion. Erosion would occur as launch vehicles are driven to the river to launch raft bays and BEBs as well as when Zodiac craft are being launched. Erosion will occur on the east side as the transporter trucks are driven to the river to load the bridge bays and BEBs. Because of the low frequency of the training exercise, erosion effects are expected to be low and temporary.

When eroded soil enters streams, it becomes sediment, which can cause negative impacts. These impacts are discussed below in the Water Quality and Fish Sections.

3. Alternative Two

Erosion impacts would be similar to those resulting from Alternative One. Because the east side of the river, where soils are finer textured, would not be used, impacts would be slightly less.

5.2 Water Quality

1. No Action Alternative

Under the No Action Alternative, turbidity and sedimentation impacts would occur from the annual training exercise. Due to the frequency and short duration of the event impacts to soil resources would be low and temporary. Turbidity and sedimentation impacts would continue from the existing recreational boat launching activities, and potential impacts on water quality from existing agricultural activities.

2. Alternative One - Preferred Alternative

Impacts on water quality from river training exercises primarily would be from turbidity and sedimentation. Sources of turbidity would include; erosion of river bank soils and disturbance of river bottom sediments as transporter trucks are driven into the water on the west side to launch raft bays and BEBs into the river, as well as when Zodiac craft are launched; erosion of river bank soils and disturbance of river bottom sediments as vehicles are driven onto and off of the rafts on both the west and east sides of the river; and disturbance of bottom sediments by waves and turbulence generated from the rafts' movements. The action of the rafts and BEBs would be expected to generate enough turbulence to re-suspend particles throughout the water column within the river crossing area (Trout, 1992). Increases in turbidity from erosion and suspension of bottom sediments, followed by the settling of the suspended materials can have negative effects on aquatic organisms. These adverse effects are discussed in the Fish Section below.

Turbidity changes at the southern access site on the east side of the river were observed during the 1991 study on aquatic ecosystem impacts (Trout, 1992). Prior to river crossing activities, turbidity measurements taken 15 to 20 m (50 to 70 ft) upstream of the site (east

side of the river) ranged from 2.2 to 3.3 Nephelometric Turbidity Units (NTU). At the access site, during training activities, turbidity measurements were 13 and 30 NTU, respectively. Within two hours following training activities, turbidity had decreased to 15 NTU. In addition to the measurements taken at the access site, turbidity measurements were taken during river training exercises along three north-south trending transects that were 10, 20, and 30 m (33, 67, and 98 ft) off shore of the east river bank. The north end of each of the three transects lay even with the access site and parallel to the shoreline. Results of these turbidity measurements are shown in Figure 5-1. The study generally shows that turbidity effects tend to be localized and of short duration. Turbidity levels were higher closer to shore, probably because sediments near the shore are finer and more easily suspended.

During the 1991 study, data were also collected on suspended solids and particle size distribution. As expected, during river crossing exercises total particulates (suspended solids) within the water column increases (as evidenced by higher turbidity levels). Additionally, particle size distribution within the water column shifts during training exercises, with larger-sized particles becoming suspended. As with turbidity effects, and in conjunction with them, the effects from suspended solids are localized and short term.

Particles placed in suspension by turbulence generated during river training exercises would eventually settle out as sediments. Larger particles would settle first, and finer particles would remain suspended longer. Depending on particle size and density, water currents, and stream morphology, among other variables, suspended particles would be sorted as they settle out. Finer particles could settle out relatively far from where they were put into suspension. Depending on where they settle, there is potential for fine sediments to cover gravels and adversely impact aquatic organisms. For further discussion of these impacts, see the Fish Section 5.5.

It should be noted that the 1991 study looked at a small-scale river crossing operation involving two daytime crossings using three rafts. During a routine training exercise as many as four rafts would be involved and each raft would cross as many as six times. Even with the cumulative effects of multiple crossings, turbidity and sedimentation impacts are expected to remain low. The amount of sediment resuspended from the training activity is minimal compared to normal turbidity fluctuations in the river.

