Information Sheet on EAA Flyway Network Sites (SIS) – 2017 version

Available for download from http://www.eaaflyway.net/about/the-flyway/flyway-site-network/

Categories approved by Second Meeting of the Partners of the East Asian-Australasian Flyway Partnership in Beijing, China 13-14 November 2007 - Report (Minutes) Agenda Item 3.13

Notes for compilers:

1. The management body intending to nominate a site for inclusion in the East Asian - Australasian Flyway Site Network is requested to complete a Site Information Sheet. The Site Information Sheet will provide the basic information of the site and detail how the site meets the criteria for inclusion in the Flyway Site Network. When there is a new nomination or an SIS update, the following sections with an asterisk (*), from Questions 1-14 and Question 30, must be filled or updated at least so that it can justify the international importance of the habitat for migratory waterbirds.

2. The Site Information Sheet is based on the Ramsar Information Sheet. If the site proposed for the Flyway Site Network is an existing Ramsar site then the documentation process can be simplified.

3. Once completed, the Site Information Sheet (and accompanying map(s)) should be submitted to the Flyway Partnership Secretariat. Compilers should provide an electronic (MS Word) copy of the Information Sheet and, where possible, digital versions (e.g. shapefile) of all maps.

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1. Name and contact details of the compiler of this form *:

EAAF SITE CODE FOR OFFICE USE ONLY:

E	A	A	F	1	0	9

Full name: Kristine Sowl

Institution/agency: U. S. Fish and Wildlife Service, Yukon Delta National Wildlife Refuge

