

## CHAPTER 4 – ENVIRONMENTAL IMPACTS

### INTRODUCTION

Chapter 4 provides information about the potential consequences of implementing the alternatives on the physical, biological, and social environment to meet the purpose and need as described in Chapter 1. The four alternatives described below are evaluated in this EA. The environmental analysis describes the direct, indirect, and cumulative impacts that would occur to each resource area. The analysis focuses on the key resource issues identified during the scoping process and also provides information about non-key resource areas potentially affected by the proposed action. Several of the issues are very closely related. For this reason, information about effects may be presented in more than one section. For a complete understanding of the analysis, it is important to read all the sections.

The key issues for this project were identified through the public involvement activities and include hydrology, fisheries, water quality, and water quantity. These issues were identified by the interdisciplinary team (ID Team) to represent the primary concerns expressed by the public and resource agencies. Although some of the key issues are not directly related to the proposed action, they represent concerns that have been expressed regarding indirect and cumulative effects of other actions that are associated with the water supply facilities.

**No Action Alternative** – This alternative makes no formal decision or action regarding the Special Use Permits. The existing Special Use Permits would not be renewed and the project facilities would remain in place, operating without an updated permit. This alternative would result in the unpermitted occupation and use of the National Forest System Lands for the diversion facilities and transmission pipeline for the City of Port Townsend water supply system.

**Non-reissuance of the Special Use Permits Alternative** – This alternative results in an immediate decision to not reissue the Special Use Permits for the project facilities.

**Continuation of Existing Permit Conditions Alternative** – This alternative would renew the three Special Use Permits for the City of Port Townsend water supply diversion facilities, transmission pipeline, and maintenance facilities. The operation and management of the water diversion facilities, voluntary water conservation measures, and management of the permit area lands would continue as in the recent past.

**Modified Permit Conditions Alternative** – This alternative would renew the three Special Use Permits for the City of Port Townsend water supply diversion facilities, transmission pipeline, and maintenance facilities. Additional conditions would be placed on the permits to provide supplementary protection, mitigation, or enhancement (PME) to sensitive resources.

### Source Information

Much of the information for the analysis of project effects is from existing resource studies completed on the Big and Little Quilcene River watersheds in previous years, and relies on professional knowledge and interpretation. Additional information was collected and analyzed as necessary to address specific issues, or fill gaps in existing data, as necessary to

provide a complete assessment of the potential effects. Source material is identified within the text and documented in the References section (Chapter 5).

### **Scope of Effects Analysis**

The direct effects of the alternatives are mostly limited to the immediate area within each Special Use Permit. Depending on the specific actions proposed in an alternative, some direct effects may occur outside of the immediate permit areas. Indirect effects are a result of secondary actions that are associated with the implementation of the primary actions within an alternative and generally occur outside of the immediate permit areas. Many of the primary issues that are evaluated in this EA are a result of secondary actions that occur from active use of the Special Use Permit area (e.g., hydrology and fish habitat). Cumulative effects are defined as those effects that result from the incremental effects of the alternative when interacting with the effects of other actions (past present, and reasonably foreseeable future actions) regardless of which agency or person undertakes such other actions. Cumulative effects can occur over a wider spatial and temporal scale than direct and indirect effects.

### **Cumulative Effects Scope**

According to the Council on Environmental Quality's regulations for implementing NEPA (50 CFR§1508.7), an action may cause cumulative impacts on the environment if its effects overlap in space or time with the effects of other past, present, or reasonably foreseeable future actions, regardless of the agency, company, or person undertaking the action. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

The spatial scope of analysis for cumulatively affected resources is defined by the physical limits or boundaries of (1) the direct and indirect effects of the Special Use Permits and secondary actions on the resources; and (2) the contributing effects from other activities within the Big Quilcene and Little Quilcene watersheds or the surrounding socio-economic area. Because an action may affect some resources differently, the spatial scope of analysis for each of the resources may vary.

The temporal scope of analysis for cumulative effects includes past, present, and future actions and their effects on each resource. For the purpose of this analysis, the temporal scope will look into the future to evaluate actions that are reasonably foreseeable and that would have cumulative effects. Existing conditions, not historical conditions, are the conditions used for comparison of alternatives. The inclusion of past actions is limited to available information, and provides a historical context from which the existing conditions have developed.

## **NO ACTION ALTERNATIVE**

### **Key Issue Resource Areas**

#### ***Hydrology***

The diversion of water from the Big Quilcene and Little Quilcene Rivers for the City of Port Townsend represents 100 percent of the water supply for the City. These diversions result in a change in some of the natural hydrological characteristics of the rivers as described in

Chapter 3. Analysis of the no action alternative describes the affect of operating the diversion facilities on five hydrological characteristics; timing, frequency, rate of change, magnitude, and duration.

### **Timing and Frequency of Flows**

The seasonal timing and frequency of flows provides the basis of the life history and ecology of the organisms that inhabit a particular river. Changes in the timing and frequency of flow events may alter the timing of life stages of salmonids and has the potential to change their survival rate during early life stages.

Implementation of the no action alternative would not result in any change in the timing and frequency of flows in the Big Quilcene and Little Quilcene Rivers compared to existing conditions. There is no measurable storage of water at the diversion sites that would allow the City to change the timing or frequency of flows downstream of the diversion sites.

### **Rate of Change of Flows**

A quick reduction in the water surface elevation of a river has the potential to strand fish, particularly juveniles along the margins of the river or in isolated pools and side channels.

A reduction in the flow of the river could occur when the City increases the amount of diversion. However operating guidelines for the Big Quilcene River diversion require a staged opening process, which permit the pipeline to fill gradually and slows the river's change in flow. The City of Port Townsend is not proposing any changes to the existing operating guidelines for the diversion facilities in the no action alternative. Therefore, the implementation of the no action alternative would have no effect on the rate of change of flows that would occur in the rivers as a result of normal project operations, compared to existing conditions.

### **Magnitude**

Changes in the magnitude of a stream flow can influence channel forming processes and the distribution of gravels and sediments throughout a stream.

The City of Port Townsend is not proposing any changes to the existing operation of the diversion facilities in the no action alternative. The effect of the existing project operations on the change in the magnitude of the natural (undiverted) flows is described in Chapter 3. Implementation of the no action alternative would not change the magnitude of low or high flows in the Big Quilcene or Little Quilcene Rivers compared to existing conditions.

### **Duration**

The duration of a stream flow event describes the period of time over which the event occurs. The duration of time over which a specific water condition exists may determine whether the life-cycle phase of a particular aquatic organism can be completed.

The City of Port Townsend is not proposing any changes to the existing operation of the diversion facilities in the no action alternative. The effect of the existing project operations on the duration of flows compared to the natural (undiverted) flow conditions is described in Chapter 3. Implementation of the no action alternative would not change the duration of flows in the Big Quilcene or Little Quilcene Rivers compared to existing conditions.

## **Fisheries**

In general, the physical location of a dam has the potential to directly affect fish migration. Facility and access road maintenance have the potential to impact aquatic habitat by affecting water quality and riparian vegetation. These are potential direct effects of the actual presence and maintenance of project facilities.

The diversion of water from the Big Quilcene and Little Quilcene Rivers results in a change in some of the natural hydrological characteristics of both rivers as described in Chapter 3, which affects water quantity downstream. Impacts to fisheries caused by water diversion are considered indirect effects because the three Special Use Permits are independent of the City's water rights to withdraw water from the Big and Little Quilcene Rivers. Aquatic habitat quantity and water temperature are the downstream habitat parameters that have the greatest potential to affect fisheries, which could be impacted by water diversion. Fish migrations downstream of the diversions could also be impacted by flow reductions.

Analysis of the no action alternative describes the direct affects of facility presence and maintenance on fish migration and fish habitat, and indirect effects of water diversion on fish habitat quantity, fish migration, and water temperature effects on fish.

### **Direct Effects**

Implementation of the no action alternative would not result in any new facilities or changes to the physical nature of the diversion dams. Fish passage and screens at the Little Quilcene Diversion meet current federal standards even though no anadromous or ESA listed fish are present. No upstream fish passage facilities are present at the Big Quilcene Diversion, but downstream fish passage and fish screens are present. Therefore, downstream passage for resident fish at the Big Quilcene and Little Quilcene diversions and upstream passage at the Little Quilcene Diversion would continue to be facilitated; and upstream resident fish passage would continue to be hindered at the Big Quilcene Diversion. Both diversions allow natural bed load movement downstream, and neither facility provides short or long-term water storage; therefore, fish habitat maintenance through natural sediment transport would continue at both diversion sites. Vegetation management would continue as subsequently described in the Vegetation section. Routine road and facility maintenance would continue as conducted under existing conditions.

Listed fish species are not present in the immediate vicinity of areas permitted for use and occupancy by the three Special Use Permits. Both water diversion facilities are well above potential anadromous habitat. The actual diversion facilities and improvements covered under the three Special Use Permits are not anticipated to have any measurable impact on Hood Canal summer chum, Puget Sound Chinook, Puget Sound steelhead or their habitats within the Big or Little Quilcene Rivers.

Both diversions allow natural bed load movement downstream, and neither facility provides short or long-term water storage. The actual facilities do not alter the hydrograph nor alter channel processes to any great extent downstream. The pipeline and access road likely have some impact on downstream aquatic habitat by constraining the river channels and reducing riparian vegetation. These impacts are difficult to quantify, but are thought to be small in comparison with indirect impacts. Because both diversions are run-of-the river facilities,

water temperatures within the Big and Little Quilcene are not likely to be affected by the physical facilities.

Road and maintenance activities would be included under the Olympic National Forest road maintenance program, and any future road and facility maintenance activities would conform to the Programmatic Biological Assessment for Selected Forest Management Activities (Olympic National Forest 2003-2008) if the special use permits were reissued. Maintenance activities covered under this programmatic BA include culvert cleaning, replacement, and installation; road grading, erosion control, brushing, hazard and downed tree removal, pavement repair, bridge maintenance, gate installation and maintenance, painting, and shoulder maintenance. The Programmatic BA requires that specific conservation measures be implemented, which apply to these activities, and these conservation measures be made conditions of all re-issued special use permits. The conservation measures specified in the 2003-2008 Olympic National Forest Programmatic BA are incorporated in this project by reference (USDA Forest Service 2003). By implementing the conservation measures specified in the Programmatic BA, impacts to listed fish species, as a result of road or facility maintenance, would be minimized or avoided.

The City of Port Townsend is not proposing any changes to the existing physical nature of the diversion dams or facilities, or facility or road maintenance procedures in the no action alternative. Therefore, the implementation of the no action alternative would have no additional impact on fish habitat or fish migration above that which occurs under existing conditions.

### Indirect Effects

Implementation of the no action alternative would not result in any change in water diversion or any hydrologic parameters as discussed previously in the analysis of hydrology for this alternative. The diversion of water would continue to reduce fish habitat quantity to some degree, as occurs under existing conditions. The existing water temperature regimes in the Big Quilcene and Little Quilcene Rivers would continue to be within the life history range for salmonid populations that reside in both watersheds. Fish migration would continue to be unimpeded by water diversion. The effect of the existing project operations on fish habitat quantity and fish migration, and water temperature effects on fish are further described in the Biological Assessment (Appendix A, Section 4.3) which is incorporated by reference. In summary the fisheries parameters with the greatest potential to be impacted are aquatic habitat quantity and fish migration. Aquatic habitat quantity in terms of spawnable area can be related to stream flows. Using this relationship the greatest loss of spawning habitat in the Big Quilcene River occurs during average (mean) flows, and generally is greatest in early September and declined through mid-October. At these times the percent diversion of water is highest. However at a streamflow of 27 cfs, typical of maximum diversion during wet years and actual low flow during dry years, there would be enough potential spawning gravel to support historical summer chum populations and full Interim Summer Chum Salmon Recovery Goal for the Quilcene system.

Adequate water depth for adult upstream migration is one factor affecting the proportion of the adult population succeeding in migration. Information is not available to make quantitative assessments of how the water diversion in the Big Quilcene River may influence

migration flows. However direct observation of chum and coho salmon in the Big Quilcene River by QNFH personnel has not identified problems with adult salmon migration upstream in relation to flows or water depths (Pers. comm. L. Telles, QNFH, 2002). Therefore diversion of water likely does not limit adult salmon upstream migration in the Big Quilcene River. At this time problems with adult salmon upstream migration are not known to occur in the Little Quilcene River.

Steelhead immigrate and spawn in late spring during times of naturally high flows. Juveniles that emerge from the gravels in mid-summer spend the first few weeks rearing along shallow margins. As they grow, the juveniles gradually inhabit deeper and faster riffles and pools. Juveniles typically rear year-round in steeper headwaters and pools, before emigrating to marine waters after one to two years in freshwater. The spatial and temporal patterns expected in the Quilcene watersheds of spawning, rearing, and migrating makes steelhead less susceptible to effects of the water diversions, compared to summer-run chum.

Water temperatures on both the Big Quilcene and Little Quilcene Rivers fall within the State temperature standards (not greater than 16.0 degrees C) during most months of the year (as measured for years 2001 and 2002). Individual daily maximum temperatures exceeded State standards in July and August, which are periods when summer chum are not in the river. Results from flow tests indicate that flow in the Big Quilcene River has only a small influence on water temperatures in the lower river. Varying the quantity of the diversion or shutting off the diversion completely would have only a minor effect on stream temperature.

The implementation of the no action alternative would have no additional impact on fisheries through the diversion of water above that which occurs under existing conditions.

### ***Water Quality***

A specific water quality goal under this alternative is to comply with the Washington State water quality criteria. Many factors related to project operations could affect water temperatures in the Big Quilcene and Little Quilcene Rivers. The interaction of many factors influences the water quality and thermal regime of these rivers.

No hazardous materials are used for instream structures, however there is a very limited potential for introducing hazardous materials (e.g. paint, gas, etc.) into the rivers during maintenance of the facilities that could result in water quality problems. Depending on the concentration of hazardous materials released into the water, mortality to fish could occur. The use and disposal of potentially hazardous materials during maintenance would be managed through best management practices (BMPs). The precautionary BMPs would minimize the risk of the introduction of hazardous materials into project waters.

Under this alternative, the City would continue to divert their full water right from both rivers. Water temperature in the Big Quilcene and Little Quilcene Rivers would continue to be indirectly affected by the diversion and would remain similar to the existing thermal regime. The water temperature in the reach below the diversions would likely remain within the water quality criteria and continue to follow diurnal and seasonal trends similar to the existing conditions (e.g. temperature changes less than 1°C). The water temperature regime in the lower Big Quilcene River could potentially be a few degrees warmer than the state criteria during warm summer months in July and August. While the indirect effects of this

alternative contribute to temperature criteria exceedences, other non-federal management activities within the watersheds also contribute to degraded water quality conditions. During the extreme dry year in 2001, the highest exceedence observed in this section was approximately 2°C above the State criteria. The thermal regime in this reach during a normal year would likely be lower than the temperatures measured during the extreme dry year.

### ***Water Supply / Water Use***

Implementation of the no action alternative would not result in any change to the existing water use in the immediate permit area, or at the community and regional level. The demand for water from the special use permit areas would continue to be influenced by the population growth within the water utility service area of the City of Port Townsend, and the growth of commercial economic activities that are supported by the City water supply system but would be limited by the existing water rights. The population of the City of Port Townsend is estimated to grow at an annual rate of 2 percent through 2046 (CH2M Hill 1998). The City would continue to implement its voluntary maintenance of a 27 cfs instream flow in the Big Quilcene River.

### **Non-Key Issue Resource Areas**

#### ***Geology and Soils***

##### **Direct Effects**

Erosion and deposition of sediments can have both positive and negative effects on channel form, water quality, and aquatic habitat. Bank erosion and deposition of sediments are natural channel processes. These processes are in part influenced by the integrity of bank material and energy of flowing water. In general, channel form is maintained by flows of the one- to two-year recurrence interval floods. Bank materials in the vicinity of the diversion sites on both the Big Quilcene and Little Quilcene Rivers are dominantly colluvium and bedrock.

Under the no action alternative, diversion operations at the Big Quilcene and Little Quilcene Rivers would continue. Flows large enough to erode channel banks and mobilize sediments are estimated at 1,200 to 1,800 cfs below the Big Quilcene River diversion, and between 230 and 320 cfs below the Little Quilcene diversion (Hydrology, Chapter 3 of this EA). Maximum water diversion at the Big Quilcene River is 30 cfs, and 9.56 cfs at the Little Quilcene River diversion site. These translate to maximum reductions of about 2.5 percent and 4.2 percent respectively; however, during high flow events there typically would be no diversions due to elevated turbidity.

No measurable direct effects of continued water diversion on geology and soils at the water diversion sites on the Big Quilcene and Little Quilcene Rivers would likely occur over the long term, due to the relatively small percentage of flow reduction during flows large enough to maintain the channel.

##### **Indirect Effects**

For reasons outlined above, no measurable indirect effects of continued water diversion on geology and soils downstream of the Big Quilcene and Little Quilcene Rivers would likely occur over the long term.