In addition to turbidity and sedimentation impacts, a potential exists for adverse effects on water quality from accidental spills of petroleum products. No vehicles that haul fuels would be used in the river crossing exercises, and no fueling of BEBs or Zodiac craft would occur on the river. Vehicles crossing the river as loads on rafts, BEBs that propel rafts, and Zodiac craft would contain their own fuel. As a precaution, spill response equipment would be stationed at the RCS during training exercises. Because of the low frequency and duration of the training event the impacts on water quality would be temporary and low.

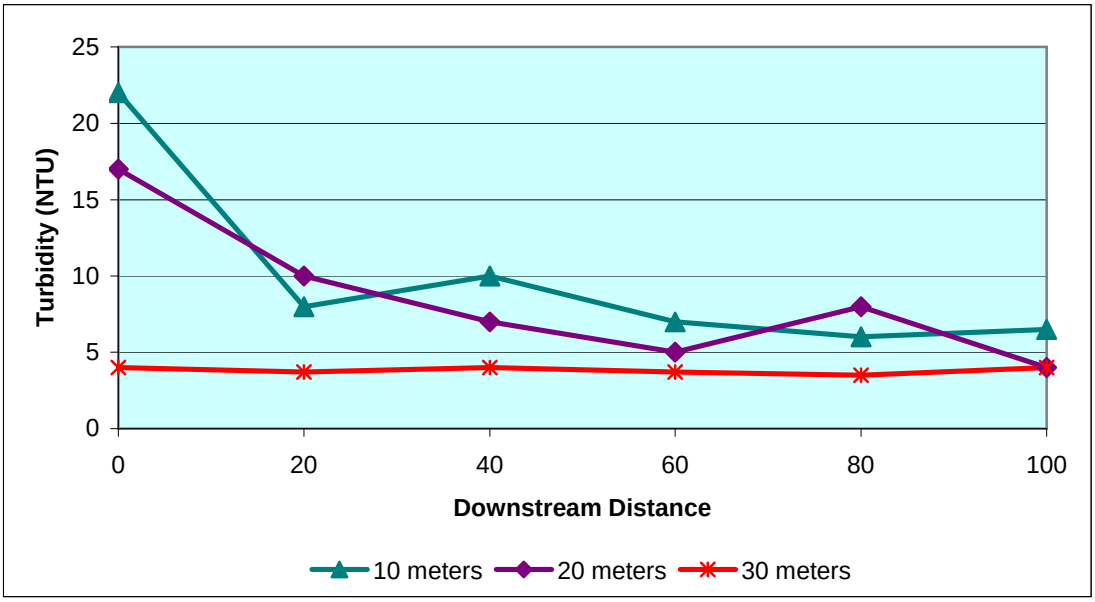

Figure 5-1. Turbidity Measurements
Source: Trout 1992

3. Alternative Two

Water quality impacts under Alternative Two would be similar to those under Alternative One. Under Alternative Two, the east side of the river would not be used. Because the east side of the river is an area of deposition with slower water currents, a greater amount of fine sediment is present on the east side than on the west side. By avoiding the east side, impacts from turbidity and sedimentation likely would be less than under Alternative One.

5.3 Vegetation

1. No Action Alternative

Some minor temporary damage to vegetation is expected in both the upland and riparian zones. Effects to vegetation during the limited, two-week training period would be of shorter duration and scope than those described under Alternative One. Because the vehicles will be using existing roads, there will be low impacts to vegetation resources.

2. Alternative One – Preferred Alternative

Launch sites on both sides of the river have established roads and approaches that lead to the shoreline of the Columbia River. No vegetation clearing would be required for access to the river. Some minor degradation of riparian vegetation would be expected near launch sites. Vehicles may also crush vegetation at the edges of the launch ramps and along the upland fringe where vehicles could park. The effects to riparian vegetation are considered low and temporary.

