

Mendenhall Wetlands Study Group

Comments on the Level 2 Screening Results
for the
Juneau Douglas North Crossing PEL Study

April 10, 2024

Executive Summary

This critique reflects the Mendenhall Wetlands Study Group's (MWSG, Study Group) review of DOWL's March 2024 second-level PEL screening of predicted impacts from six alternative corridors for construction of a second crossing between mainland Juneau and Douglas Island, as well as those of a No-Build alternative.

Discrepancies and inadequacies in DOWL's identification and application of screening criteria are explained in detail, and a re-scoring of impacts associated with crossing alternatives is proposed. Examples include the need to consider more than just the narrow footprint of a constructed crossing alternative and to avoid or minimize fish and wildlife habitat fragmentation.

Moreover, the PEL screening results need to reflect statutory and regulatory requirements of the National Transportation Act of 1966 and the State of Alaska's Title 16 requirements to prioritize off-refuge alternatives and further avoid, minimize, and mitigate impacts to the Mendenhall Wetlands State Game Refuge, across which five of the six identified channel crossing alternatives would wholly traverse.

The result of the Study Group's re-scoring of the six crossing alternatives results in the following order of adverse impacts from least to worst: Twin Lakes (TL), Salmon Creek (SC), Vanderbilt (VB), East Sunny Point (ESP), West Sunny Point (WSP), and Mendenhall Peninsula (MP). The Study Group recommends that ESP, WSP and MP not be carried forward into the EIS process because they would have highly adverse impacts on the Mendenhall Wetlands State Game Refuge.

The Study Group advocates for including the Salmon Creek alternative, as it is the only remaining potentially off-refuge alternative, among those forwarded for analysis in the NEPA process. The Study Group also cautions against any tendency to exclude alternatives while deferring a rigorous analysis of anticipated environmental impacts to the NEPA process.

The Study Group agrees with DOWL's public statements that if a crossing is built, it should be a piling-supported rather than a solid-fill structure.

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Introduction

Study Group Qualifications

The Mendenhall Wetlands Study Group (MWSG) is a group of scientists and resource managers that was formed to provide review and expert advice to the PEL Study. The ad-hoc steering committee for the MWSG is composed of a former Alaska Department of Fish and Game (ADF&G) Commissioner, a former ADF&G Deputy Commissioner, a former ADF&G Director of Wildlife Conservation, and a former NOAA Fishery Research Biologist with forty years of experience in the study and management of Alaska salmon. The larger group is composed mainly of Fisheries Biologists, Wildlife Biologists, Conservation Biologists, Habitat Biologists, Habitat Mapping and Evaluation Specialists, Naturalists, and Natural Resource Managers. Many of the studies referenced in our January 30, 2023 Comments and Recommendations (Attachment 1) were conducted and written by members of our study group.

Mendenhall Wetlands State Game Refuge

We continue to stress the fact that the Mendenhall Wetlands constitute a uniquely productive and diverse ecosystem. Because of its 24-foot extreme tidal range and the variety of freshwater and glacial inputs, it contains diverse and complex habitats used by a wide variety of species. For example, 256 species of birds have been observed on the Wetlands. Further, the Wetlands have been recognized as a Globally Important Bird Area, a status achieved by habitats that support more than 1% of a species globally; the Mendenhall Wetlands IBA supports more than 1% of the international populations of 34 different species of birds. The Mendenhall Wetlands rank along with the Stikine Flats and the Yakutat Forelands as the most significant stopover points for shorebirds to rest and refuel on their long migrations through the region. Identified in the Alaska Shorebird Conservation Plan Vol. III (Alaska Shorebird Working Group, 2019) as a state and regional priority for habitat protection and management, the Mendenhall wetlands area hosts 16 of the 17 shorebird species of greatest conservation concern in Alaska and 11 more identified as stewardship priorities due to Alaska's share of the population. Alaska Shorebird Plan (VII) conservation priority species are adopted by reference and listed among Species of Greatest Conservation Need in the State of Alaska's 2015 Wildlife Action Plan.

International travelers using the area include Snow Geese from Russia and Greater Yellowlegs from Tierra Del Fuego among many others. Alaskan long distance migrants include many of the Mallards seen wintering on the Wetlands which travel to nest on the Yukon Delta. The Wetlands also provide a key wintering area for a large portion of the region's distinctive forest-nesting

goose population (Vancouver Canada Goose), with up to 700 using the Refuge's key salt marsh and slough habitats, including the proposed Sunny Point and Vanderbilt Creek alignments.

The Mendenhall Wetlands is the most important area for fish, birds, invertebrates, and some mammals on the Juneau road system. Our January 30, 2023 comments included an extensive bibliography documenting the bird, fish, invertebrate, and wildlife resources on the Wetlands; it does not appear that this information was used in the PEL study. We again recommend it be used by DOWL and ADOT&PF in future analyses documenting the impacts of different crossing alternatives.

In recognition of these values and the need to conserve them, the Mendenhall Wetlands State Game Refuge (encompassing most, but not all of the Mendenhall Wetlands) was created in 1976, after more than a decade of citizen involvement. State and federal legislation require development projects within such special areas to take all measures to avoid, but also to minimize and mitigate effects upon refuge resources and uses.

As per state statutory responsibility, conditions for permitting should be specified to meet standards consistent with protection of fish and wildlife, public use and resource use, with no adverse effect on fish and wildlife, their habitat, or public use as per 5AAC 95.430, as well as mitigation in accordance with 5AAC 95.430 and 5AAC 95.520. Nowhere in the planning has this been clearly depicted or defined. Criteria enumerating and describing how the project will avoid, minimize, and mitigate impacts as per state statutes needs to be added and clearly defined.

Off-Refuge Crossing Priority

Federal and State laws and regulations make finding a feasible and prudent off-refuge alternative the highest priority for ADOT&PF. Section 4(f) of the National Transportation Act requires that ADOT&PF prioritize alternatives that avoid wildlife refuges and, if there is a feasible and prudent option that avoids the Refuge, ADOT&PF **must** select it. Similarly, the ADF&G regulations for the Mendenhall State Game Refuge require that ADOT&PF demonstrate that there is a significant public need for the corridor that cannot be reasonably met off-refuge before choosing a corridor that crosses the Refuge. The requirements of these state and federal laws to avoid, minimize, and mitigate impacts to the Mendenhall Wetlands State Game Refuge comprise a crucial context for the public to understand, and should guide the evaluation and ranking of alternatives.

Further, the draft PEL analysis ranks all 4(f) properties equally. Giving the same weight to impacting a CBJ trailhead as it does to putting a highway through one of the most productive

areas of the Refuge at Mendenhall Peninsula, for example, is misleading at best and should be corrected.

Reference Actual Time Savings of All Alternatives

The Purpose and Need criterion of “Improving travel times” should address scenarios for access from Douglas Island to Bartlett Regional Hospital (one of the CBJ’s highest safety priorities) in the event that the current bridge is blocked or Egan Expressway is closed by avalanche or accident below Mount Juneau. The Salmon Creek alternative would give residents from Thane, Downtown Juneau, Downtown Douglas, and West Juneau more rapid access to the Hospital than any of the other options, followed by Twin Lakes and other alternatives further north and west; how much faster would be important to know when reviewing alternatives.

The analysis of alternatives should also include a reference to the travel time analysis done by ADOT&PF. The scale from -2 to +2 does not give an accurate sense of the time benefits of different alternatives, but ADOT&PF’s travel time analysis does. The public should understand, for example, that a trip from the Back Loop Road to the Fish Creek Road will take 1.2 minutes longer using the Vanderbilt Crossing than using the Sunny Point crossing; the Twin Lakes crossing will take 3.4 minutes longer than Sunny Point; and, Salmon Creek will result in a trip 5.2 minutes longer than Sunny Point. It is important that the public understand how many (or how few) minutes in actual travel time they are saving when they look at the environmental and dollar costs of different alternatives.

Crossing Structures Limited to Elevated Structures

We agree with ADOT&PF's decision to only evaluate elevated structures in the PEL Level 2 analysis. Given the extreme tidal action that makes the Mendenhall Wetlands so diverse and productive, the final PEL should require that only elevated structures be considered and evaluated during the EIS phase of analysis for any second crossing. While we believe this draft PEL screening underestimates even the impacts of elevated structures, the effects of solid fill structures perpendicular to the extreme tidal flows would be orders of magnitude worse as they would cause far greater impacts to tidal and freshwater flows.

Re-scoring the DOWL Matrix

DOWL has constructed an evaluation matrix for the PEL Level 2 screening process that ostensibly evaluates the relative impact on the crossing alternatives in relation to the Purpose and Needs, Additional Goals, and Environmental Screening. The rating matrix is deeply flawed on several levels.

First, the scoring range does not adequately portray differences in environmental impacts between alternatives. The scoring gradients are -2 to 2 for some objectives, providing a range of 5, but restricted to 0 to 2 or 0 to -2 for environmental impacts. This both reduces the level of detail for portraying differences between alternatives and puts environmental values at a disadvantage in any attempt at cumulative scoring. In addition, criteria and scoring should be structured so that environmental factors are given weight in the overall rating that is appropriate to their regulatory and common sense importance, particularly bird habitat.

Second, a number of key criteria are not listed or rated. DOWL states that the Technical Advisory Committee and Stakeholders Advisory Committee reviewed criteria, but the PEL team has consistently failed to incorporate suggestions to revise criteria in response to comments on evaluating impacts to refuge integrity, ecosystem functions, fragmentation of habitat and viewsheds, and recreational use (See Attachment 1). The PEL assessments often limit consideration of impacts to a portion of the hypothesized fill footprints of the alternatives; other direct or consequent impacts are ignored.

Third, some of the evaluations are simply not credible. Three examples are: 1) for important migratory bird habitat affected, DOWL rates East Sunny Point (ESP) at 0 (no impact), even though the route traverses highly productive wetlands in the heart of the state refuge, in an area used by flocks of hundreds of migratory waterfowl; 2) DOWL's wetland impact acreages are limited to only a portion of fill footprints, misrepresenting impacts by an order of magnitude or more; and 3) for maintaining scenic identity, DOWL rates all alternatives except for MP the same, even though the magnificent scenic viewscape of the Wetlands, viewed from Egan Expressway, the Dike Trail, or other trails and scenic viewpoints and which has been identified in the Juneau Comprehensive Plan is greatly impacted by the Sunny Point alternatives, with diminishing impact from the alternatives to the south and east (i.e., VB, TL, and SC).

The cumulative ratings DOWL has developed are based on some criteria being scored inappropriately, using either incorrect, incomplete, or inconsistent rating factors. Below we provide a list of criteria that we find incorrectly rated. We then reevaluate these criteria considering factors such as refuge integrity, ecosystem functions, fragmentation of habitat and

viewsheds, and recreational uses, based on the expertise and literally hundreds of years of collective experience of the professionals comprising the MWSG.

The very narrow scoring range used in the PEL Level 2 screening makes it difficult to resolve differences among the alternatives. While it would be preferable to expand the scoring range, we suggest using fractions to better distinguish the differences between alternatives in terms of impacts to environmental resources and refuge integrity. Accordingly, where needed we have used fractional values in the tables below to show a finer degree of resolution.

1. Purpose and Needs:

Criterion: “Decrease existing and future traffic congestion on Douglas Island Bridge and its intersections”

DOWL has rated all alternatives as +1. This is not consistent with its own Bridge Volume Forecast Memo, which shows that the volume of traffic on the current bridge would be most reduced by the Salmon Creek and Twin Lakes alternatives, with diminishing diversion of traffic for the more westward alternatives (i.e., VB, ESP, WSP, MP).

Moreover, the Bridge Volume Forecast Memo and DOWL’s other preliminary analysis do not consider or mention the logical termini of a Bench Road Project, North Douglas Master Plan, and North Douglas Highway Improvements. A second bridge between Juneau and Douglas Island will require these projects, and perhaps others, in order to be an effective transportation link. ADOT&PF will have to consider the rational endpoints of planning and infrastructure obligations and their costs to fully evaluate and select an alternative for a second crossing. Without development of the transportation-focused logical termini mentioned here, it is likely that any second crossing alternative (with the exception of No-Build) would increase existing and future traffic congestion in other areas north of the current Douglas Island Bridge and its intersections, along the length of North Douglas Highway.

The alternatives should be re-scored to reflect the gradient of impact:
Mendenhall Peninsula (MP) -1; West Sunny Point (WSP) 0; East Sunny Point (ESP) 0;
Vanderbilt (VB) +1; Twin Lakes (TL) +2; and Salmon Creek (SC) +2.

Scores for “Decrease Congestion Douglas Island Bridge/Intersections”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	+1	+1	+1	+1	+1	+1
MWSG	-1	0	0	+1	+2	+2

2. Additional Goals:

Criterion: “Avoid, minimize, and mitigate impacts to the environment”

DOWL has rated all alternatives -2 which seems to suggest that none of the alternatives they have presented, other than the no-build alternative, can meet the regulatory requirements of avoiding or minimizing impact. However, it is stated that Salmon Creek route is the “least impactful” of the alternatives. They also mention that this alternative is likely to be located outside the refuge, but apparently give no weighting to maintaining refuge integrity, an issue that has been repeatedly raised in public comment and by both the Technical and Stakeholder advisory committees. Finding an off-refuge alternative is the first priority under both state and federal law. Avoiding and minimizing environmental impact are regulatory requirements both on and off the Refuge, rather than being just “additional goals” that may or may not be met by the project. Designs and siting should therefore be adjusted to provide choices that do avoid and minimize refuge and environmental impact.

A first step would be to retain and improve analysis of an off-refuge alignment at Salmon Creek. A second would be to adjust alignments to avoid stream mouth deltas, refuge access areas, and extensive salt marsh; none of the current alignments accomplish this. Whether for engineering convenience or land availability it appears that deltas, refuge access points, and extensive salt marsh were the focus for proposed crossing sites. In Figure 1 (following Page 25)), deltas show as rough-textured bulges at stream mouths, and low and high salt marsh can be approximated by the two elevation classes lying between 12 to 20.6 ft. above Mean Lower Low Water. From this overview, the proposed alignment locations themselves represent a failure from the start to identify and incorporate the key “environmental linkages” – the purpose of the Planning and Environmental Linkages (PEL) process.

Deltas within proposed alignments include those of the Mendenhall River, Falls Creek, Neilson Creek, 5 Mile Creek, the creek at the 9 Mile access trail and to a lesser extent, Salmon Creek. Estuarine deltas have rockweed/mussel beds and rich mudflats that are key wildlife concentration areas; the Mendenhall and Salmon/Falls Creek deltas have been documented as the most important year-round bird habitat on the refuge, and Neilson Creek is among the top seasonal sites (Armstrong et al., 2004).

