

FISHERIES CONSULTANTS



April 9, 1998

Jonathan Freedman, Project Manager
Regulatory Branch, Seattle District Office
U.S. Army Corps of Engineers
P.O. Box 3755
Seattle, WA 98124-3755

Dear Mr. Freedman:

Subject: SeaTac Airport Master Plan, Comments on Aquatic Habitat and Fish for Section 404 Permit Application

Development of the Third Runway for SeaTac Airport will have an overall neutral effect on aquatic habitat and fish populations in Miller Creek. Minor benefits to the stream corridor and fish populations will result from the following:

- ◆ Proposed storm flow detention facilities will decrease peak flow events in Miller Creek by 5% to 20%, compared to existing flood flows. This will slightly reduce the cumulative effects of storm flows caused by overall basin development (residential, commercial, industrial).
- ◆ Riparian vegetation and streambank conditions in a 100-foot wide by ¼-mile long corridor of Miller Creek will be improved after buyout and removal of houses along the stream. This will benefit aquatic life by promoting growth of riparian shrubs and trees, reducing human disturbance of fish, and removal of man-made clutter from the stream.

Adverse impacts of the proposed Third Runway project to Miller Creek include the following minor effects:

- ◆ Re-location of ¼-mile of Miller Creek from an existing excavated channel to a new excavated channel. The short-term impacts of construction negate some minor long-term benefits of a wider stream buffer zone through some of the re-located reach.

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- ◆ The runway fill and increased paved areas will result in a 8% (approx.) reduction in low stream flows in late summer, due to slightly reduced permeability of the watershed to infiltration of rainfall. This includes the effects of filling approximately 12 acres of wetlands within the basin, and slightly reduced groundwater recharge.

Other proposed changes in the basin with relevance to Miller Creek and fish populations include: construction of ½-mile drainage channel along the west side of the runway fill, possible minor changes to Lora Lake inlet and outlet, floodplain excavation to mitigate for floodplain fill, and small changes in the stream channel where existing structures would be removed or new structures placed (e.g. drainage channel inlet). I considered the net result of these activities to be neutral on aquatic habitat and fish production.

In my analysis of Third Runway effects on Miller Creek, I considered changes that would increase fish production of native species to be beneficial; this would include coho salmon, chum salmon (in lower reaches), steelhead, sea-run cutthroat trout, and sculpin. I have also included a short section to address possible issues related to fish species proposed or petitioned for listing as threatened or endangered under the Endangered Species Act.

I was hired by the Port of Seattle for this review. I have 16 years experience in salmon habitat enhancement in the Pacific Northwest as a Certified Fisheries Scientist and Registered Professional Engineer. My assignment was to provide a technical assessment of Third Runway development on Miller Creek, based on the Port's JARPA application.

Benefits and drawbacks of the Third Runway for Miller Creek are explained in more detail below. I did not review the Port of Seattle's proposed development in the Des Moines Creek watershed.

Storm Flow Detention Facilities

Storm flow detention facilities are relevant to the Section 404 permit because the airport fill (including some wetland fill) would affect peak runoff during storm events. Appendix G of the Master Plan Update EIS details the Port's hydrologic modeling study using the U.S. EPA's HSPF model. This model is widely accepted for evaluation of hydrologic relationships in basins like the Miller Creek watershed. My review of the model calibration, simulations, etc. for Miller Creek convinced me that the proposed project would result in an overall (beneficial) reduction in peak flow runoff.

Attenuation of peak flow runoff would be accomplished using three detention basins to intercept runoff from the increased runway fill area. These basins would have a total hydraulic capacity of 61 acre-feet and would more than

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mitigate direct project effects on peak flow runoff. Compared to existing peak flows, maximum discharge would be reduced 5% to 20% for most flood events, depending on flood return interval and the point of measurement.

Basin designs are not included in the EIS or Section 404 permit application; however, design guidelines and sub-basin hydraulic capacities are itemized in Appendix G of the EIS. These detention ponds would adequately mitigate increased runoff from filled areas, including the small areas of wetland fill associated with the project.

100-Foot Wide Stream Buffer

The Port is buying private property and residences along the west side of the proposed runway fill, to meet noise restrictions of the expanded airport on residential areas. Existing residential property may be re-developed as commercial or industrial property within the buy-out zone. The Port has proposed that a 100-foot wide stream buffer (50 feet +/- each side) be established along the entire length of Miller Creek within the buy-out zone (3/4-mile stream length).

The 100-foot wide buffer along the stream would benefit aquatic resources by promoting riparian shrub and tree growth, decreasing human disturbances of fish and other native species, and by removal of numerous pieces of man-made clutter from the stream. These benefits would be realized provided that re-development is relatively low density, with the "footprint" of new construction more-or-less the same as existing structures. Re-development construction will be governed by current land-use regulations, which are substantially more protective of aquatic habitats than past regulations. Therefore, a long-term improvement in stream conditions is expected from the buffer zone.

