
3.4

Plants and Animals (WAC 463-42-332)

WAC 463-42-332 NATURAL ENVIRONMENT — PLANTS AND ANIMALS.

(1) Habitat for and number or diversity of species of plants, fish, or other wildlife - The applicant shall describe all habitat types, vegetation, wetlands, animal life, and aquatic life which might reasonably be affected by construction, operation, or cessation of construction or operation of the energy facility and any associated facilities. Assessment of these factors shall include density and distribution information. The application shall contain a full description of each measure to be taken by the applicant to protect all habitat types, vegetation, wetlands, animal life, and aquatic life from the effects of project construction, operation, abandonment, termination, or cessation of operations.

(2) Unique species - Any endangered species or noteworthy species or habitat shall receive special attention.

(3) Fish or wildlife migration routes - The applicant shall identify all fish or wildlife migration routes which may be affected by the energy facility or by any discharge to the environment.

3.4 PLANTS AND ANIMALS (WAC 463-42-332)

This section presents information on existing conditions and impacts related to plants and animals, including the following sections:

- Habitats and Species Present (Subsection 3.4.1)
 - Upland Vegetation (Subsection 3.4.1.1)
 - Habitat Types and Wildlife Use (Subsection 3.4.1.2)
 - Fisheries and Aquatic Resources (Subsection 3.4.1.3)
- Unique Species (Subsection 3.4.2)
 - Federal Threatened, Endangered, and Sensitive Plant Species (Subsection 3.4.2.1)
 - Federal Threatened, Endangered, and Sensitive Wildlife Species (Subsection 3.4.2.2)
 - Federal Threatened, Endangered, and Sensitive Fish Species (Subsection 3.4.2.3)
 - State-Listed Fish and Wildlife Species and Habitats (Subsection 3.4.2.4)
- Fish or Wildlife Migration Routes (Subsection 3.4.3)

3.4.1 HABITATS AND SPECIES PRESENT

The areas defined below describe the plant site and the study area applicable to the vegetation, wildlife, and wetland studies conducted for the project.

- The plant site is defined as the construction site upon which the proposed plant will be built. This site was used as a construction laydown area remaining from the previously built nuclear facilities. The site has been graded several times, is scarcely vegetated, and covered in gravel.
- The study area is defined as the proposed plant site and 500 feet around it. The study area provides a basis for describing existing conditions within a regional context.

Biologists surveyed the vegetation focusing primarily on the areas potentially impacted by construction activities. Three teams (two biologists per team) conducted the field surveys. Mapping of vegetation types in the vicinity of the proposed site was based primarily on Energy Northwest Habitat Evaluation maps.

3.4.1.1 Upland Vegetation

This subsection describes the upland vegetation resources occurring in the vicinity of the Satsop CT Project study area. The study area was evaluated to identify upland plant communities occurring in the project vicinity.

Vegetation studies were conducted by Dames & Moore biologists during May and June 1994. These surveys of the study area consisted of reviewing and assessing aerial photographs, National Wetland Inventory Maps, and county soil surveys. Vegetation types were mapped and entered into a Geographic Information System.

Existing Conditions

Regional Conditions

The study area is located within the Puget Trough Province (Franklin and Dyrness 1988). Relief is moderate, with elevations seldom exceeding 525 feet. The majority of the soils were formed in glacial materials under the influence of coniferous forest vegetation.

The study area is also within the *Tsuga heterophylla* (Western hemlock) Zone (Franklin and Dyrness 1988). This zone is the most extensive zone in western Washington and is named for the potential climax species (Western hemlock). This zone has a wet, mild, maritime climate, although climatic variation is widespread. The greatest amount of precipitation occurs in the winter, with only 6 to 9 percent of the total precipitation during the summer. The climatic variation and precipitation patterns create moisture stresses that result in distinct community patterns along moisture gradients.

Plant Site

Prior to Phase I of the Satsop CT Project, most of the proposed power plant site had been filled and graded with several feet of compacted gravel (Parametrix 1993), lacked vegetation, and a portion of the site was covered with asphalt. The site was used as a construction laydown area and had stockpiles of concrete forms, steel reinforcing bars, and other materials remaining from construction of the nuclear facilities located on the Satsop Power Plant property. Currently, the site is under construction for Phase I and has been completely regraded including the portion of the site that would be used for Phase II.

The area immediately surrounding the plant site is a mix of developed and undeveloped mitigation areas. The area to the north of the Phase II project site is industrial with some conifers to the northeast. The area to the south of Phase II project consists of the transmission line corridor and is mostly brush, followed by conifers further south. The area immediately to the west of Phase II project is the Phase I plant, which is currently under construction. The area to the east of Phase II project is part of a mitigation area and consists of thinned conifers managed as a mature forest. Continuing east is an area managed for pasture that is mowed every year. Beyond the pasture there is a zoned preservation area.

The original nuclear power plant site composed 1,600 acres, of which 400 acres were developed, and 1,200 acres were left as mitigation land. Developed areas include land that is essentially cleared of all vegetation, such as roads, industrial parks, and other buildings and facilities. Planted grasses, forbs, shrubs, and trees typically dominate these areas. These areas also have a higher

proportion of ornamentals. The mitigation areas were chosen based on the existing habitat types that would provide beneficial features for different life stages of wildlife species.

Impacts

Since the proposed plant site is not vegetated, there will not be any impacts to upland vegetation due to construction or operation of the plant. Construction of the plant will not affect wetlands, because there are no wetlands on site. The forested and pasture areas surrounding the plant site will not be impacted by construction. However, noise from the operation of the plant will be detectable in areas immediately adjacent to the site.

3.4.1.2 Habitat Types and Wildlife Use

This subsection describes the habitat resources and wildlife within the vicinity of the Phase II study area. Habitat surveys were conducted by Dames & Moore biologists during winter (January 1994) and spring (May and June 1994) to document existing habitat conditions at the proposed plant site and in surrounding areas. Surveys completed in 1994 were for the Phase I project (which included the study area for the Phase II project), as well as the pipeline corridor, and the transmission line corridor (which were part of Phase I only). A bald eagle survey conducted in February 2001 focused on bald eagle nesting habitat within 0.5 mile of the study area for Phase II. The bald eagle survey consisted of recording evidence of the species (e.g., sign, vocalizations, and direct observations).

Existing Conditions

As previously discussed, the plant site itself has been highly disturbed by previous activities and contains minimal vegetation. The area surrounding the plant site consists of developed land, coniferous forest, regenerating coniferous forest, grassland, and shrubland.

Habitat Types

Developed

Although there are varying levels of development, these areas generally provide low-quality habitat because of the lack of native vegetation and the level of human disturbance. Species observed in developed areas during field reconnaissance in 1994 included European starlings, rock doves, American crows, house sparrows, and opossums, all of which are highly adapted to human-modified environments.

Coniferous Forest

Forest habitat consists of areas dominated by coniferous and/or deciduous tree cover, and associated forest understory vegetation. Coniferous forest is the predominant habitat in the areas around the study area to the northeast, south past the transmission lines, and immediately to the east of the project site. Deciduous and mixed forest occurs in smaller patches, generally interspersed with coniferous forest stands.