Proposed crossing alignments would affect official refuge access at Sunny Point East and West, Falls Creek, 5 Mile Creek, 9 Mile North Douglas Highway, and perhaps to a lesser extent Salmon Creek. Other refuge access via public land is affected by the alignments at Hendrickson Point and Mendenhall Peninsula. Extensive salt marsh areas, from the access trails across most of the widest part of the refuge, are traversed by both Sunny Point alignments; there is also considerable and growing salt marsh at Vanderbilt. Even using the simplest and most obvious criteria, the PEL’s choice of crossing sites indicates no credible attempt to avoid or minimize refuge and environmental impacts as required by statute and regulation, except perhaps at Salmon Creek.

The PEL ratings give no consideration of the impact of habitat fragmentation, a major concern in terms of environmental impact. At a minimum, SC should be changed to a -1. The very narrow scoring range makes it difficult to resolve differences among alternatives. Using fractions to display the difference in environmental impact and impact to refuge integrity we scored MP -2; WSP -2; ESP -2; VB -2; TL -1.5, and SC -1.

Scores for “Avoid, minimize, and mitigate impacts to the environment.”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	-2	-2	-2	-2	-2	-2
MWSG	-2	-2	-2	-2	-1.5	-1

Criterion: “Maintain the visual, cultural, and scenic identity of Juneau and Douglas Island”

DOWL has rated MP -2 and all other alternatives -1. The lower rating of MP makes sense in relation to the impact on the scenic viewshed identified in the City and Borough of Juneau’s

Comprehensive Plan. However, the iconic viewshed of the Wetlands from the airport to the southeast is also identified in the Comprehensive Plan, and the alternatives east of the airport have greatly varying degrees of impact on this viewshed, with increasing impact from east to west. Again, the limited scoring range constrains a comparison of differences among the alternatives. At a minimum, WSP and ESP should be rated as -2. We again suggest you either expand the scoring range to 0 to -3, or use fractions to show the difference in environmental impact among alternatives by scoring MP -2; WSP -2; ESP -2; VB -1.5; TL -1.5; and SC -1.

Scores for “Maintain the visual, cultural, and scenic identity.”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	-2	-1	-1	-1	-1	-1
MWSG	-2	-2	-2	-1.5	-1.5	-1

3. Environmental Screening

Criterion: “Wetlands directly impacted”

DOWL has apparently limited its wetland evaluation to a fraction of the fill footprint of the proposed alternative structures. Fill may be an appropriate factor to evaluate for “impervious surfaces added”, but is an incomplete description of the structures’ impact to wetlands within and surrounding the routes, in terms of potential impacts to hydrology, soil disturbance and erosion, long-term destruction of vegetation, shading and fragmentation of habitat, and ecosystem functions.

Using the final fill footprint also fails to consider the impacts from construction activities, which will cause decades-long impacts to a greater area of wetlands than the narrow fill corridor. When these factors are considered, there is no justification for rating ESP as less impactful than WSP. Both of these alternatives also share the Hendrickson Point freshwater wetland traverse; it appears that wetlands within the Hendrickson Point corridor – and perhaps the entire Douglas Island side of all alignments – were excluded from DOWL’s acreage tally. DOWL’s recently released wetland delineation of the Hendrickson Point area fails to map a large portion (10+ acres) of the wetland area and stream within the alignment corridor, and even the mapped portion

was apparently omitted from the wetland acreage totals. Both Sunny Point alternatives should be rated -2. Similarly, DOWL failed to map several acres of wetlands mapped by CBJ (2015) within the route alignment on the Mendenhall Peninsula.

Wetlands and waters, in terms of US Army Corps of Engineers (USACE) jurisdiction, include both freshwater and vegetated intertidal wetlands as well as mudflats. DOWL’s impact acreages apparently do not include the full range of jurisdictional wetlands and waters, even if limiting consideration to only the fill footprint and only on the mainland. The ratings matrix and accompanying documentation must therefore include the definitions of wetlands on which they are based, and if limited to certain wetland types or parts of the project area, a rationale for this, along with maps illustrating the calculated acreages.

The “impact quantification” wetland acreages listed by DOWL are not credible and require revision and documentation. Our estimates of jurisdictional wetland and water acreages for a minimal alignment width (150 ft) and just the presumed fill portion are an order of magnitude greater than DOWL’s. The footprint, types of wetland/water areas included, and data sources (NWI layers, desktop or ground delineation) should be clarified and revised as necessary.

Functional assessment was not included in DOWL’s “Wetland Delineation and Functional Assessment” report, despite its title, and impacts to wetland functions were not considered in the impact analysis and rating. This is an example of DOWL failing to consider broad-scale impacts that would be regulated by the Clean Water Act (Secs. 10 and 404), the Magnuson-Stevens Act, AS 16 (.20.020, .05.841 & .05.870) governing state special areas and anadromous fish waters, as well as other requirements.

Additionally, it is very difficult to describe the impacts to wetlands with only the criteria included here. Due to the value of salt marsh and delta habitats it would be prudent for future screening efforts to include criteria for salt marsh and delta types. Good reference points may be the SEALT Habitat Mapping and Assessment Project and the ADOT&PF/Parametrix intertidal habitat survey report.

Scores for “Wetlands Directly Impacted”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	-2	-2	-1	-2	-1	-1
MWSG	-2	-2	-2	-2	-1.5	-1

Criterion: “Intertidal zone directly impacted”

DOWL again has apparently limited its evaluation to the fill footprint, or part of that intertidal footprint, for each of the proposed crossings. As stated above, fill is an appropriate evaluation consideration for the ‘impervious surfaces added’ criterion in the matrix but is an incomplete evaluation of the structures’ impact to intertidal zones transited by the routes in terms of potential impacts to hydrology, shading and fragmentation of habitat, ecosystem functions, and long-term effects of construction impacts. When these factors are considered, along with intertidal alignment lengths, MP, ESP, and WSP should be rated -2. The deeper channel at Salmon Creek, and proposed span rather than pilings, may make a rating of -1 potentially reasonable there, although it appears that intertidal impacts on the Douglas Island side of the current alignment are significant.

According to communications from the PEL team the wetland acreages were being tallied for all “wetlands and waters” jurisdictional areas, which would be from high tide line to below Mean Low Low Water (MLLW). Since most of the intertidal is technically jurisdictional wetland and waters, DOWL’s acreages calculated for wetlands should be similar to, or larger (with addition of freshwater wetlands) than, these intertidal acreages, but they are not. DOWL must therefore provide their maps of intertidal fill, other structures, and construction impact acreages and verify that Douglas Island-side and mid-channel support structure impacts are included in their calculations. If only fill footprints are included, or only for the Egan interchanges, this is not a reasonable representation of total or relative intertidal (or wetland) impacts for the crossing alternatives and must be corrected.

Scores for “Intertidal Zone Directly Impacted”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	-1	-1	-1	-2	-2	-1
MWSG	-2	-2	-2	-2	-2	-1

Criterion: “EFH (Essential Fish Habitat) Directly Affected”

As noted by a NOAA Fisheries Habitat expert at the Joint Advisory Committee meeting on March 7, this is not a good metric for comparing the alternatives. Essential Fish Habitat (EFH) is too coarse a definition to evaluate differences; all alternatives are routed through areas mapped as EFH. The only credible mechanism for using EFH in scoring would be for NOAA to undertake a consultation with ADOT&PF and make a specific determination of impacts to EFH for each alternative. That is unlikely to occur prior to an EIS. An EFH consultation would assess impacts to waters, substrate, species, habitat types, ecosystem services, and finally the quality and quantity of EFH that would be affected. Relative ranking of alternatives should be based on habitat impacted, and until a consultation occurs, the blanket of EFH across all six build alternatives does not adequately describe or differentiate between habitat impacts. We renamed this criterion “Fish Habitat Affected”. We accepted the DOWL scores for most alternatives, based on fill footprints, but have changed the WSP and ESP scores from 0 to -2. There is also an effect of fill on fish habitat from these alternatives at their Douglas Island landings, and for WSP on the mainland junction, but more importantly, these routes bisect the salt marsh and numerous tidal sloughs and channels in the heart of the refuge, potentially affecting flow patterns and interconnectivity. This area, including the salt marsh, is important habitat for a variety of fish species, and especially for rearing juvenile coho salmon that originate in neighboring anadromous streams. Project maps and analyses should be updated to show anadromous streams, including Falls and Neilson Creeks and recently documented streams by the MP landfall on Douglas Island.

Scores for “ Fish Habitat Affected”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	-1	0	0	-2	-2	-1
MWSG	-1	-2	-2	-2	-2	-1

Criterion: “ Wildlife habitat directly impacted”

This criterion is undefined and therefore challenging to comment on. However, under the assumption that this category is meant to exclude birds and fish due to their being treated elsewhere, we will comment based on the value of the Mendenhall Wetlands to large game, small game, and furbearers.

Both WSP and ESP have a far greater impact than reflected in DOWL’s scoring. These alternatives fragment the most undisturbed portion of the refuge, which is important small game and furbearer habitat, serve as a movement corridor between Douglas Island and the mainland, especially for deer and black bear, and are important for foraging and critical for deer overwintering. From their landing point on Douglas Island to the North Douglas Highway these alternatives also fragment terrestrial habitat. ESP and WSP should be changed to -2 for impact for this criterion. MP should be changed to -2 to reflect the impacts of the large footprint of cleared forest and filled wetland habitat in a currently undisturbed area and movement corridor, in addition to loss of undisturbed shoreline habitat and creation of movement barriers along both currently undeveloped mainland and Douglas Island shorelines.

Scores for “ Wildlife Habitat Impacted”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	-2	-1	0	-2	-1	0
MWSG	-2	-2	-2	-2	-1	-1

Criterion: “Important migratory bird habitat directly impacted”

Bird Habitat Impact Criteria & Rating Issues

Rating East Sunny Point (ESP) as 0 – “no impact”, is perhaps the least credible ranking in this matrix. It is also concerning that migratory bird habitat impact contributes only a small fraction of the overall rating, when bird habitat is the primary feature and purpose of this legislatively designated wetland refuge. Human and other wildlife uses of refuge resources are also important, but these flow from habitat; to meet regulatory requirements and reflect the community’s valued use and enjoyment of the refuge, habitat impacts must be weighted to contribute a large portion of the score. It is therefore essential to set up clear and useful bird habitat impact rating criteria and apply them correctly. DOWL’s criteria, while potentially useful for some of the impact area, are unclear and incorrectly applied, seriously misrepresenting both refuge resources and project effects.

DOWL states that “# nests” is the criterion for “impact quantification” but for the rating uses “acres within 500-foot buffer of bird hotspot”. Neither are useful measures. There are certainly

nests along the upland edge at all of the alignments, but nests are not an indicator of migratory stopover or wintering use or in tidal habitats– the key uses and habitats of the refuge.

The source of the rating matrix “hotspots” is not clear; are these eBird Hotspots or the points shown in 2004 Hotspots survey funded by USFWS? We were told that eBird was used for preliminary data, but that the Armstrong et al. 2004 Hotspots report was used for the rating. In either case, this would be a highly inappropriate use of the data, because surveyed and birded areas are much larger than the impact rating’s 500-foot buffers.

eBird hotspots are Cornell Lab of Ornithology online repositories for checklists at commonly visited public use areas; they do not necessarily indicate particularly large numbers or varied species of birds. The Armstrong et al. report’s “hotspot” points indicate the general location of bird activity and are tied to analyses of the magnitude, consistency, and seasonal patterns of bird use at low tide. The points, however, are only placeholders for much larger observation areas. The polygons supplied by Hotspots author and GIS analyst Richard Carstensen in Figure 1 provide an estimated outline of these larger areas and could be used, along with other data sources, to replace the invalid 500-foot nest buffers. Additional sources such as available habitat and eBird records must be consulted for the areas that did not have the full complement of surveys, as well as for higher tide use areas and for more recent information.

We note that the Parametrix report on Bird and Habitat Surveys emphasized that habitat evaluation is the best way to rate relative impacts of development. Where systematic and spatially detailed bird survey data may be unavailable across the full tidal range and across seasons, this is a particularly useful approach. We have based our revised ratings on habitat, including channel and shoreline complexity, along with typical and maximum flock observations from a variety of sources, including the Armstrong et al. Hotspots report, eBird, and other observations.

In addition to habitat loss from fill and related vegetation and hydrologic changes, a rating of impacts should consider other effects of transport corridors: from shading and disturbance to the introduction of predator perches, and invasive species, risks from collision and lighting, and barriers to flock movement.

Sunny Point East and West

SEALT’s habitat mapping and functional assessment, and the well-documented habitat use of these and similar areas, show that ESP contains excellent migratory bird habitat (SEALT, 2024 (draft)). This is another case where habitat fragmentation, degradation and loss within and beyond the alignment footprint, especially in relation to migratory birds, would have a more severe impact. Currently WSP, which transits similar habitats and shares most of the same route, is rated -2. Accordingly, ESP should also have a rating of -2.

Both Sunny Point alignments have extensive salt marsh and meadow areas that are key foraging and resting habitat for large flocks of winter resident Vancouver Canada Geese and Mallards. The Sunny Point area is uniquely productive and varied, with large expanses of sedge and succulent low marsh; wet and brackish high marsh; a complex network of channels, ponds, and sloughs; and undisturbed shorelines and islands. While the West Sunny Point alignment would destroy more of the high and brackish marsh habitat to create a new interchange, both alignments cross a large central expanse of salt marsh and channels that is a major nexus of waterfowl movement as tides change.

The area surrounding Sunny Point did not receive the full series of Hotspot surveys, but the Hotspots database, eBird, and other observations confirm consistent use by large numbers of Canada Geese (100 to 300), Mallards (up to 500), and other species, including American Wigeon, Pintail, Green-winged Teal, Red-winged and Rusty Blackbirds, and Trumpeter Swans (Armstrong et al., 2004, eBird checklists by Hausler, MacDonald, and others). This extensive area is well-documented as important to the region's winter resident Vancouver Canada Goose and Mallard populations and provides migratory stopover habitat for a variety of species.

The southern portion of the alignment near the tidal divide includes tidal channels and flats as well as salt marsh and vegetated spoil islands. Beyond the center of the Sunny Point alignment and at its Hendrickson Point landfall, survey and eBird data are sparse, although nearby similar high marsh areas provide foraging and resting areas for waterfowl and spoil islands provide resting and nesting habitat for a variety of species. On the refuge, salt marsh and adjacent uplifted meadow are used by migrating raptors such as Short-eared Owl, Northern Harrier, Kestrel, and Merlin. Migratory flocks of songbirds such as Snow Bunting, Savannah Sparrow, Lapland Longspur, Common Redpoll, and American Pipit stop to refuel in the extensive tidelands at the heart of the refuge.