Low levels of effects to upland vegetation would occur in areas immediately surrounding the river access sites because traffic would remain along existing access routes. Upland vegetation adjacent to both the east and west river banks has been negatively impacted from past land uses and provides habitat of low value to wildlife. Trucks and support

vehicles would use existing roads, which limits the effects to previously disturbed areas. Overall impacts to vegetation would be low.

3. Alternative Two

Vegetation on the east side of the river would not be disturbed under this alternative because activity would be limited to the west side. Effects to riparian and upland vegetation on the west side of the river would be similar to those described under Alternative One.

5.4 Wildlife

1. No Action Alternative

Training activity under this alternative would be limited to the current level during the period from July 15 to September 15. Because of the low frequency and duration of the training, impacts to wildlife resources would be low and temporary.

2. Alternative One – Preferred Alternative

River training exercises would be conducted from July 1 through December 1. Restricting training to this period reduces potential effects to wildlife. Noise and human activity during training has the potential to disturb birds that may be nesting in the immediate vicinity and to temporarily exclude less tolerant wildlife from using the project area. In addition, helicopters may occasionally be used as part of training exercises. Landing and takeoff of helicopters would add to the disturbance in the immediate area of the takeoffs and landings. These sites are typically established in areas of low vegetative cover and would not directly affect the riparian zones other than temporary disturbance from noise.

The noise and activity would reduce the availability of the site for most wildlife, but this effect would be minor and temporary. Large numbers of migrating waterfowl are present during winter but not during the period when exercises would be conducted. Once training is complete, wildlife would continue to use the site in its current state. Due to the increased frequency of training events under this alternative impacts would be greater than under the no action alternative. Low impacts to wildlife would be expected as a result of implementing Alternative One.

3. Alternative Two

As with Alternative One, training activities under Alternative Two would be conducted from July 1 through December 1. Because the east side of the river would not be used under this alternative there would be a reduction in the disturbance effects to wildlife. Wildlife using the riparian zone on the east side of the river would not be affected. Effects to wildlife on the west side of the river would be similar to those described under Alternative One.

5.5 Fish

1. No Action Alternative

Under the no action alternative, river crossing exercises would occur once a year for a ten day period between July 15 and September 15. Because training would be limited in duration and frequency effects to fish would be low and temporary.

2. Alternative One - Preferred Alternative

River training exercises have the potential of affecting fisheries resources and nearshore habitats by increasing erosion, sedimentation, and turbidity above the normal range. No salmon spawning is present in the project vicinity, nor has any bass spawning been documented. The primary effect of increased sedimentation would be to benthic organisms and algae and those fish that feed on these resources, and to small fish using the nearshore habitat.

The introduction of fine sediments into a stream can have a number of adverse effects on stream habitat and aquatic organisms. Suspended fine sediment can produce turbidity, and deposition of sediment can cover gravel bottoms and fill the spaces between gravel. Sediments that are chemically reduced also can create an oxygen demand, and thus lower dissolved oxygen in the water. Because the effects from the river training would be localized and short-term, decreases in dissolved oxygen are expected to be low. Moreover, turbulence from the propulsion of the BEBs likely would act to incorporate oxygen into the water column.

Turbidity may affect aquatic life by interfering with the penetration of light. Increased suspended solids can have lethal and sub-lethal effects on fish and fish food populations. Impairment of respiration in fish, and their prey species, can result from irritation of gill filaments. Resulting stress can lead to reduced disease resistance thereby affecting the abundance of fish and fish food populations. The successful development of fish eggs and larvae is adversely affected in the presence of high suspended solids because the exchange of oxygen and metabolites in incubating fish eggs and larvae is reduced. Natural movements and migrations, and feeding efficiency of fish also can be affected by increased suspended solids.

Deposition of fine sediments can cover gravel substrate. Many organisms use gravel for feeding and reproduction. Fine sediments also may affect organisms in the hyporheic zone, the zone below the stream bottom where flow occurs within the substrate. This zone functions as a refuge from predators and swift currents and as a feeding area for early life stages of some aquatic invertebrates. It also is a site where nutrient transformation occurs (Stanford and Ward, 1988; Ward, 1989). The functions of the hyporheic zone can be altered when fine sediments fill the interstices between coarser substrate (U.S. National Research Council, 1992).