## ***Vegetation***

Implementation of the no action alternative would not result in any managed change in the native vegetation composition within the three special use permit areas. Native vegetation would continue to mature through successional development. Danger trees along the road right-of-way accessing the special use permit areas would continue to be removed when they are identified as presenting a risk to travelers along these roads. Roadside brushing would continue to occur as needed on a seasonal basis to maintain visibility along the road. Ornamental vegetation within the Big Quilcene River special use permit area would continue to be managed to provide scenic qualities and functional use associated with the maintenance activities that occur on the site.

There would be an increase in existing invasive plant infestations over time as the unpermitted use would not implement prevention and control strategies.

## ***Wildlife***

Implementation of the no action alternative would not result in any change to habitat features (e.g., vegetation and site conditions) within the three special use permit areas. Maintenance activities associated with the project facilities that generate noise may continue to result in minor disturbances to species occupying areas adjacent to the permit areas. The existing management of habitat and wildlife would not result in a change in the distribution and composition of wildlife species in the area.

## ***Threatened, Endangered, and Sensitive Species***

### **Fish**

As described in the Biological Assessment, Hood Canal summer chum salmon (threatened) spawn in the Big Quilcene and Little Quilcene Rivers. Puget Sound Chinook salmon (threatened) may occasionally spawn and rear in the Big and Little Quilcene Rivers and anadromous Coastal/Puget Sound bull trout (threatened) from other watersheds may occasionally forage in the lower portions of both rivers; however, there is no documentation of this occurring. Puget Sound steelhead use the Big and Little Quilcene Rivers for spawning and rearing. Since TES fish species are present downstream of both diversions, project operations under the no action alternative have the potential to impact TES fish species. Potential direct and indirect effects are the same as listed under the Fisheries section for this alternative.

### ***Direct Effects***

The physical location of the both diversion dams and facilities have no potential to directly impact TES fish species because all TES fish species in both rivers are separated from project facilities by natural passage barriers. Road maintenance has the potential to impact TES fish species. However, the City of Port Townsend is not proposing any changes to road maintenance procedures in the no action alternative. The effect of the existing project facilities and maintenance on fish habitat and fish migration is described in the fisheries section of this chapter and in the Biological Assessment (Appendix A, Section 4.2). The implementation of the no action alternative would have no additional impact on fish habitat or fish migration above that which occurs under existing conditions.

### *Indirect Effects*

Downstream indirect effects caused by water diversion could impact TES fish species in both rivers. Potential indirect effects on TES fish species are the same as listed in the Fisheries section for this alternative. Implementation of the no action alternative would not result in any change in water diversion or any hydrologic parameters as discussed previously in the analysis of hydrology for this alternative. The continued diversion of water would continue to reduce TES fish habitat quantity to some degree, as occurs under existing conditions. The existing water temperature regimes in the Big Quilcene and Little Quilcene Rivers would continue to be within the life history range for TES fish populations that are known to reside in both watersheds. TES fish migration would continue to be unimpeded by water diversion. The effect of the existing project operations on TES fish habitat quantity and fish migration, and water temperature effects on TES fish are described in the Fisheries key issue section of this chapter and the Biological Assessment (Appendix A, Section 4.3). The implementation of the no action alternative would have no additional impact on TES fish through the diversion of water above that which occurs under existing conditions.

### *Wildlife*

As described in Chapter 3- Existing Conditions, the bald eagle (threatened), marbled murrelet (threatened), and northern spotted owl (threatened) occur in both the Big Quilcene and Little Quilcene watersheds. Timber harvest or forest clearing would be the major source of impact to the marbled murrelet or spotted owl in the action area, however these activities in marbled murrelet or spotted owl habitats are not part of this alternative, nor do these activities produce indirect or cumulative effects associated with this alternative. Danger trees along the pipeline right-of-way road or at the caretaker's residence may be removed on a very infrequent basis, although City personnel cannot recall removal of any hazard trees. Any tree removal is anticipated to be extremely limited and the impacts to spotted owls or marbled murrelets would be so small as to be considered negligible and discountable. Road brushing in the summer is not expected to impact listed species.

Reduction in salmon abundance may impact the forage base for bald eagles in the action area, but this reduction in natural spawning and salmon abundance may be compensated for by QNFH production to a certain degree. In addition, Watson and Pierce (1998) have shown bald eagles to be highly adaptable. They use a wide range of prey items such as sea gulls, waterfowl, fish, other bird species, and can scavenge on large mammal carcasses. The wide spread reduction in salmon abundance has apparently not hindered the recovery of bald eagles in Western Washington over the last 30 years. Therefore, any reduction in salmon abundance that may be an indirect effect of the proposed action would likely have an insignificant effect on the overall bald eagle forage base. Therefore, the appropriate effects determination for this alternative is "may affect, not likely to adversely affect" the bald eagle, marbled murrelet and spotted owl.

Habitat disturbing activities would not be conducted with the implementation of the no action alternative. Therefore, there would be no impact to the one sensitive mollusk species, *Hemphillia glandulosa* (warty jumping slug), which has potential habitat in the project area.

The City of Port Townsend is not proposing any changes to the existing operation or maintenance of the diversion facilities in the no action alternative. Therefore, the implementation of the no action alternative would not adversely affect TES wildlife species.

## **Plants**

There are no threatened or endangered plant species within the project area. Although there is potential habitat within the project area for some Forest Service sensitive species, this alternative proposes no substantial changes to occupancy and use of National Forest System Land or facilities, and no additional ground disturbance activities are planned. Therefore, the no action alternative would have no impact on TES plants.

## **Other Rare or Uncommon Species**

Due to the disturbed nature of the project area there is no potential habitat these species, and no known sites.

## ***Floodplains and Wetlands***

### **Direct Effects**

Floodplain and wetland maintenance is conditioned in part by the dominant long-term pattern of hydrology in the context of landform. Significant shifts in hydrology due to management actions can alter floodplain and wetland function.

Under the No Action Alternative, diversion operations at the Big Quilcene and Little Quilcene Rivers would continue. Floodplain area at both sites is small, due to the confining nature of side slopes. No wetlands are known to exist at these sites.

No measurable direct effects of continued water diversion on floodplains at the water diversion sites on the Big Quilcene and Little Quilcene Rivers would likely occur over the long term, due to the long term pattern of natural flow and diversion at these sites.

### **Indirect Effects**

For reasons outlined above, no measurable indirect effects of continued water diversion on floodplains and wetlands downstream of the Big Quilcene and Little Quilcene Rivers would likely occur over the long term.

## ***Socioeconomics***

Implementation of the no action alternative would allow continued operation of the Port Townsend Paper Company and the City would be able to continue providing critical municipal utility services to the residential and commercial customers.

## ***Recreation / Scenic Resources***

Implementation of the no action alternative would not change the existing recreation use within the watershed. Recreation activities are prohibited within the permit areas at the diversion sites on the Big Quilcene and Little Quilcene Rivers. The types of recreation activities and the level of recreation use within the watershed would continue as in the recent past.

### ***Heritage / Cultural Resources***

There are no known historic or cultural properties within the permit areas, and as such implementation of the no action alternative would have no effect on cultural resource properties. It is unlikely that any undiscovered cultural resource sites would be identified in the permit areas. However, should any cultural resources be discovered within the permit areas, the State Historic Preservation Officer would be notified.

The traditional and customary use of natural resources within the permit area and the watershed by Native Americans would not change with implementation of the no action alternative. The dominant traditional natural resource used in the watershed is fish. The effects of the no action alternative on fisheries resources are described in a previous section.

### ***Transportation and Access Management***

Implementation of the no action alternative would have no effect on the transportation infrastructure and the management of the transportation system within the watershed. Access to the transportation network within the watershed would continue to be guided by the Forest Service Access and Management Plan. Public access to the diversion sites on the Big Quilcene and Little Quilcene Rivers will continue to be restricted by state regulations for the protection of municipal water supply systems.

### ***Lands and Land Use***

Implementation of the no action alternative would not change any existing land ownership, uses, or policies within the watershed. The land use within the permit areas are designated in the Forest Plan for the establishment and maintenance of the water diversion and transmission pipeline facilities.

## **NON-REISSUANCE OF THE SPECIAL USE PERMITS ALTERNATIVE**

### **Key Issue Resource Areas**

#### ***Hydrology***

The diversion of water from the Big Quilcene and Little Quilcene Rivers for the City of Port Townsend represents 100 percent of the water supply for the City. These diversions result in a change in some of the natural hydrological characteristics of the rivers as described in Chapter 3. Implementation of the non-reissuance of the special use permits alternative would result in the removal of the existing diversion facility on the Big Quilcene River and the relocation of the diversion facility on the Little Quilcene River. Analysis of the non-reissuance of the special use permits alternative describes the affect of operating the diversion facilities on five hydrological characteristics; timing, frequency, rate of change, magnitude, and duration.

#### **Timing and Frequency of Flows**

The seasonal timing and frequency of flows provides the basis of the life history and ecology of the organisms that inhabit a particular river. Changes in the timing and frequency of flow events may alter the timing of life stages of salmonids and has the potential to change their survival rate during early life stages.

Implementation of the non-reissuance of the special use permits alternative would not result in any change in the timing and frequency of flows in the Big Quilcene and Little Quilcene Rivers compared to existing conditions. The removal of the diversion at the Big Quilcene River would restore all hydrological parameters to natural conditions. The relocated diversion on the Little Quilcene River would contain no measurable storage of water at the diversion site that would allow the City to change the timing or frequency of flows downstream.

### **Rate of Change of Flows**

A quick reduction in the water surface elevation of a river has the potential to strand fish, particularly juveniles along the margins of the river or in isolated pools and side channels.

A reduction in the flow of the river could occur when the City increases the amount of diversion. The City of Port Townsend is not proposing any changes to the existing operating guidelines for the relocated diversion on the Little Quilcene River. The removal of the diversion on the Big Quilcene River would eliminate the ability of the City to influence any hydrological parameters on that river. Therefore, the implementation of the non-reissuance of the special use permits alternative would have no effect on the rate of change of flows that would occur in the rivers as a result of normal project operations, compared to existing conditions.

### **Magnitude**

Changes in the magnitude of a stream flow can influence channel forming processes and the distribution of gravels and sediments throughout a stream.

The City of Port Townsend is not proposing any changes to the existing operating guidelines for a possible relocated diversion on the Little Quilcene River. The relocation and continued operation of the diversion on the Little Quilcene River would have no effect on the magnitude of low and high flows compared to existing conditions.

The removal of the diversion on the Big Quilcene River would result in an increase in the magnitude of low flows and high flows in the lower Big Quilcene River. The amount of increase in magnitude would be approximately equal to the average annual diversion amount of 18 cfs. The effect of this increase in magnitude on flows in the lower river would be more prominent during low flows than high flows because of a greater percent of the total flow diverted. The natural flow conditions that would occur on the Big Quilcene River following removal of the diversion facility are described in Chapter 3.

### **Duration**

The duration of a stream flow event describes the period of time over which the event occurs. The duration of time over which a specific water condition exists may determine whether the life-cycle phase of a particular aquatic organism can be completed.

The City of Port Townsend is not proposing any changes to the existing operating guidelines for a possible relocated diversion on the Little Quilcene River. The relocation and continued operation of the diversion on the Little Quilcene River would have no effect on the duration of flows compared to existing conditions.

The removal of the diversion on the Big Quilcene River would result in an increase in the duration of flows throughout most of the year. The amount of increase in the duration of flows would be approximately equal to the average annual diversion amount of 18 cfs. The effect of this increase in the duration of flows would be more prominent during low flows because of a greater percent of the total flow diverted. The natural flow conditions that would occur on the Big Quilcene River following removal of the diversion facility are described in Chapter 3.

### ***Fisheries***

Implementation of the non-reissuance of the special use permits alternative would result in the removal of the existing diversion facility on the Big Quilcene River, and the possible relocation of the diversion facility on the Little Quilcene River. For this analysis it is assumed that the relocated diversion on the Little Quilcene River would be for the same water right and instream flow requirement as under existing conditions; the diversion structure would be located downstream of the current site, but upstream of the natural anadromous fish barrier; fish screens and passage would meet current standards; project operations would be the same as under existing conditions; operation of the new diversion would start at approximately the same time that the old diversion is stopped; and the new diversion facilities would be of similar size to current facilities.

Given these assumptions, the implementation of the non-reissuance of the special use permits alternative would not result in any substantial long-term change in existing hydrologic conditions in the Little Quilcene River. Effects the current project operations have on existing hydrologic conditions and fisheries for the Little Quilcene River would be the same as those listed under the no action alternative and as listed in the Biological Assessment. Therefore, the implementation of the non-reissuance of the special use permits alternative would have no greater long-term impact on fisheries in the Little Quilcene River above that which occurs under existing conditions and the no action alternative. Minor and temporary impact may occur and would be caused by instream work, such as removal of the old diversion and construction of the new diversion, but these impacts would be avoided or minimized by using a combination of best management practices to address temporary sedimentation and erosion and pollution prevention.

The removal of the diversion on the Big Quilcene River would restore all hydrologic parameters to natural unregulated conditions. While some temporary negative impacts, such as erosion and sedimentation, may be caused by instream work associated with removal of the Big Quilcene Diversion, these impacts would likely be avoided or minimized by using best management practices. All impacts to fish and habitat under existing conditions that are described under the No Action alternative would no longer occur. This would likely be a beneficial effect on fish populations in the lower Big Quilcene River when compared to existing conditions. It is estimated that an increase in flow from 27 to 46 cfs would increase spawning capability of summer chum by about 13 percent. It should be noted that even with the 27 cfs diversion it appears that enough spawning habitat exists to supply historical summer chum populations and the full Interim Summer Chum Salmon Recovery Goal for the Quilcene system. Upstream resident fish migration would no longer be impeded by the diversion dam since it would be removed. While this would likely be a beneficial effect

when compared to existing conditions, it is not known to what extent this may increase resident fish production.

### ***Water Quality***

Under this alternative, the City would halt the diversion of water from the Big Quilcene River, returning it to natural flow conditions. The point of diversion on the Little Quilcene River could possibly be moved downstream to a location off federal land. This alternative would require the City to construct a new diversion structure on the Little Quilcene River, with the potential to cause short-term effects on the stream during the construction. The water quality parameter most affected by the construction of a new diversion would be turbidity. The primary processes during construction that could directly increase turbidity include erosion and surface runoff, sediment, and dust from construction areas. To reduce these effects, erosion control measures would be implemented. These would include use of best management practices (BMPs) during construction, limitation of construction activities to the summer low flow period to minimize runoff of fine sediments, and the isolation of instream work areas from flowing water whenever possible. The BMPs would also be implemented to prevent hazardous materials, such as equipment fuels and oils, from entering project water and potentially impacting water quality.

An evaluation of the effect of releasing all of the available flow (i.e., natural flow) to the Big Quilcene River past the Port Townsend diversion was based on historical water temperatures, flow availability, and accretion. The analysis indicates that releasing the natural flow past the Port Townsend diversion would generally reduce mid-July to mid-September daily maximum water temperatures at RM 4.4 by about 0.3 to 0.7°C, and that reductions of up to 1.0°C could occur. However, water temperatures would be altered less in downstream reaches, and are expected to be reduced by less than 0.5°C in the reach accessible to anadromous salmonids (i.e., the reach from the hatchery down to the mouth). Downstream water quality would continue to be impacted by non-federal management activities.

### ***Water Supply / Water Use***

The water supplied by the City of Port Townsend diversions on the Big Quilcene and Little Quilcene Rivers provide water utility service to the residents within the City, and is used in the processing and manufacturing of paper products. The loss of a portion or all of this water supply would impact the economy of the City of Port Townsend, and the quality of life for residents within the City.

The City of Port Townsend diverts an average annual flow of 20-24 cfs from the Big Quilcene and Little Quilcene Rivers. During 2002, the average annual diversion from the Big Quilcene River was 17.6 cfs, and the Little Quilcene River was 3.5 cfs (City of Port Townsend, unpublished data).

Implementation of the non-reissuance of the special use permits alternative would result in the loss of water supplied by the Big Quilcene River diversion. Relocating the point of diversion off of federal land would result in substantial construction and operating costs to pump water to a point connecting to the existing transmission pipeline and storage reservoirs. The cost of changing the point of diversion on the Big Quilcene River would not be an economical action for the City and its water users. Without the supply of water from the Big

Quilcene River the total supply of water would no longer be adequate to operate the paper mill.

The City could possibly move the Little Quilcene River point of diversion downstream to a location off federal land and continue to provide water to residents and most businesses in the City. Technical and economic challenges would occur with this change of diversion, although it is considered the most feasible option to maintain a continuous water supply for the City. The diversion of water from the Little Quilcene River would be sufficient to meet the current demand for water from City residents and most businesses. The supply of water from the Little Quilcene River is not sufficient to provide the quantity of water required for the operation of the paper mill. The supply of water from the Little Quilcene River may not be sufficient to meet the future growth in demand for water by the City, requiring the City to evaluate alternative water supply options to meet future demand. The population of the City of Port Townsend is estimated to grow at an annual rate of 2 percent through 2046 (CHM2 Hill 1998). Alternative water supply options that may be available to the City were briefly described in Chapter 2 under the heading Alternatives Considered but Dismissed from Further Analysis.