The southern part of the Sunny Point alignment would compromise high marsh, channel, and spoil island habitat. At the landfall on Hendrickson Point, the crossing passes through a narrow band of upland forest to where it presumably would fill a long stretch (~2000 ft) of scrub-shrub and forested wetlands. The semi-forested wetlands contain two small streams that bisect an extensive open peatland, including a CBJ Conservation Area and a land trust conservation holding. Wetland mosaics like these provide habitat for many of the songbirds in the region, particularly Lincoln's Sparrow, Dark-eyed Junco, Wilson's and Orange-crowned Warblers, and Hermit Thrush. Nesting Greater Yellowlegs have also been observed defending the area along the Hendrickson Point alignment, a disturbance-sensitive uncommon breeder in large, pond-rich peatlands in the Juneau area.

Considered together, impacts to high quality bird habitat from both Sunny Point alternatives are extreme. Crossing the widest, least disturbed, and most central part of the refuge and adjacent

undeveloped uplands, the Sunny Point alternatives would seriously compromise the overall function and integrity of the Refuge. These alternatives should therefore be removed from further consideration, since less damaging alternatives are available, including an off-refuge site.

Mendenhall Peninsula

The score of “0” for the Mendenhall Peninsula (MP) alternative for bird habitat impact is also a serious oversight. The MP route crosses 3 of the 4 most important habitat areas on the refuge (“first tier hotspots”) in the most recent systematic survey of bird use of the Mendenhall wetlands, *Hotspots: Bird Survey of Mendenhall Wetlands, April 2002 to May 2003* (Armstrong et al., 2004). While high bridge spans may reduce some crossing impacts, habitat would be disturbed, degraded, and lost, particularly at shorelines and abutments. Spans and other elevated structures can impede flock movements, particularly for low-flying sea ducks.

The Mendenhall Peninsula crossing alternative runs through the top bird “hotspot” at the Mendenhall rivermouth tideflats and continues through the adjacent hotspots of the Western Mudflats and Fritz Cove. (Birds from the Fritz Cove observation area moved up the flooding river mouth and channel area with the rising tide, so the boundary between these is tide-dependent.) Designated as “first tier” for their consistently heavy bird use, these 3 hotspots represent a broad and continuous swath of important migratory bird habitat across the Mendenhall River mouth from Fritz Cove to the channel entrance at Fish Creek. These areas stand out among 42 survey sites across the more accessible portions of the Mendenhall Wetlands State Game Refuge. The bird totals, defined as a sum of seasonal means from repeated surveys, were over 1000 for each of these “first tier hotspots,” representing consistently high numbers and year-round habitat use (Armstrong et al., 2004).

Total bird numbers at the rivermouth and Fritz Cove are dominated by large spring flocks of migrating or staging waterfowl, although the rivermouth is also an important shorebird stopover and a winter hotspot with use by large flocks of dabblers, sea ducks, and geese. The Hotspots authors regard the mouth of Mendenhall River as the refuge’s “top hotspot” and “probably among the most important feeding habitat for ducks and shorebirds” on the Mendenhall wetlands, citing the mix of fresh, glacial, and marine waters, and observations of thousands of Western Sandpipers and hundreds of Surfbirds, Ruddy Turnstones, Semipalmated Sandpipers, and Dunlin. The area is known as the best place to find less common and high-conservation-concern shorebird species, including American and Pacific Golden-Plover, Whimbrel, Red Knot, Baird’s Sandpiper, and Hudsonian, Bar-tailed, and Marbled Godwits (Table 1). The “Hotspots” authors also counted large flocks of waterfowl at the rivermouth, including 800 Northern Shovelers, 350 Mallards, and 300 American Wigeon feeding in the sloughs and amongst the fucus/mussel beds (Armstrong et al., 2004). To the south, the MP alignment transits two “second tier hotspots,” the channels, rockweed beds, and tideflats

extending from the Fish Creek estuary and the Western Channel. The outer Fish Creek estuary hosted a sum of seasonal means just under 1000 (so virtually “top tier”), including heavy migration and winter use on par with the Western Mudflats. Similar to the Mendenhall River mouth, the channel and bars west of entrance point (f09, Western Channel) host large numbers during spring and winter (Armstrong et al., 2004, p 6 & 7). As it approaches the landfall at the 9 mile refuge access trail, the MP alignment also passes near the center of “seasonal hotspot” f06, the bay east of the boat launch; this secluded cove is known for grebes and loons, flocks of up to 500 or more American Wigeon, and huge off-shore rafts of scoters (Figure 1). MP should be rated -2.

Salmon Creek

The current Salmon Creek crossing alternative is along the southern edge of the Salmon Creek delta. The estuary, an official ADF&G refuge access point and popular option for near-town duck hunting and birding, is one of the 4 “top tier” refuge hotspots (Armstrong et al., 2004), an important resting and feeding area for gulls, ducks, and shorebirds. Up to 200 Dunlin have been observed in winter and spring. It is a top seasonal hotspot fall through spring for dabbling ducks, with approximately 300 Mallards often observed feeding there. In summer and fall, gulls are abundant, including an August observation of 1000 Short-billed, 700 Glaucous-winged, 500 Bonaparte’s, and 100 Herring Gulls. Salmon bring in over a dozen Bald Eagles at once. Up to 600 Surf and White-winged Scoters have been observed staging in Gastineau Channel and feeding on the extensive delta-edge mussel beds (Armstrong, 2004 p 22).

On the Douglas Island side, the alignment reaches the shore where Falls Creek has formed a smaller delta similar in character to that of Salmon Creek, with a salt marsh and extensive mudflat and rockweed/barnacle/mussel habitat regularly used by a variety of bird species, including Great Blue Heron, Barrow’s Golden-eye, Green-winged Teal, and Mallard. It also has patches of eelgrass along its eastern edge. Shorebirds, gulls, and waterfowl move between the two deltas at low tide separated by a narrow channel, making it functionally one larger habitat (SEALT 2024).

Bird use at Salmon Creek is extremely high, but habitat impacts here may be limited by the high span expected at this deepwater location. Impacts have been somewhat reduced by locating the mainland approach at the southern delta edge, but effects on birds, habitat, and human use will remain, including impacts to two refuge access trails. Moving the bridge landing off the Falls Creek delta could further reduce impacts. We rate this -1 for bird habitat impacts.

Twin Lakes

Twin Lakes site was visited periodically in the Hotspots study. As at Sunny Point, some portions did not receive the full complement of surveys. Armstrong et al. (2004) describe the Twin Lakes area as an important feeding and “refuge” area for Mallards and scaup during duck-hunting

season. Up to 100 scaup were observed in the open waters of Twin Lakes and 150 Mallards in nearby Vanderbilt marsh. Trumpeter Swans also use both habitats; three are currently using Twin Lakes and Vanderbilt marsh. The Vanderbilt (“Pioneer”) marsh area is regularly used by Great Blue Herons and Red-winged Blackbirds. Less common species such as American Coot, Hooded Mergansers are also regularly seen in the Twin Lakes, and sometimes Ring-necked Ducks, Canvasbacks, and Ruddy Ducks (Armstrong, 2004). For its richness of unusual species and by flocks for resting and foraging, this parkside area is considered a “nearby hotspot” in the Hotspots report, important as a “refuge from the refuge” and for wildlife viewing (Armstrong et al., 2004).

The Douglas Island landfall for the Twin Lakes crossing is at the Neilson Creek delta, Hotspots survey site e02. Much of the upper delta of Neilson Creek has been filled for a heliport, but the remaining low marsh, stream channels, rockweed/mussel beds, mudflats, and bars provide extensive and varied intertidal habitat similar to Lemon Creek, though somewhat smaller and with less hatchery enrichment. The Neilson delta area ranks as a “second tier hotspot” and a top seasonal hotspot in spring and fall for use by large numbers of waterfowl and gulls, including observations of up to 1000 Surf Scoters, 200 Mallards, and 500 Short-billed Gulls. Smaller groups of other species are also common at Neilson Creek, including American Wigeon, Bufflehead, Green-winged Teal, and Northern Shoveler (Armstrong et al., 2004). The Neilson Creek delta could be considered virtually continuous with a smaller delta formation to the north; the two are separated at low tide by only a narrow channel so could be considered a functional habitat unit.

Potential impacts here stem from extensive intertidal fill for an interchange at the Egan Expressway and for the Douglas Island landfall on the western side of the Neilson Creek delta and tideflats. Additional bird habitat impact would occur from development of one of the few shoreline natural areas on the southern half of the refuge. We suggest a bird habitat impact rating of -1.5.

Salmon Creek

The Twin and Vanderbilt impact areas overlap at Vanderbilt (or “Pioneer”) marsh, noted above for use by dabbling ducks and Red-winged Blackbirds, and at the western part of Twin Lakes. Both are considered “nearby hotspots” (Armstrong, 2004), where aquatic vegetation beds and lack of hunting result in a foraging and resting area for waterfowl, including several less common species such as American Coot, Hooded Merganser, and Trumpeter Swan.

The Vanderbilt crossing fill footprint includes a long band of salt marsh habitat on both sides of Egan Expressway, part of the freshwater wetland habitat of Vanderbilt (“Pioneer”) marsh, and the new and old channels and tributaries of Vanderbilt Creek. Leaving shore, the alignment crosses rich and dynamic tidelands where Lemon Creek’s glacial waters meet several clear streams and mix with saltwater. The route crosses a tributary channel of Lemon Creek and a

large tidal “island.” Isolated, yet in clear view of the highway, this planarian-shaped salt marsh and mudflat provides key resting and foraging habitat, acting seasonally as a “refuge within the refuge” for large flocks of geese and wintering shorebirds (SEALT draft, 2024). 1000 Rock Sandpipers were observed at Vanderbilt estuary (L04) in May 2003 (Armstrong et al., 2004 p 8). Both sides of the channel see some use for duck hunting, but on the mainland side, access is complicated by Egan Expressway and particularly difficult for the tidal “island.”

The 5-Mile Creek site (e01) opposite Vanderbilt Creek is another that did not receive the full series of Hotspot surveys, but waterfowl, including up to 200 Mallard and smaller numbers of other dabblers, were consistently observed on the mudflats and marsh of the 5 Mile Creek delta and nearby tideflats (Armstrong et al., 2004). The area sees little birding activity, so eBird observations are limited, although there is a forested CBJ beach access trail at the alignment landfall on the 5-mile Creek delta. Nearby homeowners and others have reported, however, that the 5 mile to Hendrickson Creek tideflats and channels are consistently used by hundreds of resident and migrant Canada Geese for bathing, resting, and access to foraging on the isolated mid-channel salt marsh island (M. Stanley, K. Sorenson, personal communication and SEALT (draft), 2024). Great Blue Heron and flocks of wintering Killdeer have also been observed using this little-disturbed area, and there is sign of extensive use of mudflats by wintering shorebirds (SEALT, 2024 (draft)). Sandhill Cranes have also been reported from this out-of-the-way corner of the refuge (L. Lamm, eBird).

We have rated bird habitat effects for the Vanderbilt alignment at -2, given the lengthy marsh footprint on both sides of Egan Expressway, the presence of rich and growing mid-channel low marsh and mudflats, and that area’s role as a haven within the refuge. Impacts at this crossing could be reduced somewhat by avoiding Pioneer marsh, elevating interchange lanes, and moving the alignment off the 5-Mile Creek delta, but the special habitat values of the isolated intertidal island would be lost.

In summary, potential impacts to the most concentrated and extensive seasonal and year-round migratory bird habitats on the refuge were omitted from the most important piece (the piece that relates to the purpose of the state refuge) of the PEL impact quantification and rating matrix, undermining the credibility of the entire ratings process. Our scoring reflects consideration of the best available information.

References: Armstrong, Robert H., Carstensen, Richard L., Willson, Mary F., Hotspots: Bird Survey of Mendenhall Wetlands, April 2002 to May 2003, Juneau Audubon Society and Taku Conservation Society, 2004. Juneau, AK.

eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: <http://www.ebird.org>.

Alaska Shorebird Group. 2019. Alaska Shorebird Conservation Plan. Version III. Alaska Shorebird Group, Anchorage, AK.

Scores for “Important Migratory Bird Habitat Affected”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	0	-2	0	-1	-1	-1
MWSG	-2	-2	-2	-2	-1.5	-1

Criterion: “Section 4(f)/6(f) resources affected”

DOWL has scored all alternatives at -1, with the exception of MP, which is -2. These ratings are based on the number of 4(f)/6(f) resources affected. Making an equivalency of impact to the Refuge and minor 4(f)/(6f) resources at MP they ignore the repeated concerns expressed in the public process on maintaining the MWSGR’s integrity; the direct impacts on Refuge lands are very different among the alternatives. As such, some credit for this should be given to the SC alternative for having lower impact on Refuge integrity, and the other alternatives should have more strongly negative ratings to reflect this impact. It is possible that, with careful planning and mitigation efforts, the SC alternative would only have a minimal impact under the ADF&G regulations preferring an off-Refuge alternative.

Furthermore, DOWL’s score for MP reflects consideration of CBJ 4(f)/6(f) resources, but does not consider even larger and more significant CBJ 4(f)/6(f) resources at Hendrickson Point and Fish Creek on Douglas Island to merit the same additive scoring for WSP and ESP. The managed trails, social trails, and general public access points at both termini of the WSP and ESP alternatives are used just as heavily by hunters, hikers, and other Refuge users as the public access points at the tip of MP. We propose the following ratings, east to west: MP -2; WSP -2; ESP -2; VB -2; TL -2; and SC -1.

Scores for “Section 4(f)/6(f) resources affected”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	-2	-1	-1	-1	-1	-1
MWSG	-2	-2	-2	-2	-2	-1

Criterion: “Protected lands directly affected”

DOWL has apparently evaluated this criterion only in relation to lands conserved by the Southeast Alaska Land Trust (SEALT). Even under this definition, DOWL neglects to include three SEALT conservation properties: the SEALT fishing/beach access property at Falls Creek, and two SEALT mitigation sites on Hendrickson Point. DOWL also neglects to include the Johnson Creek State Recreation Site, or CBJ’s Fish Creek Park, in scores for either the 4(f)/6(f) category or the protected lands category, but the uses for both of those areas would be severely impacted in the case of construction nearby.

In addition, the majority of Hendrickson Point is designated as a Conservation Area and managed by the Parks & Recreation Department for public access and uses under the City and Borough of Juneau’s Comprehensive Plan. DOWL’s scoring does not consider CBJ conservation areas or public access corridors as “protected lands”, but this narrow view ignores decades of community planning efforts that have in fact set aside those lands for recreation and habitat. If DOWL does not consider the parks, managed trails, access points, legally protected lands, and conservation areas to be 4(f)/6(f) resources, then at minimum they must be considered protected lands.

In actuality, the entirety of the Mendenhall Wetlands State Game Refuge and its adjoining public use areas are in a protected lands category, something that has never been acknowledged by the PEL process.

When the Mendenhall Wetlands State Game Refuge, CBJ natural areas, state recreation areas, and other protected lands are (appropriately) considered, the alternatives should be scored MP -2; WSP -2; ESP -2; VB -1.5; TL -1; and SC-0.5.