Limited water quality sampling during river crossing training (described under the Water Quality Section) indicates that turbidity at the east side landing was not significantly increased beyond critical thresholds. Observed increases in sediment suspension were localized and occurred over a short period. Measurable effects were limited to within 40 m (132 ft) of the shoreline. Although excess sedimentation and turbidity can affect fish and benthic invertebrates, the limited short-term effects from the river training to these resources would be negligible compared to existing conditions.

Smaller fish that use the shallows to avoid predation will be temporarily affected by increases in turbidity from resuspended sediments. Past surveys indicate the use of shallows in the project area by out-migrating Chinook salmon from mid-April through June. The WDFW suggests that river crossing exercises occur no earlier than July 1 because of

the potential of out-migrating salmon utilizing the shallow water habitat in the project vicinity. Sporadic weekend training prior to July 1 may be allowed with prior approval by WDFW, depending on the scope and timing of the activity.

The proposed river training could affect any out-migrating salmon using the vicinity. These fish will avoid the landing and launch sites, and some may venture into deeper water and become susceptible to predation by picivorous fish such as northern pike minnow or walleye. The relatively small area that would be affected by the training activity would cause only minor, temporary effects to out-migrating salmon; consequently, overall impacts to fish would be low.

3. Alternative Two

As with Alternative One, training activities under Alternative Two would be no earlier than July 1. Because launching and landing of float bridges would only occur on the west side of the river, temporary resuspension of sediments and resulting turbidity would be reduced compared to Alternative One. The west side of the river drops off at a steeper gradient than the east side. The action of the BEBs in the vicinity of the west side, therefore, would result in less sediments becoming temporarily suspended in the water column than would the same activity on the east shore. Under Alternative Two, river training activities would not include use of the east shore.

The effects from temporary resuspension of sediments and the increase in turbidity would be the same as described under Alternative One. The affected area would be smaller because exercises would be limited to the west side. Training in early spring could affect out-migrating salmon using the shallows of the reservoir. The effects under Alternative Two would be less than those of Alternative One because only one side of the river would be used as a launch and landing site.

5.6 Threatened and Endangered Species

1. No Action Alternative

Under the No Action Alternative, training activities would continue to be conducted during a ten day period between July 15 and September 15. There would only be negligible effects to federally listed or proposed threatened or endangered species. No training would occur during the bald eagle wintering period from December 8 through March 24 or the salmonid out-migration period from mid-April through June.

2. Alternative One - Preferred Alternative

Impacts to endangered fish species are described in Section 5.5.

The bald eagle is the only federally listed bird species that regularly uses areas near the project site (WDFW 2004; USFWS 2004). Bald eagles use the project area during the winter from December through March. In order to avoid impacts to bald eagles, training activities would be conducted from July 1 through December 1. In addition, no vegetation clearing would occur, and no wintering perch trees would be affected by this alternative. Therefore, impacts to bald eagles would be negligible.

The American white pelican is the only state endangered species that regularly uses areas near the project site. A small number of wintering pelicans utilize the Columbia River from

the mouth of the Walla Walla River to Priest Rapids, which is immediately adjacent to the eastern most boundary of YTC. In 1994 a breeding colony was established on Crescent Island, which was constructed for nesting birds in the Columbia River, Walla Walla County in 1985 (WDFW 1994). This species is known to occur near the RCS; however, the nearest breeding colony, at Crescent Island, is over 100 km away. Although some foraging by white pelicans may occur in the area, the temporary nature and small footprint of the training exercises is expected to have a negligible impact on this species.

Artemisia campestris ssp. Borealis var. wormskjoldii, a federal candidate species, has been documented upstream of the project area. As a federal candidate, this species is afforded no legal protections by the ESA. However, in accordance with Army Regulation 200-3, if a population of *Artemisia campestris ssp. Borealis var. wormskjoldii* is documented during the scheduled botanical survey in April of 2005, this species will be considered further.