Establishment of the buffer zone along Miller Creek would not result in excavation or fill within the floodplain or stream channel, and is not directly regulated by Section 404 permit authority. The proposed stream buffer is intended to improve overall stream conditions, as mitigation for excavation and fill proposed within the floodplain and wetland areas in the Miller Creek watershed.

Re-location of Miller Creek (1/4-mile length)

The reach of Miller Creek that would be re-located is currently in poor condition, as described in the EIS and JARPA application. At the time of my site survey, the stream was about 5 feet wide and 1 foot deep (average flow in spring). Habitat conditions adverse to native fish include typical "urban stream" conditions: straight alignment, lack of habitat diversity, lack of overhead or in-stream cover, silt/sand bottom, trash dumping, etc. Nevertheless, the stream

reach to be re-located is probably inhabited by cutthroat trout and provide potential habitat for other salmonids.

Stream re-location would necessarily disrupt existing riparian vegetation, existing in-stream habitat, and kill some aquatic organisms (e.g., frogs). These short-term consequences of stream re-location are characteristic of all stream projects, even when care is taken to collect and transport aquatic organisms as possible. Considering the short stream section involved in relocation, these impacts are minor to the overall system.

The re-located stream would have a wider riparian area (30 to 60 feet) than the existing stream. This would provide some minor long-term benefits to the overall stream. Stream re-location plans include a gravel substrate to replace the existing stream's silt and sand bottom. This gravel will be covered with silt and sand after several high flow events, due to erosion within the watershed (not necessarily related to the airport). The low stream gradient (0.3%) will make it impossible to prevent deposition of fine sediment; in fact, this is probably a natural characteristic of this reach of Miller Creek due to its topography.

Excavation and fill within the stream channel and floodplain will be required for stream re-location. These activities are typically detrimental to habitat conditions for fish, even though the length of stream to be re-located is short. Therefore, I have concluded that stream re-location will have a minor adverse impact on aquatic life, despite application of Best Management Practices by the Port of Seattle.

Reduction in Late Summer Low Flows

A background caution for evaluation of this factor is that ground water modeling, HSPF calculations, and all other sources of information should be considered "ballpark estimates" rather than exact numbers defining late summer flow amounts in Miller Creek. Logic and common sense tell us that filling and paving a small portion of the watershed (i.e. Third Runway) should result in a more-or-less proportional decrease in infiltration of rainfall. This decrease in infiltration would result in less groundwater flow and lower rates of streamflow accretion (from groundwater) and seepage supporting late summer flows.

Hydraulic relationships between rainfall, infiltration, groundwater recharge, groundwater "loss" to deep aquifers, and streamflow are presented in Appendix G of the EIS. In the EIS, a 7% reduction in Miller Creek late summer streamflow was estimated from all construction (fill and paving) associated with the Third Runway. However, the EIS model did not account for reduced groundwater infiltration and late summer streamflow (baseflow) caused by wetland filling.

I calculated the expected reduction in late summer flow in Miller Creek attributable to wetland filling using the same procedures as outlined in the EIS. Wetlands are estimated to have an infiltration rate over 30 times higher than

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glacial till soils or compacted fill, for the same unit of land area. Third Runway construction would result in filling about 8 acres of wetland in the Miller Creek basin and 4 acres in the Des Moines Creek watershed. Wetland fill and conversion to "compacted fill" in the Miller Creek watershed would result in a 0.6% reduction in overall basin infiltration to groundwater. Conceptually, this would result in a 0.6% reduction in late summer streamflow to Miller Creek.

The estimated reduction in late summer streamflow in Miller Creek, due to the Third Runway, should be listed as 7.6% instead of 7% cited in the EIS (Appendix G). Most of this reduction (7%) is due to fill over glacial outwash soils, with the remaining 0.6% due to wetland fill. This minor reduction in flow is considered adverse to fish (and other aquatic life) because it will occur when aquatic organisms are already stressed by low flow conditions.

Existing low flows in Miller Creek are presently about 1 cubic foot per second (cfs) during late summer. A 7.6% (+/-) change in flow would not be visually apparent, and would probably not be measurable. Overall, this change in stream hydrology was considered a minor detrimental impact of runway development.

Endangered Species Act Considerations

Naturally spawning (vs. hatchery) chinook salmon in tributaries to Puget Sound have been proposed as "threatened" by the National Marine Fisheries Service (NMFS) under provisions of the Endangered Species Act (ESA). Also, a petition to list sea-run cutthroat trout throughout Washington as "threatened" is being reviewed by NMFS.

Chinook salmon do not currently inhabit Miller Creek, and the stream is considered too small to support a natural run of chinook salmon. Proposed critical habitat for Puget Sound chinook salmon does not include streams that currently do not have chinook salmon (i.e. Miller Creek). This is because NMFS considers the existing range of chinook salmon in tributaries to Puget Sound to provide adequate habitat for species recovery. Therefore, ESA considerations for chinook salmon are not relevant to Miller Creek.