Scores for “Protected lands directly affected”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	0	0	-2	0	0	0
MWSG	-2	-2	-2	-1.5	-1	-0.5

Criterion: “Social”

This category has three criteria embedded within it to capture social impacts. This would seem to be where recreational use and potential impacts to future airport operations and expansion should be incorporated. The ESP and WSP have the greatest potential to conflict with future runway and airport lighting options. The airport is the only dependable access to Juneau. Alternatives that have the most potential to limit future operations of the airport should be rated lower.

DOWL has received numerous comments on potential impacts to hunting, fishing, hiking, and birding. Yet these impacts do not seem to be considered in the rating matrix except in reference to VB, where recreational use (water access) was considered to rate VB to -1. Impacts to recreational use would be most severe at the WSP and ESP alternatives, especially in relation to waterfowl hunting.

ADF&G reports that 243 hunters expended 2088 hunter days on the MWSGR in 2023, taking 3428 ducks, 126 geese, and 124 snipe. Twenty-nine percent of registered MWSGR hunters reported using Sunny Point/Switzer Creek as an access point with a further nine per cent using the Eagan Expressway turnout. Construction of either the ESP or WSP alignments, and to a lesser degree the VB route, will seriously affect hunter access and success. It is also likely that either of the Sunny Point crossings and their safety buffers would divide the MWSGR into units so small that hunt management would become impossible, eliminating the most important waterfowl hunting area in Southeast Alaska. These impacts are more severe than at VB, so WSP and ESP should each be scored -2.

The presence of a road across the refuge would affect multiple social activities in addition to affecting neighborhoods. Access points and associated recreational activities such as walking/exercising and birding in addition to hunting would suffer impacts from a new road so we have added these into our scoring. The effects of a crossing at WSP or ESP would be particularly strong, with VB, TL, and SC having somewhat less influence.

Scores for “Social: Community Affected”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	0	0	0	-1	0	-1
MWSG	-1	-2	-2	-1	-1	-1

Criterion: “Cost: Estimated Total Construction”

Because construction cost estimates were apparently not available when DOWL constructed the scoring matrix, they rated all alternatives at 0. DOWL has now provided estimated construction costs, and we have scored them to consider them in the ranking process.

DOWL proposes using a scoring of 0 to -2 for costs. Given the wide range of costs, it is more appropriate to use the -2 to +2 range, as was done for some of the additional goals and for the Safety criteria. In comparing cost estimates for full structure crossings by the 2005 HDR crossing study, we found that when adjusted for a 2% inflation rate, most of the DOWL cost estimates are consistent with the HDR estimates with the notable exception of Salmon Creek. DOWL estimates SC will cost twice as much as the HDR estimate. There is no explanation of the difference since the HDR estimate included a structure to allow for navigation of the channel. We recommend accepting the HDR estimate and scoring SC a +2. Accepting the DOWL estimate would put SC at +1.

MP, at an estimated cost of \$1.7 billion, should get the lowest (-2) score, recognizing that this cost alone may make this alternative unfeasible. With the other alternatives, we gave similar scores to alternatives that were within \$30 million differential in the estimates.

Scores for “Estimated Total Construction Costs”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	0	0	0	0	0	0
MWSG	-2	0	0	+2	+1	+1

Criterion: Cost: “Estimated Annual Maintenance”

Because maintenance cost estimates were apparently not available when DOWL constructed the scoring matrix, they rated all alternatives 0. DOWL has now provided estimated maintenance costs, and we have scored them to consider them in the ranking process. DOWL proposes using a scoring of 0 to -2 for costs. Given the wide range of costs, it is more appropriate to use the -2 to +2 range, as was done for some of the additional goals and for the Safety criteria. MP, at an estimated annual maintenance cost of \$365K, should get the lowest (-2) score. With the other alternatives, we gave similar scores to alternatives that were within \$15K differential in the estimates.

Scores for “Estimated Annual Maintenance Costs”
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	0	0	0	0	0	0
MWSG	-2	-1	-1	+1	+2	+2

Summary of Scores

The Table below summarizes how the revaluation of the scoring using more comprehensive and biologically appropriate rating factors affects the cumulative scores for each crossing alternative.

Summary Table: Cumulative Scores for All Criteria
By Alternative

Scoring	MP	WSP	ESP	VB	TL	SC
DOWL	-11	-8	-3	-10	-6	-14
MWSG	-23	-20	-17	-11	-6	-10.5

MWSG’s cumulative re-scoring of the crossing alternatives results in the following ranking in terms of minimizing impacts to the environment and refuge integrity:

Lowest Impacts	Twin Lakes	-6
	Salmon Creek	-10.5
↓	Vanderbilt	-11
	East Sunny Point	-17
	West Sunny Point	-20
Highest Impacts	Mendenhall Peninsula	-23

A PEL Study is not designed to evaluate the merits of a No-Build alternative. In Level 2, DOWL inexplicably scored a No-Build alongside the construction alternatives, giving it a maximum score of 0 for the criteria outside of Purpose and Need. The No-Build alternative, which will be carried forward in the NEPA process in any case, is not considered here but would obviously not cause environmental impacts.

Re-scoring the criteria identified above using factors that were overlooked or ignored in the DOWL assessment made a profound difference in the relative ranking of the six route alternatives in terms of their environmental impact. In contrast to the DOWL assessment, which identified East Sunny Point, Twin Lakes, and West Sunny Point, in that order, as the top three ranked alternatives and Salmon Creek as the lowest, the MWSG re-assessment identified Twin Lakes, Salmon Creek, and Vanderbilt, in that order, as the top three alternatives, with East Sunny Point, West Sunny Point, and Mendenhall Peninsula as the lowest ranked alternatives.

The MWSG has provided comments to DOWL on serious flaws with the scoring methodology, in terms of a skewed, poorly weighted, and inconsistent scoring rubric and incomplete and invalid environmental screening criteria. Some of these problems could be addressed by corrections to methods and additions to data sets such as we have suggested. Even with these outstanding issues, however, the application in the evaluation matrix of appropriate biological and ecological factors, consideration of recreational use, credible assessments of viewshed and traffic impacts, and scoring of cost estimates results in a more realistic and defensible ranking of the alternatives.

The re-scoring by MWSG strongly supports moving the top two or three alternatives identified by the MWSG (TL, SC, and VB) forward for evaluation by NEPA along with the mandatory No-Build alternative. If DOWL adds additional criteria in line with the recommendations of MWSG and other technical reviewers it is likely that Salmon Creek would emerge as the alternative with the best score.

If the scoring remains more or less as DOWL presented it on March 7, MWSG recommends that no alternatives be eliminated prior to NEPA. It is totally inappropriate to defer to the NEPA process the consideration of broader scale impacts while employing the PEL process to eliminate alternatives that minimize those impacts to the Mendenhall Wetlands and the Mendenhall Wetlands State Game Refuge. Regardless of how the alternatives are ranked in the scoring matrix, the Salmon Creek alternative must go forward to NEPA as a potentially valid route lying mostly outside the refuge. In addition, NEPA should not be limited solely to the alternatives forwarded by the PEL study, as other routes that do a better job of avoiding valuable resource areas may be feasible.

The ADF&G Refuge regulations require that an off-refuge alternative be selected unless: “1) there is a significant public need for the corridor which cannot reasonably be met off-refuge; 2) that the use of Refuge lands are avoided or minimized to the maximum extent feasible including use of subsurface or elevated no-fill corridor options where feasible; 3) that public access to the Refuge is maintained; and 4) that all unavoidable impacts to the Refuge and to Refuge resources are fully mitigated through restoration, replacement and/or other compensation.” The PEL Level 2 analysis is not adequate to make this determination and so at least the Salmon Creek alternative, as a possible off-refuge or de minimis option, should be carried forward into the EIS analysis.

The National Transportation Act of 1966 provides instruction under Section 4(f):

“The Secretary shall cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture, and with the States in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of the lands traversed. **After the effective date of this Act, the Secretary shall not approve any program or project which requires the use of any land from a public park, recreation area, wildlife and waterfowl refuge, or historic site unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreation area, wildlife and waterfowl refuge, or historic site resulting from such use.**”

If an off-refuge alternative is eventually determined to be not prudent, then the alternatives that cross the state refuge and other 4(f)/6(f) resources must be ranked and prioritized according to the most minimally harmful impacts to the affected 4(f)/6(f) resources. This would include engineering requirements that are minimally harmful to the protected 4(f) resources, such as requiring bridge spans and elevated structures supported by pilings rather than embankment fill and adjusting alignments to minimize fill and disturbance to deltas, salt marsh, refuge access, and productive tideflats.

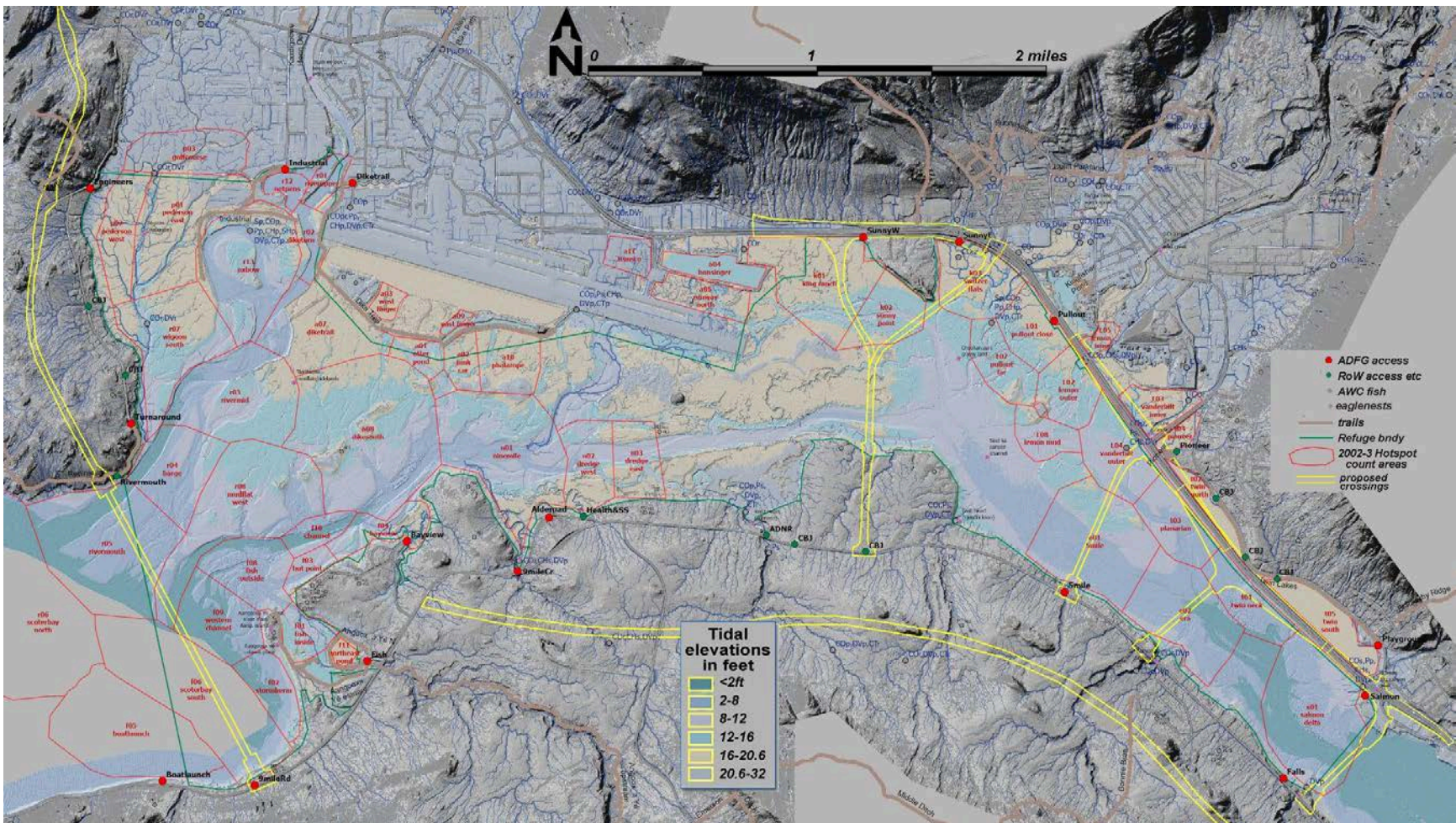










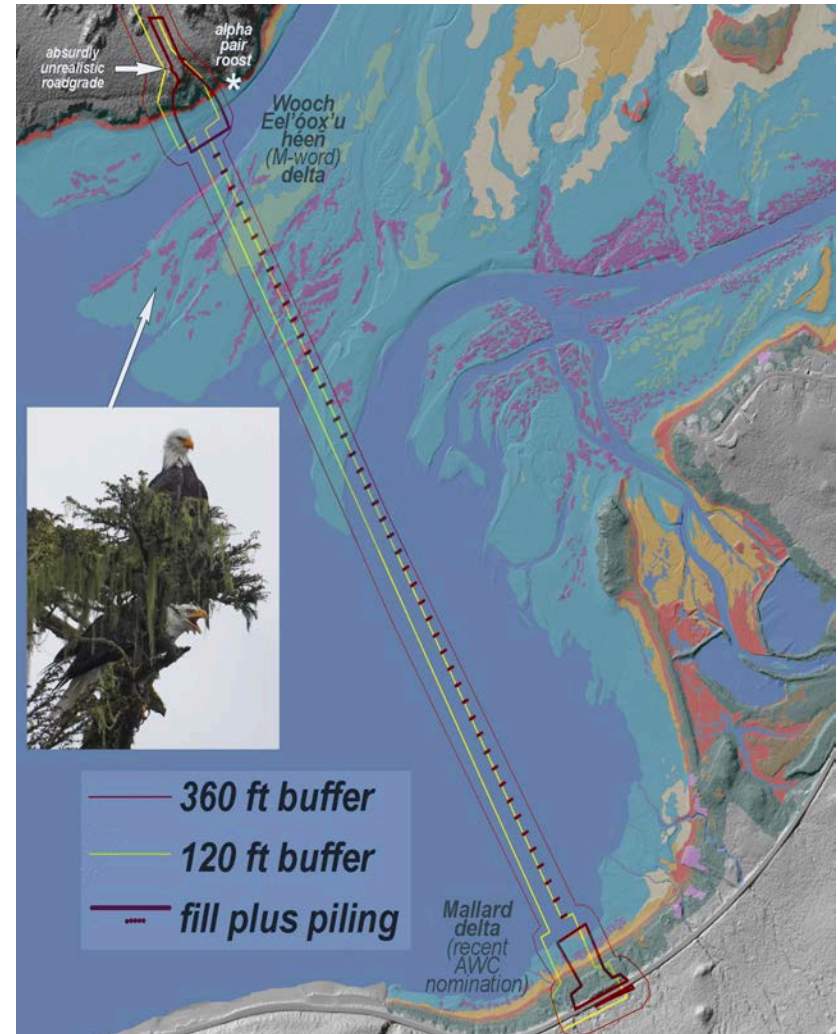


Figure 1.