3. Alternative Two

As with Alternative One, training activities under Alternative Two would be conducted from July 1 through December 1. Impacts under Alternative Two would be similar to those of Alternative One except there would be less impact on the east bank of the river. Overall impacts to threatened and endangered species would be negligible.

5.7 Cultural Resources

1. No Action Alternative

Under the No Action Alternative, river training exercises would continue to occur in the current location, at the current frequency and duration. Activities would be conducted using existing roads and bivouac areas so that no adverse affects on cultural resources are expected.

2. Alternative One - Preferred Alternative

River crossing training and miscellaneous amphibious activities would be conducted using existing roads and bivouac areas; therefore, adverse affects on cultural resources are not expected. Based on results of its 1994 archaeological survey, the Army found no adverse effects on cultural resources from river training exercises (McGuff, 1995). As part of a Programmatic Agreement Fort Lewis has with the Washington State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP) (U.S. Army, Corps of Engineers, 1994), a letter describing the proposed activities was sent to SHPO and ACHP, as well as representatives of the Yakama Nation, the Nisqually Tribe, and the Wanapum People for their review and comment. These letters are included in Appendix B of the 1996 EA.

In the letters sent out to the above-mentioned agencies and entities it was requested that any necessary comments be submitted within 30 days of receipt. In response to the letter sent to SHPO, a letter was received on December 21, 1995, concurring with the Army's finding that no cultural resources would be affected by the river-training activities.

3. Alternative Two

As with Alternative One, the river training exercises under Alternative Two are not expected to result in any adverse affects on cultural resources.

5.8 Air Quality

1. No Action Alternative

Effects on local air quality would not change under the No Action Alternative. Small amounts of carbon monoxide and hydrocarbons would continue to be emitted from vehicles, including BEBs, and PM10 emissions would continue to be produced from vehicles traveling on either shore on unpaved or makeshift roads. Current training levels do not cause a violation of NAAQS for criteria pollutants. Temporary decreases in air quality during training exercises would constitute a negligible impact.

2. Alternative One - Preferred Alternative

During the river training exercises, there would be a slight decrease in air quality because of vehicle, helicopter, and boat operations at the project site. Small amounts of carbon monoxide and hydrocarbons would be emitted from vehicles, including BEBs, and PM10 emissions would be produced from vehicles traveling on either shore on unpaved or makeshift roads. Existing YTC smoke generating policies described in Policy #01-05 Yakima Training Center Policy on Use of Chemical and Smoke Training Munitions on the Installation would remain in effect. Decreases in air quality would be localized and of short duration, and no mitigation would be required. Increased traffic on local roadways would be negligible, and would not increase congestion. Although air quality impacts would be low, there would be small cumulative effects on air quality when combined with activities occurring at YTC, as well as local agricultural and recreational activities. Overall, effects to air resources resulting from Alternative One would not cause a violation of the NAAQS for criteria pollutants.

Because river-training exercises would occur within an area that meets NAAQS, a general conformity analysis under the Clean Air Act, Section 176, is not required.

3. Alternative Two

Effects on local air quality under Alternative Two would be very similar to those under Alternative One, although total emissions per training operation would be less because vehicles would have a shorter distance for their return trip to the YTC.

5.9 Noise

1. No Action Alternative

Under the No Action Alternative, localized, temporary minor increases in noise levels would continue at current levels during one two-week period per year. During training exercises, there would be a temporary increase in noise levels attributable mainly to operation of BEBs, raft assembly, and movement of vehicles to and from staging areas as well as on and off rafts. For the purposes of this analysis, a sound level range of 70 to 90 dB at 15 m from the source will be used. This range would be approximately the same as busy traffic at the low end or a heavy truck at the high end (Tipler 1976).