The quality of forest habitat for wildlife varies depending on the age or successional stage of the stand, the presence of several vegetative layers (i.e., shrub/midstory and herbaceous/understory vegetation), the presence of snags and downed logs, and the size of the stand. A stand along Fuller Creek on the Public Development Authority (PDA) property is over 80 years old and is classified as mature coniferous forest. This stand is defined as a "Preservation Area" and is being managed to create structural characteristics of old-growth forest. The intent of the management is to provide thermal cover for deer, habitat for cavity-nesting wildlife such as pileated woodpeckers, and large snags for raptor nesting and perching.

Wildlife occurring in forest habitat in the study area is typical of wildlife occurring in second-growth forest stands throughout western Washington. Common forest songbirds observed in the 1994 surveys throughout the study area included Pacific slope flycatchers, Steller's jays, chestnut-backed chickadees, red-breasted nuthatches, brown creepers, winter wrens, golden-crowned kinglets, varied thrushes, solitary vireos, Townsend's warblers, Wilson's warblers, western tanagers, and black-headed grosbeaks. Sign of black-tailed deer, mountain beaver, and Douglas' squirrel also was observed in many forested areas.

Regenerating Coniferous Forest

Regenerating coniferous forest is defined as areas that were clearcut up to 20 years ago and where successional advancement is moving rapidly toward forest development. For the first few years after clearcutting, these stands are dominated by a mix of forbs, ferns, and shrubs, such as salal, Oregon grape, trailing blackberry, vine maple, sword fern, bracken fern, and red alder. The diversity of plant species is higher in regenerating stands than during later stages of forest succession because the open space following clearcutting allows many plant species to invade. Within 5 to 10 years after clearcutting, the conifer seedlings (primarily Douglas fir) become the dominant vegetation. Herbs, ferns, and shrubs become overtopped by young trees and often die under the taller growing species. By age 20, the stands have developed closed canopies and are classified as forest habitat. Regenerating forest is interspersed with forest habitat in the study area.

Many wildlife species are found in regenerating forest stands since the variety of plants and seeds provides an abundance and diversity of food. The young plants are fairly palatable, are accessible to ground-foraging animals (i.e., deer), and provide hiding cover for songbirds and other wildlife. Wildlife commonly observed in regenerating coniferous forest during the 1994 field surveys included ruffed grouse, mourning doves, rufous hummingbirds, Swainson's thrushes, orange-crowned warblers, MacGillivray's warblers, Wilson's warblers, rufous-sided towhees, song sparrows, white-crowned sparrows, dark-eyed juncos, and American goldfinches. Red-tailed hawks occasionally were observed circling over the open stands. Sign of coyote, black-tailed deer, and elk was observed within regenerating forest habitat and on logging roads through the regenerating stands. Garter snakes were common along the edges of logging roads. Mountain beaver sign also was prevalent throughout many of the stands.

Grassland/Agricultural

Grasslands and agricultural areas include pastures, croplands, orchards, hayfields, and untended fields. Some of the low-lying fields become flooded during winter and provide habitat for numerous species of waterfowl where they rest and feed on grains. Species observed in flooded fields near the Chehalis River during the 1994 field surveys included trumpeter swans, Canada geese, mallards, northern pintails, American wigeons, green-winged teal, common goldeneyes, killdeer, and common snipe. Open areas also provide foraging habitat for raptors. Red-tailed hawks and northern harriers occur year-round in open agricultural areas. American kestrels occur in open areas in the study area during winter. Songbirds occurring in this habitat type include violet-green swallows, savannah sparrows, and American robins.

Shrubland

Shrub habitat is the primary habitat type in existing rights-of-way for the BPA transmission line to the south of the project site. Shrub habitat is not a forest successional stage. Shrub habitat is dominated primarily by Scotch broom, but also includes trailing blackberry, Himalayan blackberry, salmonberry, thimbleberry, and young red alder.

Wildlife Species

There are 148 species of birds that potentially occur within habitats in the vicinity of the study area and adjacent lands (DeGraaf et al. 1991). Of these, 46 species are most likely to occur in forest habitat, 25 in shrub habitat, 31 in open agricultural areas and grasslands, and 46 in wetland, riparian, and aquatic habitats. Approximately 75 of the bird species are year-round residents, 45 are summer breeding residents, 23 are winter residents, and 5 occur only during spring and/or fall migration periods. A total of 32 species of mammals potentially occur within habitats traversed by Phase I of the project, with a smaller total utilizing the area immediately adjacent to Phase II. Small mammals, including rodents, shrews, bats, and rabbits are the most numerous although they are not readily observed. Large mammals include deer, elk, coyotes, and black bears.

Prior to the February 2001 bald eagle survey, Washington Department of Fish and Wildlife (WDFW) biologists were contacted for information about nest sites and bald eagle activity near the study area. There are no nests mapped by the WDFW Priority Habitat and Species (PHS) Division in the study area. The closest mapped nests are approximately 1.5 miles northeast of the study area. The location and status of these nests were confirmed by personal communication with the WDFW area biologist (Zahn 2001). Also confirmed was that there are no known bald eagle nests in the study area or the vicinity (Zahn 2001). The field survey found no bald eagles or bald eagle nests within 0.5 mile of the study area. The field survey focused on two areas of potential nesting habitat identified from the review of aerial photographs; a small creek corridor between the study area and the Chehalis River, and a steep slope along the south bank of the river. The weather at the time of the survey permitted good visibility.

A small creek flows to the Chehalis River, approximately 0.3 mile to the northwest. Although the creek was dry most of its length at the time of investigation, a distinct channel is evident by

the presence of gravelly substrate, eroded banks, and lack of vegetation. The creek's riparian corridor is mainly composed of deciduous forest, but does contain some patches of coniferous trees. The creek corridor was surveyed from Keys Road northwest to the edge of the terrace where the creek discharges down a steep slope to the river, crossing underneath an abandoned railroad bed via three metal culverts. The tops of large conifer trees along the creek and in the forested area to the north of the creek were surveyed. No bald eagles or nests were observed in this area.

The Chehalis River is bordered to the south by a steep slope with mature deciduous and conifer trees. The southern riverbank is lined with large deciduous trees that could be used as perch trees for foraging. Some of the largest trees are rooted on a fairly large terrace located on the slope. Agricultural farm fields dominate the north side of the river with only sparse trees along the riverbanks. There is no habitat suitable for bald eagle nesting on the north side of the river in the area surveyed. The south side of the river was surveyed by walking the abandoned railroad bed that borders the river and by both focusing on perch trees overlooking the river and searching for nests in the mature trees on the terrace edge. No observations of foraging or nesting bald eagles were made between the beginning of the railroad bed, at the bridge crossing near Fuller Creek, and approximately 1.5 miles southwest along the riverbank.

Impacts

Construction of the Phase II project will result in no impacts to habitat or wildlife onsite because habitat conditions at the plant site are highly disturbed and provide minimal value for wildlife. Human activity and noise generated from construction of the plant will be temporary and result in temporary disturbance of wildlife in immediately surrounding habitat areas. Wildlife tends to habituate, so only minor impacts are expected to occur.