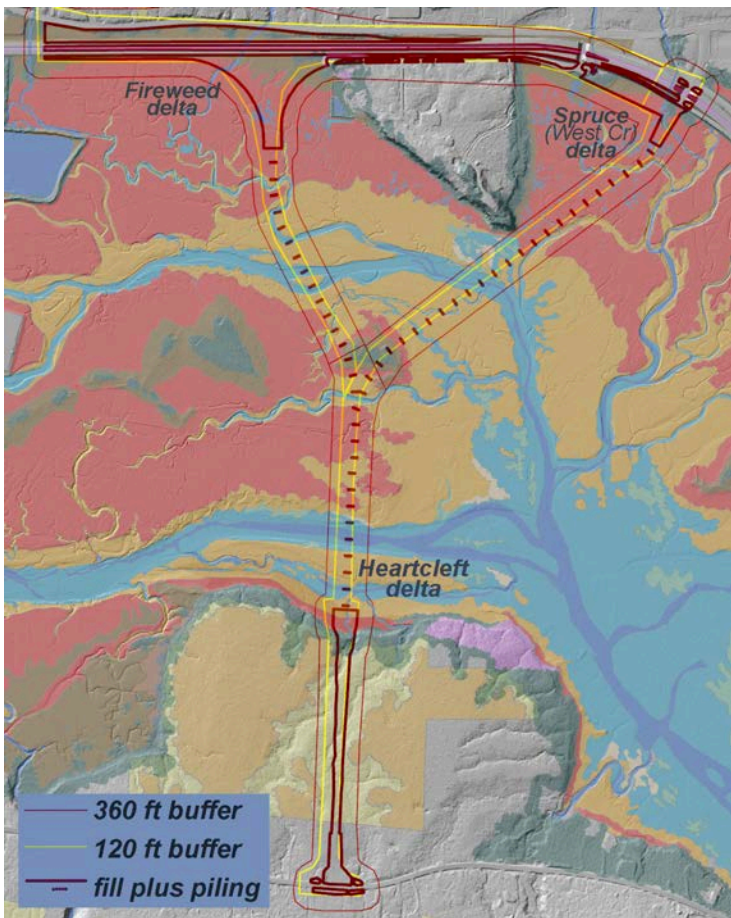
Map Key

	wd <i>wooded</i>
	md <i>meadow</i>
	sd <i>seeded</i>
	hm <i>high marsh</i>
	lm <i>low marsh</i>
	ll <i>lower low</i>
	al <i>algal mat</i>
	nv <i>non-veg</i>
	ms <i>musselbed</i>
	wa <i>water</i>

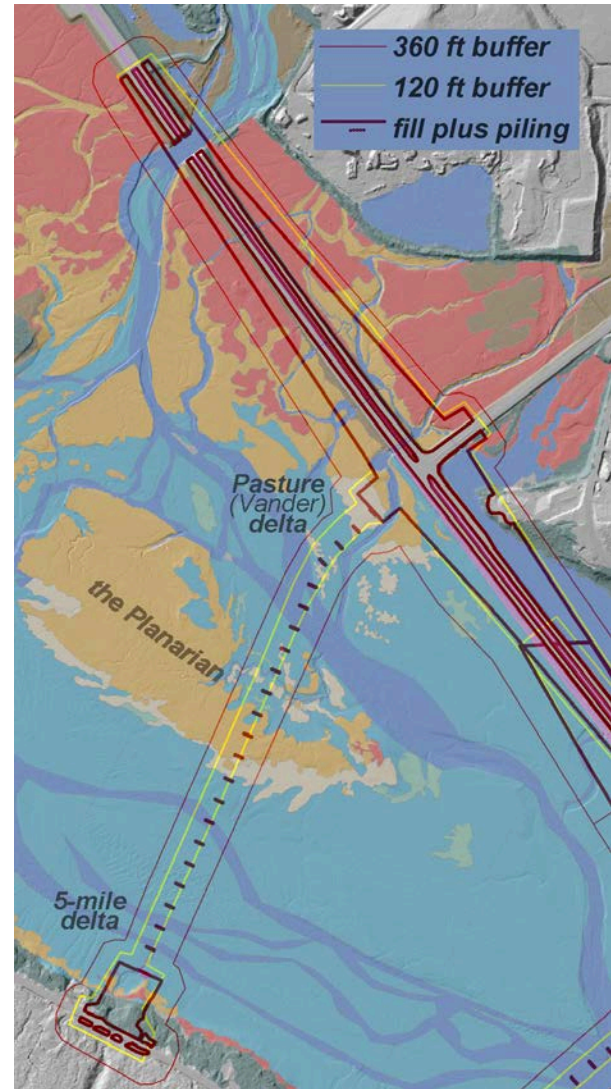
Mendenhall Peninsula



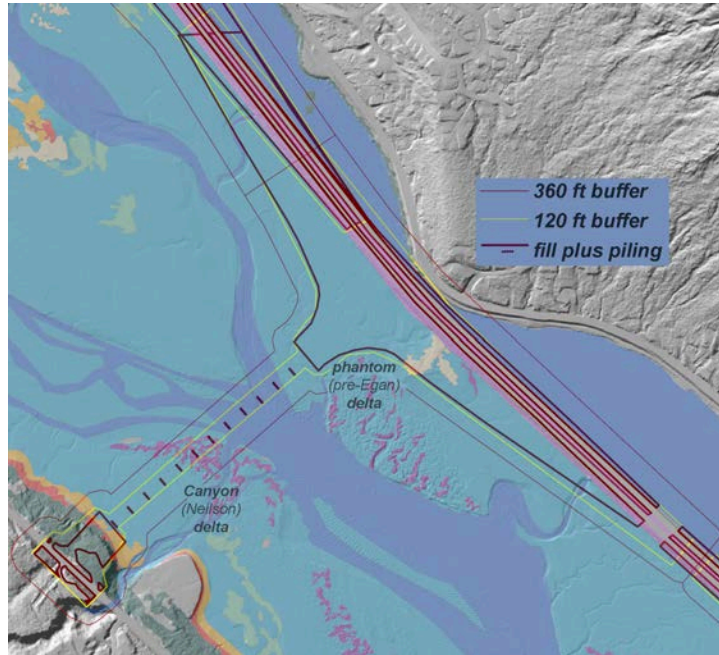
West & East Sunny Point



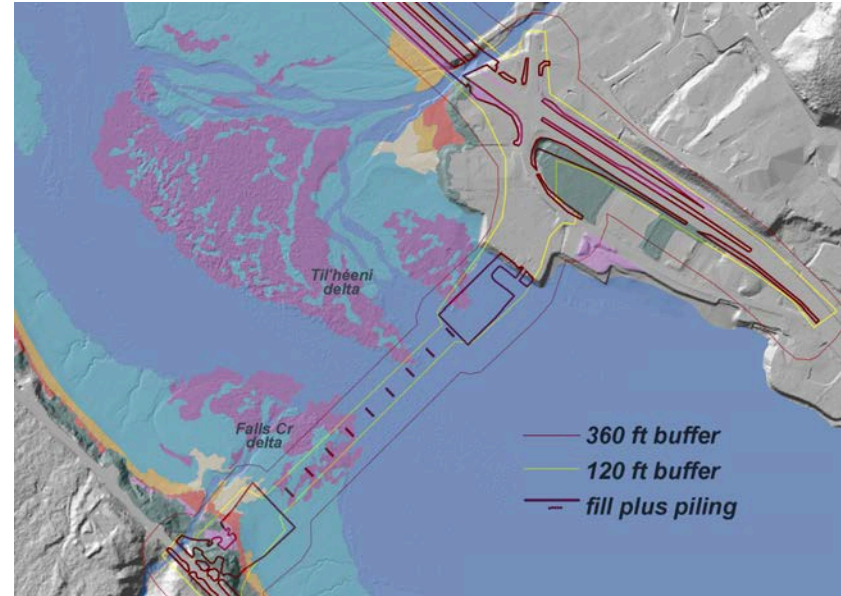
Vanderbilt



Twin Lakes



Salmon Creek



Attachment 1

Mendenhall Wetlands Study Group
Second Crossing to Douglas Recommendations and Comments

January 30, 2023

Introduction:

This is the response of the Juneau Mendenhall Wetlands Study Group (MWSG) to the requests for comments on the Juneau Douglas North Crossing PEL study. Although the opportunity to provide comments on the alternative routes at this point in the PEL study is somewhat of a surprise and contrary to our previous understanding of the process, we sincerely appreciate the opportunity to provide our input while the prescreening process is still in play.

Our group has extensive experience in studying and documenting the values associated with the Mendenhall Wetlands. The Mendenhall Wetlands State Game Refuge is a legislatively established special area which has specific legal and management requirements. Documents like the Mendenhall Wetlands State Game Refuge Management Plan, The Mendenhall Wetlands by Armstrong, Willson, Osborn, & Carstensen, and the December 22, 2003 letter from the Department of Natural Resources (Office of Habitat Management and Permitting) to DOT&PF are important references. The latter letter in particular clearly outlines most of the issues that are required to be addressed when selecting and finalizing a crossing route. We have attached a copy of the letter for your use.

Although the PEL process so far has outlined a number of justifications for a second crossing, it isn't clear what the priorities really are and they should be clarified. The suitability of each particular alternative shifts depending on the relative importance of access to EMS, infrastructure resiliency, developable land, etc. Recognizing that access to Douglas Island is important to our borough assembly and many residents, we describe the significant values of the Mendenhall Wetlands; the risk to those values from various alternatives; and, the alternatives we think should move forward to the next stage of analysis so that the second crossing effort can be successful.

Any planning for North Douglas Island must include the development of a Douglas Island Bench Road to facilitate the projected traffic which DOT&PF has indicated the North Douglas Highway is incapable of handling. Second, it seems irresponsible to develop a major project like this without a clear understanding of what the fiscal limitations are. It is prudent to develop recommendations based on the route which has the least negative impacts and the most cost effective positive benefits.

The following provides our comments and recommendations for the various crossing routes presented in the existing PEL process.

Legal and Regulatory Issues

It is important for the PEL analysis to explain to the public the legal context and issues that will have to be dealt with for each proposed alternative. For example, the PEL analysis should explain that each alternative that crosses or impacts the Mendenhall Wetlands State Game Refuge must meet the legal standards for the Refuge. ADF&G Refuge regulations state that Refuges shall be managed to maintain and enhance fish and wildlife populations and their habitat and maintain and enhance public use of fish, wildlife and public lands (5 AAC 95.520).

The Mendenhall Wetlands State Refuge Statute, 16.20.034(i), and regulations (p. 9-10 of the Mendenhall Wetlands Refuge Plan) specify criteria for a potential transportation corridor or docking facility on refuge land. Specifically:

"The City and Borough of Juneau may acquire refuge lands for a transportation corridor, including a water corridor, only after the following have been demonstrated:

- o That there is a significant public need for the corridor which cannot be met off Refuge;
- o That the use of refuge lands is avoided or minimized to the maximum extent feasible including the use of subsurface or elevated, no-fill corridor options where feasible;
- o That public access to the refuge is maintained; and
- o That all unavoidable impacts to the refuge and to refuge resources are fully mitigated through restoration, replacement, and/or other compensation."

Further, the PEL analysis should explain that if U.S. Department of Transportation federal funds are to be used for a project that permanently incorporates, or substantially impairs the attributes of refuge land, then Section 4(f), The Department of Transportation Act of 1966 applies. If a section 4(f) evaluation identifies a feasible and prudent alternative that completely avoids the refuge it **must** be selected. The PEL analysis should note that there are feasible and prudent off-refuge alternatives that avoid the need for a 4(f) analysis and clearly meet the stated purpose and need for this project.

Any solid fill causeway alternatives proposed in the Mendenhall Wetlands State Game Refuge will have unavoidable significant impacts on refuge resources and uses. Any of the on-refuge options built as a solid fill causeway would lie perpendicular to the tidal flow from Gastineau Channel. Culverts and a small bridge over the dredge channel will not be adequate to pass the large flow of water at high tides coming from Gastineau Channel. The large area of wetlands and refuge lands from the causeways west to the airport will lose tidal wetlands from the reduced and changed pattern of flow. This lost tidal flow will not be replaced from Auke Bay to the west because: 1. there is a natural hydrologic divide at the east end of the airport; and 2. the airport

and diking that protect it; and, the large dredge islands southeast of the airport have reduced flow from the west. Because of these unavoidable and unacceptable impacts, and because there are feasible and prudent off-refuge alternatives that meet the stated purpose and needs, we suggest that consideration of solid fill causeway proposals for the Sunny Point east and west, Vanderbilt, and Twin Lake alternatives be eliminated from further consideration.

Further, because there are feasible alternatives off-refuge, in particular the Salmon Creek crossing with a Douglas Island bench road, and because even elevated crossings at Sunny Point east and west, Vanderbilt and Twin Lakes will have significant impacts on refuge resources and uses, the option of elevated crossings in those areas should be eliminated and focus should be on detailed analysis of feasible off-refuge options.

Finally, the PEL should explain that all alternatives and structures that require dredging or filling wetlands of the United States will need a U.S. Army Corps of Engineers 404 permit.

Miscellaneous Considerations

Footprint

Frequently the second crossing discussions are distorted by referring to the footprint of the crossing and the relatively small size of the structure in comparison to the size of the total wetlands area. In reality, the impact of the structure on the surrounding area is greater than the actual "footprint". If the structure does not allow free tidal flow then the impact area is much larger. Similarly, if an area is closed to hunting for one-half mile on each side of the structure, then the impact area is at least a mile wide. If the calculations include altered bird movements, the impact area increases in size accordingly. Other current public uses, such as nature walks, birdwatching, hiking, fishing and wetland studies will be impacted to varying degrees depending on the location and type of structure created. Certainly, viewsheds of the wetlands will be permanently altered.

As mentioned above, the issue of hunting is a critical issue for the community. The refuge was originally supported by local high school students that valued the local access to annual waterfowl hunting opportunities literally in their backyard, a practice that is encouraged to this day. Facilitating a reasonable hunting opportunity requires a productive wetlands environment, adequate space to accommodate and spread out hunters and a natural environment that provides a pleasant and sometimes successful experience.

If the immediate impact area includes fisheries habitat modifications then the actual impact area may well include portions of the northern southeast region depending on the species involved. Since the Mendenhall Wetlands is a major resting area for migratory birds, the impact area may well include major portions of the flyway. A critical examination of the listed birds in this document will clearly amplify the importance of the channel crossing decision.

Mitigation

A variety of activities have been taking place the last few years that have positively affected the Mendenhall Wetlands and the Mendenhall State Game Refuge. Mitigation efforts with the expansion of the airport and use of other available funds have resulted in the purchase of areas near or in the Refuge by Southeast Alaska Land Trust to protect existing public values and critical wetlands and associated uplands. However, the availability of lands to mitigate future crossing impacts in kind and locally are clearly limited.