Address: P.O. Box 346, Bethel, AK 99559 USA

Telephone: 907-543-1014

Fax numbers: 907-543-4413

E-mail address: kristine_sowl@fws.gov

Full name: Pete Probasco

Institution/agency: U.S. Fish and Wildlife Service

Address: 1011 E. Tudor Rd, Anchorage, AK 99503

Telephone: 907-785-3545

Fax numbers: 907-786-3575

E-mail address: pete_probasco@fws.gov

2. Date this sheet was completed *:

DD/MM/YYYY

xx/03/2012

3. Country *:

USA

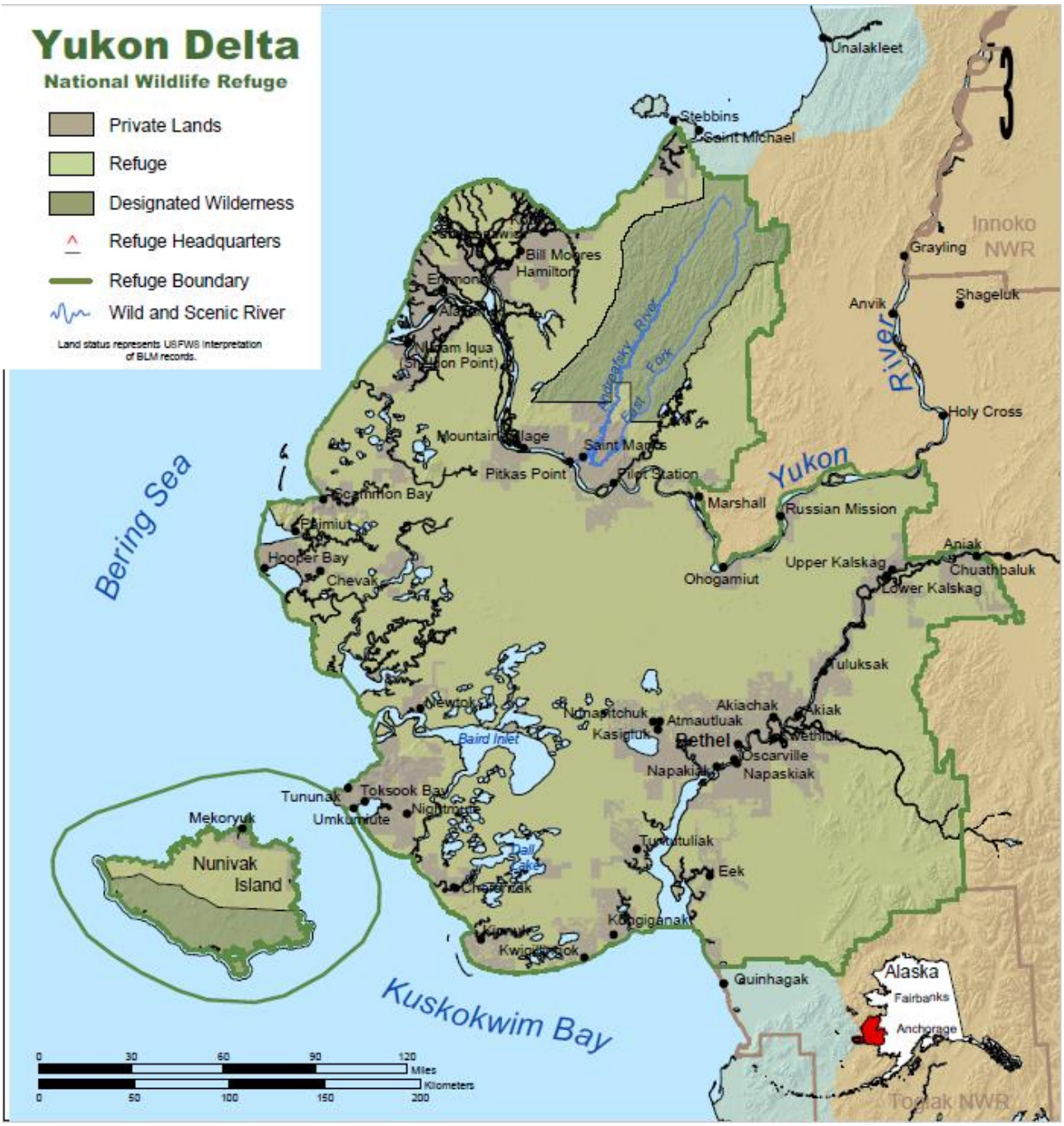
4. Name of the Flyway Network site *:

Accepted English transcription of the Site's name.

Yukon Delta National Wildlife Refuge

5. Map of site *:

The most up-to-date available and suitable map of the wetland should be appended to the SIS (only in digital format and shape file). The map must clearly show the boundary of the site. Please refer to the "Digitising Site Boundaries in Google Earth" file linked here.



6. Geographical coordinates (latitude/longitude, in decimal degrees) *****:

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

The designated area includes the coastal portion of Yukon Delta National Wildlife Refuge, beginning at the eastern edge of the Yukon River's deltaic fan at about 63°04'N, 163°04'W and

extending northwestward around the active delta, then southward along the Bering Sea coastline to about 60°01'N, 162°11'W on the east side of the Kuskokwim River mouth. From there, the boundary extends northward along the east side of Kuskokwim River to about 60°38'N, 162°05'W and then continues northward along the inland edge of the coastal grass-sedge meadows to the starting coordinates (63°04'N, 163°04'W). The nomination also includes Nunivak Island as well as the surrounding waters and seafloor for which YDNWR has jurisdiction.

7. Elevation *: (in metres: average and/or maximum & minimum)

90% < 15 m; maximum elevations exceed 300 m on Nunivak Island and in the Askinuk Mountains.

8. Area *:

The total area of the site, in hectares. If the areas of discrete site units are known, please also list each of these together with the names (or labels) used to identify and differentiate these units.

The proposed site, including Nunivak Island, encompasses about 4,824,000 ha. Approximately 20% percent of these lands are Native selected and conveyed lands, and currently do not fall under consideration of this nomination.

9. General overview of the site *:

A brief (two sentences) summary of the site, mentioning principal physical and ecological functions, and its importance for migratory waterbirds.