Noise in the wildlife area to the east of the Satsop CT Project site will increase from 61 dB(A) with Phase I operating, to 75 dB(A) with both plants in operation. This is a considerable increase in noise, however given the scarcity for definitive criteria for noise level impacts to wildlife and the assumption that wildlife tends to habituate, the increase in noise from the addition of Phase II is not likely to permanently impact wildlife in the surrounding areas.

The then-named Washington Department of Wildlife management recommendations (Milner and Roderick 1991) include a site-specific approach to designating buffers for bald eagle nests. In general, buffers for active nests range from 1,300 to 2,600 feet (0.25 to 0.5 mile) during the nesting period (January through August 15). There were no bald eagle nests found near the study area, therefore no buffers or timing restrictions are needed.

No special wildlife use areas, such as fawning areas, seasonal congregation areas, or critical seasonal use habitats have been reported adjacent to the study area, and none were noted during fieldwork. It is possible that fawning areas may exist and are unknown.

Construction and maintenance vehicle traffic may cause mortality among some individual animals as they cross the access roads. These impacts generally will affect a very small percentage of the existing animal populations, and therefore the impacts will not be significant.

3.4.1.3 Fisheries and Aquatic Resources

The plant will use 9.5 cfs of water from the existing Ranney well. Eighty percent of the water in the well comes from the Chehalis River. This section describes the fisheries and aquatic resources important to the Satsop CT Project study area, which includes portions of the Chehalis River Basin. The study area is defined as the streams and rivers potentially affected by the construction and operation of the power plant facility and would include Fuller Creek and the Chehalis River.

Data sources, including USFWS, WDFW, Washington Department of Natural Resources (WDNR), Lewis County Conservation District (LCCD), and monitoring program studies conducted for the WPPSS, were reviewed in the preparation of this section. Maps from the then-named Washington Department of Fisheries (WDF) stream catalog (WDF 1975) were used to obtain information about the locations of cascades and falls. WDF and Washington Rivers Information System (WARIS) maps (WDW 1992a) were used to delineate stream use by fish.

Existing Conditions

Fisheries

The focus of this subsection is on salmonids (salmon and trout) because of their economic, cultural, and biological importance, their well-documented sensitivity to a wide range of environmental stresses, and their position near the top of the aquatic food chain. Streams that support anadromous species (fish which ascend rivers from the sea to spawn) are emphasized. Important species include fall chinook salmon, coho salmon, sockeye salmon, pink salmon, chum salmon, bull trout, and Dolly Varden. Also discussed are the anadromous gamefish species, winter and summer steelhead trout, coastal cutthroat trout, and resident species, including largemouth bass and resident cutthroat trout. Table 3.4-1 lists all fish species that occur within the study area. Primary and secondary producers (such as plankton and invertebrates) are a critical food source for fish populations and are discussed later in this section.

Nine species of anadromous salmonids (chinook, coho, sockeye, pink, and chum salmon; steelhead trout; coastal cutthroat trout, bull trout, and Dolly Varden) potentially utilize waters within the study area (WDF 1975; Willa et al. 1991; WDW 1992a; WDW 1992b, USFWS 2001). Most anadromous species in the Chehalis River system are hatchery-produced, outnumbering native stocks (Willa et al. 1991).

**TABLE 3.4-1
RESIDENT AND ANADROMOUS FISH SPECIES IN THE PROJECT AREA**

Common Name	Scientific Name
Anadromous Fishes	
Chinook Salmon	<i>(Oncorhynchus tshawytscha)</i>
Coho Salmon	<i>(Oncorhynchus kisutch)</i>
Sockeye Salmon	<i>(Oncorhynchus nerka)</i>
Pink Salmon	<i>(Oncorhynchus gorbuscha)</i>
Chum Salmon	<i>(Oncorhynchus keta)</i>
Steelhead Trout	<i>(Oncorhynchus mykiss)</i>
Coastal Cutthroat Trout	<i>(Oncorhynchus clarki clarki)</i>
Bull trout	<i>(Salvelinus confluentus)</i>
Dolly Varden	<i>(Salvelinus malma)</i>
Pacific Lamprey	<i>(Entosphenus tri)</i>
River Lamprey	<i>(Lampetra ayresi)</i>
Resident Fishes	
Cutthroat Trout	<i>(Oncorhynchus clarki)</i>
Bull Trout	<i>(Salvelinus confluentus)</i>
Dolly Varden	<i>(Salvelinus malma)</i>
Largemouth Bass	<i>(Micropterus salmoides)</i>
Sculpin	<i>(Cottus spp.)</i>
Threespine Stickleback	<i>(Gasterosteus aculeatus)</i>
Olympic Mudminnow	<i>(Novumbra hubbsi)</i>
Northern Squawfish	<i>(Ptychocheilus oregonensis)</i>
Speckled Dace	<i>(Rhinichthys osculus)</i>
Redside Shiner	<i>(Richardsonius balteatus)</i>
Bridgelip Sucker	<i>(Catostomus columbianus)</i>
Western Brook Lamprey	<i>(Lampetra richardsoni)</i>

Chinook salmon are the least abundant of the salmon species which occur on the west coast of the United States, but are nevertheless important to both the commercial and sport catches in Washington. Chinook salmon are most abundant in large rivers in the northwest and typically use the main channels of these rivers for spawning and rearing. Juvenile fall chinook salmon can spend extended periods of time in larger estuarine areas.

Coho salmon are a highly sought-after sport and commercial species in Washington. They typically spawn in tributary channels and rear in pools and backwater areas associated with good cover. Coho salmon juveniles typically spend 1 to 2 years rearing in streams before out-migrating to the sea. Off-channel areas are often used for overwintering habitat (Groot and Margolis 1991).

Sockeye salmon are the least-abundant salmon species occurring in the study area but are highly prized by sport and commercial fishermen on the west coast.

Pink salmon are the most abundant of the Pacific salmon, comprising more than 50 percent of the commercial catch on the west coast and a major portion of the commercial catch in odd years in

Puget Sound. Chum salmon are also a major species in Puget Sound. Both pink and chum salmon typically spawn near the mouths of streams but can also be found far upstream in major rivers. The out-migration patterns of pink salmon and chum salmon fry are similar. Fry emerge from the gravel and migrate downstream immediately to the estuary, where they spend an extended period of time before gradually moving offshore (Groot and Margolis 1991).

Steelhead trout (the sea-run form of rainbow trout) are one of the most sought-after sport species in Washington. Steelhead trout spawn in mainstream and tributary stems. Juveniles rear in tributaries and large river mainstems. The coastal subspecies of cutthroat trout is widely distributed in western Washington drainages, spawning in small headwater streams and tributaries and usually remaining there at least a year before migrating down to larger streams. The sea-run form occurs in most sea-accessible drainages. The non-anadromous form is found in many coastal lakes and most streams. Cutthroat trout is considered a good sport fish.

Bull trout and Dolly Varden are difficult to distinguish in the field and are managed as a single species (native char) by the WDFW (WDF 1992b, WDFW 1998a). Anadromous (sea-run), fluvial (living in mainstem streams), lacustrine (lake-dwelling), and stream resident (living in tributary streams) populations of bull trout/Dolly Varden are found in coastal drainages from the Chehalis River to the Canadian border (WDF 1992b, WDFW 1998b). Dolly Varden are typically anadromous except where migration is blocked. Some anglers consider Dolly Varden an excellent game fish (Wydoski and Whitney 1979).