Under normal circumstances, the sound level of outdoor noise decreases by 6 dB with each doubling of distance from the source (known as the inverse-square law), eventually being cancelled out to human receptors as background noise. The nearest permanent receptors are approximately 1 km (0.6 mi) away. At that distance, estimated sound levels would be 34

to 54 dBA, well within the 45 to 60 dBA Leq noise measurements taken during the 1995 ICUZ study (discussed in the Affected Environment). In addition, river training activities would not change the annual average DNL. Any auditory annoyances inferred upon temporary receptors within a closer proximity to training exercises (e.g., recreational boaters) would last only as long as that receptor remained nearby or, in a worst case scenario, as long as training exercises persisted (16 hours per day maximum).

Under the No Action Alternative, some of the vehicles transported to the east side of the Columbia River would return to YTC via public roads such as SR-243 and I-90. Convoys would typically be approximately 40 vehicles, and would create additional traffic noise. These minor, temporary increases in noise levels would be low because they would be infrequent and of short duration. For increased traffic noise to be discernible to residents, traffic would have to increase by more than 50 percent. This project will not increase traffic volumes by a discernible level.

Although noise impacts would be low because they are short term and infrequent, there would be negligible cumulative effects on the noise environment when combined with YTC activities, as well as local agricultural and recreational activities.

2. Alternative One - Preferred Alternative

Compared to the No Action Alternative, Alternative One would involve impacts from similar noise sources on the same receptors, but would increase training frequency up to a maximum of six times per year. Additional noise sources would include amphibious training activities, and occasional helicopter usage. Helicopters would most likely produce the loudest noise associated with training activities. However, even with periodic helicopter usage and increased training frequency, there would be no significant change to annual average DNL. Noise impacts resulting from Alternative One would be low.

3. Alternative Two

Localized noise levels would be very similar to those described for Alternative One, except operations would be confined to the west banks of the Columbia River. Also, because vehicles would not cross the Columbia River additional roadway travel noise between the west and east shore landing sites would not occur, resulting in no additional off post traffic noise.

5.10 Cumulative Effects

NEPA defines cumulative impacts as the result of the incremental impact of the proposed action in addition to the impacts of other past, present, and foreseeable future actions. Reasonably foreseeable future actions addressed in the cumulative effects assessment include:

- Military use at YTC.
- GCPUD Federal Energy Regulatory Commission (FERC) relicensing for the operation of dams.
- Construction of a new Bonneville Power Administration (BPA) power line.
- Columbia River erosion control project just downstream of the RCS.
- Activities associated with existing agricultural uses along the river.

- Existing recreational activities that occur within the river training area.
- Potential construction of Black Rock Reservoir.

Cumulative effects of the proposed action have been considered in a worst case context to ensure the overall effects of all alternatives have been assessed. The reason this approach was used is because of the similarity between the three alternatives considered. This assessment assumes the maximum number of training iterations would occur each year for both river crossing (six each) and amphibious training events (six each), the duration for each event would be ten days, and all consequences described in Chapter 5 would occur as a result of each event. The direct and indirect consequences described for each resource in Chapter 5 was low for all alternatives considered. Considering the small area, timing, and duration of where river crossing and amphibious training would occur, the overall cumulative effects of this action on the region and resources evaluated would not be significant. The annual window of July 1 through December 1 avoids potential periods when conflicts with other resources may occur (e.g., out-migration of salmonids and wintering bald eagles). In conclusion, effects on resources coupled with the other reasonably foreseeable future actions identified above would not result in any significant cumulative effects as a result river crossing and amphibious training activities.

5.10.1 Geology and Soils

YTC has been used for military training for many years. Adequate mitigation measures exist to minimize impacts from ongoing military training exercises as described in the YTC CNRMP (2002). Cumulative impacts from other foreseeable future projects along with the proposed action will likely adversely impact soil resources along the Columbia River shoreline. Localized areas of erosion will be improved as a result of proposed mitigation measures.

5.10.2 Water Quality

Adverse effects on water quality are likely to occur as a result of ongoing military training and implementation of the projects described in section 5.10. However, mitigation measures are in place to minimize these impacts and will likely decrease the quantity of sediment entering YTC streams and the Columbia River as a result of this action.