The implementation of this alternative would have no affect on numerous small wells that provide water to the individual homes and businesses in the community of Quilcene. The implementation of this alternative may improve water availability for the Quilcene National Fish Hatchery water diversion during part of the year. This increased availability would depend on the future use of the senior water right held by the City of Port Townsend.

## **Non-Key Issue Resource Areas**

### ***Geology and Soils***

#### **Direct Effects**

Erosion and deposition of sediments can have both positive and negative effects on channel form, water quality, and aquatic habitat. Bank erosion and deposition of sediments are natural channel processes. These processes are in part influenced by the integrity of bank material and energy of flowing water. In general, channel form is maintained by flows of the one- to two-year recurrence interval floods. Bank materials in the vicinity of the diversion sites on both the Big Quilcene and Little Quilcene Rivers are dominantly colluvium and bedrock.

Under the non-reissuance of the special use permits alternative, diversion operations at the Big Quilcene and Little Quilcene Rivers would cease. Flows large enough to erode channel banks and mobilize sediments are estimated at 1,200 to 1,800 cfs below the Big Quilcene River diversion, and between 230 and 320 cfs below the Little Quilcene diversion (Hydrology, Chapter 3 of this EA). Under existing conditions of diversion, the maximum water diversion at the Big Quilcene River is 30 cfs, and 9.56 cfs at the Little Quilcene River diversion site. These translate to maximum reductions of about 2.5 percent and 4.2 percent respectively of estimated natural channel forming flows.

No measurable direct effects of discontinued water diversion on geology and soils at the water diversion sites on the Big Quilcene and Little Quilcene Rivers would likely occur over

the long term, due to the relatively small percentage of flow increase during flows large enough to maintain the channel. In addition due to elevated turbidity, the City typically does not divert water during high flow events.

### **Indirect Effects**

For reasons outlined above, no measurable indirect effects of discontinued water diversion on geology and soils downstream of the Big Quilcene and Little Quilcene Rivers would likely occur over the long term.

### **Vegetation**

Implementation of the non-reissuance of the special use permits alternative would likely result in the reestablishment of native vegetation within the cleared permit areas. Native vegetation in these areas would continue to mature through successional development. The diversion access roads would likely be closed with the removal of the pipelines, resulting in revegetation of the riparian corridors.

There would likely be an increase in existing invasive plant infestations over time as there would be no authorized use of the area, and no special use permit terms and conditions to include prevention and control strategies. The Forest Service would be solely responsible for management of invasive species, and activities in the project area would need to compete for limited funds to carry out these strategies. There would be an increase risk of new infestations associated with the pipeline removal ground disturbance.

### **Wildlife**

Implementation of the non-reissuance of the special use permits alternative would result in some changes to habitat features (e.g., vegetation and site conditions) within the three special use permit areas, however, due to the small footprint of the diversion facilities, their removal and subsequent revegetation would not likely result in a significant change in the distribution and composition of wildlife species in the area.

### **Threatened, Endangered, and Sensitive Species**

#### **Fish**

Implementation of the non-reissuance of the special use permits alternative would have the same potential for direct and indirect effects on TES fish species in the Little Quilcene River as listed in the Fisheries section for this alternative. This alternative would not result in any change in project operations or maintenance and would maintain the existing hydrologic regime even though the diversion would be moved a short distance downstream. Effects that the current Little Quilcene diversion operations and hydrologic regime have on existing TES fish species are the same as listed under the no action alternative. The implementation of the non-reissuance of the special use permits alternative would have no greater impact on TES fish species in the Little Quilcene River above that which occurs under existing conditions and the no action alternative. Temporary effects caused by moving the diversion would be avoided or minimized by using best management practices.

The removal of the Big Quilcene diversion would have the same effects on TES fish species as described under the Fisheries section analysis for this alternative. It is likely that removal

of the Big Quilcene River diversion would increase TES fish habitat downstream of the diversion site.

It is worth noting that the Big Quilcene River summer chum salmon runs (ESA threatened) were an order of magnitude larger from the 1910's to 1930's compared to current abundance (QNFH unpublished data). Water diversion rates were similar to or greater than current diversion rates during the late 1920's to 1930's and appeared to have had little impact on summer chum salmon abundance in the Big Quilcene River. Current summer chum salmon abundance is much lower than historical levels even though average diversion is less. This leads one to believe that water diversions may not be the significant limiting factor for chum salmon production. Other factors include land use and aquatic impacts, such as urbanization, stream channelization, timber harvest, estuary habitat degradation, over-harvest, and predation by (and competition with) hatchery salmon and other predators in the marine environment. Reduced ocean productivity has also likely negatively influenced salmon production.

### **Wildlife**

The analysis presented under the No Action alternative shows that water diversion and facility operations and maintenance under existing conditions may affect, but are not likely to adversely affect TES wildlife species in both the Big Quilcene and Little Quilcene River watersheds. Although the Little Quilcene diversion would be moved a short distance downstream under the non-reissuance of the special use permits alternative, this action would not likely principally alter TES wildlife habitat since the area of impact would likely be small and similar in size and scope to existing facilities. In addition, the City of Port Townsend is not proposing any changes to the existing operation or maintenance of the new diversion facilities. Therefore, the implementation of this alternative would not adversely affect TES wildlife species and would maintain existing conditions.

### **Plants**

There are no threatened or endangered plant species within the project area. There is potential habitat within the project area for some Forest Service sensitive species, and implementation of the non-reissuance of the special use permits alternative would result in some changes to habitat features (e.g., vegetation and site conditions) within the three special use permit areas. However, due to the small footprint of the diversion facilities, their removal and subsequent revegetation would not likely result in a significant change in the distribution and composition of sensitive species in the area. Therefore, the non-reissuance of the special use permits alternative would have no impact on TES plants.

### **Other Rare or Uncommon Species**

Due to the disturbed nature of the project area there is no potential habitat for these species, and no known sites.

## ***Floodplains and Wetlands***

### **Direct Effects**

Floodplain and wetland maintenance is conditioned in part by the dominant long-term pattern of hydrology in the context of landform. Significant shifts in hydrology due to management actions can alter floodplain and wetland function.

Under the Non Reissuance of the Special Use Permits Alternative, diversion operations at the existing Big Quilcene and Little Quilcene Rivers would cease. Floodplain area at both sites is small, due to the confining nature of side slopes. No wetlands are known to exist at these sites.

No measurable direct effects of discontinued water diversion on floodplains at the existing water diversion sites on the Big Quilcene and Little Quilcene Rivers would likely occur over the long term, due to the long term pattern of natural flow and limited floodplain availability at these sites.

### **Indirect Effects**

For reasons outlined above, no measurable indirect effects of discontinued water diversion on floodplains and wetlands downstream of the Big Quilcene and Little Quilcene Rivers would likely occur over the long term.

## ***Socioeconomics***

The water supplied by the City of Port Townsend diversions provide water utility service to the residents within the City and is used in the processing and manufacturing of paper products. The loss of a portion or all of this water supply would impact the quality of life for the residents of the City and the operation by the paper mill.

Implementation of the non-reissuance of the special use permits alternative would result in the loss of water supplied by the Big Quilcene River diversion. Without the supply of water from the Big Quilcene River, the total supply of water provided by the City would not be adequate to support the operation of the paper mill. Alternate sources of water are not currently available to provide an adequate supply of water for the continued operation of the paper mill. This would result in the closure of the paper mill and loss of a direct employment base in the City of Port Townsend. The Port Townsend Paper Mill is the largest single employer in Jefferson County. Additional secondary economic losses to the Jefferson County economy would occur following closure of the paper mill as a result of reduced wages and tax base, see Chapter 3 for the socioeconomics of the Paper Mill.

## ***Recreation / Scenic Resources***

Implementation of the non-reissuance of the special use permits alternative would likely result in the removal of the existing diversion access roads. Although these roads were built and have been maintained for access to facilities, they are also used by the public for recreation access.

## ***Heritage / Cultural Resources***

Implementation of the non-reissuance of the special use permits alternative would have no effect on cultural resource properties within the permit areas. It is unlikely that any

undiscovered cultural resource sites would be identified in the permit areas as activities to remove existing facilities occur. However, should any cultural resources be discovered within the permit areas, the State Historic Preservation Officer would be notified.

The traditional and customary use of natural resources within the permit area and the watershed by Native Americans would not change with implementation of the non-reissuance of the special use permits alternative. The dominant traditional natural resource used in the watershed is fish. The effects of the non-reissuance of the special use permits alternative on fisheries resources is described in a previous section.

### ***Transportation and Access Management***

Implementation of the non-reissuance of the special use permits alternative would likely result in the closure of the diversion access roads. Access to the transportation network within the watershed would continue to be guided by the Forest Service Access and Travel Management Plan.

### ***Lands and Land Use***

Implementation of the non-reissuance of the special use permits alternative would not change any existing land ownership, uses, or policies within the watershed. The land use within the permit areas would continue to be managed by the Forest Service for the protection of natural resources, including water quality. The Big Quilcene River and Little Quilcene River watersheds would continue to be designated in the Forest Plan of the Olympic National Forest as municipal watersheds. The management area designation for the Big Quilcene River watershed may be changed when the Forest Plan for the Olympic National Forest is revised during the forest planning process if the diversion of water for the City of Port Townsend municipal water supply is discontinued in the future.

## **CONTINUATION OF EXISTING PERMIT CONDITIONS ALTERNATIVE**

### **Key Issue Resource Areas**

#### ***Hydrology***

The diversion of water from the Big Quilcene and Little Quilcene Rivers for the City of Port Townsend represents 100 percent of the water supply for the City. These diversions result in a change in some of the natural hydrological characteristics of the rivers as described in Chapter 3. Analysis of the continuation of existing permit conditions alternative describes the affect of operating the diversion facilities on five hydrological characteristics; timing, frequency, rate of change, magnitude, and duration.

#### **Timing and Frequency of Flows**

The seasonal timing and frequency of flows provides the basis of the life history and ecology of the organisms that inhabit a particular river. Changes in the timing and frequency of flow events may alter the timing of life stages of salmonids and has the potential to change their survival rate during early life stages.

Implementation of the continuation of existing permit conditions alternative would not result in any change in the timing and frequency of flows in the Big Quilcene and Little Quilcene Rivers compared to existing conditions. There is no measurable storage of water at the

diversion sites that would allow the City to change the timing or frequency of flows downstream of the diversion sites.

### **Rate of Change of Flows**

A quick reduction in the water surface elevation of a river has the potential to strand fish, particularly juveniles along the margins of the river or in isolated pools and side channels.

A reduction in the flow of the river could occur when the City increases the amount of diversion. However operating guidelines for the Big Quilcene River diversion require a staged opening process, which permit the pipeline to fill gradually and slows the river's change in flow. The City of Port Townsend is not proposing any changes to the existing operating guidelines for the diversion facilities in the continuation of existing permit conditions alternative. Therefore, the implementation of the continuation of existing permit conditions alternative would have no effect on the rate of change of flows that would occur in the rivers as a result of normal project operations, compared to existing conditions.

### **Magnitude**

Changes in the magnitude of a stream flow can influence channel forming processes and the distribution of gravels and sediments throughout a stream.

The City of Port Townsend is not proposing any changes to the existing operation of the diversion facilities in the continuation of existing permit conditions alternative. The effect of the existing project operations on the change in the magnitude of the natural (undiverted) flows is described in Chapter 3. Implementation of the continuation of existing permit conditions alternative would not change the magnitude of low or high flows in the Big Quilcene or Little Quilcene Rivers compared to existing conditions.

### **Duration**

The duration of a stream flow event describes the period of time over which the event occurs. The duration of time over which a specific water condition exists may determine whether the life-cycle phase of a particular aquatic organism can be completed.

The City of Port Townsend is not proposing any changes to the existing operation of the diversion facilities in the continuation of existing permit conditions alternative. The effects of the existing project operations on the duration of flows compared to the natural (undiverted) flow conditions are described in Chapter 3. Implementation of the continuation of existing permit conditions alternative would not change the duration of flows in the Big Quilcene or Little Quilcene Rivers compared to existing conditions.

### ***Fisheries***

Implementation of the continuation of existing permit conditions alternative would have the same potential for direct and indirect effects on fisheries as listed for the no action alternative. Implementation of the continuation of existing permit conditions alternative would not result in any change in project operations or maintenance and would maintain the existing hydrologic regime. Effects that the current project operations have on existing fisheries are the same as those listed under the no action alternative. The implementation of

the continuation of existing permit conditions alternative would have no greater impact on fisheries above that which occurs under existing conditions and the no action alternative.

### ***Water Quality***

This alternative would result in similar water quality effects as the no action alternative. A specific water quality goal under this alternative is to comply with Washington State water quality criteria. Factors related to project operations could affect water temperatures in the Big Quilcene and Little Quilcene Rivers.

No hazardous materials are used for instream structures, however there is a very limited potential for introducing hazardous materials (e.g. paint, gas, etc.) into the rivers during maintenance of the facilities that could result in water quality problems. Depending on the concentration of hazardous materials released into the water, mortality to fish could occur. The use and disposal of potentially hazardous materials during maintenance would be managed through best management practices (BMPs). The precautionary BMPs would provide reasonable assurance that water quality would not be degraded beyond state criteria.

Under this alternative, the City would continue to divert their full water right from both rivers. Water temperature in the Big Quilcene and Little Quilcene Rivers would continue to be indirectly affected by the diversion and would remain similar to the existing thermal regime. The water temperature in the reach below the diversions would likely remain within the water quality criteria and continue to follow diurnal and seasonal trends similar to the existing conditions. The water temperature regime in the lower Big Quilcene River could potentially exceed state criteria during warm summer months in July and August. While the indirect effects of this alternative contribute to temperature criteria exceedences, other non-federal management activities within the watersheds also contribute to degraded water quality conditions. During the extreme dry year in 2001, the highest exceedence observed in this section was approximately 2°C above the State criteria. The thermal regime in this reach during a normal year would likely be lower than the temperatures measured during the extreme dry year. Operation of the diversions is estimated to increase stream temperatures downstream by less than 1°C.

### ***Water Supply / Water Use***

Implementation of the continuation of existing permit conditions alternative would not result in any change to the existing water use in the immediate permit area, or at the community and regional level. The demand for water from the special use permit areas would continue to be influenced by the population growth within the water utility service area of the City of Port Townsend, and the growth of commercial economic activities that are supported by the City water supply system but would be limited by the existing water rights. The population of the City of Port Townsend is estimated to grow at an annual rate of 2 percent through 2046 (CH2M Hill 1998). The City would continue to implement its voluntary maintenance of a 27 cfs instream flow in the Big Quilcene River.

## **Non-Key Issue Resource Areas**

### ***Geology and Soils***

#### **Direct Effects**

Erosion and deposition of sediments can have both positive and negative effects on channel form, water quality, and aquatic habitat. Bank erosion and deposition of sediments are natural channel processes. These processes are in part influenced by the integrity of bank material and energy of flowing water. In general, channel form is maintained by flows of the one- to two-year recurrence interval floods. Bank materials in the vicinity of the diversion sites on both the Big Quilcene and Little Quilcene Rivers are dominantly colluvium and bedrock.

Under the continuation of existing permit conditions alternative, diversion operations at the Big Quilcene and Little Quilcene Rivers would continue. Flows large enough to erode channel banks and mobilize sediments are estimated at 1,200 to 1,800 cfs below the Big Quilcene River diversion, and between 230 and 320 cfs below the Little Quilcene diversion (Hydrology, Chapter 3 of this EA). Maximum water diversion at the Big Quilcene River is 30 cfs, and 9.56 cfs at the Little Quilcene River diversion site. These translate to maximum reductions of about 2.5 percent and 4.2 percent respectively; however, during high flow events there typically would be no diversions due to elevated turbidity.

No measurable direct effects of continued water diversion on geology and soils at the water diversion sites on the Big Quilcene and Little Quilcene Rivers would likely occur over the long term, due to the relatively small percentage of flow reduction during flows large enough to maintain the channel.

#### **Indirect Effects**

For reasons outlined above, no measurable indirect effects of continued water diversion on geology and soils downstream of the Big Quilcene and Little Quilcene Rivers would likely occur over the long term.

### ***Vegetation***

Implementation of the continuation of existing permit conditions alternative would not result in any managed change in the native vegetation composition within the three special use permit areas. Native vegetation would continue to mature through successional development. Hazard trees along the road right-of-way accessing the special use permit areas would be removed when they are identified as presenting a risk to travelers along these roads. Roadside brushing would occur as needed on a seasonal basis to maintain visibility along the road. Ornamental vegetation within the Big Quilcene River special use permit area would be managed to provide scenic qualities and functional use associated with the maintenance activities that occur on the site.

Prevention of invasive plant spread and treatment of existing infestations would result in eradication and control of invasive plants and improve watershed conditions.