The site comprises extensive grass-sedge meadows in the contiguous deltas of the Yukon and Kuskowin Rivers as well as estuaries, sea coast and an offshore island. The mostly tree-less landscape is dominated by small wetlands that, when thawed in summer-autumn, provide breeding and post-breeding habitat for several million waterbirds of several families. The waterbirds disperse into the East Asian – Australasian and/or American flyways.

10. Justification of Flyway Site Network criteria *:

Please provide waterbird count information (with year of latest count) that demonstrates that the site meets the criteria of the Flyway Site Network (Annex 1). That is:

- it regularly supports > 20 000 migratory waterbirds; or,
- it regularly supports > 1 % of the individuals in a population of one species or subspecies of migratory waterbird; or,
- it supports appreciable numbers of an endangered or vulnerable population of migratory waterbird
- it is a “staging site” supporting > 5 000 waterbirds, or > 0.25% of a population stage at the site.

A listing of the populations of migratory waterbirds covered by the East Asian – Australasian Flyway Partnership and the 1% thresholds is attached (Annex 3).

The "staging site" criterion is particularly difficult to apply and application of this should be discussed with the Secretariat. Also note that some species have several populations that are very difficult to distinguish in the field.

Criterion 1 – regularly supports > 20,000 migratory waterbirds

We do not have survey data for the entire proposed site, which is vast and challenging to access, both logistically and economically. A regularly-surveyed area of 12,832 km^2, however, comprising 27% of the proposed site, supports approximately 900,000 waterbirds including waterfowl, loons, cranes, gulls, terns, and jaegers.

In terms of shorebirds, an area of 853 km^2, 1.77% of the proposed site, supports approximately 310,000 breeding shorebirds. An expanded area of one particular habitat, including 2200 km^2 (< 5% of the proposed site) of low wet coastal meadows, supports about 915,000 shorebirds. Overall, we estimate that several million shorebirds use the entire area during breeding; similarly, several million shorebirds use the site during the post-breeding period.

Of the waterbirds using the site, at least 500,000 migrate into the East Asian – Australasian Flyway: see the table under Criterion 2 below. These include 61,000 Bar-tailed Godwit *Limosa lapponica baueri* and at least 375,000 Dunlin *Calidris alpina arcticola*.

Criterion 2 – regularly supports > 1% of the individuals in a population of one species or subspecies of migratory waterbird

The Yukon Delta National Wildlife Refuge site supports > 1% threshold for the following 11 species/populations that migrate within the EAA Flyway:

Population	**Minimum estimated number using the site**	**EAAF 1% threshold**
Spectacled Eider[1]	7,200	3,300
Steller's Eider[7]	7,800	1,000
Long-tailed Duck[4, 9]	11,670	5,000
Pacific Golden-Plover[5]	>> 4,000	1,000
Bar-tailed Godwit[2] (baueri)	61,000	1,550
Ruddy Turnstone[6] (interpres)	>>1,200	350
Sharp-tailed Sandpiper[3]	>>5,000	1,600
Rock Sandpiper[6] (tschuktschorum)	>>6,656	600
Dunlin[8,12] (arcticola)	>375,000	7,500
Arctic Tern[10]	>23,000	10,000
Aleutian Tern[11, 13]	> 500	300

[1]Fischer, J. B., R. A. Stehn, and G. Walters. 2011. Nest population size and potential production of geese

and spectacled eiders on the Yukon-Kuskokwim Delta, Alaska, 1985-2011. Unpubl. U. S. Fish and Wildlife Service report, Anchorage, Alaska.

[2]Gill, R. E., Jr., and B. J. McCaffery. 1999. Bar-tailed Godwits *Limosa lapponica* in Alaska: a population estimate from

the staging grounds. Wader Study Group Bull. 88:49-54.