Sea-run cutthroat trout in Puget Sound may be proposed for "threatened" status in the next few years. This species historically inhabited most small tributaries to Puget Sound, probably including Miller Creek. Possible future designation of critical habitat and required Section 7 (ESA) consultations with federal agencies would probably require that proposed developments result in "no net loss of habitat or population" for listed species. The existing Third Runway development plan would meet this potential future habitat protection threshold, as outlined above. This assessment would also apply to other native fish species possibly listed as threatened in the future.

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Summary

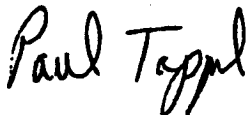
Third Runway development including proposed mitigation measures will result in a neutral effect of the project on aquatic habitat and fish populations in Miller Creek. Specifically, excavation and fill activities in wetland and floodplain areas appear to be adequately mitigated that the resulting changes to aquatic habitat will be insignificant in a watershed context. Adverse project effects (e.g. stream re-location) are counterbalanced with positive changes (e.g. stream buffer zone).

The proposed Third Runway development would not result in any measurable or biologically important changes to Miller Creek habitat or fish populations. Factors limiting fish population productivity in the basin are numerous and well-known (stream channelization, altered hydrology, residential and commercial development, etc.). These limiting factors are spread through all human uses of the basin and are not specific to the airport or any other single entity.

The current proposed listing of Puget Sound chinook salmon as "threatened" is not relevant to Miller Creek. Sea-run cutthroat trout and other native species in Miller Creek may be listed as "threatened" in the future. The Port's existing proposed plans would result in "no net loss of habitat or population" for these other fish species.

Please give me a call at 425-482-6420 if you have any questions about my review.

Sincerely,



Paul Tappel
Civil Engineer & Fisheries Biologist

PAUL D. TAPPEL, P.E.
Civil Engineer & Fisheries Biologist

EDUCATION

Civil Engineering, M.E., University of Idaho, 1982
Fisheries Resources, M.S., University of Idaho, 1981
Fisheries, B.S., Humboldt State University, 1978

PROFESSIONAL REGISTRATION

Registered Professional Engineer
AK, ID, MT, OR, WA
Certified Fisheries Scientist

Fisheries Consultants (self-employed), Brier, WA**1995-2002**

As a licensed engineer and certified fisheries scientist, Mr. Tappel specializes his combined skills in "fisheries engineering" and fisheries enhancement projects. Typical work includes aquatic habitat assessment, site surveys, development of fisheries enhancement alternatives, civil engineering and hydraulic design, and construction contract preparation. He is currently working on 10 fisheries enhancement projects including upstream and downstream fish passage structures, channel re-construction, spawning gravel placement, erosion control, side channel development, acclimation pond construction, and modifications to a salmon hatchery.

Harza Northwest, Bellevue, WA**1989-1994**

At Harza Northwest, Mr. Tappel worked on a wide range of fisheries engineering projects in the Pacific Northwest. His work spanned the fish biology and civil engineering fields, as well as a substantial administrative workload. Accomplishments included: Fish passage work on mainstem Columbia and Snake River dams, development of reasonable balances between hydroelectric projects and fisheries resources (FERC licensing), expansion of Harza's capabilities and staff to the "top level" in the Pacific Northwest fisheries engineering field, and completion of a wide range of technical assignments. Technical work was almost all related to fish passage design, fish habitat enhancement development, and fish hatchery facility analysis and design (fisheries engineering).

R.W. Beck and Associates, Seattle, WA**1985-1989**

Fisheries studies and fisheries engineering projects were completed for the following clients during Mr. Tappel's time at R.W. Beck and Associates: Bonneville Power Administration, Puyallup Indian Tribe, Washington Department of Wildlife, City of Walla Walla, Alaska Department of Fish and Game, Seattle City Light, Colville Confederated Tribes, Nisqually Indian Tribe, Quileute Indian Tribe, Northern Southeast Regional Aquaculture Association, Southern Southeast Regional Aquaculture Association, Bureau of Land Management, Sumas Mountain Power Company, Squaxin Island Tribe, and U.S. Forest Service.

U.S. Forest Service, Ketchikan, AK**1982-1985**

Mr. Tappel was the USFS District Fisheries Engineer for southern Southeast Alaska for 4 years. Major projects in fisheries engineering included: Development and implementation of fish passage criteria and designs for culverts installed on forest roads, evaluation and prioritization of about 40 fish enhancement projects, design and construction of the Bakewell Creek and Sunny Creek fish ladders, design and construction of the mile-long Marx Creek groundwater-fed spawning channel, and development of a "typical design handbook" for use by USFS staff to build hundreds of in-stream structures for salmon habitat enhancement.

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