Resident game fish species inhabiting waters in the vicinity of the project include resident cutthroat trout, largemouth bass, and pumpkinseed (sunfish family). Important resident nongame fish species include three-spine stickleback, Northern squawfish, dace, shiner, sucker, and the Olympic mudminnow.

Primary and Secondary Producers

Aquatic primary producers (plankton and algae) and secondary producers (aquatic invertebrates) are important contributors to the freshwater environment. These organic aquatic organisms combined with terrestrial organisms, provide food for fish. The distribution patterns of aquatic insects are influenced by a variety of physical factors including stream flow, temperature, water quality, substrate, and hydrography, and biological factors such as predation and competition. Studies of various aquatic organisms were conducted within the study area from 1973 through 1980 (WPPSS 1974b; Envirosphere 1978a, 1978b, 1978c, 1979, 1980, 1981). Because invertebrate fauna of the study area have not been studied in detail, general regional aspects will be discussed.

Nineteen diatom genera were identified in the Chehalis River, predominantly *Navicula*, *Nitzschia*, *Cocconeis*, and *Melosira*. Surveys of macrophytes in the Chehalis River indicated that during spring and summer macrophyte growth was sparse, with most species only appearing from July to October. Twelve species were widely dispersed and occurred in relatively small groups in the river. *Potamogeton* spp., *Elodea canadensis*, and *Fontinalis antipyretica* were the predominant species collected.

Periphyton (algae that attach to substrates) consisted mainly of diatoms and blue-green algae. The most abundant diatom genera collected were *Cocconeis*, *Achnanthes*, *Cymbella*, *Gomphonema*, *Synedra* and *Navicula*. *Chamaesiphon* and *Lyngbya* were the dominant blue-green genera collected. Zooplankton densities collected in June and July were consistently low. *Canthocamptus* and *Cyclops* were the dominant copepoda genera while Dipterans (Tendipedidae) were the most abundant non-crustaceans. Chehalis River macroinvertebrate densities were generally highest in the spring and lowest for the autumn exposure period. Midges (Chironomidae) were dominant in most of the samples. Other abundant groups included scuds (*Gammarus* sp.), true flies (Diptera), may-flies (Ephemeroptera), caddisflies (Trichoptera), stoneflies (Plecoptera), beetles (Coleoptera), snails (Gastropoda), and worms (Oligochaeta).

Aquatic Resources

This section discusses aquatic resources near the plant site potentially affected by the proposed project. The study area lies within the Chehalis Basin and includes the Chehalis River and Fuller Creek.

Chehalis Basin

The Chehalis Basin is composed mainly of the Chehalis River watershed. The Chehalis River forms near Pe Ell, Washington and flows generally northward to Grays Harbor. Grays Harbor is an important estuary area that provides rearing and feeding areas for juvenile salmonids produced in the Chehalis Basin (WDF 1975). Salmon enter Grays Harbor to feed on abundant smaller marine fishes which school in the western portion of the harbor (WDF 1975). Eleven species of anadromous fish use the Chehalis Basin, including the River lamprey, Pacific lamprey, coastal cutthroat, steelhead trout, bull trout, Dolly Varden, and chinook, coho, chum, pink, and sockeye salmon. Pink salmon and sockeye salmon occur in small numbers and are assumed to be strays from other areas as they are not indigenous to the Chehalis Basin (WDF 1975). Forestry and farming are the primary commercial land uses in the Chehalis basin. Over time, habitat loss and degradation have reduced the diversity of fish species in the basin.

Chehalis River and Vicinity

The Chehalis River supports chinook, coho, and chum salmon, steelhead, bull trout, Dolly Varden, coastal cutthroat trout, River lamprey, and the Pacific lamprey. Pink and sockeye salmon have been reported in the Chehalis River in insignificant numbers.

Outside of the Columbia River system, the Chehalis River is the largest watershed in the state of Washington (Seiler 1989). The Chehalis River is classified as Class A (excellent), as are most of the water bodies of the Chehalis Basin. Beneficial uses of Class AA and Class A waters include water supply, fish spawning and rearing, recreation, and navigation (LCCD 1992a, LCCD 1992b). The Chehalis River flows into Grays Harbor, the fourth largest estuary in the western United States.

Salmon produced or reared in the Chehalis basin are harvested by sport and commercial fishermen from northern California, Oregon, Washington, Canada, and Alaska (WDF 1975). Low wild runs

of coho salmon, chinook salmon, and steelhead trout have been evident for over 50 years in the Chehalis River (Seiler 1989). The decrease in wild coho salmon originating from the Chehalis basin has led to restrictions on coho salmon ocean fisheries (WDF 1992a). Wild and hatchery coho salmon smolts from the Chehalis have a consistently lower survival rate than smolts from other coastal watersheds. In order to increase run sizes (out-migrating juvenile salmon) WDFW has planted up to 2 million coho salmon smolts and up to 5 million coho salmon fingerlings per year in the Chehalis River system. Total coho salmon smolt production in the Chehalis system is estimated at 2 to 3 million per year (Seiler 1989; WDF 1993).

Chinook salmon enter the Chehalis River from March through November, spawning mainly in areas downstream of Oakville (WDF 1975), a town about 39 miles south of Olympia. Fall chinook salmon fry remain in fresh water from 3 to 5 months, and spring chinook fry remain for more than 1 year (WDF 1975). Both spring and fall Chinook salmon stocks in the Chehalis River are considered healthy based on the present number of returning adults in recent years as compared to past returns (WDW 1992c).

A native stock is one that has not been substantially affected by genetic interactions with non-native stocks and is present in all or part of its original range. A mixed stock has individuals that have originated from the mating and/or commingling of native and non-native parents or undergone a substantial change in its genetic makeup. A non-native stock is one that has become established outside of its original range. Wild stocks are stocks sustained by natural spawning and rearing in the natural habitat, regardless of parentage (WDW 1992c). The origin of Chehalis River chinook salmon stocks are both native (Spring chinook salmon) and mixed (Fall chinook salmon), but both are sustained through wild population spawning (WDW 1992c).

Coho salmon adults use virtually all accessible streams in the Chehalis basin which offer suitable spawning habitat; juveniles use many non-spawning streams for rearing and refuge during high water periods (WDW 1992c; Bisson et al. 1982). Grays Harbor coho salmon runs enter fresh water beginning in September and continuing through February (WDF 1975).

Chum salmon spawning areas occur mainly in larger tributaries entering the north side of the Chehalis River, downstream of Cloquallum Creek (WDF 1975). Chum salmon runs in areas further upstream have suffered significant declines. The only stream within the study area with reported chum salmon use is the Chehalis River (WDW 1992a).

Steelhead trout occur in many of the larger streams within the Chehalis basin. However, in the vicinity of the project site, the Chehalis River itself is the only area where steelhead trout have been documented. Steelhead trout are taken by anglers every year from the Chehalis River. An estimated 21 summer run steelhead trout were harvested by sport fishermen in the Chehalis River during the 1992 summer fishery, and 1,091 winter run steelhead trout were harvested during the winter fishery (WDW 1993b). Indian treaty steelhead trout harvests (Chehalis and Quinault tribes combined) numbered about 95 summer run steelhead trout during the 1992 summer run fishery and 1,410 winter run steelhead trout during the 1992-1993 winter run fishery (WDW 1993b).