[3]Handel, C. M., and R. E. Gill, Jr. 2010. Wayward youth: Trans-Beringian movement and differential southward migration by juvenile sharp-tailed sandpipers. Arctic 63:273-278.

[4]Mallek, E. J., and D. J. Groves. 2010. Alaska – Yukon Waterfowl Breeding Population Survey. Unpubl. U.S. Fish and

Wildlife Service report, Fairbanks and Juneau, Alaska.

[5]McCaffery, B. J. 1996. The status of Alaska's large shorebirds: A review and an example. International Wader Studies

8:28-32.

[6]McCaffery, B. J., J. Bart, C. Wightman, and D. Kreuper. *In Press* (2012). Shorebird surveys in western Alaska. Chapter 3 *in* Arctic shorebirds in North America: a decade of monitoring (J. Bart and V. H. Johnston, Eds). Studies in Avian Biology Series (Vol. 44), University of California Press, Berkeley, CA.

[7]McCaffery, B. J., unpublished data.

[8]Morrison, R. I. G., B. J. McCaffery, R. E. Gill, S. K. Skagen, S. L. Jones, G. W. Page, C. L. Gratto-Trevor, and B. A. Andres. 2006. Population estimates of North American shorebirds, 2006. Wader Study Group Bulletin 111:67-85.

[9]Petersen, M. R., B. J. McCaffery, and P. Flint. 2003. Post-breeding distribution of Long-tailed Ducks (*Clangula hyemalis*) from the Yukon-Kuskokwim Delta, Alaska. Wildfowl 54:103-113.

[10]Platte, R. M., and R. A. Stehn. 2011. Abundance and trend of waterbirds on Alaska's Yukon-Kuskokwim Delta Coast

based on 1988 to 2010 aerial surveys. Unpubl. U. S. Fish and Wildlife Service report, Anchorage, Alaska.

[11]Stephensen, S. W., and L. Kondratyeva. 2001. The Beringian seabird colony catalog. U. S. Fish and Wildlife Service,

Office of Migratory Bird Management, Anchorage, Alaska.

[12]Warnock, N. D., and R. E. Gill, Jr. 1996. Dunlin (*Calidris alpina*). *In* The Birds of North America , No. 203 (A. Poole

and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.

[13]Yukon Delta National Wildlife Refuge, unpublished data.

Criterion 3 – Appreciable numbers of an endangered or vulnerable population of migratory waterbird

Steller's Eider – *Vulnerable*: Minimum estimates of 7,800 molting birds in the fall, including the barrier islands along the south coast of the Delta, and Cape Mendenhall on Nunivak

Island. Other molting sites on Nunivak are known, but numbers not quantified. In addition, during spring migration, virtually the entire adult population (i.e., tens of thousands) of Pacific Steller's Eiders "spends days or weeks feeding and resting in northern Kuskokwim Bay" in the waters immediately adjacent to the refuge.[1]

An additional population is not presently listed as endangered or vulnerable but is included for information purposes here in case its status deteriorates:

Emperor Goose – *Near threatened*: The vast majority of the breeding population of this species occurs within the proposed site during the nesting season. In fact, some estimates of local breeders on the Delta[2] exceed the global population estimate for the species[3] (which is derived from pre-breeding spring survey away from the nesting grounds).

[1]U. S. Fish and Wildlife Service, 2002. Steller's Eider Recovery Plan. Fairbanks, Alaska.

[2]Fischer, J. B., R. A. Stehn, and G. Walters. 2010. Nest population size and potential production of geese and spectacled eiders on the Yukon-Kuskokwim Delta, Alaska, 1985-2010. Unpubl. U. S. Fish and Wildlife Service report, Anchorage, Alaska.

[3]Dau, C. P., and E. J. Mallek. 2011. Aerial survey of emperor geese and other waterbirds in southwestern Alaska, spring 2010. Unpubl. U. S. Fish and Wildlife Service report, Anchorage and Fairbanks, Alaska.