## **Wildlife**

Implementation of the continuation of existing permit conditions alternative would not result in any change to habitat features (e.g., vegetation and site conditions) within the three special use permit areas. Maintenance activities associated with the project facilities that generate noise may result in minor disturbances to species occupying areas adjacent to the permit areas. The management of the water supply system would not result in a change in the distribution and composition of wildlife species in the area.

## ***Threatened, Endangered, and Sensitive Species***

### **Fish**

Implementation of the continuation of existing permit conditions alternative would have the same potential for direct and indirect effects on TES fish species as listed for the no action alternative. Implementation of the continuation of existing permit conditions alternative would not result in any change in project operations or maintenance and would maintain the existing hydrologic regime. Effects that the current project operations have on existing TES fish species are the same as those listed under the no action alternative. The implementation of the continuation of existing permit conditions alternative would have no greater impact on TES fish species above that which occurs under existing conditions and the no action alternative.

### **Wildlife**

The analysis presented for the No Action alternative shows that water diversion and facility operations and maintenance under existing conditions may affect, but are not likely to adversely affect TES wildlife species in both the Big Quilcene and Little Quilcene River watersheds. The City of Port Townsend is not proposing any changes to the existing operation or maintenance of the diversion facilities in the continuation of existing permit conditions alternative; therefore, the implementation of this alternative would not adversely affect TES wildlife species.

### **Plants**

There are no threatened or endangered plant species within the project area. Although there is potential habitat within the project area for some Forest Service sensitive species, this alternative proposes no substantial changes to occupancy and use of National Forest System Land or facilities, and no additional ground disturbance activities are planned. Therefore, the continuation of existing permit conditions alternative would have no impact on TES plants.

### **Other Rare or Uncommon Species**

Due to the disturbed nature of the project area there is no potential habitat for these species, and no known sites.

## ***Floodplains and Wetlands***

### **Direct Effects**

Floodplain and wetland maintenance is conditioned in part by the dominant long-term pattern of hydrology in the context of landform. Significant shifts in hydrology due to management actions can alter floodplain and wetland function.

Under the continuation of existing permit conditions alternative, diversion operations at the Big Quilcene and Little Quilcene Rivers would continue. Floodplain area at both sites is small, due to the confining nature of side slopes. No wetlands are known to exist at these sites.

No measurable direct effects of continued water diversion on floodplains at the water diversion sites on the Big Quilcene and Little Quilcene Rivers would likely occur over the long term, due to the long term pattern of natural flow and diversion at these sites.

### **Indirect Effects**

For reasons outlined above, no measurable indirect effects of continued water diversion on floodplains and wetlands downstream of the Big Quilcene and Little Quilcene Rivers would likely occur over the long term.

### ***Socioeconomics***

Implementation of the continuation of existing permit conditions alternative would allow continued operation of the Port Townsend Paper Company and the City would be able to continue providing critical municipal utility services to the residential and commercial customers.

### ***Recreation / Scenic Resources***

Implementation of the continuation of existing permit conditions alternative would not change the existing recreation use within the watershed. Recreation activities are prohibited within the permit areas at the diversion sites on the Big Quilcene and Little Quilcene Rivers. The types of recreation activities and the level of recreation use within the watershed would not change as a result of this alternative.

### ***Heritage / Cultural Resources***

Implementation of the continuation of existing permit conditions alternative would have no effect on cultural resource properties within the permit areas. It is unlikely that any undiscovered cultural resource sites would be identified in the permit areas. However, should any cultural resources be discovered within the permit areas, the State Historic Preservation Officer would be notified.

The traditional and customary use of natural resources within the permit area and the watershed by Native Americans would not change with implementation of the continuation of existing permit conditions alternative. The dominant traditional natural resource used in the watershed is fish. The effects of continuation of existing permit conditions alternative on fisheries resources is described in a previous section.

### ***Transportation and Access Management***

Implementation of the continuation of existing permit conditions alternative would have no effect on the transportation infrastructure and the management of the transportation system within the watershed. Access to the transportation network within the watershed would be guided by the Forest Service Access and Travel Management Plan. Public access to the diversion sites on the Big Quilcene and Little Quilcene Rivers would be restricted by state regulations for the protection of municipal water supply systems.

## ***Lands and Land Use***

Implementation of the continuation of existing permit conditions alternative would not change any existing land ownership, uses, or policies within the watershed. The land use within the permit areas are designated in the Forest Plan for the establishment and maintenance of the water diversion and transmission pipeline facilities.

## **MODIFIED PERMIT CONDITIONS ALTERNATIVE**

### **Key Issue Resource Areas**

#### ***Hydrology***

The diversion of water from the Big Quilcene and Little Quilcene Rivers for the City of Port Townsend represents 100 percent of the water supply for the City. These diversions result in a change in some of the natural hydrological characteristics of the rivers as described in Chapter 3. Analysis of the modified permit conditions alternative describes the affect of operating the diversion facilities on five hydrological characteristics; timing, frequency, rate of change, magnitude, and duration.

#### **Timing and Frequency of Flows**

The seasonal timing and frequency of flows provides the basis of the life history and ecology of the organisms that inhabit a particular river. Changes in the timing and frequency of flow events may alter the timing of life stages of salmonids and has the potential to change their survival rate during early life stages.

Implementation of the modified permit conditions alternative would not result in any change in the timing and frequency of flows in the Big Quilcene and Little Quilcene Rivers compared to existing conditions. There is no measurable storage of water at the diversion sites that would allow the City to change the timing or frequency of flows downstream of the diversion sites.

#### **Rate of Change of Flows**

A quick reduction in the water surface elevation of a river has the potential to strand fish, particularly juveniles along the margins of the river or in isolated pools and side channels.

A reduction in the flow of the river could occur when the City increases the amount of diversion. However operating guidelines for the Big Quilcene River diversion require a staged opening process, which permit the pipeline to fill gradually and slows the river's change in flow. The City of Port Townsend would change the existing operating guidelines for the diversion facilities in the modified permit conditions alternative, specifically making the 27 cfs minimum instream flow mandatory. However, the implementation of the modified permit conditions alternative would have no effect on the rate of change of flows that would occur in the rivers as a result of normal project operations, compared to existing conditions.

#### **Magnitude**

Changes in the magnitude of a stream flow can influence channel forming processes and the distribution of gravels and sediments throughout a stream.

The City of Port Townsend would change the existing operating guidelines for the diversion facilities in the modified permit conditions alternative, specifically making the 27 cfs minimum instream flow mandatory. The effect of the existing project operations on the change in the magnitude of the natural (undiverted) flows is described in Chapter 3. Implementation of the modified permit conditions alternative would not change the magnitude of low or high flows in the Big Quilcene or Little Quilcene Rivers compared to existing conditions.

### **Duration**

The duration of a stream flow event describes the period of time over which the event occurs. The duration of time over which a specific water condition exists may determine whether the life-cycle phase of a particular aquatic organism can be completed.

The City of Port Townsend would change the existing operating guidelines for the diversion facilities in the modified permit conditions alternative, specifically making the 27 cfs minimum instream flow mandatory. The effect of the existing project operations on the duration of flows compared to the natural (undiverted) flow conditions is described in Chapter 3. Implementation of the modified permit conditions alternative would not change the duration of flows in the Big Quilcene or Little Quilcene Rivers compared to existing conditions.

### **Fisheries**

#### **Direct Effects**

Listed fish species are not present in the immediate vicinity of areas permitted for use and occupancy by the three Special Use Permits. Both water diversion facilities are well above potential anadromous habitat. The actual diversion facilities and improvements covered under the three Special Use Permits are not anticipated to have any measurable impact on Hood Canal summer chum, Puget Sound Chinook, or their habitats within the Big or Little Quilcene Rivers. Potential adverse effects caused by operating the water diversions are addressed under Indirect Effects.

Both diversions allow natural bed load movement downstream, and neither facility provides short or long-term water storage. The actual facilities do not alter the hydrograph nor alter channel processes to any great extent downstream. The pipeline and access road likely have some impact on downstream aquatic habitat by constraining the river channels and reducing riparian vegetation. These impacts are difficult to quantify, but are thought to be small in comparison with indirect impacts. Because both diversions are run-of-the river facilities, water temperatures within the Big and Little Quilcene are not likely to be affected by the physical facilities.

Road and maintenance activities would be included under the Olympic National Forest road maintenance program, and any future road and facility maintenance activities would conform to the Programmatic Biological Assessment for Selected Forest Management Activities (Olympic National Forest 2003-2008) if the special use permits were reissued. Maintenance activities covered under this programmatic BA include culvert cleaning, replacement, and installation; road grading, erosion control, brushing, hazard and downed tree removal, pavement repair, bridge maintenance, gate installation and maintenance, painting, and

shoulder maintenance. The Programmatic BA requires that specific conservation measures be implemented, which apply to these activities, and these conservation measures be made conditions of all re-issued special use permits. The conservation measures specified in the 2003-2008 Olympic National Forest Programmatic BA are incorporated in the BA for this project by reference (USDA Forest Service 2003). By implementing the conservation measures specified in the Programmatic BA, impacts to listed fish species, as a result of road or facility maintenance, would be minimized or avoided.

### Indirect Effects

Water diversions on the Big and Little Quilcene Rivers have a direct impact to water quantity and, therefore, instream habitat quantity downstream of the diversion points. Impacts would be relatively minor at high flow levels during the late fall, winter, and spring because the diversion would account for only a small percentage of the overall streamflow. Impacts would be greatest during moderate flows in mid-summer and early fall because the percent diversion of water is highest during this time. At extremely low streamflows below 27 cfs (Big Quilcene) and 6.0 cfs (Little Quilcene) the City does not divert water so there would be no impacts.

During wet years, the flow diversion on the Big Quilcene River may result in a consistent 15 to 20 percent reduction in available summer chum spawning habitat throughout the entire spawning season. During dry years, a 15 to 20 percent reduction in available spawning habitat could occur early in the season, but the magnitude of the reduction in spawning habitat would decline to 5 percent or less by late October as natural streamflows decline. Once natural streamflows in the Big Quilcene River reach 27 cfs, the diversion is turned off so there would be no reduction in available spawning habitat over natural conditions.

Quantitative impacts of the water diversions in the Big Quilcene on summer chum are uncertain. As described in the Biological Assessment, flow reductions of up to 55 percent in the lower 1 mile of river during the September to October summer chum spawning period would result in less spawning habitat being available during wet years or early in the spawning season. Reductions in potential spawning habitat could adversely affect summer chum by limiting the amount of spawning habitat available, eliminating preferred spawning areas, increasing redd super-imposition, and encouraging spawning within the main channel rather than along channel margins where redd scour during high flow may be less. All of these factors could reduce survival of eggs and incubating fry.

Adverse impacts to summer chum spawning from flow reductions associated with the diversion would be expected to be greater during wet years than in dry years. During wet years, flow reductions would cause a 15 to 20 percent decline in available spawning habitat. These reductions would be relatively consistent throughout the summer chum spawning period.

During low flow years, adverse impacts to summer chum spawning from the diversion would likely be much less than during wet years. Flow reductions would cause the same 15 to 20 percent decline in available spawning habitat early in the season. Early returning fish would be unable to spawn along some channel margins or in some shallow backwater areas. However, these same areas would naturally go dry as streamflows declined later in the

season, potentially causing high mortalities in any incubating eggs. By reducing early season flows and maintaining a more-or-less consistent streamflow during low flow years, the diversion may actually benefit summer chum by discouraging early fish from spawning in areas that will go dry later in the year as flows drop. During extreme low flow periods, when the streamflow drops below 27 cfs, the diversion is shut off so it has no effect on the magnitude of the lowest natural streamflows.

Using data from Beecher’s (2000) study on changes in spawnable width at two representative summer chum spawning sites on the lower Big Quilcene River, coarse estimates of total summer chum spawning habitat available in the lower mile of the Big Quilcene were calculated for various streamflows. Measured spawnable width information at the two sites were averaged and expanded to the entire lower 1.0 miles of the Big Quilcene where the majority of summer chum spawning typically occurs. Note this analysis may overestimate the abundance of spawning habitat present because it does not incorporate any notion of the quality of the available habitat and that some areas that appear to be potential spawning habitat would not be utilized.

At a streamflow of 46 cfs that would typically occur during a wet year or during the early portion of a dry year, there would be approximately 216,480 square feet of potential summer chum spawning habitat in the lower 1.0 miles of the Big Quilcene. At a streamflow of 27 cfs, which would be typical of the maximum diversion during wet years and the natural low flow during dry years, there would be approximately 191,136 square feet of potential spawning gravel. An average chum spawning density of between two fish per 62 sq. ft. and two fish per 248 sq. ft. was used to calculate the number of chum the habitat would support. These values correspond to the average area of a chum redd and the area recommended per pair of fish in artificial spawning channels, respectively (Bjornn and Reiser 1991). The information is displayed in Table 4-1.

**Table 4-1. Potential summer chum spawning habitat capability in the lower 1.0 miles of the Big Quilcene River.**

<b>Flow (cfs)</b>	<b>Average Spawnable Width</b>	<b>Estimated Spawning Habitat</b>	<b>Spawning Capability (based on redd size)</b>	<b>Spawning Capability (recommended spawning density)</b>
46 cfs	41 ft	216,480 sq ft	6972 fish	1743 fish
27 cfs	36.2 ft	191,136 sq ft	6156 fish	1539 fish

Based on average redd size, it appears that enough spawning habitat exists in the Big Quilcene River to support historical summer chum populations of between 650 and 5800 fish, even with the diversions. Adequate spawning habitat would also appear to be available to support the full Interim Summer Chum Salmon Recovery Goal for the Quilcene system (an escapement of 2860 fish) (WDFW and PNPTC 2003). The area recommended per pair of fish in artificial spawning channels likely underestimates summer chum spawning densities in the Big Quilcene because adequate spawning habitat to support observed historical escapements would not occur under either the typical natural streamflow or the diverted flow.

An analysis of historical and recent summer chum escapements in the Big Quilcene River tend to support the conclusion that adequate spawning habitat is available, even with the current diversion. During the late 1960s and early 1970s, summer chum escapements in the Big Quilcene ranged from 655 to 5,797. Typical escapements ranged from 1,300 to 3,000 fish. The diversion was operating during this entire period. Recent escapements of natural-origin fish in the Big Quilcene between 2001 and 2004 have ranged from a low of 2,757 to a high of 33,000 fish (QNFH Unpublished data, 2005). Although the recent escapements were undoubtedly influenced by the summer chum hatchery program, the fact that enough summer chum spawned naturally in the Big Quilcene to produce these large escapements supports the conclusion that adequate spawning habitat is available in the Big Quilcene, even with the current flow diversion.

Data was not available to conduct a similar detailed analysis for the Little Quilcene River. Given the modeled flows by Orsborn and Orsborn (2002), the percent diversion for the average monthly mean flows for August to October ranges from 29 to 60 percent if diversion is equal to the 9.56 cfs maximum allowed. Under the worst case scenario, given the City's water right (9.56 cfs) and instream flow requirement (6 cfs), the City could reduce instream flows by as much as 61 percent (at flows equaling 15.56 cfs) during the summer chum salmon spawning season.

Under normal operation in the summertime, the reservoir is full and the amount of flow diverted from the Little Quilcene is typically small. In dry years, low natural streamflows fall below the required 6 cfs minimum so the diversion is shut off. Unpublished data from the City of Port Townsend for 1992 through 2004 showed an average diversion from the Little Quilcene in September and October of only 1.1 cfs. A diversion of 1.1 cfs represents 22 and 10 percent of the average monthly mean flows for September and October, respectively. Decreasing instream flow by 10 to 20 percent would be expected to decrease chum salmon spawning habitat by 5 to 10 percent if the relationship between flow and spawnable area for the Big Quilcene and Little Quilcene rivers is similar.

Not all water diverted from the Little Quilcene River during the summer and fall is lost to the anadromous zone. The City likes to keep some water running through the reservoir to keep it fresh and replace water lost through evaporation. Under normal operation when the reservoir is usually full in the summer and fall (Lords Lake level 34.4 feet) and given average instream flows the water diverted to refresh the reservoir is almost entirely returned to the Little Quilcene River as additional water spills over the reservoir outlet to Howe Creek, which drains into the Little Quilcene River well above potential summer chum habitat. The only water lost to the anadromous zone due to this diversion in a typical or wet year is through evaporation. During a low water year, such as in the fall of 2002, diverted water was not returned via Howe Creek because the reservoir dropped below 34.5 feet and eventually dropped to -2.0 feet during the drought, as the City relied on reservoir water from late September to early November. Of note during this period is that no water was diverted from the Little Quilcene River between late September and early November in order to maintain the mandatory instream flow on the Little Quilcene River.