Bull trout/Dolly Varden in the Chehalis River/Grays Harbor system have been identified as a distinct stock based on the geographic distribution. Spawn timing and locations are unknown. Chehalis River bull trout/Dolly Varden are native and are maintained by wild production. The Chehalis River is closed to fishing for bull trout/Dolly Varden, but there may be some mortality from hook and release of bull trout/Dolly Varden in fisheries targeting other species (WDFW 1996b).

Coastal cutthroat trout are considered to be an excellent game fish and are harvested annually from the Chehalis system. They use most accessible areas with suitable habitat (WDFW 1994) and have been stocked in the Chehalis River and several tributary systems from the Black River downstream (WDW 1993; WDFW 1994). Approximately 4,200 coastal cutthroat trout were stocked in the Chehalis River mainstream in 1991 by WDFW (1994).

Pacific lamprey adults are parasitic on fish in the Pacific Ocean while the larvae are filter feeders that inhabit the fine silt deposits in backwaters and quiet eddies of streams. Upon reaching maturity the adults enter fresh water in the late spring and early summer to spawn. Newly metamorphosed individuals migrate from their parent stream to the Pacific Ocean from March to July, with a peak in April and June (Wydoski and Whitney 1979).

Little is known about the biology of the River lamprey. However, it does migrate to sea and is parasitic on fishes. After feeding in the Pacific Ocean for an unknown period of time, river lamprey migrate to freshwater to spawn (Wydoski and Whitney 1979).

Limiting factors are those factors excluding harvest that lead to a reduction or complete loss of the environment's capability to sustain fish production. In most streams in the Chehalis basin, limiting factors affecting fisheries resources may include seasonal low flows resulting in degradation of spawning and rearing areas and water quality (WDF 1975; WDW 1992a). A major limiting factor in the Chehalis basin is degraded water quality. Grays Harbor is reportedly degraded by fecal bacterial and unknown agents from sources including industrial, municipal, and pasture land uses, and from timber harvesting, residential wastewater, and other unknown sources (LCCD 1992a).

The Chehalis River from its mouth upstream to the Newaukum River confluence, River Mile (RM) 75.4, is reportedly impaired by fecal bacteria and low dissolved oxygen (LCCD 1992a). From its confluence with the Satsop River upstream to the city of Chehalis, the river has a history of fish kills associated with high temperatures and low dissolved oxygen levels. Elevated temperatures (in excess of 18°C) have been measured throughout the Chehalis River system in most years, resulting in water quality problems that restrict anadromous fisheries in this basin (LCCD 1992a, 1992b). Elevated temperatures and depressed dissolved oxygen levels typically occur during the summer season (LCCD 1992a). Despite the limiting factors associated with water quality in the lower Chehalis River, better fisheries habitat is found in the area downstream of the confluence of the Black River (RM 47.0), as compared to the upper Chehalis basin (Seiler 1989).

Although degraded water quality can be a seasonal limiting factor affecting fisheries production, rearing conditions in the Chehalis Basin are not the primary reason for the overall decrease in coho salmon and other anadromous fish survival (WDF 1992). High occurrences of the diagenic fluke

Nanophyetus salmincola are present in lower areas of the Chehalis River. Adult coho salmon migrating through the lower reaches become heavily infested with this parasite that places physiological burdens on the fish and increases their vulnerability to additional stress, and may increase mortality (WDF 1992).

The inner Grays Harbor area has degraded water quality that can stress coho salmon smolts (WDF 1992, Berg and Northcoat 1985, Bjornn et al. 1974). Fall chinook salmon may be more negatively impacted than coho salmon, due to a longer residence time in Grays Harbor (Seiler 1989; WDF 1992). Chum salmon production is comparable to other watersheds in the area, possibly due to the migration of juveniles during a time when flows are higher and water quality in Grays Harbor is better (Seiler 1989, WDF 1992). It appears that degraded water quality and heavy parasite infestation cause exceptionally high mortality in the Chehalis River coho salmon smolts (WDF 1992). Another factor that limits salmon production is the presence of a robust population of squawfish, known predators of juvenile salmonids, in the lower Chehalis River and many of its tributaries (WDF 1992).

Ground water helps sustain stream flow during low flow (basal flow) conditions, which typically occur during the summer months. Groundwater problem areas are evident in Grays Harbor County near Elma. Typical causes of ground water contamination include septic systems, agricultural waste (manure and pesticides), automotive waste, landfills, and industrial waste (LCCD 1992a). Contaminated ground water is probably a contributing factor in water quality impairment in the lower Chehalis River basin.

Based upon quantity and quality of spawning and rearing habitat available and historical data, the potential salmon production of the Chehalis River and its tributaries is similar to that of other systems throughout the state (Seiler 1989).

Fuller Creek and Vicinity

Fuller Creek flows into the Chehalis River from an area south and east of the proposed plant site. The creek has produced only a few coho and chum salmon in recent years (WDFW 1994). Fuller Creek maintains a population of resident cutthroat trout (WDFW 2000b). Coho and chum salmon have been planted in previous years, but few if any adults returned. Fuller Creek substrate is primarily sand in the lower reach, turning to a mixture of rubble, gravel, and sand in the mid and upper reaches. Where spawning habitat does exist, gravels are sub-optimal; in addition, river flows in this stream further restrict spawning. Rearing habitat and refuge areas are provided during high flow periods (WDFW 1994). The area near Fuller creek has been logged three times in recent history. Increased sedimentation and erosion from logging is reported to be the predominant factor contributing to the sand substrate of the creek (WDFW 1994). Spawning coho salmon adults have been observed in Fuller Creek (WDFW 1994) located immediately east of the plant site, although only limited numbers (107 adult spawners) have been observed during WDF spawning index counts since 1987 (WDF 1993).

Impacts

Potential Plant Construction Impacts

Although there are no aquatic resources on the plant site, the Certificate Holder will implement the already approved erosion and sediment control plan to avoid sediment releases into nearby streams.

Discharges from the Satsop CT Project will use the existing outfall structure, and therefore, construction of an outfall will not be necessary. Thus, there will not be a significant adverse impact due to construction of the power plant.

Potential Operational Impacts

Plant Operations

Water to be used in the facility will be withdrawn from existing Ranney wells and transported to the site through an existing pipeline infrastructure system (see Sections 3.3 - Water, WAC 463-42-322, and 2.5 - Water Supply System, WAC 463-42-165). Process water will be delivered to the plant site through a connection to the existing outflow line. The project will send its effluent back to the blowdown line via another connection downstream of the project intake. Effluent from the facility will be discharged through an existing outfall in the Chehalis River. The discharge will meet the limitations of the existing NPDES Permit; however, the permit will be amended to include the wastewater discharge of the Phase II project.

The alluvial aquifer in the Chehalis River valley, in which the Ranney wells draw water, is interconnected with surface water sources. Surface water recharges the alluvial aquifer and groundwater in the aquifer provides baseflow to the Chehalis River. Due to this interconnection between the alluvial aquifer and the Chehalis River, the Ranney wells draw on a mixture of Chehalis River water (88 percent) and groundwater (12 percent). Phase I is authorized to use 9.5 cubic feet per second (cfs) from the Ranney wells, and the Grays Harbor Public Development Authority (PDA) has a permitted water right to withdraw an additional 20 cfs from the Ranney wells. The Certificate Holder is proposing to use 9.5 cfs of the PDA's permitted water right for Phase II.