Bench Road

We believe it is crucial that the bench road project be included in this analysis. The existing North Douglas Highway is not adequate for the current high density zoning the Borough implemented along the North Douglas Highway, much less the projected traffic from a second crossing and the eventual development of West Douglas. The benefits of a second crossing are limited and the hazards of the North Douglas Highway increased unless a bench road is part of the project.

Analysis of Alternatives

The primary needs identified for the Second Crossing are alternate access and infrastructure resiliency. Alternate access would allow for access to emergency services, especially transport to the hospital, should the existing bridge be somehow blocked or compromised. The PEL document also states that an alternative should reduce traffic pressure on the Douglas Island Bridge and intersections. All of the alternatives meet these needs in some fashion.

There is a gradient to how well they meet the emergency access concern, especially in terms of medical transport. The two alternatives northwest of the airport would not improve transport times for the vast majority of Douglas Island residents. Of the alternatives southeast of the airport, the Salmon Creek crossing stands out as the best alternative to provide reduced transport/response time, landing at the intersection with the hospital.

The alternatives also have a range of impacts or benefits relative to maintaining Refuge integrity and ecosystem function of the Refuge and associated wetlands. The MWSG is particularly concerned with how well the alternatives meet the goals to "avoid, minimize, and mitigate impacts to the environment ... " and "maintain the visual, cultural, and scenic identity of Juneau and Douglas Island." The MWSG provides below an overview of the ecological and environmental importance of the wetlands encompassed by the study area. The State of Alaska recognized the importance of the Wetlands by establishing the Mendenhall Wetlands State Game Refuge. It also needs to be recognized that over 40% of the original wetlands have been filled and developed since the late 19th and early 20th centuries up until today. The incremental destruction and sectioning of the Mendenhall Wetlands emphasizes the need for choosing a

crossing alternative that avoids impact to the integrity of the Refuge and the ecosystem functions of the Mendenhall Wetlands.

The best way to maintain the integrity of the Refuge is to keep the crossing out of the Refuge. Alternatives need to meet the Mendenhall Wetlands State Game Refuge Management Plan requirement to allow a transportation corridor on refuge land only if "there is a significant public need for the corridor which cannot be reasonably met off-refuge". This requirement would pertain to the Sunny Point, Vanderbilt, and Twin Lakes alternatives, given that other alternatives that avoid the Refuge have been identified.

Alternatives that avoid the Refuge include Downtown, Eagle Creek, and Salmon Creek. The North Douglas Tunnel alternative could also be designed to avoid impacts to the Refuge by going under it. The entry and exit points for the tunnel would need to be designed to be sufficiently upland to be outside the Refuge and to avoid sensitive habitat areas included in the map schematic for this alternative.

The Mendenhall Peninsula route, although outside of the Refuge, has the potential for significant impacts to Mendenhall Wetlands resources; the specific routing chosen for this alternative would determine its position in one of the groups discussed above.

Environmental Resource Values

The Mendenhall Wetlands is the most important area for fish, birds, invertebrates and some mammals on the Juneau road system. It also has been documented and officially designated as an Important Bird Area of Statewide and Global Significance (Alaska IBAs are mapped at :<https://ak.audubon.org/important-bird-areas-4>).

In the broader context of Southeast Alaska's great river-mouth estuaries, according to NWI mapping (National Wetlands Inventory), the Mendenhall Wetlands are 9th in total size, with 3,632 acres. Comparing only salt marsh---the vegetated portion so critical to water birds, rearing fish, and nutrient export---the Mendenhall has 1,450 acres, 3rd among all Southeast estuaries. Unfortunately this size has been much diminished by dikes, fill and roads.

(https://juneanature.discoverysoutheast.org/content_item/american-wetlands-month-features-taa-shuyee/)

Much of this information has been documented in the book "The Mendenhall Wetlands a globally recognized Important Bird Area" by Robert H. Armstrong, Richard L. Carstensen, Mary F. Willson and Marge Hermans Osborne (available as a pdf on <http://naturebob.com/sites/default/files/Mendenhall%20Wetlands%20book.pdf>). Here are a few examples and documentation on the importance of the Mendenhall Wetlands:

Fish

Dolly Varden - Mendenhall Lake is a major overwintering area for Dolly Varden in the Juneau area. Of special interest is the overall condition of Dolly Varden leaving the lake in the spring is about the same as when they entered in the fall. This indicates that the cold water of the glacial lakes may be the most important overwintering areas for these fish. In the warmer non-glacial lakes these fish lose a fair amount of body fat overwinter. Since these fish have to migrate up Mendenhall River to reach the lake the connections between the wetlands and the lake could be quite important. When the overwintering Dolly Varden leave the lake in the spring the wetlands with their abundance of invertebrates and other fish is a very important feeding area.

Dolly Varden have been documented as one of the most sought after sport fish in the Juneau area. This is especially true for the "land-based fishermen".

Some useful references for these fish are:

Armstrong, R.H. 1974. Migration of anadromous Dolly Varden (*Salvelinus ma/ma*) in southeastern Alaska. Journal of the Fisheries Research Board of Canada 31: 435-444.

Bethers M., K. Munk, and C. Seifert. 1995. Juneau Fish Habitat Assessment. Alaska Department of Fish and Game, Division of Sport Fish, Douglas, Alaska. 128 p.

Reed, R. and R.H. Armstrong. 1971. Dolly Varden Sport Fishery-Juneau Area. Federal Aid to Fish Restoration Research Project Segment. Project F-9-3, Study R-IV, Job R-IV-C.

Schmidt, A., S. Robards, and M. McHugh. 1973. Inventory and cataloging of the sport fish and sport fish waters in Southeast Alaska. Alaska Department of Fish and Game. Annual Progress Report. Federal Aid in Fish Restoration. Project F-9-5 Job G-I-A. 62 p.

Pacific herring -- We know that Pacific herring are an important food for Bald Eagles in the Juneau area because researchers have often found herring cached in Bald Eagle nests. Eagles also concentrate to feed on spawning herring wherever they occur in Southeast Alaska. We have observed both juvenile and adult herring trapped in small tidal ponds on the Mendenhall Wetlands. Studies also have shown that occasionally large numbers of juvenile herring use the Wetlands for early feeding.

Whale watching in the Juneau area is an established resource. The Mendenhall Wetlands, with its importance for herring, Pacific sand lance and capelin may be a considerable help in attracting the humpback whales.

Pacific sand lance - On Mendenhall Wetlands, at least two areas of sand lance burrowing activity have been noted. One is straight out from the mouth of Fish Creek near channel marker 19A. The other is up the channel near marker 18. In the area near marker 19A we have observed numerous gulls, ravens, crows, and up to 85 Bald Eagles feeding on sand lance during low tides.

We have also observed Arctic Terns bringing sand lance to their young at the colony on the Wetlands.

Some useful references for these fish are:

Neff, Darcie 2021. A Nonlethal, Whole Oocyte Approach to determining Spawn Readiness in Pacific sand lance, *Ammodytes personatus*, in Southeastern Alaska. A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science in Fisheries University of Alaska Fairbanks (note: the field work for this project was done on the Mendenhall Wetlands).

Willson, M.F. and R.H. Armstrong 1998. Intertidal foraging for Pacific sand lance, *Ammodytes hexapterus*, by birds. *Canadian Field-Naturalist* 112(4):715-716.

Willson, M. F., R.H. Armstrong, M. D. Robards, and J. F. Piatt. 1999. Sand lance as cornerstone prey for wildlife predators. Pages 17-44 in: Robards, M. D., M. F. Willson, R.H. Armstrong, and J. F. Piatt. 1999. Sand lance (*Ammodytes*): Biology, ecology, and annotated bibliography. Pacific Northwest Research Station PNW-RP 521: 1-327.

Capelin -- Capelin, like sand lance, are an important forage fish in Alaska. We have often observed numerous spawned-out capelin in some of the sloughs adjacent to the lower Mendenhall River. We think that the spawning areas for capelin on the Mendenhall Wetlands may be very important for the overall abundance of these forage fish in the Juneau area.

Salmon -- Fifteen fish-producing streams empty out onto the Mendenhall Wetlands. If we count their tributaries as well, 28 streams connect to the Wetlands. Salmon spend all or part of their adult lives in salt water then return to fresh water to spawn-access these streams through the Wetlands. They probably use the Wetlands for feeding and short-term rearing of their young as well.

Most of the salmon found naturally on the Wetlands (coho, chum, sockeye, and pinks) use the freshwater and/or intertidal portions of Wetland streams for spawning and rearing of their young. All four species also pass through the Wetlands during migration to and from the sea.

The Macaulay Salmon Hatchery, operated by Douglas Island Pink and Chum, Inc. (DIPAC) is located adjacent to Mendenhall Wetlands near Salmon Creek. Young and adult chum, coho, pink, and possibly chinook salmon from the hatchery also use tidal sloughs and streams around the Wetlands for early marine rearing and spawning. In most years the hatchery releases millions of young salmon into Gastineau Channel. Many returning adults stray into and spawn in streams associated with the Wetlands.

The sport and commercial salmon fisheries are very important in Juneau. We believe the Mendenhall Wetlands contributes considerably and may even be critical to the health of these fisheries.

Some useful references are:

Bethers M., K. Munk, and C. Seifert. 1995. Juneau Fish Habitat Assessment. Alaska Department of Fish and Game, Division of Sport Fish, Douglas, Alaska. 128 p.

Bishop, D., R. Armstrong, and R. Carstensen. 1987. Environmental analysis of lower Jordan Creek and nearby wetlands in regard to planned airport taxiway extension. Environaid, Juneau, AK. 67 pp.

https://juneanature.discoverysoutheast.org/content_item/bishop-armstrong-carstensen-1987/

Briscoe, R. 2004. Overwinter use of microhabitats by juvenile coho salmon in Jordan Creek. Alaska Department of Fish and Game, Southeast Sustainable Salmon Funds Project on Duck and Jordan Creeks, Juneau, Alaska.

Celewycz, A.G., A.C. Wertheimer, J.A. Orsi, and J.L. Lum. 1994. Nearshore distribution and residency of pink salmon (*Oncorhynchus gorbuscha*) and chum salmon (*O. keta*) fry and their predators in Auke Bay and Gastineau Channel, southeast Alaska. U.S. Dep. Commer., AFSC Proc. Rep. 94-05, 39 p.

Gerke, B., M. Lorenz, and K.V. Koski. 1999. Distribution of Pink and Chum Salmon Fry in Estuaries near Juneau. In Proceedings of the Northeast Pacific Pink and Chum Salmon Workshop, Juneau Alaska, June 1, 1999, NMFS, 11305 Glacier Hwy, Juneau, pp 73-79.

Koski, K.V. 2009. The fate of coho salmon nomads: the story of an estuarine-rearing strategy promoting resilience. *Ecology and Society* 154(1): 4. [online] URL; <http://www.ecologyandsociety.org/vol14/iss1/art4/>

Mortensen, D.G., A.C. Wertheimer, J.M. Maselko, and S.G. Taylor. 2002. Survival and straying of Auke Creek, Alaska, pink salmon marked with coded wire tags and thermally induced otolith marks. *Transactions of the American Fisheries Society* 131(1):14-26.

Thrower, F.P. 1988. Migratory behavior of maturing pink salmon in Gastineau Channel, Southeast Alaska. Unpublished MS Thesis, University of Alaska.

Starry Flounder -- Starry flounder were the most common flounder captured on Mendenhall Wetlands during a study in 2002 by Lynn Mattes. They were also numerous within the intertidal channels near the airport in 1986. We have observed Great Blue Herons feeding on them, and one Southeast study found they were common prey items brought to eaglets by their parents. We have also observed river otters feeding on them within the Wetlands, and we've watched American Dippers eating juvenile flounder within the lower reaches of Switzer Creek.

Mattes, Lynn A. 2003. Habitat usage by flatfish (Pleuronectidae) in the Mendenhall wetlands, Juneau, Alaska. M.S. Thesis, University of Alaska, Fairbanks. 76 pp.

Birds

Mendenhall Wetlands provides food and/or resting space to a remarkable variety and abundance of birds. As of November 2008, observers had recorded sightings of 256 different species of birds. That's 83 percent of the 308 species seen in the entire Juneau area (from Taku Inlet to Berners Bay) and 73 percent of the 352 bird species seen in all of Southeast Alaska (from Dixon Entrance to Yakutat). Because of the variety and complexity of its habitats, Mendenhall Wetlands is widely acknowledged to be one of the key stopover points for migratory waterfowl and shorebirds in coastal Alaska.

To help identify, monitor, and prevent further degradation of shorebird stopover areas, the Western Hemisphere Shorebird Reserve Network has been established. The Alaska plan recognizes only three important shorebird sites in all of Southeast Alaska the Stikine River Delta, Yakutat Forelands, and Mendenhall Wetlands. These sites are currently under consideration for inclusion within the Western Hemisphere Shorebird Reserve Network.

Besides the importance of the Mendenhall Wetlands for birds of Southeast Alaska it is also considered important for many species both state and world-wide. In order to qualify for a globally or continentally significant IBA a site must support a significant portion of the flyway population of a particular species. In general, to qualify the site must have supported over one percent of the North American population at one time, or more than five percent of the population for the season. At the time of application there were more than 10,000 documented observations of the number of birds, by species, that occurred on the Mendenhall Wetlands at one time. Several species fell within the IBA qualifying criteria. They included Greater White-fronted Goose, Canada Goose (Vancouver subspecies), Surf-bird, Thayer's Gull, Surf Scoter, American Golden-Plover, Lesser Yellowlegs, Ruddy Turnstone, Black Turnstone, Western Sandpiper, Pectoral Sandpiper, Rock Sandpiper, Dunlin, Short-billed Dowitcher, and Bonaparte's Gull. Some of these species were also on the Audubon WatchList because of concerns about their conservation status. Those included Surf-bird, American Golden-Plover, Rock Sandpiper, and Short-billed Dowitcher.

For example **Canada Geese** are essentially year-round residents on the Mendenhall Wetlands, favoring the sedge meadows and ponds near the dike. The resident subspecies is the Vancouver Canada Goose (*Branta canadensis fulva*), which lives and nests from northern Southeast Alaska southward to northern Vancouver Island, British Columbia. Within this area it is considered to be a nonmigratory subspecies. We estimate that between 500 and 700 Vancouver Canada Geese use the Wetlands. This figure is based on counts covering the entire Wetlands when we were fairly sure the geese had not been disturbed.

Another example is **Mallards**. They occur in greatest numbers on the Wetlands from December through April, when up to 2,000 individuals have been seen in a single day. In most other months the numbers range from 200 to 1,000 individuals. Banding studies have shown that winter Mallards on the Wetlands are not the same as summer Mallards. Young produced in Juneau go

mostly down the coast to Washington and California. The winter birds have come from nesting habitat in the Yukon River Valley. The Mendenhall Wetlands are an important wintering area for these birds, and judging from the peak numbers documented in April, they're also an important stopover for migrating Mallards. The Mendenhall Wetlands provide summer food and a limited amount of nesting habitat for Mallards. Every year at least one brood has been observed within the floatplane basin and we have seen Mallard nests in the vicinity of Wigeon Ponds near Mendenhall Peninsula.