Salmon species migrate up the Big Quilcene and Little Quilcene Rivers in the late summer and fall to spawn. Juvenile salmon migrate downstream to the marine environment primarily

in the winter and spring. Project operations have the potential to affect fish migration patterns by altering flow regimes. NMFS has draft internal guidance to assess impacts to fish migration for adult and juvenile salmon (Pers. comm. M. Longenbaugh, NMFS, 2003). Following are analyses of how flows in the Big Quilcene and Little Quilcene Rivers compare to the NMFS draft internal guidance for adult upstream and juvenile downstream migration.

Adequate water depth for adult upstream migration is one factor affecting the proportion of the adult population succeeding in this migration. Migration requirements found in Bjornn and Reiser (1991) suggest that adult Chinook salmon require 24 cm (approximately 9 inches) minimum water depth for migration. This criteria was used by NMFS to evaluate flows in the White River, Puyallup River basin (NMFS 2002a). As a rule of thumb, NMFS has indicated that chum-sized salmon generally need 0.6 foot depth (approximately 7 inches) to surmount shallow riffles during upstream passage from late August through October (Pers. comm. M. Longenbaugh, NMFS, 2003). This rule of thumb is the NMFS draft internal guidance for adult upstream migration.

Cross-section and longitudinal data for critical riffle reaches in the Big Quilcene and Little Quilcene Rivers is not available to make quantitative assessments of how water diversion may influence minimum adult salmon migration flows. However, direct observation of chum and coho salmon in the Big Quilcene River by QNFH personnel has not identified problems with adult salmon migration upstream in relation to flows or water depths (Pers. comm. L. Telles, QNFH, 2002). The QNFH relies on fish to migrate up to the hatchery in order to collect brood stock. Direct observations by QNFH personnel lead to the conclusion that upstream fish migration of chum and coho salmon is not hindered by low flows in the late summer and fall; and therefore, diversion of water likely does not limit adult salmon upstream migration in the Big Quilcene River. Similar agency observations are not available for the Little Quilcene River. However, at this time problems with adult salmon upstream migration are not known to occur in the Little Quilcene River.

At an agency meeting on March 3, 2003 regarding the Port Townsend special use permits, NMFS presented their draft internal flow guidance for assessing juvenile downstream migration flows. It is not known how the NMFS juvenile emigration flow guidance actually applies to juvenile emigration in the Big Quilcene and Little Quilcene Rivers. As a general rule of thumb, NMFS suggests that juvenile emigration flows can be met with 80 percent of mean monthly flows and 50 percent for years that are substantially dryer than normal (Pers. comm. M. Longenbaugh, NMFS, 2003).

Based on an analysis of mean-monthly flows for average and dry water years, flows in the Big Quilcene River would meet the NMFS juvenile emigration flow criteria for all juvenile summer chum salmon emigration months during both average water year and low water years. Flows in the Little Quilcene River would nearly meet the NMFS juvenile emigration criteria during an average water year. Flows in the Little Quilcene River would not meet the NMFS juvenile emigration flow criteria in low water years during the peak emigration of summer chum.

Steelhead immigrate and spawn in late spring during times of naturally high flows. Juveniles that emerge from the gravels in mid-summer spend the first few weeks rearing along shallow margins. As they grow, the juveniles gradually inhabit deeper and faster riffles and pools.

Juveniles typically rear year-round in steeper headwaters and pools, before emigrating to marine waters after one to two years in freshwater. The spatial and temporal patterns expected in the Quilcene watersheds of spawning, rearing, and migrating makes steelhead less susceptible to effects of the water diversions, compared to summer-run chum. Because steelhead immigration, spawning, and incubation coincide with periods of naturally high streamflow, there is a low likelihood that any of these functions would be substantially affected by water withdrawals.

The greatest potential impact to steelhead would be for juvenile rearing during the mid-late summer when streamflows are about 60 cfs and the City withdraws their 30 cfs water right. Streamflows could be reduced up to 50 percent during this period. A 1985 IFIM study (Hosey and Associates 1985) found that even with a reduction from 60 cfs to 30 cfs, approximately 90 percent of the habitat capability for rearing juvenile steelhead would remain within the affected reach. During late summer/early fall, when natural streamflows are lower, less water would be diverted. Water withdrawals would reduce natural streamflows by a maximum of only about 15 percent. Potential reductions in steelhead juvenile rearing habitat capacity within the impacted stream reaches during this period would be minor.

In August of 2002, the City of Port Townsend conducted a flow test on the Big Quilcene to determine the effect of flow diversion on temperature. They shut off the diversion for 24 hours to see it would affect the water temperature lower down the river. Flows in the Big Quilcene River increased from approximately 35 cfs to 60 cfs, which resulted in about a 1°C decrease in stream temperature (Pers. Comm. I. Jablonski, City of Port Townsend, 2004).

In December of 2004, the Port Gamble S'Klallam Tribe, Jefferson County Conservation District, and Watershed Sciences, Inc built a stream temperature model for various streams in WRIA 17, including the Big Quilcene River. They evaluated a number of scenarios including reducing streamflows by 10%, reducing streamflows by 30%, increasing streamflows by 10%, and restoring 50% of withdrawal flows. Results from the model yielded an increase of 0.5°C, increase of 1°C, decrease of 0.5°C, and decrease of 1°C, respectively.

Results from both of the above studies support the conclusion that flow in the Big Quilcene has only a small influence on water temperatures in the lower river. Varying the quantity of the diversion or shutting off the diversion completely would have only a minor effect on stream temperature.

It should be noted that both of the above studies were conducted with a diversion of between 25 and 30 cfs. The typical diversion from the Big Quilcene during the peak summer chum spawning months of September and October is well below 25 cfs, so actual temperature changes would likely be substantially smaller than those suggested by the studies.

### ***Water Quality***

This alternative would result in similar water quality effects as the no action alternative. A specific water quality goal under this alternative is to comply with Washington State water

quality criteria. Factors related to project operations could affect water quality and temperature in the Big Quilcene and Little Quilcene Rivers.

No hazardous materials are used for instream structures, however there is a very limited potential for introducing hazardous materials (e.g. paint, gas, etc.) into the rivers during maintenance of the facilities that could result in water quality problems. Depending on the concentration of hazardous materials released into the water, mortality to fish could occur. The use and disposal of potentially hazardous materials during maintenance would be managed through best management practices (BMPs). The precautionary BMPs would limit the introduction of hazardous materials into project waters.

Under this alternative, the City would continue to divert their full water right from the Little Quilcene River and would maintain a mandatory instream flow in the Big Quilcene River of 27 cfs when the natural flow above the diversion exceeds 27 cfs. Water temperature in the Big Quilcene and Little Quilcene Rivers would continue to be indirectly affected by the diversion and would remain similar to the existing thermal regime. The water temperature in the reach below the diversions would likely remain within the water quality criteria and continue to follow diurnal and seasonal trends similar to the existing conditions. The water temperature regime in the lower Big Quilcene River could potentially exceed state criteria during warm summer months in July and August. While the indirect effects of this alternative contribute to temperature criteria exceedences, other non-federal management activities within the watersheds also contribute to degraded water quality conditions. During the extreme dry year in 2001, the highest exceedence observed in this section was approximately 2°C above the State criteria. The thermal regime in this reach during a normal year would likely be lower than the temperatures measured during the extreme dry year. Operation of the diversions is estimated to increase stream temperatures downstream by less than 1°C

### ***Water Supply / Water Use***

Implementation of the modified permit conditions alternative would result in changes to the existing water use in the immediate permit area, and at the community and regional level. Maintenance of the mandatory 27 cfs instream flow would reduce the City's flexibility to meet the water demand during extended low flow periods. The demand for water from the special use permit areas is influenced by the population growth within the water utility service area of the City of Port Townsend, and the growth of commercial economic activities that are supported by the City water supply system but would be limited by existing water rights. The population of the City of Port Townsend is estimated to grow at an annual rate of 2 percent through 2046 (CH2M Hill 1998). The City has developed water conservation strategies which provides a way for the City to reduce the growth in the demand for water over the long-term to a rate of growth below current demand projections. This would help the City meet the mandatory 27 cfs instream flow in the Big Quilcene River during periods of high water demand, and delay the need to develop additional water sources to meet future water demands.

## **Non-Key Issue Resource Areas**

### ***Geology and Soils***

#### **Direct Effects**

Erosion and deposition of sediments can have both positive and negative effects on channel form, water quality, and aquatic habitat. Bank erosion and deposition of sediments are natural channel processes. These processes are in part influenced by the integrity of bank material and energy of flowing water. In general, channel form is maintained by flows of the one- to two-year recurrence interval floods. Bank materials in the vicinity of the diversion sites on both the Big Quilcene and Little Quilcene Rivers are dominantly colluvium and bedrock.

Under the modified permit conditions alternative, diversion operations at the Big Quilcene and Little Quilcene Rivers would continue. Flows large enough to erode channel banks and mobilize sediments are estimated at 1,200 to 1,800 cfs below the Big Quilcene River diversion, and between 230 and 320 cfs below the Little Quilcene diversion (Hydrology, Chapter 3 of this EA). Maximum water diversion at the Big Quilcene River is 27 cfs, and 9.56 cfs at the Little Quilcene River diversion site. These relate to maximum reductions of about 2.3 percent and 4.2 percent respectively; however, during high flow events there typically would be no diversions due to elevated turbidity.

No measurable direct effects of continued water diversion on geology and soils at the water diversion sites on the Big Quilcene and Little Quilcene Rivers would likely occur over the long term, due to the relatively small percentage of flow reduction during flows large enough to maintain the channel.

#### **Indirect Effects**

For reasons outlined above, no measurable indirect effects of continued water diversion on geology and soils downstream of the Big Quilcene and Little Quilcene Rivers would likely occur over the long term.

### ***Vegetation***

Implementation of the modified permit conditions alternative would not result in any managed change in the native vegetation composition within the three special use permit areas. Native vegetation would continue to mature through successional development. Hazard trees along the road right-of-way accessing the special use permit areas would be removed when they are identified as presenting a risk to travelers along these roads. Roadside brushing would occur as identified and scheduled in the road maintenance plan with the objectives of maintaining user safety and the protection of resources. Ornamental vegetation within the Big Quilcene River special use permit area would be managed to provide scenic qualities and functional use associated with the maintenance activities that occur on the site.

Prevention of invasive plant spread and treatment of existing infestations would result in eradication and control of invasive plants and improve watershed conditions.

## **Wildlife**

Implementation of the modified permit conditions alternative would not result in any change to habitat features (e.g., vegetation and site conditions) within the three special use permit areas. Maintenance activities associated with the project facilities that generate noise may result in minor disturbances to species occupying areas adjacent to the permit areas. The management of the water supply system would not result in a change in the distribution and composition of wildlife species in the area.

## ***Threatened, Endangered, and Sensitive Species***

### **Fish**

Implementation of the modified permit conditions alternative would have the same potential for direct and indirect effects on TES fish species as listed for the no action alternative, with the added assurance of maintenance of the 27 cfs minimum instream flow requirement. Implementation of the modified permit conditions alternative would not result in any change from recent project operations or maintenance and would maintain the existing hydrologic regime. Effects that the current project operations have on existing TES fish species are the same as listed under the no action alternative, that being no effect for Chinook salmon and bull trout and May Affect, Likely to Adversely Affect for chum salmon and Puget Sound steelhead. The implementation of the modified permit conditions alternative would have no greater impact on TES fish species above that which occurs under existing conditions and the no action alternative.

### **Wildlife**

The analysis presented for the No Action shows that water diversion and facility operations and maintenance under existing conditions may affect, but are not likely to adversely affect TES wildlife species in both the Big Quilcene and Little Quilcene River watersheds. The City of Port Townsend is not proposing any changes to the existing operation or maintenance of the diversion facilities in the modified permit conditions alternative that affect wildlife; therefore, the implementation of this alternative would not adversely affect TES wildlife species. Effects determinations for northern spotted owl, marbled murrelet, and bald eagle are May Affect, Not Likely to Adversely Affect; and no effect for spotted owl and marbled murrelet critical habitat.

### **Plants**

There are no threatened, endangered, or sensitive plants, lichens, fungi or mosses within the project area. Although there is potential habitat within the project area for some Forest Service sensitive species, this alternative proposes no substantial changes to occupancy and use of National Forest System Land or facilities, and no additional ground disturbance activities are planned. Therefore, the modified permit conditions alternative would have no impact to the viability of these species, nor a trend towards federal listing.

### **Other Rare or Uncommon Species**

Due to the disturbed nature of the project area there is no potential habitat for these species, and no known sites.

## ***Floodplains and Wetlands***

### **Direct Effects**

Floodplain and wetland maintenance is conditioned in part by the dominant long-term pattern of hydrology in the context of landform. Significant shifts in hydrology due to management actions can alter floodplain and wetland function.

Under the modified permit conditions alternative, diversion operations at the Big Quilcene and Little Quilcene Rivers would continue with additional protection, mitigation or enhancement to sensitive resources. Floodplain area at both sites is small, due to the confining nature of side slopes. No wetlands are known to exist at these sites.

No measurable direct effects of continued water diversion on floodplains at the water diversion sites on the Big Quilcene and Little Quilcene Rivers would likely occur over the long term, due to the long term pattern of natural flow and diversion at these sites.

### **Indirect Effects**

For reasons outlined above, no measurable indirect effects of continued water diversion on floodplains and wetlands downstream of the Big Quilcene and Little Quilcene Rivers would likely occur over the long term.

## ***Socioeconomics***

Implementation of the modified permit conditions alternative would allow continued operation of the Port Townsend Paper Company and the City would be able to continue providing critical municipal utility services to the residential and commercial customers.

Maintaining the 27 cfs minimum instream flow requirement during extended low flow periods may result in the need for additional water conservation measures which could have an adverse effect on paper mill operations. These adverse effects could result in economic losses to the paper mill, and correspondingly to the economy of Jefferson County.

## ***Recreation / Scenic Resources***

Implementation of the modified permit conditions alternative would not change the existing recreation use within the watershed. Recreation activities are prohibited within the permit areas at the diversion sites on the Big Quilcene and Little Quilcene Rivers. The types of recreation activities and the level of recreation use within the watershed would not change as a result of this alternative.

## ***Heritage / Cultural Resources***

Implementation of the modified permit conditions alternative would have no effect on cultural resource properties within the permit areas. It is unlikely that any undiscovered cultural resource sites would be identified in the permit areas. However, should any cultural resources be discovered within the permit areas, the State Historic Preservation Officer would be notified.

The traditional and customary use of natural resources within the permit area and the watershed by Native Americans would not change with implementation of the modified permit conditions alternative. The dominant traditional natural resource used in the

watershed is fish. The effects of the modified permit conditions alternative on fisheries resources is described in a previous section.

### ***Transportation and Access Management***

Implementation of the modified permit conditions alternative would have no effect on the transportation infrastructure and the management of the transportation system within most of the watershed. Access roads to the diversion facilities on the Big Quilcene and Little Quilcene Rivers would be guided by a road maintenance plan agreement between the City and the Forest Service developed as part of this alternative. Access and maintenance of the transportation network in the remaining portion of the watershed would be guided by the Forest Service Access and Travel Management Plan. Public access to the diversion sites on the Big Quilcene and Little Quilcene Rivers would be restricted by state regulations for the protection of municipal water supply systems.

### ***Lands and Land Use***

Implementation of the modified permit conditions alternative would not change any existing land ownership, uses, or policies within the watershed. The land use within the permit areas are designated in the Forest Plan for the establishment and maintenance of the water diversion and transmission pipeline facilities.

## **CUMULATIVE EFFECTS**

### **Definition and Scope of Cumulative Effects**

Cumulative effects are the incremental impact upon a resource that result from the interaction of two or more individual actions. There are two types of cumulative effects that could occur in this project, and are described in this document: (1) the incremental effect of two different resource actions occurring within a proposed alternative, and (2) the incremental effect resulting from a project action and a non-project action. Each type of cumulative effect must consider past, present, and reasonably foreseeable future actions (temporal component), and actions that may be separated by distance (spatial component) if there is the potential for incremental effects.

Based on information collected for this project, the level of detail of cumulative effects analysis is greatest with respect to direct project effects, with broader basin-wide impacts analyzed more qualitatively.

### ***Cumulative Effects Resulting from Project Actions***

Two or more project actions that result in a cumulative effect are defined as a direct project effect and have been described within the effects analysis for each alternative. These cumulative effects are not described further in this section.

### ***Cumulative Effects between Project and non-Project Actions***

Cumulative effects can also occur when project-related effects interact with non-project actions or effects that are already occurring, or are expected to occur, within the watershed. Non-project actions can include other Federal, State, local government or private industry activities, or management and policy decisions relating to social or resource management. Such cumulative effects are presented in the following sections.

In order to present the cumulative effects analysis in a clear manner that promotes understanding of the complex issues, the descriptions in this section have been organized in short, three-element paragraphs. In the paragraph for each resource area, a non-project action and effect is identified, the related project action and effect is identified, then the resulting incremental effect is described.

Non-project Action/Effect + Project Action/Effect = Incremental or Cumulative Physical, Biological, or Social Effect

### Non-Project Actions Contributing to Cumulative Effects

Non-project actions that were considered as potentially contributing to the cumulative effects of the City of Port Townsend Special Use Permit renewal are listed below. These policies, projects, and actions may possibly interact with resources and project actions evaluated in this EA to create a cumulative effect upon a resource.