The estimated maximum instantaneous water requirement for Phase II is 9.5 cfs (4,264 gallons per minute [gpm]). This maximum includes process water and water to cool the temperature of the discharge to a temperature below that specified in the existing NPDES permit. Using 25 percent of the 7-day, 10-year Chehalis River flow of 416 cfs (predicted low flow), and conservatively estimating that all the flow comes from the river, at worst case Phase II would withdraw less than 2.3 percent of this flow. Phase I and Phase II together will require 19 cfs or 8528 gpm. This is less than 4.6 percent of the 25 percent, 7-day, 10-year low flow. The United States Geological Survey (USGS) considers that monitors for flow (river gauges) operate at plus or minus 10 percent accuracy (Wiggins 2001). Therefore, water withdrawal for the project will not have a measurable impact on the baseflow in the Chehalis River or surrounding creeks and there will not be a measurable impact on aquatic resources.

Process effluent will be discharged to the Chehalis River through the existing outfall. As described in Section 3.3 - Water, WAC 463-42-322, the effluent will meet discharge limitations set forth in the existing NPDES permit and the discharge will meet all Class A water quality criteria for toxic substances. The discharge temperature will be in compliance with the stipulations of the existing NPDES permit and Site Certification Agreement. Therefore, project related discharges will not significantly impact the river water quality or the aquatic resources of the area (see Section 3.3 - Water, WAC 463-42-322 for additional details on water quality).

Water for potable uses will be supplied to the plant by the PDA's raw water wells located near the confluence of Chehalis and Satsop Rivers on the north bank of the Chehalis River and east of the Satsop River. The maximum anticipated demand for Phase I and Phase II is expected to be 100 gpm, and the average use will be less than 40 gpm (0.08 cfs). No significant impacts to aquatic resources from the use of this well are anticipated.

Mitigation

Maintenance wastewater will be discharged under NPDES guidelines and solid waste and toxic waste (i.e., used lubricants) will be disposed of according to state and federal regulations. Storage and use of petroleum products will be controlled and trained personnel will be equipped to respond to large and small spills.

3.4.2 UNIQUE SPECIES

Federally listed threatened and endangered species are those plant and animal species formally listed by the USFWS and National Marine Fisheries Service (NMFS) under authority of the Endangered Species Act of 1973, as amended. An *endangered* species is defined as "one in danger of extinction throughout all or a significant portion of its range." A *threatened* species is defined as "one likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Species listed as *proposed* receive limited federal protection (i.e. Section 7 consultation requirement for federal actions). *Candidate* species are those being considered for listing as threatened or endangered by the USFWS and NMFS, but do not receive any federal protection.

The USFWS, NMFS, WDNR, and WDFW were contacted for information on threatened and endangered species potentially occurring in the study area. The WDNR's Natural Heritage Data Systems were searched for documented occurrences of species of concern in the study area. Local biologists with the WDFW were contacted to confirm specific information on bald eagles and other species of concern in the study area (USFWS 1986; Zahn 2001).

3.4.2.1 Federal Threatened, Endangered and Sensitive Plant Species

The USFWS was contacted for information on the potential occurrence of threatened, endangered, and candidate plant species in or adjacent to the study area. The Washington Natural Heritage Program was also contacted for information on endangered, threatened, and sensitive plants; high quality native plant communities; and high quality natural areas and wetlands occurring in the

vicinity of the study area. *Endangered, Threatened and Sensitive Vascular Plants of Washington* (WDNR 1990) and *An Illustrated Guide to the Endangered, Threatened and Sensitive Vascular Plants of Washington* (WDNR 1981) were reviewed for information on the distribution and status of plant species of special interest potentially occurring in the study area.

There are no threatened, endangered, candidate, or sensitive plant species on or adjacent to the study area (USFWS 2001; WDNR 2001).

Impacts to Threatened, Endangered, or Candidate Plant Species

There will be no impacts to threatened, endangered, candidate, or sensitive plant species in the study area because none are present.

3.4.2.2 Federal Threatened, Endangered and Sensitive Wildlife Species

Threatened, endangered, and candidate wildlife species potentially occurring near the vicinity of the study area are listed in Table 3.4-2.

**TABLE 3.4-2
THREATENED, ENDANGERED, AND CANDIDATE WILDLIFE SPECIES
LIKELY TO OCCUR IN THE VICINITY OF THE STUDY AREA^{(a)(b)}**

Common Name	Scientific Name	Federal Status ^(c)	State Status ^(d)
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	ST
Northern spotted owl	<i>Strix occidentalis caurina</i>	T	SE
Streaked horned lark	<i>Eremophila alpestris strigata</i>	C	SC
Western pocket gopher	<i>Thomomys mazama</i>	C	SC

(a) USFWS 2001

(b) The study area is defined as the proposed plant site and 500 feet around it.

(c) T = Threatened - A species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

C = Candidate - A species that is being considered for listing as threatened or endangered.

(d) SE = State Endangered - A species, native to the state of Washington, that is seriously threatened with extirpation throughout all or a significant portion of its range within the state.

ST = State Threatened - A species, native to the state of Washington, that is likely to become endangered in the foreseeable future throughout a significant portion of its range within the state without cooperative management or the removal of threats.

SC = State Candidate - A species that is under review for possible listing as endangered, threatened, or sensitive.

The bald eagle is a state- and federally-listed threatened species. Wintering bald eagles occur in the vicinity of the study area from about October 31st through March 31st. The WDFW has conducted midwinter bald eagle surveys throughout the state. Fairly low numbers of bald eagles have been observed along the Chehalis River. Therefore, these areas are not considered to be high concentration areas for wintering bald eagles. There are no known bald eagle nests in the study area. The nearest known nests are approximately 1.5 miles northeast of the project site.

Perching habitat for wintering and nesting bald eagles consists of large trees and snags along the Chehalis River. Food stocks for bald eagles in the study area consist primarily of anadromous and resident fish in the Chehalis River and their tributaries. More detail on fish availability is presented in Subsection 3.4.1.3. Bald eagles also prey on waterfowl that concentrate in seasonally flooded fields, emergent wetlands, and ponds near the Chehalis River.

The northern spotted owl is a state-listed endangered species and a federally-listed threatened species. This species is dependent on large stands of mature and old-growth forest. Surveys for the northern spotted owl were conducted in mature forest habitat at the Satsop Development Park in 1993 and 1994 by qualified biologists from the WDNR. The surveys were designed to meet USFWS protocol. No spotted owls were detected during these surveys (Welker 1993; Schinnell 1994). There are no other stands of mature or old-growth forest in the vicinity of the study area; therefore, northern spotted owls are unlikely to occur in the study area.

Other federal candidate wildlife species potentially occurring near the study area include the streaked horned lark and the Western pocket gopher. The streaked horned lark historically occurred in prairies throughout the Puget Trough. Urbanization, conversion of prairies to agriculture, fire suppression, and introduction of exotic plants have evidently played a role in extirpating this subspecies from most of its Washington range. Currently, the only known breeding of the streaked horned lark occurs at Fort Lewis/McChord Air Force Base in Pierce County and Ocean Shores in Grays Harbor County (Smith et al. 1997).