And **Bald Eagle**--In 2008, about 68 Bald Eagle nests were close enough to Mendenhall Wetlands that the resident pairs could forage there; about 35 percent of those nests are active in any given year. The Wetlands have probably been essential to the nesting success of these birds.

Glaucous-winged and **Herring Gulls** have a nesting colony on the rock face near Mendenhall Glacier, and they use the Mendenhall Wetlands for foraging. **Arctic Terns** also use the Wetlands for feeding from late April to late August.

Shorebirds What is it about the Mendenhall Wetlands that makes the area attractive to so many shorebirds? For one answer we can consider what birds need. According to Scott Weidensaul, the author of *Living on the Wind*, a book about bird migration: Most of the world's surface is useless to a shorebird--too wet, too dry, too forested, too mountainous, too farmed, too urban, too this or that. Much of the wetland habitat on which many species depend has been lost. So the relatively few places that still suit the birds' needs are important beyond measure. The Mendenhall Wetlands are indeed important beyond measure because they are one of very few places in Southeast that provide enough food and habitat that migrating shorebirds need. Along their migration routes, which may extend for thousands of miles, shorebirds depend on relatively few stopover sites for refueling and resting. Those sites are usually separated by considerable distances, and during stopovers, food is often available for only a few hours around low tide. For a small bird traveling thousands of miles between its wintering and breeding ranges, efficiency in refueling and quality of resting time can mean the difference between life and death, or between succeeding or failing to reproduce in a given year.

In summary, migratory shorebirds and waterfowl are the species most often discussed in association with Mendenhall Wetlands. But there is no question that the Wetlands are equally important to many other groups of birds, including a number of migrating songbirds and the raptors that travel with and prey on them, and local resident species such as Northwestern Crows and Common Ravens.

Some useful references:

Armstrong, R.H., R.L. Carstensen and M.F. Willson. 2004. Hotspots: Bird Survey of Mendenhall Wetlands, April 2002 to May 2003. Juneau Audubon Society and Taku Conservation Society. 74 pp.

Armstrong, R. and R. Gordon, 2002. Birds of Mendenhall Wetlands, checklist, Juneau Audubon Society.

Cain, S., J. Hodges, and E. Robinson-Wilson. 1988. Bird Use of the Mendenhall Wetlands in Juneau, Alaska. USFWS, Juneau, AK. 72 pp.

Hodges, J. I., and B. Conant 1986. Experimental Vancouver Canada Goose Survey-Northern Portion of Southeast Alaska. Waterfowl Investigations, U.S. Fish and Wildlife Service, Juneau, Alaska. 9 pp.

King, J.G. 2008. Attending Alaska's Birds. Trafford Publishing. 470 pp.

Watson, S. 1979. Avian habitats and use of the Mendenhall Wetlands Wildlife Refuge, 30 April-30 June 1979. ADF&G unpublished report, Juneau, AK 28 pp.

Watson, S. 1979. Avian Habitats and Use of the Mendenhall Wetlands Wildlife Refuge. Prepared in partial fulfillment of graduate degree from Utah State University.

Invertebrates

The large expanses of sand and mudflat on Mendenhall Wetlands may look barren, but in fact many of them are treasure-fields of marine invertebrates that provide important food for wetland birds. Buried in mud and sand, or tucked among rocks and clumps of seaweed, is an amazing variety of small creatures such as amphipods (small, shrimp-like invertebrates), tiny clams, snails, worms, and other creatures often invisible to people casually visiting the area. Even the larger more obvious invertebrates such as mussels and barnacles are important food for certain birds.

Certain species of tiny amphipods build double-ended U-shaped tubes in the sediment of sloughs. The tubes appear to be slightly sticky and stick up above the sediment a short distance, so debris collects around them, making a fuzzy mat. These amphipods feed from one end of the tube by sweeping the surrounding area for algae and plant debris with their antennae. These tube-dwelling amphipods are an extremely important shorebird food in some areas. One study concluded that Semipalmated Sandpipers prefer these amphipods over other food, and a part of the Wetlands where these amphipods are abundant is a favored feeding spot for several species of shorebirds.

This is the best source of information on the invertebrates of the Mendenhall Wetlands: Willson M.F. and A.P. Baldwin. 2004. Invertebrate surveys on the Mendenhall wetlands. pp 1-32. Report to USFWS.

https://juneanature.discoverysoutheast.org/content_item/willson-baldwin-invert-study-2004/

Mammals

A variety of mammals have been seen on Mendenhall Wetlands. On rare occasions, moose and brown bear have been among them, but the most commonly seen are Sitka black-tailed deer, black bears, harbor seals, and smaller mammals such as river otters, mink, and short-tailed weasels. The most important mammals for birds are small rodents and insectivores. Voles, mice, and shrews are important prey for Short-eared Owls, Northern Harriers, and American Kestrels. Long-tailed voles (*Microtus longicaudus*) are the most common year-round mammals on the Wetlands. They inhabit sedge and grass areas, where they feed on roots, seeds, and the tender bases of stems. Our examination of regurgitated Short-eared Owl pellets indicates they prey here almost exclusively on long-tailed voles. The owls periodically overwinter in numbers when vole populations are high. Of interest is beavers have been recently moving into and living in the wetlands. The ponds they create often provide good habitat for fish and aquatic insects.

Development around the periphery of the Wetlands has created nearly impassable barriers for large mobile mammals such as deer, black bear, wolf, porcupine and beaver. Although primarily forest-dwelling, these species throughout Southeast Alaska move seasonally onto more open estuarine habitats for grazing, hunting, and strategic crossings, in our case between Sayeik (Douglas Island) and mainland. Much of this use is nocturnal, especially around high human densities.

Glacial rebound, along with restrictions to tidal flow from roads, dikes and spoil islands, is rapidly altering the array of vegetation types throughout the Wetlands. Trends are generally discouraging for fish and water birds, but there is one positive progression. Around the periphery, uplift parkland---former tideland raised above extreme high tide---is advancing seaward. Almost completely lost to development outside the Refuge boundary, this belt of uplift parkland is now growing again within it. That's good news for the above-listed widely traveling mammals, and some smaller resident species such as long-tailed vole. Managers should do all in their power to maximize such benefits, which means minimizing further fragmentation that comes with additional crossings of the Wetlands.

Vegetation

Vegetation of the Wetlands is constantly changing in response to glacial rebound and human-induced changes to landforms and tidal flow. Estuarine vegetation was mapped and described in 2003 for Southeast Alaska Land Trust (SEALT) by Carstensen (2004) GIS Mapping for Mendenhall Wetland State Game Refuge. A pdf can be downloaded from:

https://juneanature.discoverysoutheast.org/content_item/glacial-rebound-in-the-mendenhall-wetlands/

Before impacts of any proposed crossing can be understood, updated maps are necessary, both in the immediate vicinity and wetlands-wide, in order to identify rare and decreasing vegetation

types, and trends. Vegetation types in the 2004 report should be used, for analysis of change over time.

Historical Note

According to Jim King: "The history of Mendenhall Wetlands repeats the continent-wide loss of coastal wetlands in North America. Wetlands in urban areas have been filled even when that depleted the resources that attracted the original settlers. Cities such as Boston, New York, Baltimore, New Orleans, San Francisco, and Seattle were built upon the country's largest and richest estuaries. Millions of dollars are being spent to repair a fraction of our national coastal wetlands. The values of these wetlands are now known to be the source of our nearshore seafood, as buffers against storm surges, their ability to filter many pollutants, and their importance in providing food and habitat for a wide variety of birds and other animals. In the past there have been attempts to fund a socioeconomic study of the Mendenhall Wetlands as a guide to current planning and activities in the area. It is not too late to do such a study."

Summary

Our recommendations concerning the specific potential crossing routes are listed here.

Mendenhall Peninsula:

The Mendenhall Peninsula alternative could be designed to stay out of the refuge, with connection points at the end of the Peninsula and west of the North Douglas boat ramp. However, the location of the connection point at the end of Mendenhall Peninsula would be crucial and must avoid the area at the Mendenhall River mouth, which has been identified as the most important feeding habitat in the Refuge for waterfowl, terns, shorebirds, and other seabirds (Armstrong et al. 2009) and constitutes an important Pacific sand lance spawning area.

If this alternative cannot be routed so as to avoid impacts to the Mendenhall River Estuary it should not go forward for Level 2 screening. Tunneling from the Peninsula might be a better alternative if this route is seriously considered.

North Airport:

The only way this route can be accommodated without significant environmental damages is through tunneling the entire distance. An above ground structure would be unacceptable for a variety of reasons involving the airport and the environmental impacts.

Sunny Point West:

This crossing route creates some of the most serious environmental impacts because it travels through the heart of the Refuge/wetlands areas. The only way it can be environmentally acceptable is if it is tunneled the entire way. All of the negative issues come in to play with this route.

Sunny Point East:

This crossing route creates some of the most serious environmental impacts because it travels through the heart of the Refuge/wetlands area. The only way it can be environmentally acceptable is if it is tunneled the entire way. All of the negative issues come in to play with this route.

Vanderbilt:

This crossing route is marginal at best. Although it does not run through the heart of the Refuge, it does cross critical wetlands that are improving annually due to the glacial rebound issue. Marginal mud flats now surfacing during the tidal flushes will eventually provide critical salt marsh vegetation and food critical to the birds utilizing the Refuge during critical parts of the year. If the route is selected for further analysis, it is important that the crossing be on pilings because of the tidal flux issue.

Twin Lakes:

This crossing route is similar to the Vanderbilt route but is important to a lesser degree as the channel is deeper at this time and it is uncertain how much the glacial rebound will affect this area. If this route is selected, it would be preferable to move it further to the east if at all possible. Placing this crossing on pilings is important because of the tidal issues associated with the wetlands.

Salmon Creek:

From a safety issue and access to the hospital, this route is the most logical. If the crossing is on piling, then there are no obvious tidal concerns that would impact the wetlands.

Eagle Creek:

This crossing provides few negatives as long_ as the crossing is elevated and there are no tidal flux issues.

Downtown:

This crossing provides few negatives as long as the crossing is elevated and there are no tidal flux issues.

Attachment

Letter from the Department of Natural Resources
(Office of Habitat Management and Permitting) to DOT&PF
December 22, 2003

STATE OF ALASKA

**DEPARTMENT OF NATURAL
RESOURCES OFFICE OF HABITAT
MANAGEMENT AND PERMITTING
JUNEAU AREA OFFICE**

FRANK H. MURKOWSKI, GOVERNOR

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22 December, 2003
Mr. Michael Lukshin
ADOT&PF, Southeast Region
Statewide Design & Engineering Services
Juneau, AK 99801

Dear Mr. Luk.shin:

RE: Gastineau Channel Second Crossing, NEPA scoping comments
ADOT&PF Project No. 68540, Fed. Project No. HP-0954(18)

The Alaska Department of Natural Resources Office of Habitat Management and Permitting (DNR OHMP) has received your request for scoping comments for the Second Crossing EIS and offers the following comments.

In summary, DNR OHMP recommends the following:

- 1. Clarify, rank, and fully document the project purposes and needs.**
- 2. Incorporate environmental goals in the Purpose & Need Statement.**
- 3. Broaden geographic scope to include reasonably foreseeable impacts.**
- 4. Realistically assess potential benefits, beneficiaries and costs.**
- 5. Fully explore off-refuge alternatives, including water-based transport.**
- 6. Consider interchange sites other than those existing.**

Project Overview

The 1984 CBJ Second Gastineau Channel Crossing Feasibility Study looked at 15 alternative alignments to connect the Mendenhall Valley with North Douglas Island; most were located on the Mendenhall Wetlands State Game Refuge. The recommended alternative extended from 8-Mile Egan to Fish Creek Road on Douglas Island. The 1992 update to the 1984 feasibility study identified a low-level crossing through the Mendenhall State Game Refuge in the Mendenhall Bar area as the least costly alternative.

The 1984 feasibility study assumed very extensive fill footprints (up to 4000 linear feet) at the crossing locations within the refuge, with much of the fill being obtained from dredging within Gastineau Channel or elsewhere on the refuge. The feasibility study stated that alternatives located near, but not on, the refuge would also have significant effects on refuge habitats and use.

According to DOT, crossing types now under consideration for the Second Crossing EIS include fixed bridge, bascule bridge, floating bridge, causeway, and tunnel. The currently proposed Gastineau Channel Second crossing EIS project has not as yet identified specific alternatives. It

appears, however, that some of the alternatives, including alternatives currently favored by DOT and CBJ, would cross the refuge near its widest extent, with significant impacts to refuge hydrology, wildlife, and human use. Such crossings could compromise the basic function and purpose of the refuge, fragmenting habitats and reducing their long-term value for wildlife, hunting, and recreation.

The Mendenhall State Game Refuge was established in 1976 to protect natural habitat and game populations, especially waterfowl, and to provide recreation. It contains approximately 3,800 acres of saltwater and freshwater intertidal habitat along Gastineau Channel from Salmon Creek to the Mendenhall Peninsula. Salt marsh and mud flat habitats are regionally rare due to the extreme topography and strong currents of southeast Alaska. There is no other extensive salt marsh of comparable value to migratory birds in northern southeast Alaska. The refuge is perhaps the most popular public recreation and outdoor education area in Juneau, and provides habitat for a large proportion of the regions' Vancouver Canada geese and for other waterfowl, bald eagles, shorebirds, passerine birds, terrestrial and marine mammals, invertebrates, and anadromous and marine fish.

Purpose and Need

The project purposes should be ranked in importance and clarified so that alternatives may be evaluated with respect to each one. The primary stated goal is for improved access to the West Douglas potential New Growth Area in order to facilitate its development. What is the degree of access improvement deemed necessary to meet the need and why? Are cars and trucks the only transport means under consideration? Water-based transport, as provided for many remote communities, may be a feasible means of transport for West Douglas and therefore must be considered to meet review criteria for refuge lands.

Given the public resources at stake and the stringent criteria for disposal of refuge land, the specific needs for the project, as well as the populations served, should be well defined and thoroughly documented. For example, is the need for West Douglas residents to gain quicker access to commercial areas of the Valley, or to downtown? Or is the main concern to gain quicker access from Valley residential areas to commercial areas of West Douglas? Is creation of new housing an important part of the rationale for West Douglas development, and if so, is the type of housing in line with community needs?

Population projections in the 1984 Feasibility Study substantially overestimated the population growth that has occurred since then. The current analysis should carefully re-evaluate population and growth assumptions.

Another need mentioned as secondary, but apparently important, is for alternate access in case of a major disaster affecting the existing bridge. A risk assessment and comparison with other isolated communities would be helpful to address this concern.