5.10.3 Vegetation

There will be positive and negative impacts to vegetation resulting from the cumulative effects of the described actions. The increased disturbance will likely promote the spread of noxious weed species such as purple loosestrife and cheatgrass. Increases in native woody riparian vegetation will occur as a result of active efforts to stabilize the stream bank below the project area.

5.10.4 Wildlife

The levels of disturbance and food availability are important factors determining effects to wildlife species. Because the reach of the Columbia River bordering YTC is not highly developed, and is not likely to be in the foreseeable future, the probability of outside influences adding to the minimal impacts expected from the proposed action would be

negligible. Management regulations exist that provide protection for several wildlife species on the installation, and therefore, should somewhat insulate the installation from any cumulative wildlife effects should substantial development (or projects) occur adjacent to YTC.

5.10.5 Fish

There will likely be impacts to fish resources as a result of the increase in reservoir water level proposed by GCPUD. Refer to the FERC NEPA analysis for impacts related to fish resources. When considered in conjunction with the GCPUD project, the proposed action is not anticipated to result in significant impacts to fish.

5.10.6 Threatened and Endangered Species

Effects on resources coupled with the other reasonably foreseeable future actions identified above would not result in any significant cumulative effects as a result of river crossing and amphibious training activities.

5.10.7 Cultural Resources

All of the described activities have the potential to increase the risk of disturbing cultural resources. Mitigation measures are in place to minimize the potential for impacts to cultural resources (YTC 2002).

5.10.8 Air Quality

None of the described activities are likely to have a significant effect on air quality because of the short duration and types of projects proposed. Off-base sources of PM10 include recreational and agricultural activities (including burning) and dust storms.

5.10.9 Noise

Cumulative effects from the described projects will not have a significant impact on noise. There would be no noise mitigation necessary beyond the management practices currently in place at YTC

5.11 Comparison of Environmental Consequences

Table 5-1 depicts impacts to resources resulting from the No Action Alternative, Alternative One, and Alternative Two.

Table 5-1. Environmental Consequences

Issue or Concern	No Action	Alternative One	Alternative Two
Geology and Soils	∅	∅	∅
Water Quality	∅	∅	∅
Cultural Resources	0	0	0
Air Quality	0	∅	∅
Noise	∅	∅	∅
Biological Resources			
Vegetation	∅	∅	∅
Wildlife	∅	∅	∅
Fish	∅	∅	∅
Threatened and Endangered Species	0	0	0

Legend:

⊕ - Positive Impact
⊗ - Medium Adverse Impact
0 - Negligible Impact
⊗ - High Adverse Impact
∅ - Low adverse impact

Chapter 6 Mitigation Measures

6.1 Geology and Soils

Impacts to soil are expected to be low. The potential for erosion can be minimized by limiting vehicle movement to existing roads. Additionally, any newly created disturbed areas would be revegetated or reseeded with appropriate native species. Any revegetation or reseeding would be conducted under the supervision of YTC, Public Works.

6.2 Water Quality

Impacts to water quality are expected to be low. The following measures would be taken to reduce impacts to water quality. To decrease the amount of sediment introduced into the river when vehicles are loaded and unloaded on rafts, as little driving as possible would occur along the shoreline and especially within the river itself. Rafts should be landed as close to the shore as possible to reduce the distance vehicles must travel through water.

In order to decrease the potential for accidental spills, military vehicles that haul fuel products or chemicals, such as fuel tankers or POL trailers, would not be transported during river crossing training exercises. In addition, vehicles would be refueled away from the river, a detailed spill response plan would be created, and the equipment necessary to carry out the plan would be put in place during these exercises. All spill response for river crossing training activities would be coordinated through the YTC, Public Works.

6.3 Vegetation

Only low effects to vegetation are anticipated from training exercises. Any areas that are disturbed would be revegetated or reseeded with appropriate native species as part of the annual reseeding program. Revegetation and reseeding would be conducted under the supervision of the YTC, Public Works.