The Western pocket gopher requires open, undisturbed tracts of prairie or meadows free of conifer encroachment, with a substantial growth of herbs and relatively dry soil loose enough for burrowing (Johnson and Cassidy 1997).

Impacts to Threatened, Endangered, and Candidate Wildlife Species

No bald eagles nests were found within 0.5 mile of the project site. The nearest bald eagle nests are 1.5 miles to the northeast of the study area. It is unlikely that the project would impact the known bald eagle nests due to the distance between the project site and the nearest nest location.

No spotted owls have been detected during surveys in mature forest habitat of the Satsop Development Park property. No other stands of mature or old-growth forest are located in the study area.

Due to the lack of suitable habitat in the study area and the adjacent vicinity, it is unlikely that the streaked horned lark or Western pocket gopher would be affected by this project.

3.4.2.3 Federal Threatened, Endangered and Sensitive Fish Species

The USFWS and NMFS were contacted for a list of threatened, endangered, proposed, and candidate species occurring in the Chehalis River in the vicinity of the proposed project. These species are listed in Table 3.4-3.

**TABLE 3.4-3
THREATENED, ENDANGERED, AND CANDIDATE FISH SPECIES
LIKELY TO OCCUR IN THE VICINITY OF THE STUDY AREA^{(a)(b)}**

Common Name	Scientific Name	Federal Status ^(c)	State Status ^(d)
Bull Trout	<i>Salvelinus confluentus</i>	T	SC
Dolly Varden	<i>Salvelinus malma</i>	PT	N/A
Coastal Cutthroat Trout	<i>Oncorhynchus clarki clarki</i>	PT	N/A
Coho Salmon (Lower Columbia/Southwest WA ESU)	<i>Oncorhynchus kisutch</i>	C	N/A

^(a) USFWS 2001, NMFS 2001.

^(b) The *study area* is defined as the proposed plant site and 500 feet around it.

^(c) T = Threatened - A species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

PT = Proposed Threatened. Species receives limited federal protection (Section 7 consultation).

C = Candidate - A species that is being considered for listing as threatened or endangered.

^(d) SC = State Candidate - A species that is under state review for possible listing as endangered, threatened, or sensitive.

N/A = Not available, species has not yet been added to the state list.

Native char (bull trout and Dolly Varden) have been documented in the Chehalis River. The majority of the Chehalis River Basin is low gradient and low elevation, which is not ideal habitat for native char. Bull trout/Dolly Varden are generally associated with cool, clear mountain streams and lakes. The highest abundance has been found in streams dominated by gravel and cobble. In lakes and streams, these fish prefer regions of temperature less than 15°C (59°F). Bull trout/Dolly Varden require cool streams for spawning, typically in high elevation headwater streams that are fed by snow melt or springs. In western Washington spawning usually occurs above 2,000 feet elevation in low gradient reaches of snow-fed streams. Spring-fed reaches of bull trout/Dolly Varden spawning streams usually occur in recent volcanic formations that are fed by high-altitude snow run off. Spawning usually occurs when stream temperatures drop below 9°C (48°F) and successful incubation generally requires temperatures of less than 4°C (39°F) for most of the incubation period. Although some bull trout/Dolly Varden may spend their entire life in a small segment of a stream, most are highly migratory, traveling between headwater spawning streams and large stream reaches (fluvial populations) or lakes (adfluvial populations) to rear as adults and larger juveniles. In western Washington, anadromous populations occur that spend a portion of their life history in marine or estuarine environments. Consequently, part of their habitat requirement is interbasin migratory routes free of blockages. Because of the bull trout/Dolly Varden's characteristic of residing in the substrate or other protected areas as juveniles, they require clean, mostly sediment-free bottom areas, or an abundance of large woody debris for cover.

The Bonneville Power Administration environmental impact statement, dated November 1995, cited a letter from D. Frederick, USFWS, July 10, 1995, identifying the bull trout (*Salvelinus confluentis*) as Federal Candidate species of fish that occurs, or may occur in streams in the vicinity of the Chehalis River (page 3-35). Since that time, the Coastal/Puget Sound Distinct

Population Segment of bull trout has been listed by the USFWS as threatened and on January 9, 2001, the USFWS proposed to list Dolly Varden as threatened under the “Similarity of Appearance” provisions of the ESA (Federal Register Vol. 66, No. 6, p. 1629).

There is scant historical and current information about native char populations in the Chehalis River Basin, but native char in the Chehalis and other southwestern Washington coastal basins appear to be in low abundance based on anecdotal information. The little available current information on the status of native char in the Grays Harbor/Chehalis River drainage is available in the 1998 bull trout/Dolly Varden stock inventory (WDFW 1998b) and the 1998 bull trout coastal/Puget Sound population segment candidate and listing priority assignment form (USFWS 1998). Native char in the Chehalis River Basin have not been identified to the species level (bull trout or Dolly Varden) and the status of the Chehalis River/Grays Harbor sub-population was listed as “unknown” in the 1998 bull trout/Dolly Varden stock inventory (WDFW 1998b).

Native char are believed to be distributed in tributaries of the Chehalis River Basin west of and including the Satsop River. Because the Chehalis River is located near the southern extent of the coastal distribution of native char in North America, abundance of the species may be naturally low in the Chehalis River (USFWS 1998). Anglers in the anadromous zone of the Chehalis River have occasionally caught native char in the spring and fall during steelhead and salmon spawning runs. The anadromous zone refers to all portions of a stream that are accessible to anadromous fish. The Chehalis River is accessible to fish at least to RM 113 and above. These are adult fish, 457 mm in length or larger. A single juvenile was observed in a WDFW downstream migrant trap at RM 50 in 1997 (WDFW 1998a). A couple of native char have been caught in the Wynoochee and Satsop rivers in the past by steelhead anglers and in smaller systems that flow into Grays Harbor, such as the Hoquiam and Humptulips Rivers. Although suitable spawning conditions may exist in the headwaters of the Humptulips and Satsop Rivers, the Wynoochee River is the only tributary of the Grays Harbor/Chehalis River drainage with extensive areas of snow melt fed streams in its headwaters.

Resident fish have not been documented in the Chehalis River and it has not been determined if the fish that have been caught by anglers in the anadromous zone of the river are anadromous, fluvial or both. Spawning populations of native char have not been documented in the Chehalis River Basin and it is possible that char found in the Grays Harbor/Chehalis River drainage are primarily or entirely composed of anadromous fish spawned in river systems to the north (Quinault, Hoh, and Queets Rivers) that enter the Grays Harbor Chehalis River drainage to forage and overwinter.

Cutthroat trout are present in virtually all perennial tributaries and mainstem reaches of this system in one or more of their life history forms. The anadromous and fluvial forms inhabit mainstem and accessible tributary reaches. The Chehalis coastal cutthroat stock is complex and considered distinct based on the geographic distribution of its spawning grounds (WDFW 2000a). River entry is from October through April and spawning occurs from January through mid-March.