In explaining the rationale for and scope of the proposed Second Crossing EIS, city and the consultants have described the West Douglas Conceptual Plan as a Master Plan. The plan itself states that it is "conceptual," however, and not intended to meet the more detailed CBJ land use

criteria for a "Master Plan". This may be an important distinction. Project materials that refer to the Conceptual Plan as a Master Plan should be corrected.

Similarly, the North Douglas Highway Extension Corridor Identification EIS has been informally referenced in the rationale for the Second Crossing project as well as the rationale for the proposed omission of West Douglas from the scope of the Second Crossing EIS. The Final EIS for the North Douglas Corridor ID EIS responded to comments from ADF&G concerning the lack of resource and impact information in the draft EIS by explaining that the document considered corridor designation only and therefore did not warrant the more thorough analysis of impacts needed for a road proposal. The EIS also states that in 1988, respondents were generally opposed to building a highway in the West Douglas area. More recent information on public need may be required to support a finding of "superior public need" for a Second Crossing.

Given the project location, it would be wise, and realistic, to incorporate environmental goals, including refuge management goals, into the purpose and need. The *Mendenhall Wetlands State Game Refuge Management Plan* (page 6) states that the refuge will be managed to maintain and enhance fish and wildlife populations and their habitat and to maintain and enhance public use of fish, wildlife, and refuge lands. Cumulative impacts of incremental developments and actions must be considered, and habitat degradation due to fragmentation must be minimized.

Key criteria for permitting activities on the refuge are that use or activity is consistent with the protection of fish and wildlife and their habitat, and public use and enjoyment of the resource values for which the special area was established. Specific criteria for a transportation corridor on the refuge are that there is a significant public need for the corridor which cannot reasonably be met off-refuge, that use of refuge lands must be avoided or minimized to the extent feasible, that public access must be maintained, and all unavoidable impacts must be fully mitigated.

Scope of Review

If the primary purpose of the second crossing is to allow development of West Douglas, it is 'reasonably foreseeable' that the project would result in development of West Douglas, including habitat impacts to that area which would not otherwise occur. Given the project purpose, the scope of review needs to be extended to include the West Douglas potential New Growth Area. As noted above, detailed planning and impact analysis documents for a road and related development on West Douglas do not currently exist.

Similarly, the project scope should be extended to include some analysis of the bench road corridor parallel to the North Douglas Highway and upgrade of the North Douglas Highway. The 1984 Second Gastineau Channel Crossing Feasibility Study concluded that a "bench road" would likely be needed if a second crossing were built because it would not be possible to upgrade North Douglas Highway sufficiently to meet the increased traffic needs.

The effects of the project on congestion at the current bridge could also be dealt with to evaluate the need for the second crossing in the context of related, and potentially more urgent traffic concerns. Development of West Douglas may increase use of the North Douglas Highway and further burden the busy highway and existing bridge.

As we understand it, DOT will consider only those routes that connect to existing interchanges. This constraint may unduly constrain crossing locations, unnecessarily limiting opportunities to avoid or minimize effects on refuge habitats and public access.

ADF&G and DNR review roles

A memorandum of understanding between DNR and ADF&G dated October 16, 2003 provides guidelines regarding habitat/review responsibilities for each agency, including the following:

Alaska Department of Fish and Game (ADF&G) is the lead for

- ▶ Special Area (including game refuges) management and permitting
- ▶ Coastal management reviews (and COE permit reviews) within Special Areas, and
- ▶ habitat-related review of DNR land disposals, including those for acquisition of land or easements within state game refuges.

DNR Office of Habitat Management and Permitting (OHMP) is the lead for

- ▶ Fish Habitat permitting,
- ▶ Coastal management reviews (and COE permit reviews) outside Special Areas, and
- ▶ NEPA reviews for federal actions.

Potential impacts to Mendenhall State Game Refuge will be central to this NEPA review, so we expect that ADF&G and DNR will coordinate closely and that both agencies will participate. Depending on the preferred alternative, either ADF&G or OHMP may be the lead for coastal management review of this project. Coastal management review normally coincides with release of the draft EIS.

An AG's opinion (366-045-84 and 366-122-84, 11/8/85), addresses in detail the land management authorities of DNR and ADF&G with respect to state game refuges. In brief, it states that ADF&G has authority over activities that affect fish and game or their habitats. Any activity that normally requires a DNR authorization or action outside a refuge is also likely to require a similar DNR action inside a refuge. Decisions of both agencies must reflect the legislative intent for the refuge.

Review Criteria for the Refuge

Alternative routes and designs for the second crossing must be evaluated for impacts on refuge resources and goals. Regulations governing the refuge include a management plan that outlines management goals (*Refuge Mgmt Plan 5 AAC 95.520*): "The goals and policies of the *Mendenhall Wetlands State Game Refuge Management Plan* dated March 1990 are adopted by reference."

As noted above, the *Mendenhall Wetlands State Game Refuge Management Plan* (page 6) states that the refuge will be managed to maintain and enhance fish and wildlife populations and their habitat and to maintain and enhance public use of fish, wildlife, and refuge lands. Cumulative impacts of incremental developments and actions must be considered, and habitat degradation due to fragmentation must be minimized.

According to the refuge plan, all management decisions affecting the Mendenhall Wetlands State Game Refuge, whether for activities undertaken by the department, other agencies, or the public, must be in accordance with the following goals:

For wildlife--

- *Protect important wildlife habitat including water quality;
- *Minimize harmful disturbance to wildlife especially to nesting, rearing, staging and wintering waterfowl;
- *Maintain, protect, and where appropriate, enhance the quality and quantity of nesting, rearing, staging and wintering habitat for resident and migrant waterfowl;
- *Protect bald eagle nesting, perching, and roosting habitat including the maintenance of wind firm _ boundaries around large old trees;
- *Protect habitat and minimize harmful disturbance to endangered species, such as peregrine falcon and humpback whales.

For fish--

- *Protect water quality and circulation patterns to maintain fish habitats;
- *Maintain refuge water quality sufficient for growth and propagation of fish, shellfish and other aquatic life in fresh, estuarine, and marine waters;
- *Maintain refuge water quality sufficient for harvest for human consumption of raw mollusks or other raw aquatic life;
- *Maintain and, where necessary, improve the hydrologic integrity of the refuge.

For human activities--

- *Maintain public access to and within the refuge consistent with the Refuge Plan;
- *Maintain opportunities for hunting waterfowl and fishing;
- *Maintain opportunities for recreation, viewing, photography, education and the study of fish and wildlife;
- *Provide information about the refuge to the public.

The refuge mgmt plan is implemented through Special Area Permitting for activities affecting fish and wildlife, their habitat, or their use (5 AAC 94.410 (b), AAC 95.700-760.) Special Area permit review criteria require that the basic purpose and function of the refuge be maintained. Permits are issued only if

1. the use or activity is consistent with the protection of fish and wildlife and their use, protection of fish and wildlife habitat, and the purpose for which the special area was established; and
2. the use or activity does not unduly restrict or interfere with the public use and enjoyment of the resource values for which the special area was established; and
3. any adverse effect upon fish and wildlife, and their habitats, and any restriction or interference with public use, is mitigated in accordance with 5AAC 95.900.

[5AAC 95.430 Conditioning, Approval, or Denial of Special Area Permits.]

For reference, ADF&G Special Area Permit Regulations, 5 AAC 95.900, contain the following requirements for mitigation on state game refuge lands, with primary emphasis on impact avoidance:

- (a) Each permittee shall mitigate any adverse impact upon fish or wildlife or their habitat, which the commissioner determines may be expected to result from, or which actually results from, the permittee's activity, or which was a direct result of the permittee's failure to
 - (1) comply with the permit condition or a provision of this chapter; or
 - (2) correct a condition or change a method foreseeably detrimental to fish or wildlife, or their habitat.

- (b) Mitigation techniques must be employed in the following order of priority:
 - (1) avoid an impact altogether by not taking a certain action or parts of an action;
 - (2) minimize an impact by limiting the degree of magnitude of the action;
 - (3) rectify the impact by repairing, rehabilitating, or restoring the affected environment;
 - (4) reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action;
 - (5) compensate for the impact by replacing or providing substitute resources or environments.

A special area permit from ADF&G cannot convey an interest in state land or grant any preference right for the lease or purchase of state land (5 AAC 95.440. Limitations on Special Area Permits). Lease or acquisition would entail additional review and criteria, and would be contingent upon a joint finding by ADF&G and DNR.

In accordance with AS 16.20.034, the Mendenhall Wetlands State Game Refuge Management Plan (p.10) specifies criteria for a potential transportation corridor or docking facility on refuge land:

"The City and Borough of Juneau may acquire refuge lands for a public transportation corridor, including a water corridor, only after the following have been demonstrated:

- (1) that there is a significant public need for the corridor which cannot reasonably be met off-refuge;
- (2) that the use of refuge lands is avoided or minimized to the maximum extent feasible including use of Sl,bsurface or elevated, no-fill corridor options where feasible;
- (3) that public access to the refuge is maintained; and
- (4) that all unavoidable impacts to the refuge and to refuge resources are fully mitigated through restoration, replacement and/or other compensation."

"The City and Borough of Juneau may acquire land for use as a publicly owned and operated docking facility only if there is a significant public need for which there is no feasible off-refuge

alternative and impacts to the refuge and to refuge resources are fully mitigated. Any such site must avoid dredging and filling for construction and maintenance to the maximum extent feasible."

Each of these criteria must be fully and explicitly addressed through the identification and evaluation of alternatives for the second crossing.

Refuge Advisory Group Recommendations

Per the refuge management plan, a citizens committee advises ADF&G on issues relating to the protection and management of the refuge. Mendenhall Refuge Citizen's Advisory Group members have requested that impacts to refuge resources and uses, including indirect, secondary and cumulative impacts, be fully identified and avoided. They have requested clarification of the project need and advised that off-refuge alternatives should be fully explored and considered in preference to those crossing the refuge. They have requested that they be informed of project status throughout the EIS process.

Additional Review Criteria

Habitat impacts of the project within and outside of the refuge will also be reviewed with reference to other applicable municipal and state land use documents and regulations, including state habitat standards, coastal management enforceable policies (including the Juneau Wetlands Management Plan, Juneau Coastal Mgmt Plan and Policies), impaired waterbody recovery plans, state species of concern, and state fish passage/habitat requirements (AS 41.14.840 and .870).

Impact Assessment

Because of the need to evaluate extensive and significant potential impacts to the refuge and other affected habitats, a thorough analysis of biological and hydrologic functions and impacts will be critical. We would like to see comprehensive cumulative impact analysis to provide context for long-term land management decisions on North and West Douglas Island as well as the Mendenhall wetlands. Impacts to human use of resources should receive special attention.

Cumulative, indirect and secondary effects. Impact assessment for affected Gastineau Channel wetlands and streams should address cumulative habitat loss and degradation due to development, including proposed expansion of the airport. It should also address cumulative impacts from stormwater, wastewater, and industrial discharges; colonization by invasive species; isostatic uplift; and potential, pending, and approved accretion claims.

Preliminary results from recent re-sampling of wetlands plots from the 1960s indicate that striking changes have occurred over large portions of the remaining Gastineau Channel wetlands. Dredge spoils, runways, and roads appear to have contributed to changes in remaining wetlands via changed salinity, sediment transport, and/or drainage patterns. Impact assessment for fill in estuarine wetlands must therefore address cumulative and potential effects on natural communities from changes in water quality, tidal flushing, salinity, sediment and nutrient transport.

"Pilings-only" design options. Cost estimates for each alternative should take into account criteria for avoidance and minimization of habitat damage. For example, alternatives analysis will need to include cost estimates for "pilings-only" design options for routes within wetlands. Structures

supported by pilings, rather than fill, would be expected to have fewer impacts on hydrology and fish and wildlife movement through the refuge.

Behavioral effects. Analyses should consider effects of alternatives on bird habitat use as well as habitat availability and should consider potential effects on airport safety. Effects of noise and lighting, and effects on wildlife movement and resting as well as foraging, should be considered.

Douglas Island impacts. West Douglas is a popular deer hunting area for Juneau residents. It hosts a number of productive salmon streams and provides winter refuge habitat for deer. To cover the scope of reasonably foreseeable project impacts, the analysis should address important fish and wildlife resources, and current human use of those resources, along North Douglas Highway, the along the potential alignment of the "bench road", and in the potential new growth area on West Douglas. Habitat identification and impact assessment should include :freshwater and estuarine wetlands, resident and anadromous fish habitat, deer winter refuge habitat, waterfowl concentration areas, amphibian breeding ponds, productive eelgrass and shellfish beds, and rare natural communities/forest types.

According to CBJ land use code, a Master Plan is needed in advance of development of a new growth area. CBJ Master Plan criteria include identification of important habitats. The West Douglas Conceptual Plan and North Douglas Highway Extension Corridor EIS do not identify resources or potential impacts in adequate detail to predict significant impacts. An example of this information gap is the extensive additional fish habitat recently mapped in the Peterson Creek watershed that was not available and therefore not included in these documents. Additional habitat mapping and fieldwork is needed to identify Douglas Island resources that may be affected by the Second Crossing project.

Human use. The EIS should address effects of the project on access, hunting, shellfish gathering, sport and commercial fishing and related vessel traffic, outdoor education, wildlife viewing, and other recreational uses and values, including scenic values of the refuge.

Selected Refuge Information Needs

Geographically referenced recreational and hunter use information will be needed to assess potential impacts on access and use. Water quality and benthic toxicology data for the refuge is lacking and would be required to address cumulative impacts of urban pollutants from proposed and existing road run-off and other sources.

Relatively little information is available for the refuge concerning habitat use by invertebrates; bird resting and night-time use areas; quantification of marsh productivity or waterfowl foraging intensity in different habitats; patterns of use by juvenile anadromous and marine fish; use by adult capelin, sand lance, and eulachon; bird use of habitats on the central Douglas side of the refuge; and wildlife disturbance effects from development and recreational use. The refuge has been selected by the Alaska Shorebird Working Group as a key regional site for shorebird population monitoring, but currently available stopover population estimates are limited to informal observations.

New and Existing Information

We have briefly reviewed the extensive project bibliography and have noted a few omissions. We will provide additional citations and/or contact information for salt marsh vegetation work by C. Stone and by J. Crow; ADF&G-funded amphibian surveys; FWS-funded refuge "Hotspots" and invertebrates surveys; estuarine rearing and juvenile marine fish habitat use papers by Atagi, Koski and others; and accretion/vegetation mapping by Sealtrust. Hunter survey information from the Mendenhall Wetlands registration hunt will be available from ADF&G later this winter. Limited sport-fishing, commercial use, and escapement information is also available from ADF&G.

Thank you for the opportunity to comment. We look forward to continued involvement in the scoping and impact analysis process. If you have any questions, please contact OHMP, Catherine Pohl, at 465-4182.

Sincerely,

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