Summary of Botanical Resources
Section
Exhatib E, Chapter 3 of the
Susitna Hydroelectric Project
FERC License Application

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BASELINE DESCRIPTION

Threatened or Endangered Plants

The Susitna River watershed upstream from Gold Creek was surveyed at selected habitat sites for plant taxa under consideration for threatened or endangered status. Access routes, borrow areas, and the intertie corridor were also surveyed for the presence of these taxa. No candidate threatened or endangered plants were found. Further endangered plant surveys will be made in the Healy-to-Fairbanks and Willow-to-Anchorage transmission corridors during the detailed design phase of project development.

Plant Communities

A diversity of plant communities occurs within the areas potentially affected by the project. The types of plant communities encountered and their areal coverage within a 20 mile (32km) wide area spanning the Susitna River between Gold Creek and the Maclaren River, include: Coniferous forest (351,640 ac), consisting of woodland, open and closed spruce (black and white spruce); mixed open and closed conifer-deciduous (56,500 ac); deciduous forest (10,860 ac), consisting of open and closed birch, and closed balsam poplar vegetation types; tundra (283,490 ac), consisting of wet sedge-grass, sedge scrub, herbaceous alpine, and mat and cushion vegetation types; shrubland (438,020 ac) consisting of open and closed tall shrub, and birch, willow, and mixed low shrub vegetation types; herbaceous (44 ac), and grassland (2,670 ac) communities.

Wetlands

Wetlands within the Susitna project area primarily include locations within riparian zones, ponds and lakes and adjacent areas on upland plateaus, wet black spruce woodland, and wet tundra. Concentrations of wetlands occur in the vicinity of upper Brushkana Creek and Tsusena Creek, the area between lower Deadman Creek and Tsusena Creek, the Fog Lakes area, the Stephan Lake area, Swimming Bear Lake, Jack Long Creek, in and near the many lakes of the Watana watershed, and along the transmission line corridors between Willow and Knik Arm and in the Tanana Flats area.

IMPACTS

This section summarizes botanical resource impacts that are of sufficient magnitude to influence mitigation planning. Impacts are grouped into one of three categories (direct loss; indirect loss; and alteration of communities), based on resource vulnerability, the probability of the impact occurring, and the duration of the impact. Direct losses of vegetation are judged most important because of the certainty and permanence of the impact. Plant community alterations are judged to be less important than vegetation losses. These impacts are less predictable and often of shorter duration than vegetation losses.

Direct Loss of Vegetation

Direct losses for the Watana project include 31,300 acres (12,667 ha) of vegetation for the dam, impoundment, and spillway. An additional 4300 acres (1742 ha) have been designated for use as camp, village, airstrip, and borrow areas. These potential losses account for 1 percent of all vegetation in the middle Susitna basin, and 3.6 percent of the vegetation present in a 20 mile (32 km) wide area spanning the Susitna River from the mouth of the Maclaren River to Gold Creek. More importantly, substantial losses of certain vegetation types will be sustained during construction of the Watana Dam. Losses of forested areas may total 8.3 percent of the 20 mile (32 km) wide area. Losses of open and closed birch forest will be greater than 20 percent for the 20 mile (32 km) wide area.

Direct losses for the Devil Canyon project will include 5871 acres (2376 ha) of forests, tundra and shrubland. Negligible amounts of tundra and shrubland (less than .05 percent) will be lost, but 0.7 percent of all forested lands in the middle basin (1.8 percent of the 20 mile (32 km) wide area) will be affected. Because of the steepness of Devil Canyon, these losses are relatively small compared to the Watana site and are comparatively less important for wildlife. However, 18.6 percent of the closed birch forest within the 20 mile (32 km) area will be eliminated.

The Watana access road will result in a loss of approximately 568 acres (230 ha) of mixed tundra vegetation types. Additional losses of about 494 acres (200 ha) for access roads and 193 acres (78 ha) for rail will be produced by the Devil Canyon facility. Direct losses within transmission corridors will occur from construction of access tails, tower sites, and substations.

Indirect Loss of Vegetation

Additional losses of vegetation may occur due to erosion, permafrost melting and subsequent land slides and slumpage, ORV use, blowdown of trees, and other causes. While some of these losses will be short-term with typical vegetation succession ensuing, or with shifts to new vegetation types for that area, long-term vegetational losses enduring for 30 to more than 100 years may occur on sites of continual erosion, land slumpage, or ORV use. The amounts that will be lost because of these factors are small compared to amounts inundated by the reservoirs.