Criterion 4 – > 5,000 waterbirds, or > 0.25% of a population stage at the site

The fall staging of four species of shorebirds is well-documented at the proposed site (Bar-tailed Godwit, Sharp-tailed Sandpiper, Rock Sandpiper, and Dunlin [*arcticola* subspecies]). Each population individually exceeds the minimal subcriteria (numerically and proportionally) for Criterion 4. A conservative estimate of the total number of staging birds of these four populations is 450,000.

11. Wetland Types *:

List the wetland types present (see Annex 2). List the wetland types in order of their area in the Flyway Network site, starting with the wetland type with the largest area.

The wetland habitats on the outer Yukon-Kuskokwim Delta are diverse and complex. To date, that complexity has prevented the completion of the National Wetland Inventory for this area, despite efforts over the last two decades. We currently do not have habitat mapping at the scale and resolution that would allow us to quickly and reasonably estimate the area of each of the wetland types within the site under the Ramsar Classification System. Instead we simply list the

various wetland types to demonstrate the diversity of this area; they appear in the order in which they are listed in Annex 2:

Marine/Coastal Wetlands	Inland Wetlands
Permanent shallow marine waters	Permanent rivers/streams/creeks
Marine subtidal aquatic beds	Permanent freshwater lakes
Rocky marine shores	Seasonal/intermittent freshwater lakes
Sand, shingle or pebble shores	Permanent freshwater marshes/pools
Estuarine waters	Non-forested peatlands
Intertidal mud, sand, or salt flats	Alpine wetlands
Intertidal marshes	Tundra wetlands
Coastal brackish/saline lagoon	Shrub-dominated wetlands
	Freshwater, tree-dominated wetlands
	Seasonal/intermittent/irregular rivers/streams/creeks.
	Seasonal/intermittent freshwater marshes/pools on inorganic soils

12. Jurisdiction *:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Ministry of Agriculture/Dept. of Environment, etc.

The entire area proposed for inclusion within the site network is administered by the Yukon Delta National Wildlife Refuge (U. S. Fish and Wildlife Service). As indicated under item 8, Native-owned lands within the described borders are not currently included.

13. Management authority *:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland and the title and/or name and email address/phone number of the person or persons in this office with direct responsibility for managing the wetland.

Kenneth Stahlnecker – Refuge Manager
Yukon Delta National Wildlife Refuge
807 Chief Eddie Hoffman Highway
P.O. Box 346
Bethel, AK 99559
USA

14. Bibliographical references *:

A list of key technical references relevant to the wetland, including management plans, major scientific reports, and bibliographies, if such exist. Please list Web site addresses dedicated to the site or which

prominently feature the site, and include the date that the Web site was most recently updated. When a large body of published material is available about the site, only the most important references need be cited, with priority being given to recent literature containing extensive bibliographies.

Dau, C. P., and E. J. Mallek. 2011. Aerial survey of emperor geese and other waterbirds in southwestern Alaska, spring 2010. Unpubl. U. S. Fish and Wildlife Service report, Anchorage and Fairbanks, Alaska.

Fischer, J. B., R. A. Stehn, and G. Walters. 2010. Nest population size and potential production of geese and spectacled eiders on the Yukon-Kuskokwim Delta, Alaska, 1985-2010. Unpubl. U. S. Fish and Wildlife Service report, Anchorage, Alaska.

Fischer, J. B., R. A. Stehn, and G. Walters. 2011. Nest population size and potential production of geese and spectacled eiders on the Yukon-Kuskokwim Delta, Alaska, 1985-2011. Unpubl. U. S. Fish and Wildlife Service report, Anchorage, Alaska.

Gill, R. E., Jr., and C. M. Handel. 1981. Shorebirds of the Eastern Bering Sea, pp. 719-738. *In* D. W. Hood and J. A. Calder, eds. Eastern Bering Sea Shelf; Oceanography and Resources Vol. 2. Office of Marine Pollution Assessment. NOAA. Distributed by U. of Washington Press, Seattle, Washington.