Coho salmon are found throughout the Chehalis River watershed. Spawning occurs in the upper mainstem and all suitable accessible tributaries. Adults enter the river in October and spawning begins in November and continues into January and sometimes February (WDW 1992c). The Chehalis River coho stock is considered healthy (WDW 1992c).

Impacts to Threatened, Endangered, and Candidate Fish Species

Bull trout/Dolly Varden are not known to spawn in the Chehalis River. They could however use the river in the study area as a migration corridor, foraging area, and possibly a rearing area. Bull trout/Dolly Varden are known to follow runs of spawning salmon upstream to feed on the eggs and later on the rearing juvenile salmon. Coastal cutthroat trout and coho salmon spawn in smaller tributary streams and therefore could also use the Chehalis River in the vicinity of the study area as a migratory corridor, foraging area, or rearing area. No impacts are anticipated to any of these species by the construction of the plant or water discharge. Water withdrawals for the operational use of the plant are also not expected to impact the fish due to the negligible amount being withdrawn even during low flows.

3.4.2.4 State-Listed Wildlife Species and Habitats

The WDFW publishes a Priority and Habitat Species (PHS) list and a Species of Concern (SOC) list. The PHS list is a catalog of habitats and species considered to be priorities for conservation and management. Priority species require protective measures for their perpetuation due to their population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. Priority Species include, but are not limited to state endangered, threatened, sensitive, and candidate species. Priority habitats are those habitat types or elements with unique or significant value to a diverse assemblage of species (WDFW 2001).

The SOC list published by the Wildlife Management Program includes only native Washington fish and wildlife species that are state-listed, as well as federal-listed endangered, threatened, sensitive, or candidates for these designations (WDFW 2001).

The PHS database was searched through the WDFW for documented occurrences of priority habitats and species in the study area (WDFW 2000b). There were several priority fish species documented in the immediate study area (see Table 3.4-3). A list of Species of Concern was obtained through the WDFW website and those species that may occur in the vicinity of the study area are also listed in Table 3.4-4.

**TABLE 3.4-4
PRIORITY SPECIES AND SPECIES OF CONCERN
OCCURRING IN THE VICINITY OF THE STUDY AREA^{(a)(b)}**

Common Name	Scientific Name	PHS Species in Study Area	Federal SOC Status^(c)	SOC State Status^(d)
Yuma myotis	<i>Myotis yumanensis</i>		SOC	N/A
Long-eared myotis	<i>Myotis evotis</i>		SOC	N/A
Long-legged myotis	<i>Myotis volans</i>		SOC	N/A
Keen's myotis bat	<i>Myotis keenii</i>		NW	C
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>		SOC	C
Mazama (Western) pocket gopher	<i>Thomomys mazama</i>		C	C
Western gray squirrel	<i>Sciurus griseus griseus</i>		SOC	T
Oregon vesper sparrow	<i>Pooecetes gramineus affinis</i>		SOC	N/A
Pacific Fisher	<i>Martes pennanti pacifica</i>		SOC	E
Bald eagle	<i>Haliaeetus leucocephalus</i>		FT	T
Northern goshawk	<i>Accipiter gentiles</i>		SOC	C
Spotted owl	<i>Strix occidentalis</i>		FT	E
Vaux's swift	<i>Chaetura vauxi</i>		NW	C
Pileated woodpecker	<i>Dryocopus pileatus</i>		NW	C
Olive-sided flycatcher	<i>Contopus cooperi</i>		SOC	N/A
Willow flycatcher	<i>Empidonax traillii</i>		SOC	N/A
Streaked horned lark	<i>Eremophila alpestris strigata</i>		C	C
Purple martin	<i>Progne subis</i>		NW	C
Western toad	<i>Bufo boreas</i>		SOC	C
Tailed frog	<i>Ascaphus truei</i>		SOC	N/A
Pacific lamprey	<i>Entosphenus tridentatus</i>		SOC	N/A
River lamprey	<i>Lampetra ayresi</i>		SOC	C
Olympic mudminnow	<i>Novumbra hubbsi</i>		NW	S
Bull trout	<i>Salvelinus confluentus</i>	Chehalis River	FT	C
Dolly Varden	<i>Salvelinus malma</i>	Chehalis River	PT	N/A
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	Chehalis River	NW	N/A
Chum salmon	<i>Oncorhynchus keta</i>	Chehalis River	NW	N/A
Coho salmon	<i>Oncorhynchus kisutch</i>	Chehalis River	C	N/A
Sockeye salmon	<i>Oncorhynchus nerka</i>	Chehalis River	NW	N/A
Coastal Cutthroat	<i>Oncorhynchus clarki clarki</i>	Chehalis River	PT	N/A
Steelhead Trout	<i>Oncorhynchus mykiss</i>	Chehalis River	NW	N/A
Largemouth Bass	<i>Micropterus salmoides</i>	Chehalis River	NW	N/A
Resident Cutthroat	<i>Oncorhynchus clarki</i>	Fuller Creek	NW	N/A

TABLE 3.4-4 (Continued)
PRIORITY SPECIES AND SPECIES OF CONCERN
OCCURRING IN THE VICINITY OF THE STUDY AREA^{(a)(b)}

- (a) The study area is defined as the proposed plant and 500 feet around it.
- (b) Data from Natural Heritage Data Systems, WDFW 2000, and USFWS 2001
- (c) SOC = Federal Species of Concern
FT = Federal Threatened Species
PT = Federal Proposed Threatened Species
C = Federal Candidate Species
N/W = Not warranted
- (d) E = State Endangered - A species, native to the state of Washington, that is likely seriously threatened with extirpation throughout all or a significant portion of its range.
T = State Threatened - A species, native to the state of Washington, that is likely to become endangered in the foreseeable future throughout a significant portion of its range within the state without cooperative management or the removal of threats.
C = State Candidate - A species that is under review for possible listing as endangered, threatened, or sensitive.
S = State Sensitive - A species native to the state of Washington that is vulnerable or declining and likely to become endangered or threatened throughout a significant portion of its range within the state without cooperative management or removal of threats.
N/A = Not applicable, available

Impacts to State-Listed Wildlife and Plant Species

There are no wetlands or waterbodies on the project site, therefore there would be no impacts to species relying on those habitats. The project site has minimal vegetation and marginal if any current habitat value. No woodlands would be impacted by the construction of the Phase II project. The state listed wildlife in the vicinity of the study area may be temporarily displaced due to either the construction or operational noise. Signs of pileated woodpecker foraging activity was observed in forested stands near Fuller Creek, but no long-term impacts are anticipated with either the construction or operation of the plant. None of the remaining listed wildlife have been documented onsite or within the study area by WDFW. The fish species documented in the Chehalis River and Fuller Creek are not expected to be impacted.

3.4.3 FISH OR WILDLIFE MIGRATION ROUTES

Concentrations of waterfowl, including Canada geese, mallards, gadwalls, pintails, wigeons, shovelers, and teal, are defined as a state priority species. Seasonally flooded fields along the Chehalis River provide wintering habitat for over 10,000 wigeons, mallards, pintails, and buffleheads, 250 Canada geese, and 80 trumpeter swans (WDNR 1994). Numerous waterfowl were observed in flooded fields and emergent wetlands in the study area during field surveys in January 1994. Construction and operation of the project will not affect the migration of these or other migrating species.