Indirect losses of vegetation are projected to be greatest at the Watana site, where large areas on the south side of the impoundment are underlain by 200 to 300 feet (60 to 90 m) of permafrost at near melting temperature. Also, because of the large size of the reservoir, other erosional processes such as wind erosion, together with effects of dust, may cause very localized vegetation loss, especially in wind-exposed areas. The smaller, steeper nature of Devil Canyon will limit indirect losses of vegetation. Except for the possibility of one massive flow near River Mile 175, rock slides occurring above the impoundment represent the greatest threats and these will result in only small scale losses.

Some indirect loss of vegetation is expected due to erosion caused by changes in drainaage patterns and dust deposition along the access road edges. Increased utlilization by ORVs along access roads and road maintenance may damage adjacent areas. Little indirect loss in transmission line corridors is likely as a result of clearing or construction, but uncontrolled ORV access could affect vegetation on and adjacent to corridors.

Alteration of Vegetation Types

Alteration of vegetation types will be caused by changes in drainage patterns, altered river flows, and fire. In many instances, natural succession of cleared or disturbed areas not subject to inundation, will result in vegetation type changes. For example, primary herbaceous and weedy vegetation and secondary shrub growth may follow clearing of sites. There may be development of algal species and aquatic vegetation in shallow areas of the impoundments.

The most important change to existing conditions that will result from the Watana and Devil Canyon dams will be in the downstream floodplain between Gold Creek and Talkeetna, where annual spring and summer flooding and scour by ice jams will be reduced. As a result, some of the previously pulse-stabilized communities will mature. The willow and balsam poplar shrub will eventually change to mature balsam poplar and then to spruce. Within the license period, new vegetation on the newly exposed banks and island will develop into medium and tall shurubs.

Potentially significant impacts may occur to the vegetation surrounding the Watana Reservoir. Disturbance may cause warming of the soil, melting of the permafrost, and deepening of the active layer. In well-drained areas, this may result in increased growth and productivity by the existing plant community, but in waterlogged areas a shift to bog vegetation is likely. If the organic layer is lost during disturbance, long term losses of vegetation may result. Most forest and shrub areas disturbed near the reservoir will recover naturally. The ensuing patterns of vegetational succession will be enhanced if the organic layer is retained, and if root suckers or seed of vegetation remain.

Outside the actual impoundment and dam site, very few alterations of vegetation types are anticipated at Devil Canyon. Forest types will be subject to minor alterations, primarily near borrow sites G and K, and near camp and village sites. Likewise, changes in drainage, waterlogging of soil

or permafrost melting, will be highly localized because the soil is generally very rocky and well drained, with only sporadic occurrences of permafrost. The smaller, steeper character of Devil Canyon will also act to limit microclimatic and mesoclimatic alterations.

The access roads between the Devil Canyon and Watana sites, and between Watana and the Denali Highway, as well as rail construction between Devil Canyon and Gold Creek, will alter surface drainage patterns and may induce dust-related alterations in vegetation at roadsides. Selective clearing or top-cutting of tall vegetation for transmission line corridors will result in local shifts in plant types from trees to shrubs. Wet and moist tundra areas and their peripheries will be more susceptible to water logging due to vehicular traffic, with subsequent development of bog species and/or black spruce in place of cottongrass and shrub species.

Mitigation Summary

Mitigation plans for botanical resources have been developed primarily to support the wildlife mitigation program. Listed below is a brief synopsis of the mitigation plan elements:

1. Minimize facility dimensions.
2. Consolidate structures.
3. Site facilities in areas of low biomass.
4. Site facilities to minimize clearing of less abundant vegetation types.
5. Site facilities to minimize clearing of vegetation types productive as wildlife habitat components.
6. Minimize volume requirements for borrow extraction.
7. Dispose of spoil within the impoundments or previously excavated areas.
8. Design transmission corridors to allow selective cutting of trees and to accomodate uncleared low shrub and tundra vegetation within rights-of-way.

9. Dismantle nonessential structures as soon as they are vacated.
10. Develop a comprehensive site rehabilitation plan.
11. Monitor progress of rehabilitation to identify locations requiring further attention.
12. Acquire replacement lands for implementation of habitat enhancement measures.
13. Plan and develop an environmental briefings program for all field personnel.
14. Avoid the Prairie Creek, Stephan Lake, Fog Lakes, and Indian River areas by access routing.
15. Restrict public access during construction by gating the access road.
16. Use signs and possibly establish regulatory designation and measures to discourage use of ORVs and ATVs.
17. Phase implementation of the project Recreation Plan with interagency review and concurrence.
18. Site and align all facilities to avoid wetlands to the maximum extent feasible.
19. Involve agency coordination and participation in detailed engineering design and construction planning of civil engineering measures to minimize potential wetlands impacts.
20. Conduct high-resolution mapping of wetland vegetation within the project area, in coordination with COE and USFWS representatives (scheduled for 1983).