6.4 Wildlife

Only low effects to wildlife would be associated with the river training activities. Continued coordination between YTC staff and WDFW staff will ensure incorporation of any new data on wildlife use in the vicinity. No mitigating measures are required.

6.5 Fish

Only negligible effects to fish are associated with the river training activities. Continued coordination between YTC, NOAA Fisheries, USFWS, and WDFW staff will ensure the incorporation of any new data on disturbances to fish in the area. Mitigation measures discussed under water quality would also help minimize impacts to fish. No additional mitigating measures are required.

6.6 Threatened and Endangered Species

Impacts to bald eagles and salmonids, the only federally listed threatened or endangered species occurring in this area, would be negligible. Requirements in the Hydraulic

Protection Area (HPA) to continue coordination with WDFW allow the agency to incorporate any new data on threatened or endangered species into the permit process. No mitigating measures are required.

6.7 Cultural Resources

No mitigation measures are proposed for cultural resources because no significant impacts on cultural resources are anticipated.

6.8 Air Quality

No mitigation measures are proposed for air quality because no significant impacts on air quality are anticipated.

6.9 Noise

No significant impacts from noise are expected from the river training exercises, and no mitigation measures are proposed.

Chapter 7 Conclusions

River crossing exercises using float bridge equipment are currently conducted annually, during a single two-week period between July 15 and September 15. Alternative One (preferred) and Alternative Two would increase the number of potential training exercises to six per year and extend the period for training to the time between July 1 and December 1. In addition, amphibious training exercises, including the use of helicopters, would occur up to six times per year.

The previous HPA from WDFW has stipulated several conditions for training exercises, including prohibiting training during the winter eagle use season (December 8 through March 24), prohibiting training during Chinook salmon out-migration, limiting landing sites to the established sites, prohibiting the clearing of vegetation, revegetating disturbed areas, and requiring notification of WDFW staff prior to field exercises.

The HPA restrictions are designed to reduce potential adverse effects of the river training exercises on threatened and endangered species, wildlife, fish, and vegetation. Effects on water quality and fisheries resources from the re-suspension of sediments would be low. Effects on cultural or archaeological resources and noise would also be negligible.

After an assessment of the alternatives, it has been determined that the river training exercises would cause no significant environmental impacts. The action would not violate any federal, state, or local regulations. The preparation of an Environmental Impact Statement, therefore, is not necessary. Operational measures have been proposed for actions that may have the potential to cause adverse effects. It is expected that the mitigation proposed will minimize and maintain impacts to below the threshold of significance. As a result, it is concluded that a Finding of No Significant Impact (FNSI) is appropriate for the proposed action.

Chapter 8 Permits

The following is a list of permits that would be, or have already been, obtained for the river training exercises. Also included in this list is the name of the agency that grants the permit and information pertaining to the status of the permit or requirements for the permit.

- HPA - WDFW
  This permit is issued for a five-year period

- Temporary Modification of Water Quality Criteria - Washington Department of Ecology.
  This permit must be applied for annually. To obtain the annual permit, the Army must submit a letter describing the river training activities along with the authorization letter.

- Field Training Permit - GCPUD No. 2
  This permit is issued for a five-year period.

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Chapter 10 Agencies and Individuals Consulted

Dale Bambrick - Habitat Conservation Chief, Eastern Washington, NOAA.

Rex Buck - Wanapum Leader.

Barbara Erickson Cooke - Shapiro and Associates, Inc.

Antonio Felix - Range Coordinator, YTC-DPTMS.

Randy Korgel - Cultural Resource Manager, YTC – PW – ENRD.

Colin Leingaing - Wildlife Biologist, YTC – PW – ENRD.

Johnson Meninick - Yakama Nation.

David Morgan - Wildlife Biologist, USFWS.

Pete Nissen - Natural Resources Management Specialist, YTC – PW – ENRD.

Kevin Tyler - Natural Resources Management Specialist, YTC – PW – ENRD.

Bill Van Hoesen - NEPA Program manager, Fort Lewis ENRD.