- Change (increase) in recreation usage in the watershed.
- Quilcene National Fish Hatchery Projects.
  - a. Discontinuation of the summer chum supplementation program.
  - b. Normal hatchery operations.
  - c. Bank stabilization projects
- Installation of gravel traps for sediment management by the County.
- Road maintenance practices (by all agencies / landowners).
- Road decommissioning (primarily by the Forest Service).
- Modifications to the river levees.
- Timber management practices in the watershed.
- Long-term population change (increase).
- Recreational and commercial fisheries harvesting.
- Bank stabilization projects (other than the Hatchery project).
- Climate change and ocean warming (e.g., La Niña, El Niño).

### No Action Alternative

#### ***Fisheries and Water Quality***

Factors, other than the No Action alternative, that are currently affecting the action area environment and salmonid species abundance include the Quilcene National Fish Hatchery, commercial and recreational harvest, urbanization, and forest practices. The Forest Service also is in the process of completing some restoration and road stabilization work in this area.

The QNFH located on the Big Quilcene River at approximately RM 2.8 raises fall chum salmon and coho salmon, which are outplanted in the Big and Little Quilcene Rivers. Until

2003 QNFH also had a large summer chum supplementation program. The hatchery limits natural production for anadromous fish in the Big Quilcene River to areas below the electric weir at RM 2.8; however, historic distribution extended to at least RM 7.4. The QNFH has out-planted juvenile salmon above the hatchery barrier and has passed a limited number of coho adults above the barrier sporadically in the past. Good coho salmon juvenile rearing habitat is present upstream of the hatchery in the mainstem Big Quilcene River and Penny Creek and some spawning habitat is present upstream of the hatchery. Natural spawning habitat and juvenile rearing habitat has been limited to an extent by hatchery practices; however, the highest quality spawning habitat is located downstream of the hatchery.

Releases from the QNFH of hatchery origin coho and chum salmon may have negative density dependant effects on naturally spawning and rearing chum salmon through competition for space, food, and spawning habitat. Although density dependent effects caused by hatchery programs in the Hood Canal region were discussed in NMFS (2002b) with respect to hatchery program effects on summer chum salmon, a detailed treatment of effects in the Big Quilcene River was not included, only broad statements about the region as a whole were made. Based on the limited spawning and rearing habitat available in the Big Quilcene River, there is potential that hatchery releases could lead to negative density dependant effects on all aquatic species present.

The QNFH summer chum supplementation program was terminated in 2003. For the past decade, the hatchery program has helped to increase the numbers of summer chum in the Big Quilcene and to compensate for any potential losses in summer chum production due to poor instream habitat, reductions in streamflow during the spawning period, and winter floods. Now that the summer chum salmon stocking program has terminated, long-term population maintenance for the Big and Little Quilcene Rivers will be dependent on the quality and quantity of spawning habitat within these two river systems. The QNFH summer chum salmon hatchery production will no longer be available to buffer any negative effects caused by instream habitat degradation or natural weather fluctuations.

There is potential that the QNFH operations could impact water quality in the lower Big Quilcene River due to their water diversion and operations; however, these effects are unknown. Potential for water quality impacts were dismissed in NMFS (2002b) because the QNFH operates under an NPDES discharge permit (permit number WA-187-2). Therefore, NMFS assumed no impact to water quality and water temperature would be caused by QNFH operations and water diversions. However, the QNFH can withdraw up to 65 cfs total from the Big Quilcene River and Penny Creek, which is more than twice the City's water right of 30 cfs. No information is available to assess potential water quality impacts that may be caused by the QNFH; however, due to their relatively large water right they have the potential to influence a substantial portion of water reaching the lower Big Quilcene River even though this water is returned after flowing through the hatchery system.

A recreational fishery exists for coho salmon in the Big Quilcene River during the summer chum salmon spawning period. This fishery results in incidental harvest (unintentional and intentional poaching) of summer chum salmon and likely causes damage of their redds by anglers targeting coho salmon. In addition, MWH personnel observed anglers retaining chum salmon in August (2002) on the Big Quilcene River. QNFH personnel have noted high

angler pressure on the Big Quilcene River during the chum and coho salmon spawning season, and have observed many anglers exceeding the coho salmon bag limit and the poaching of summer chum salmon (Pers. comm. L. Telles, QNFH, 2002). Commercial fisheries in Hood Canal and Puget Sound targeting coho salmon have some level of incidental catch and mortality on summer chum salmon, although in recent years management practices have reduced the incidental summer chum salmon catch in the Quilcene Bay fishery (Parametrix et al. 2000).

Habitat in the lower Big Quilcene River has been greatly affected by channelization, increased sediment transport from the upper watershed and loss of large wood recruitment and retention. Diking activities have constrained the channel to a narrow corridor, resulting in the aggradation of the stream channel bed. Dredging and the maintenance of gravel traps have been used to control the amount of aggradation in the lower reaches of the river and assist with flood control efforts. These activities have been concentrated below RM 2.8 of the Big Quilcene River. Extensive diking and bank armoring has also occurred in the lower Little Quilcene River. The poor condition of habitat in the lower rivers may exacerbate the impact of reduced summer low flows caused by water diversion during the summer chum salmon spawning season.

Over the past several years, Jefferson County, Jefferson Conservation District, the Skokomish Tribe, private landowners, and the Hood Canal Salmon Enhancement Group have initiated several restoration projects in the lower Big Quilcene River and estuary aimed at improving spawning habitat for summer chum. Projects have ranged from installing instream large wood structures to riparian revegetation, acquiring key land parcels, and pulling back dikes.

Impacts to fisheries resources in the Big Quilcene and Little Quilcene Rivers would also continue to occur as a result of changing La Niña and El Niño weather patterns in the Pacific Ocean and their associated effects on ocean and anadromous fish productivity. The continued use of both water diversions would limit fish habitat and natural production of anadromous and resident fish species in both rivers. The effects of changing weather patterns in the Pacific Ocean and the continued operation of the Big Quilcene and Little Quilcene diversions would produce either an offsetting or an adverse cumulative effect on fisheries resources in the Big Quilcene and Little Quilcene Rivers, depending on changes in ocean productivity.

Long-term population increases and increased urbanization have been shown to negatively correlate with salmon abundance in local areas; where population and urbanization increase, local salmon population abundance decreases. The continued use of both water diversions would reduce fish habitat in both rivers, limiting natural production of anadromous and resident fish species to a certain degree. The effects of increased urbanization in the Big Quilcene and Little Quilcene watersheds in conjunction with the continued operation of both diversions would likely produce an adverse cumulative effect on fisheries resources in the Big Quilcene and Little Quilcene Rivers.

## **Non-reissuance of the Special Use Permits Alternative**

### ***Fisheries and Water Quality***

Factors, other than activities proposed under this alternative, that are currently affecting the action area environment and salmonid species abundance include the Quilcene National Fish Hatchery, commercial and recreational harvest, urbanization, and forest practices. The Forest Service also is in the process of completing some restoration and road stabilization work in this area.

The QNFH located on the Big Quilcene River at approximately RM 2.8 raises fall chum salmon and coho salmon, which are outplanted in the Big and Little Quilcene Rivers. Until 2003 QNFH also had a large summer chum supplementation program. The hatchery limits natural production for anadromous fish in the Big Quilcene River to areas below the electric weir at RM 2.8; however, historic distribution extended to at least RM 7.4. The QNFH has out-planted juvenile salmon above the hatchery barrier and has passed a limited number of coho adults above the barrier sporadically in the past. Good coho salmon juvenile rearing habitat is present upstream of the hatchery in the mainstem Big Quilcene River and Penny Creek and some spawning habitat is present upstream of the hatchery. Natural spawning habitat and juvenile rearing habitat has been limited to an extent by hatchery practices; however, the highest quality spawning habitat is located downstream of the hatchery.

Releases from the QNFH of hatchery origin coho and chum salmon may have negative density dependant effects on naturally spawning and rearing chum salmon through competition for space, food, and spawning habitat. Although density dependent effects caused by hatchery programs in the Hood Canal region were discussed in NMFS (2002b) with respect to hatchery program effects on summer chum salmon, a detailed treatment of effects in the Big Quilcene River was not included, only broad statements about the region as a whole were made. Based on the limited spawning and rearing habitat available in the Big Quilcene River, there is potential that hatchery releases could lead to negative density dependant effects on all aquatic species present.

The QNFH summer chum supplementation program was terminated in 2003. For the past decade, the hatchery program has helped to increase the numbers of summer chum in the Big Quilcene and to compensate for any potential losses in summer chum production due to poor instream habitat, reductions in streamflow during the spawning period, and winter floods. Now that the summer chum salmon stocking program has terminated, long-term population maintenance for the Big and Little Quilcene Rivers will be dependent on the quality and quantity of spawning habitat within these two river systems. The QNFH summer chum salmon hatchery production will no longer be available to buffer any negative effects caused by instream habitat degradation or natural weather fluctuations. However with the removal of the Big Quilcene River diversion, the natural hydrograph would be restored and there would be an increase in fish habitat. To some degree this would offset the lack of negative effects buffering previously provided by the QNFH.

There is potential that the QNFH operations could impact water quality in the lower Big Quilcene River due to their water diversion and operations; however, these effects are unknown. Potential for water quality impacts were dismissed in NMFS (2002b) because the

QNFH operates under an NPDES discharge permit (permit number WA-187-2). Therefore, NMFS assumed no impact to water quality and water temperature would be caused by QNFH operations and water diversions. However, the QNFH can withdraw up to 65 cfs total from the Big Quilcene River and Penny Creek, which is more than twice the City's water right of 30 cfs. No information is available to assess potential water quality impacts that may be caused by the QNFH; however, due to their relatively large water right they have the potential to influence a substantial portion of water reaching the lower Big Quilcene River even though this water is returned after flowing through the hatchery system.

A recreational fishery exists for coho salmon in the Big Quilcene River during the summer chum salmon spawning period. This fishery results in incidental harvest (unintentional and intentional poaching) of summer chum salmon and likely causes damage of their redds by anglers targeting coho salmon. In addition, MWH personnel observed anglers retaining chum salmon in August (2002) on the Big Quilcene River. QNFH personnel have noted high angler pressure on the Big Quilcene River during the chum and coho salmon spawning season, and have observed many anglers exceeding the coho salmon bag limit and the poaching of summer chum salmon (Pers. comm. L. Telles, QNFH, 2002). Commercial fisheries in Hood Canal and Puget Sound targeting coho salmon have some level of incidental catch and mortality on summer chum salmon, although in recent years management practices have reduced the incidental summer chum salmon catch in the Quilcene Bay fishery (Parametrix et al. 2000).

Habitat in the lower Big Quilcene River has been greatly affected by channelization, increased sediment transport from the upper watershed and loss of large wood recruitment and retention. Diking activities have constrained the channel to a narrow corridor, resulting in the aggradation of the stream channel bed. Dredging and the maintenance of gravel traps have been used to control the amount of aggradation in the lower reaches of the river and assist with flood control efforts. These activities have been concentrated below RM 2.8 of the Big Quilcene River. Extensive diking and bank armoring has also occurred in the lower Little Quilcene River. The poor condition of habitat in the lower rivers may exacerbate the impact of reduced summer low flows caused by water diversion during the summer chum salmon spawning season.

Over the past several years, Jefferson County, Jefferson Conservation District, the Skokomish Tribe, private landowners, and the Hood Canal Salmon Enhancement Group have initiated several restoration projects in the lower Big Quilcene River and estuary aimed at improving spawning habitat for summer chum. Projects have ranged from installing instream large wood structures to riparian revegetation, acquiring key land parcels, and pulling back dikes.

Impacts to fisheries resources in the Big Quilcene and Little Quilcene Rivers would also continue to occur as a result of changing La Niña and El Niño weather patterns in the Pacific Ocean and their associated effects on ocean and anadromous fish productivity. The continued use of the Little Quilcene River water diversion would limit fish habitat. However, the discontinued use of the Big Quilcene River diversion would increase fish habitat. Combined, these actions would produce either an offsetting or beneficial cumulative effects

on fisheries resources in the Big Quilcene and Little Quilcene Rivers, depending on changes in ocean productivity.

Long-term population increases and increased urbanization have been shown to negatively correlate with salmon abundance in local areas; where population and urbanization increase, local salmon population abundance decreases. The continued use of the Little Quilcene River water diversion would limit fish habitat. However, the discontinued use of the Big Quilcene River diversion would increase fish habitat. The effects of increased urbanization in the Big Quilcene and Little Quilcene watersheds in conjunction with project operations would likely produce an adverse cumulative effect on fisheries resources in the Little Quilcene River, but may have offsetting or adverse effects in the Big Quilcene River.

## **Continuation of Existing Permit Conditions Alternative**

### ***Fisheries and Water Quality***

Implementation of the continuation of existing permit conditions alternative would have the same potential for cumulative effects on fisheries and water quality as listed for the no action alternative, because implementation of this alternative would not result in any change in project operations or maintenance, and would maintain the existing hydrologic regime.

## **Modified Permit Conditions Alternative**

### ***Fisheries and Water Quality***

Implementation of the modified permit conditions alternative would have a similar potential for cumulative effects on fisheries and water quality as listed for the no action alternative, with the added assurance of maintaining the existing hydrologic regime due to the mandatory 27 cfs instream flow requirement.

## **UNAVOIDABLE ADVERSE IMPACTS**

### **No Action Alternative**

#### ***Hydrology***

An unavoidable indirect impact associated with the implementation of the no action alternative is the continued reduction of flows in the Big Quilcene and Little Quilcene River below natural undiverted flow conditions.

#### ***Fisheries***

Continued water diversion from the Big Quilcene and Little Quilcene Rivers would limit fish habitat. The limitation in fish habitat would be the same as occurs under existing conditions and is described in the no action alternative environmental impact discussion, and in the Biological Assessment (Appendix A, Section 4.3.1). Upstream fish passage for resident fish would continue to be blocked at the Big Quilcene River diversion dam.

#### ***Water Quality***

Implementation of this alternative would continue to result in slight water temperature increases, estimated to be less than 1°C above natural conditions. While the indirect effects of

this alternative contribute to temperature criteria exceedences, other non-federal management activities within the watersheds also contribute to degraded water quality conditions.

## **Non-reissuance of the Special Use Permits Alternative**

### ***Hydrology***

An unavoidable indirect impact associated with the implementation of the non-reissuance of permits alternative is the continued reduction of flows in the Little Quilcene River below natural undiverted flow conditions.

### ***Fisheries***

Continued water diversion from the Little Quilcene River would limit fish habitat. The limitation in fish habitat would be the same as occurs under existing conditions in the Little Quilcene River and is described in the no action alternative environmental impact discussion, and in the Biological Assessment (Appendix A, Section 4.3.1).

### ***Water Quality***

Implementation of this alternative would result in unavoidable adverse impacts on turbidity. Moving the diversion in the Little Quilcene River would increase turbidity levels during construction. BMPs would reduce the impact, but the turbidity levels could still exceed the state criteria for relatively short periods during the construction. This adverse impact would be short term and limited to the vicinity of the construction area.

## **Continuation of Existing Permit Conditions Alternative**

### ***Hydrology***

An unavoidable indirect impact associated with the implementation of the continuation of existing permit conditions alternative is the continued reduction of flows in the Big Quilcene and Little Quilcene River below natural undiverted flow conditions.

### ***Fisheries***

Continued water diversion from the Big Quilcene and Little Quilcene Rivers would limit fish habitat. The limitation in fish habitat would be the same as occurs under existing conditions and is described in the no action alternative environmental impact discussion, and in the Biological Assessment (Appendix A, Section 4.3.1). Upstream fish passage for resident fish would continue to be blocked at the Big Quilcene River diversion dam.

### ***Water Quality***

Implementation of this alternative would continue to result in water temperature increases slightly greater than natural conditions. While the indirect effects of this alternative contribute to temperature criteria exceedences, other non-federal management activities within the watersheds also contribute to degraded water quality conditions.

## **Modified Permit Conditions Alternative**

### ***Hydrology***

An unavoidable indirect impact associated with the implementation of the modified permit conditions alternative is the continued reduction of flows in the Big Quilcene and Little Quilcene River below natural undiverted flow conditions.

### ***Fisheries***

Continued water diversion from the Big Quilcene and Little Quilcene Rivers would limit fish habitat. The limitation in fish habitat would be the same as occurs under existing conditions and is described in the No Action alternative. Upstream fish passage for resident fish would continue to be blocked at the Big Quilcene River diversion dam.

### ***Water Quality***

Implementation of this alternative would continue to result in slight water temperature increases, estimated to be less than 1°C above natural conditions. While the indirect effects of this alternative contribute to temperature criteria exceedences, other non-federal management activities within the watersheds also contribute to degraded water quality conditions.