Gill, R. E., Jr., and C. M. Handel. 1990. The importance of subarctic intertidal habitats to shorebirds: a study of the central Yukon-Kuskokwim Delta, Alaska. Condor 92:709-725.

Gill, R. E., Jr., and B. J. McCaffery. 1999. Bar-tailed Godwits *Limosa lapponica* in Alaska: a population estimate from the staging grounds. Wader Study Group Bull. 88:49-54.

Handel, C. M., and R. E. Gill, Jr. 2010. Wayward youth: Trans-Beringian movement and differential southward migration by juvenile sharp-tailed sandpipers. Arctic 63:273-278.

Mallek, E. J., and D. J. Groves. 2010. Alaska – Yukon Waterfowl Breeding Population Survey. Unpubl. U.S. Fish and Wildlife Service report, Fairbanks and Juneau, Alaska.

McCaffery, B. J. 1996. The status of Alaska's large shorebirds: A review and an example. International Wader Studies 8:28-32.

McCaffery, B. J., J. Bart, C. Wightman, and D. Kreuper. *In Press* (2012). Shorebird surveys in western Alaska. Chapter 3 *in* Arctic shorebirds in North America: a decade of monitoring (J. Bart and V. H. Johnston, Eds). Studies in Avian Biology Series (Vol. 44), University of California Press, Berkeley, CA.

Morrison, R. I. G., B. J. McCaffery, R. E. Gill, S. K. Skagen, S. L. Jones, G. W. Page, C. L. Gratto-Trevor, and B. A. Andres. 2006. Population estimates of North American shorebirds, 2006. Wader Study Group Bulletin 111:67-85.

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Platte, R. M., and R. A. Stehn. 2011. Abundance and trend of waterbirds on Alaska's Yukon-Kuskokwim Delta Coast based on 1988 to 2010 aerial surveys. Unpubl. U. S. Fish and Wildlife Service report, Anchorage, Alaska.

Stephensen, S. W., and L. Kondratyeva. 2001. The Beringian seabird colony catalog. U. S. Fish and Wildlife Service, Office of Migratory Bird Management, Anchorage, Alaska.

U. S. Fish and Wildlife Service, 2002. Steller's Eider Recovery Plan. Fairbanks, Alaska.

Warnock, N. D., and R. E. Gill, Jr. 1996. Dunlin (*Calidris alpina*). *In* The Birds of North America , No. 203 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.

15. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

The dominant feature of the site is the abundance and diversity of wetlands occurring on the combined deltas of Alaska's two largest rivers, the Yukon and the Kuskokwim. Flooding, tidal action, thermokarst processes, riparian erosion and sedimentation, siltation, and variable precipitation patterns combine to produce a complex mosaic of wetland communities.

16. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

"The landscape is dominated by low-lying wetlands, but uplands and mountains are found along the northern, eastern, and southern borders of the refuge. The southern extension of the Nulato Hills is located near the refuge's northern boundary. Rising from 1,000 to 3,000 feet in elevation, these rounded hills are the western extension of this large geographic feature. The Askinuk Mountains are located along the refuge's western coast, immediately south of Scammon Bay. This range covers an area 10 by 40 miles in size and is the only part of the coastal plain that has been glaciated. The Kusilvak Mountains are located approximately 40 miles west of the village of St. Mary's and southeast of Nunavaknuk Lake. Rising 2,300 feet, they extend for eight miles from north to south, and five miles east to west. The Ingakslugwat Hills, north of Baird Inlet, are a group of small volcanic cones, lava flows, and craters, with the tallest reaching 650 feet. These hills may be one of the most recently active volcanic areas on the Delta. The Kilbuck Mountains are the southern extension of the Kuskokwim Range. Located in the southeast part of the refuge, they range from 2,000 to 4,000 feet elevation."