## **SHORT-TERM USE VS. LONG-TERM PRODUCTIVITY**

### **No Action Alternative**

#### ***Fisheries***

Implementation of the no action alternative would have the same potential for direct and indirect effects on fisheries and fishery productivity as previously described in the Fisheries section under the no action alternative, analysis of direct and indirect effects.

Implementation of the no action alternative would not result in any change in project operations or maintenance and would maintain the existing hydrologic regime. Effects that the current project operations have on existing fishery productivity are the same as occur under existing conditions and as described in the Biological Assessment. The implementation of the no action alternative would have no greater impact on fishery productivity above that which occurs under existing conditions.

#### ***Floodplains and Wetlands***

Implementation of the no action alternative would result in the use of the riparian area and floodplain immediately adjacent to the diversion sites on the Big Quilcene and Little Quilcene Rivers for the occupation of diversion facilities, and the maintenance facilities associated with the municipal water supply diversion. The short-term use of the site for the diversion and maintenance facilities precludes the use of the site by native forest vegetation and wildlife habitat.

### **Non-reissuance of the Special Use Permits Alternative**

#### ***Fisheries***

Implementation of the non-reissuance of the special use permits alternative would have the same potential for direct and indirect effects on fisheries and fishery productivity as previously described in the Fisheries section under the non-reissuance of the special use

permits alternative, analysis of direct and indirect effects. Implementation of this alternative would not result in any change in project operations or maintenance of the Little Quilcene River diversion and would maintain the existing hydrologic regime of the Little Quilcene River. Effects the current project operations have on existing hydrologic conditions and fisheries would be the same as listed under the no action alternative for the Little Quilcene River. Therefore, the implementation of the non-reissuance of the special use permits alternative would have no greater long-term impact on fishery productivity in the Little Quilcene River above that which occurs under existing conditions. Minor and temporary impacts to fishery productivity may occur as a result of instream work, such as removal of the old diversion and construction of the new diversion. These impacts would be avoided or minimized by using a combination of best management practices to address temporary sedimentation and erosion, and pollution prevention.

The removal of the diversion on the Big Quilcene River would restore all hydrologic parameters to natural unregulated conditions. While some temporary negative impacts, such as erosion and sedimentation, may be caused by instream work associated with removal of the Big Quilcene Diversion, these impacts would likely be avoided or minimized by using best management practices. All impacts to fish and habitat under existing conditions that are described in the No Action alternative would no longer occur. Therefore, no long-term impacts to fishery productivity in the Big Quilcene River would be expected by the implementation of this alternative. This would likely be a beneficial effect on fishery productivity in the lower Big Quilcene River when compared to existing conditions; however, it is not known to what extent, if any, that eliminating existing impacts would increase fish production. Upstream resident fish migration would no longer be impeded by the diversion dam since it would be removed. While this would likely be a beneficial effect when compared to existing conditions, it is not known to what extent resident fish productivity would increase.

### ***Floodplains and Wetlands***

Implementation of the non re-issuance of the special use permits alternative would result in revegetation of the site by native forest vegetation and use as wildlife habitat.

## **Continuation of Existing Permit Conditions Alternative**

### ***Fisheries***

Implementation of the continuation of existing permit conditions alternative would have the same potential for direct and indirect effects on fisheries and fishery productivity as previously described in the Fisheries section under the continuation of existing permit conditions alternative, analysis of direct and indirect effects. Implementation of the continuation of existing permit conditions alternative would not result in any change in project operations or maintenance and would maintain the existing hydrologic regime. Effects that the current project operations have on existing fishery productivity are the same as occur under existing conditions and as described in the No Action alternative. The implementation of the continuation of existing permit conditions alternative would have no greater impact on fishery productivity above that which occurs under existing conditions.

### ***Floodplains and Wetlands***

Implementation of the continuation of existing permit conditions alternative would result in the short-term use of the riparian and floodplain immediately adjacent to the diversion sites on the Big Quilcene and Little Quilcene Rivers for the occupation of diversion facilities and the maintenance facilities associated with municipal water supply diversion. The short-term use of the site for the diversion and maintenance facilities precludes the use of the site by native forest vegetation and wildlife habitat.

### **Modified Permit Conditions Alternative**

#### ***Fisheries***

Implementation of the modified permit conditions alternative would have the same potential for direct and indirect effects on fisheries and fishery productivity as previously described in the Fisheries section under the modified permit conditions alternative, analysis of direct and indirect effects. Implementation of the modified permit conditions alternative would not result in any change in project operations or maintenance and would maintain the existing hydrologic regime. Effects that the current project operations have on existing fishery productivity are the same as occur under existing conditions and as described in the No Action alternative. The implementation of the modified permit conditions alternative would have no greater impact on fishery productivity above that which occurs under existing conditions.

### ***Floodplains and Wetlands***

Implementation of the modified permit conditions alternative would result in the short-term use of the riparian and floodplain immediately adjacent to the diversion sites on the Big Quilcene and Little Quilcene Rivers for the occupation of diversion facilities and the maintenance facilities associated with municipal water supply diversion. The short-term use of the site for the diversion and maintenance facilities precludes the use of the site by native forest vegetation and wildlife habitat.

### **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

This section identifies the commitment of resources from an action that would be considered irreversible or irretrievable. An irreversible commitment of resources is an impact that cannot be regained once the action is implemented. These resources are generally non-renewable even after the action is implemented. The removal and use of mined ore is an example of the type of resource that is irreversible.

An irretrievable commitment of resources is an impact to a resource that is lost for a period of time while the action is implemented. These resources are generally either renewable or reclaimable when the action is complete. An example of this is the temporary loss of timber productivity in a forested area that is kept clear for a power line right-of-way, or a road.

## **No Action Alternative**

### ***Hydrology***

An irretrievable commitment of instream water resources would continue to occur during the permit period as water is diverted from the Big Quilcene and the Little Quilcene Rivers to provide the municipal water supply for the City of Port Townsend.

### ***Fisheries***

An irretrievable commitment of resources would continue to affect fisheries resources as long as water diversion from the Big Quilcene and Little Quilcene Rivers continues. The irretrievable commitment of water resources would result in the continued reduction in fish habitat in the Big Quilcene and Little Quilcene Rivers.

### ***Water Quality***

An irretrievable commitment of resources would continue to affect water quality. A minor increase in water temperature (i.e. temperature changes less than 1°C) would continue to occur as a result of reduced instream flows attributed to the water diversions. While the indirect effects of this alternative contribute to temperature criteria exceedences, other non-federal management activities within the watersheds also contribute to degraded water quality conditions.

### ***Vegetation and Wildlife Habitat***

Implementation of the no action alternative would result in the continued irretrievable commitment of native vegetation resources for approximately 2 acres immediately adjacent to the diversion site on the Big Quilcene River for the occupation of the diversion, and maintenance facilities associated with the municipal water supply diversion. The continued maintenance of this site with ornamental vegetation precludes the use of the site by native forest vegetation and wildlife habitat for the duration of the permit period.

## **Non-reissuance of the Special Use Permits Alternative**

### ***Hydrology***

An irretrievable commitment of instream water resources would continue to occur on the Little Quilcene River while water is diverted to provide the municipal water supply for the City of Port Townsend.

### ***Fisheries***

No irreversible commitment of resources would occur to fisheries resource by the implementation of the non-reissuance of the special use permits alternative.

An irretrievable commitment of resources would continue to occur in the Little Quilcene River as a result of continued water diversion. The irretrievable commitment of water resources would result in the continued reduction in fish habitat in the Little Quilcene River. A small amount of inchannel fish habitat below the diversion, estimated to be less than 2,500 square feet, would be lost at the new Little Quilcene diversion dam site as long as the diversion facility remained in place. This habitat would be regained if the facility were removed at some future date.

### ***Water Quality***

An irretrievable commitment to water quality would result from an increase of turbidity during the construction of a new diversion facility on the Little Quilcene River.

## **Continuation of Existing Permit Conditions Alternative**

### ***Hydrology***

An irretrievable commitment of instream water resources would continue to occur during the permit period as water is diverted from the Big Quilcene and the Little Quilcene Rivers to provide the municipal water supply for the City of Port Townsend.

### ***Fisheries***

An irretrievable commitment of resources would continue to affect fisheries resources as long as water diversion from the Big Quilcene and Little Quilcene Rivers continues. The irretrievable commitment of water resources would result in the continued reduction in fish habitat in the Big Quilcene and Little Quilcene Rivers.

### ***Vegetation and Wildlife Habitat***

Implementation of the continuation of existing permit conditions alternative would result in the continued irretrievable commitment of native vegetation resources for approximately 2 acres immediately adjacent to the diversion site on the Big Quilcene River for the occupation of the diversion, and maintenance facilities associated with municipal water supply diversion. The continued maintenance of this site with ornamental vegetation precludes the use of the site by native forest vegetation and wildlife habitat for the duration of the permit period.

## **Modified Permit Conditions Alternative**

### ***Hydrology***

An irretrievable commitment of instream water resources would continue to occur during the permit period as water is diverted from the Big Quilcene and the Little Quilcene Rivers to provide the municipal water supply for the City of Port Townsend.

### ***Fisheries***

An irretrievable commitment of resources would continue to affect fisheries resources as long as water diversion from the Big Quilcene and Little Quilcene Rivers continues. The irretrievable commitment of water resources would result in the continued reduction in fish habitat in the Big Quilcene and Little Quilcene Rivers.

### ***Vegetation and Wildlife Habitat***

Implementation of the modified permit conditions alternative would result in the continued irretrievable commitment of native vegetation resources for approximately 2 acres immediately adjacent to the diversion site on the Big Quilcene River for the occupation of the diversion, and maintenance facilities associated with municipal water supply diversion. The continued maintenance of this site with ornamental vegetation precludes the use of the site by native forest vegetation and wildlife habitat for the duration of the permit period.

## **OTHER ENVIRONMENTAL CONSIDERATIONS**

### **Clean Water Act**

The Specialist Report Addressing Water Quality Issues concluded that the proposed federal action is consistent with requirements under the Clean Water Act. This action is one of many management activities throughout the watersheds that contribute cumulatively to degraded water quality. Mandatory instream flow requirements conditioned as part of permit reissuance, will in effect provide supplementary protection, mitigation, and enhancement to water quality and supporting beneficial uses. This action is consistent with Forest Service direction for managing water resources.

### **Clean Air Act**

This project will not affect air quality. There is no burning associated with any of the alternatives. Road maintenance and future use of the access roads could create a limited amount of dust, but this would be minimal and localized to the project area.

### **National Forest Management Act**

Compliance with the National Forest Management Act (NFMA) can be demonstrated by finding that a project is consistent with the following applicable requirements of 16 USC 1604(g)(3).

*(g)(3)(A) insure consideration of the economic and environmental aspects of various systems of renewable resource management, including the related systems of renewable resource management, including the related systems of silviculture and protection of forest resources, to provide for outdoor recreation (including wilderness), range, timber, watershed, wildlife, and fish.*

This EA considered the effects of implementing the alternatives on the economic and environmental aspects of the project area. This consideration, as documented in this chapter, included the forest resources of watershed, wildlife, fish, and vegetation.

*(g)(3)(B) provide for diversity of plant and animal communities based on the sustainability and capability of the specific land area in order to meet overall multiple-use objectives, and within the multiple-use objectives of a land management plan adopted pursuant to this section, provide, where appropriate, to the degree practicable, for steps to be taken to preserve the diversity of tree species similar to that existing in the region controlled by the plan.*

Actions proposed under the alternatives provide for diversity of plant and animal communities within the project area as described within the multiple-use objectives of the Forest Plan. The effects to plant and animal communities are described in the resource sections of this chapter.

*(g)(3)(C) insure research on and (based on continuous monitoring and assessment in the field) evaluation of the effects of each management system to the end that it will not produce substantial and permanent impairment of the productivity of the land.*

Implementation and effectiveness monitoring proposed to be included in the special use permit's Operation and Maintenance Plan would provide an evaluation of the effects of implementing an alternative.

### **Forest Plan Consistency**

The analysis performed by the interdisciplinary team found that the actions proposed under the alternatives are consistent with the Forest Plan. The project's purpose and need is consistent with Forest Plan goals, and impacts to resources as evaluated in this EA have been found to be consistent with Forest Plan direction and standards and guidelines. Descriptions of the effects of implementing the various alternatives and Forest Plan consistency rationale can be found in the individual resource sections in this chapter.

### **Aquatic Conservation Strategy Consistency**

**Objective 1: Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.**

The project will have no effect on Objective 1. All of the facilities that would be reauthorized by the Port Townsend Water Supply Special Use Permits are existing structures that have been in place for many years. The water diversion dam, intake structure, and water transmission pipeline on the Big Quilcene River was initially constructed in 1928. The water diversion dam, intake structure, and water transmission pipeline on the Little Quilcene River was initially constructed in 1956. No additional construction or infrastructure development is planned as part of this project. Existing conditions would be maintained within the project area.

**Objective 2: Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.**

The project will maintain the existing level of connectivity within the Big and Little Quilcene watersheds. The two diversion dams are currently fish passage barriers. They are located at River Mile 9.4 and 7.2 on the Big Quilcene and Little Quilcene Rivers, respectively. Both diversion dam structures are well above the limits of anadromous habitat.

All of the diversion dam and intake facilities that would be reauthorized by the Port Townsend Water Supply Special Use Permits are existing structures that have been in place for many years. The water diversion dam on the Big Quilcene River was constructed in 1928. The water diversion dam on the Little Quilcene River was constructed in 1956. No modifications to the existing diversion dams are planned as part of this project. Existing conditions would be maintained within the project area.

**Objective 3: Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.**

The project will have no effect on Objective 3. All of the facilities that would be reauthorized by the Port Townsend Water Supply Special Use Permits are existing structures that have been in place for many years. The water diversion dam, intake structure, and water transmission pipeline on the Big Quilcene River was initially constructed in 1928. The water diversion dam, intake structure, and water transmission pipeline on the Little Quilcene River was initially constructed in 1956. No additional streambed or streambank disturbance is planned as part of this project. Existing conditions would be maintained within the project area.

**Objective 4: Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.**

The project will maintain existing water quality conditions within the Big Quilcene and Little Quilcene watersheds. All of the facilities that would be reauthorized by the Port Townsend Water Supply Special Use Permits are existing structures that have been in place and in use for many years. The water diversion dam, intake structure, and water transmission pipeline on the Big Quilcene River was initially constructed in 1928. The water diversion dam, intake structure, and water transmission pipeline on the Little Quilcene River was initially constructed in 1956. No additional construction or infrastructure development is planned as part of this project.

The existing water withdrawals from the Big Quilcene River and Little Quilcene River adversely impact water quality in these watersheds by reducing the amount of streamflow in the channels below the diversions during summer low flow periods. Existing adverse impacts on instream flows would continue under the new special use permit.

Since 1997, the City of Port Townsend has voluntarily provided an instream flow of 27 cfs in the Big Quilcene as part of an interagency agreement with USFWS, WDFW, Jefferson County and affected Indian tribes. The city is required to maintain an instream flow of at least 6 cfs in the Little Quilcene as a condition of their State water right.

The percentage of streamflow that is currently diverted from the Big Quilcene River ranges from 0 to 50 percent, with an average of about 22 percent during the summer period. Reduced streamflow can increase stream temperatures and likely contributes to designation of portions of the Big Quilcene and Little Quilcene Rivers downstream of the diversions as water quality impaired water bodies under Section 303(d) of the Clean Water Act. Both of the 303(d) listed stream segments in the Big Quilcene and the listed segment in the Little Quilcene have been designated due to stream temperatures that exceed State standards. All of the 303(d) listed stream segments in these watersheds are in the lower watersheds, well below the water diversions and downstream of national forest lands.

Natural instream flows, the magnitude and frequency of water diversions, the amount of flow remaining in the lower channels after diversion from the Big and Little Quilcene Rivers, and

potential effects to stream temperatures are described in detail in the Big Quilcene watershed analysis, in the Biological Assessment for the project issued by the Forest Service on July 7, 2005, and in the Biological Opinion issued by NMFS on November 14, 2006 and amended on March 31, 2008.

A water temperature/ flow study conducted by the City of Port Townsend in 2002 and temperature modeling conducted by the Port Gamble S'Klallam Tribe and the Jefferson County Conservation District in 2004 both showed a relatively small influence of the water diversion on downstream water temperatures in the Big Quilcene River. The city's temperature study showed that an increase in flow from 35 to 60 cfs decreased the water temperature in the lower river by approximately 1°C. The 2004 stream temperature modeling study predicted a similar magnitude of change in stream temperature in relation to potential decreases in flow diversion. With the low amounts of water that are actually diverted during the critical summer low flow period, the existing water diversions have only a minor influence on stream temperatures in the lower river.

Under the proposed project, the 27 cfs minimum instream flow will be converted from a voluntary agreement to a mandatory requirement of the special use permit. Although this will not change current conditions or existing uses, converting the instream flow requirement from a voluntary agreement to a mandatory requirement will provide additional certainty that minimum instream flows will be achieved during low flow periods.

**Objective 5: Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.**

The project will have no effect on Objective 5. All of the facilities that would be reauthorized by the Port Townsend Water Supply Special Use Permits are existing structures that have been in place for many years. The water diversion dam, intake structure, and water transmission pipeline on the Big Quilcene River was initially constructed in 1928. The water diversion dam, intake structure, and water transmission pipeline on the Little Quilcene River was initially constructed in 1956. No additional construction or infrastructure development is planned as part of this project.

The existing water diversions will not affect sediment transport because the amount of water diverted is only a small percentage of the maximum streamflows during high flow periods when the majority of substrate transport occurs. During extreme high flow events, the water diversions are typically shut off entirely to avoid introducing natural turbidity into the city's water supply.

**Objective 6: Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.**

The project will maintain existing in-stream flow conditions within the Big Quilcene and Little Quilcene watersheds. All of the facilities that would be reauthorized by the Port Townsend Water Supply Special Use Permits are existing structures that have been in place and in use for many years. The water diversion dam, intake structure, and water transmission

pipeline on the Big Quilcene River was initially constructed in 1928. The water diversion dam, intake structure, and water transmission pipeline on the Little Quilcene River was initially constructed in 1956. No additional construction or infrastructure development is planned as part of this project.

Since 1997, the city of Port Townsend has voluntarily provided an instream flow of 27 cfs in the Big Quilcene as part of an interagency agreement with USFWS, WDFW, Jefferson County and affected Indian tribes. The city is required to maintain an instream flow of at least 6 cfs in the Little Quilcene as a condition of their State water right.

The existing water withdrawals from the Big Quilcene River and Little Quilcene River adversely impact in-stream flows in these watersheds by reducing the amount of streamflow in the channels below the diversions during summer low flow periods. The percentage of streamflow that is diverted in the Big Quilcene River ranges from 0 to 50 percent, depending on the natural streamflow and the City's water supply needs. Existing adverse impacts on instream flows would continue under the new special use permit.

Natural instream flows, the magnitude and frequency of water diversions, and the streamflows remaining in the lower channels after diversion within the Big and Little Quilcene Rivers are described in detail in the Biological Assessment for the project issued by the Forest Service on July 7, 2005, and in the Biological Opinion issued by NMFS on November 14, 2006 and amended on March 31, 2008. Both documents conclude that the proposed water withdrawals are likely to adversely affect Hood Canal summer chum and Puget Sound Steelhead by reducing the amount of spawning and rearing habitat available during the summer low flow period, but the effects will not be substantial enough to jeopardize populations or preclude recovery of the listed fish species.

Under the proposed project, the 27 cfs minimum instream flow will be converted from a voluntary agreement to a mandatory requirement of the special use permit. Although this will not change current conditions or existing uses, converting the instream flow requirement from a voluntary agreement to a mandatory requirement will provide additional certainty that necessary instream flows will be achieved during low flow periods.

**Objective 7: Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.**

The project will have no effect on Objective 7. All of the facilities that would be reauthorized by the Port Townsend Water Supply Special Use Permits are existing structures that have been in place for many years. The water diversion dam, intake structure, and water transmission pipeline on the Big Quilcene River was initially constructed in 1928. The water diversion dam, intake structure, and water transmission pipeline on the Little Quilcene River was initially constructed in 1956. No additional construction or infrastructure development is planned as part of this project. Existing conditions would be maintained within the project area.

The existing water diversions will have no effect on the current floodplain inundation or water table conditions. Only a small percentage of the streamflows are withdrawn from the rivers during high flow periods. During extreme high flow events, the water diversions are typically shut off entirely to avoid introducing natural turbidity into the city's water supply.

No water will be withdrawn from stream channels when natural streamflows drop below 27 cfs in the Big Quilcene River or 6 cfs in the Little Quilcene River. These streamflows are within the range of the summer low flows expected in these systems in late September – early October.

**Objective 8: Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.**

The project will have no effect on Objective 8. All of the facilities that would be reauthorized by the Port Townsend Water Supply Special Use Permits are existing structures that have been in place for many years. The water diversion dam, intake structure, water transmission pipeline on the Big Quilcene River was initially constructed in 1928. The water diversion dam, intake structure, and water transmission pipeline on the Little Quilcene River was initially constructed in 1956. No additional construction or infrastructure development is planned as part of this project. Existing conditions would be maintained within the project area.

**Objective 9: Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.**

The project will maintain existing habitat conditions for fish and aquatic organisms within the Big Quilcene and Little Quilcene watersheds. All of the facilities that would be reauthorized by the Port Townsend Water Supply Special Use Permits are existing structures that have been in place and in use for many years. The water diversion dam, intake structure, and water transmission pipeline on the Big Quilcene River was initially constructed in 1928. The water diversion dam, intake structure, and water transmission pipeline on the Little Quilcene River was initially constructed in 1956. No additional construction or infrastructure development is planned as part of this project.

The existing water withdrawals from the Big Quilcene River and Little Quilcene River adversely impact aquatic habitat and the potential production of fish and aquatic organisms in these watersheds by reducing the amount of spawning and rearing habitat available during the summer low flow period.

Since 1997, the city of Port Townsend has voluntarily provided an instream flow of 27 cfs in the Big Quilcene as part of an interagency agreement with USFWS, WDFW, Jefferson County and affected Indian tribes. The Port Townsend Water Supply SUP will make the 27 cfs instream flow requirement mandatory. The city is required to maintain an instream flow of at least 6 cfs in the Little Quilcene as a condition of their State water right.

The hydrology of the Big and Little Quilcene watersheds, the existing conditions, and the likely impacts of continuing the existing water withdrawals and maintaining the current 27 cfs and 6 cfs minimum instream flow levels in the Big Quilcene and Little Quilcene, respectively, were analyzed in a Biological Assessment issued by the Olympic National Forest on July 7, 2005 and a Biological Opinion issued by NMFS on November 14, 2006 and

amended on March 31, 2008. Both documents conclude that the proposed water withdrawals are likely to adversely affect Hood Canal summer chum and Puget Sound Steelhead by reducing the amount of spawning and rearing habitat available during the summer low flow period, but the effects will not be substantial enough to jeopardize populations or preclude recovery of the listed fish species.

## **SUMMARY**

Overall, the Port Townsend Water Supply SUP project will maintain current aquatic conditions within the Big Quilcene and Little Quilcene watersheds. All of the facilities that would be reauthorized by the special use permit have been in place and in use for at least 50 years. No additional construction or infrastructure development is planned as part of this project.

The City of Port Townsend currently adheres to a voluntary minimum in-stream flow of 27 cfs in the Big Quilcene River. There is a mandatory minimum in-stream flow requirement of 6 cfs in the Little Quilcene River as a condition of the State's water right.

The existing water withdrawals adversely impact aquatic habitat and aquatic species by reducing the amount of spawning and rearing habitat available during summer low flow periods. Existing adverse impacts would continue under the new special use permit. Both the Biological Assessment and the Biological Opinion conclude that the proposed water withdrawals are likely to adversely affect Hood Canal summer chum and Puget Sound Steelhead, but the effects will not be substantial enough to jeopardize populations or preclude recovery of the listed fish species.

The existing water withdrawals adversely impact water quality by increasing water temperatures in downstream reaches to some degree. Both modeling results and an actual temperature/ flow study conclude that the water diversions have a relatively minor influence on stream temperatures in the lower river, especially with the low amounts of water that are actually diverted during the critical summer low flow period.

Under the proposed project, the 27 cfs minimum instream flow will be converted from a voluntary agreement to a mandatory requirement of the special use permit. Although this will not change current conditions or existing uses, converting the instream flow requirement from a voluntary agreement to a mandatory requirement will provide additional certainty that necessary instream flows will be achieved during low flow periods.

## **Executive Orders 11988 and 11990: Flood Plains and Wetlands**

In 1977 the National Environmental Policy Act of 1969 (NEPA) was amended (42 U.S.C. 4321 et seq.) in order to avoid short and long term adverse impacts associated with the destruction or modification of flood plains and wetlands. Two Executive Orders were issued as a result of this amendment.

As disclosed in the EA there would be no measurable direct effects to flood plains at the diversion sites, and no wetlands are known to exist at these sites. Also there would be no measurable indirect effects to flood plains or wetlands located downstream of the diversion sites on the Big and Little Quilcene Rivers.

## **Wild and Scenic River**

The Big Quilcene River was considered for eligibility in the Wild and Scenic River system during development of the Forest Plan but was determined not to have an outstandingly remarkable value and was dropped from consideration.

## **Magnuson-Stevens Fishery Conservation and Management Act (MSA), Essential Fish Habitat**

Freshwater MSA Essential Fish Habitat for Chinook, coho, and pink salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except those areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). The reaches downstream of the natural fish passage barriers at RM 6.6 (Little Quilcene) and RM 7.4 (Big Quilcene) that may have historically been accessible to Chinook, pink, and coho salmon are designated as freshwater Essential Fish Habitat for these species.

The reduction of streamflow in the lower Big and Little Quilcene Rivers in the summer and fall is an indirect effect of the proposed action. The reductions in streamflow could potentially limit the quantity and quality of available spawning and/or rearing habitat. Therefore, the proposed action is “likely to adversely affect” freshwater EFH. For a more complete discussion please refer to Chapter 4 of this EA and the project’s Biological Assessment.

## **Possible Conflicts with Plans and Policies of Other Jurisdictions**

The regulations for the implementation of NEPA require an evaluation of possible conflicts between the proposed action and the objectives of Federal, State, and local land use plans and policies. The approval of the special use permits for the City of Port Townsend water supply diversion and transmission facilities does not require the approval of additional State or local permits.

The approval of the special use permits requires section 7 ESA consultation with the US Fish and Wildlife Service and the National Marine Fisheries Service for species listed under the Endangered Species Act that may potentially be impacted by the proposed action. An evaluation of the threatened, endangered, and sensitive species potentially impacted by the project is presented in Chapter 3 of this document and in the Biological Assessment prepared for the preferred alternative.

The Department of Ecology is assisting Jefferson County and other resource agencies in the evaluation of water resources in WRIA 17, which includes the Big Quilcene and Little Quilcene River watersheds. The purpose of the evaluation is to summarize the current status of water quantity, water quality, habitat, and instream flow for the sub-basins within the WRIA 17 planning area. The technical assessment also includes an analysis of potential future growth impacts on these resources and identifies potential data gaps and limitations. The Forest Service and the City of Port Townsend are cooperating agencies in this assessment, although the recommendations of this assessment are outside the scope of the evaluation and decision for the special use permits.

## **Energy Requirements and Conservation Potential**

The implementation of any alternative would require the expenditure of energy (e.g., fuel consumption). The amount of energy used would be the same for the no action alternative, the continuation of existing permit conditions alternative, and the modified permit conditions alternative. Energy and fuel consumption would occur as an indirect effect during the operation and maintenance of the water diversion facilities and transmission pipeline. The diversion and transmission of water to project reservoirs and the City of Port Townsend is conducted via a gravity-operated system and requires no additional energy consumption. Maintenance personnel use vehicle fuel during travel between diversion facilities during daily operations and maintenance checks of the water supply system.

Additional energy would be consumed with the implementation of the non-reissuance of the special use permits alternative. This alternative would require the use of pumps to transmit water from the relocated diversion facility on the Little Quilcene River to Lords Lake for storage.

## **Natural or Depletable Resource Requirements and Conservation Potential**

The use of natural resources would occur as an indirect effect of the implementation of any alternative. The diversion of water by the City of Port Townsend for consumptive use results in less water available for aquatic resources in the Big Quilcene and Little Quilcene Rivers during periods of diversion. This impact is mitigated through the implementation of a minimum instream flow requirement in the Little Quilcene River, and the voluntary or mandatory application of a minimum instream flow in the Big Quilcene River during periods of low natural flows. The amount of water resources that are used is the same for the no action alternative, the continuation of existing permit conditions alternative, and the modified permit conditions alternative; although the mandatory instream requirement under the modified permit conditions alternative would assure maintenance of the current hydrologic regime. A lesser amount of water would be used in the non-reissuance of the special use permit alternative, as the diversion on the Big Quilcene River would be removed from service.

## **Urban Quality, Historic and Cultural Resources and the Design of the Built Environment**

The special use permit areas contain no urban areas of any kind. The direct, indirect, and cumulative effects of the alternatives on cultural resources have been evaluated. The Forest Service has determined that there are no cultural and historical resources identified at the site that would be impacted from the implementation of any alternative. The State Historic Preservation Officer has concurred with this determination. A description of the effects of the proposed project on cultural and historical resources is presented in a previous section of this chapter.

## **Effects on Consumers, Civil Rights, Minorities, and Women**

All Forest Service actions have the potential to produce some form of impact, positive or negative, on consumers. The effects of the implementation of the alternatives on consumers is reflected in the Socioeconomic section. This includes a discussion of the goods and services that would be provided upon implementation of an alternative.

The need to conduct an analysis of the proposed action on the potential impact to civil rights, minority groups, and women is required by Forest Service NEPA Manual and Handbook direction. The implementation of any alternative would not result in the violation of civil rights or present a discriminatory action against any social group.

### **Effects on Prime Farm Land, Rangeland, and Forestland**

Secretary of Agriculture Memorandum 1827 requires an evaluation of the effects of a project on prime farmland, rangelands, and forestlands. The special use permit areas do not contain any prime farmlands or rangelands, and therefore does not result in an impact to these resources. The prime forestland classification does not apply to forestlands within the National Forest System. The evaluation of all alternatives considered the direct, indirect, and cumulative effects of the actions on all National Forest System lands and adjacent lands.

### **Environmental Justice**

Executive Order 12898 directs Federal agencies to achieve environmental justice as part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations, low-income populations, or Native American tribes. The evaluation of environmental justice is to consider the impacts of the project on subsistence use of natural resources by local Native American tribes.

The Forest Service has communicated with local tribal governments during the scoping and public involvement phases of this project. A range of project alternatives has been evaluated that provides a diversity of impacts to the physical, biological, and social resources of the area. The assessments of biological and social resources for the project alternatives have not identified any adverse impacts of the project that would result in a disproportionately high adverse human health or environmental effect on minority populations, low-income populations, or Native American tribes.

### **Public Health and Safety**

Public health and safety would be protected by adherence to Occupational Safety and Health Administration (OSHA) and other laws. Public access to the diversion sites on the Big Quilcene and Little Quilcene Rivers would be restricted by state regulations for the protection of municipal water supply systems.

### **Management Indicator Species**

An indicator species represents an association of other animals that respond to the same set of habitat features and management activities. It is assumed that management that maintains or enhances the habitat of the indicator species will likewise maintain or enhance that of its association. Seven species, or groups of species, have been selected as indicator species for the Olympic National Forest.

Columbian Black-Tailed Deer and Roosevelt Elk: These two species are identified as management indicators for species needing a balance of forage and cover throughout the landscape. No effect on these species is expected to occur as a result of implementation of any of the action alternatives. Although riparian zones are an important habitat for these

species, the use of the riparian zone in the Big Quilcene and Little Quilcene Rivers for the diversion facilities is not expected to result in a substantial impact to deer or elk.

**Pileated Woodpecker and Pine Marten:** The pileated woodpecker and the pine marten represent species that inhabit mature conifer habitat. The implementation of any of the action alternatives would not result in any change to the quantity and quality of mature conifer habitat, and thus would not impact pileated woodpecker and pine marten.

**Primary Cavity Excavators:** This group of species represents snag-dependent cavity nesters. Hazard trees along the road right-of-way accessing the special use permit areas would be removed when they are identified as presenting a risk to travelers along these roads. The removal of these hazard trees may reduce the number of snags available for primary cavity excavators, although this is not expected to have a substantial impact on the quantity of habitat available for primary cavity excavators in the watershed.

**Bald Eagles:** This species, listed as Threatened under ESA, represents species dependent on mature timber within riparian areas. Habitat needs are accommodated by the Late-Successional Reserve allocations of the Northwest Forest Plan, in combination with the Olympic Forest Plan Bald Eagle Management Area allocations. Implementation of any of the action alternatives would not result in any change to the quantity and quality of habitat for Bald Eagles.

**Northern Spotted Owl:** This species, also listed as Threatened under ESA, represents wildlife species associated with mature and older timber stands in the Douglas-fir and other conifer types. Implementation of any of the action alternatives would not result in any change to mature and older timber stands that comprise habitat used by the northern spotted owl.

## **Visual Quality**

Forest-wide standards and guidelines for visual resources state that management activities should meet Visual Quality Objectives. Forest Plan direction for visual resources is established in each management prescription and is provided by the Visual Management System. Of the Forest Plan management prescriptions within the area of the special use permits, only the River Corridors prescription (A4BG) provide specific Visual Quality Objectives, which are Retention or Partial Retention as seen from the river or riverbank. Retention means that activities should not be evident but remain visually subordinate to the characteristic landscape and Partial Retention means that activities may be evident but remain visually subordinate to the characteristic landscape.

Visual Quality Objectives would be met under all the alternatives. The current visual condition, which existed at the time the Forest Plan was approved, would not be changed by any actions proposed in the alternatives as there would be no new management activities.