Source: USFWS, 2004, Land Conservation Plan, Yukon Delta National Wildlife Refuge

17. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

(See Section11.)

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Flyway Network site, and the ecosystem services of the site and the benefits derived from them.

(See Section 15.)

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the SIS.*

(Please add here the species which do not come under sec no 14)

Refuge vegetation is primarily subarctic tundra, underlain by permafrost, supporting a variety of scrub, peatland, heath meadow, marsh, and bog habitats. Tall scrub and forest habitats are found in the eastern interior areas, while alpine tundra occurs in the mountainous areas at higher elevations. Less than five percent of the refuge is forested. Narrow bands of riparian, black spruce hardwood, mixed black spruce-balsam poplar, and balsam poplar woodlands extend onto the delta along the Yukon and Kuskokwim Rivers and their tributaries. In addition, pockets of black spruce and white spruce are interspersed throughout the Kilbuck Mountains and the southern Nulato Hills. None of the wooded areas contain timber suitable for commercial harvest.

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 10. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the SIS.*

(Please add here the species which do not come under sec no 14)

Fish – Waters within the boundary, including the coastal Bering Sea, provide habitat for at least 40 species of fishes. The Yukon and Kuskokwim rivers support regionally and internationally significant salmon fisheries. Waters flowing through the refuge contribute substantially to the commercial and/or subsistence harvests of chinook, chum, coho and sockeye salmon in Kuskokwim Bay, Norton Sound, and the lower Yukon and Kuskokwim rivers. Yukon-Kuskokwim origin salmon also contribute to the commercial harvests (harvested incidentally in the sockeye fishery) in the Area M and False Pass fisheries of the Alaska Peninsula and bycatch from the North Pacific groundfish fisheries. Sheefish, several species of whitefish, Alaska blackfish, burbot, northern pike, Dolly Varden, rainbow trout, and grayling are important resident

freshwater species found on the refuge. Near-shore ocean habitats harbor Pacific herring, halibut, tomcod and starry flounder.

Marine Mammals – Several species of marine mammals use the coastal lands and near-shore waters of the refuge. Some provide a vital subsistence resource for coastal villages. Pacific walruses, spotted seals, ringed seals, and Pacific bearded seals are hunted on the ice in spring, and seals are hunted in bays and estuaries during the summer. Harbor and Dall porpoises, northern fur and harbor seals, and beluga, fin, gray, killer, and minke whales also inhabit near-shore waters.

Large Mammals – Historically, caribou were abundant on the Yukon- Kuskokwim Delta. During their peak in the 1860's, they were found throughout the refuge, even crossing the pack ice to reach Nunivak Island. From the 1860s to 1990s, caribou nearly disappeared from the area, with remnant herds using the Kilbuck Mountains and the southern Nulato Hills. In the 1990s, tens of thousands of the Mulchatna Caribou Herd began crossing west through the Kilbuck mountains and entering portions of the lower Kuskokwim River on an annual basis. Recently, the number of caribou in this herd has declined markedly. Moose were rare on the delta prior to 1950. Populations are still very low over many portions of the refuge, but are increasing along the Yukon River and have reached their highest densities along the lower Yukon River below Mountain Village. This area supports one of the highest moose densities in the state. Wolves are present in low densities in the northern and eastern parts of the refuge. Small numbers of lynx occur in riparian areas in the Yukon drainage and along major river corridors in the eastern portion of the refuge. Both black and brown bears use the refuge. Brown bears are most common in the Nulato Hills and the Kilbuck mountains Black bears can be found in the forests and riparian corridors in both the Yukon and Kuskokwim drainages.

Threatened or Endangered Species – There are four threatened or endangered species currently or historically known to use the refuge. Historically, the Eskimo curlew used the tundra near St. Michael during the spring and fall. However, this species has not been documented in Alaska since the 19th century. Small numbers of endangered Steller sea lions haul out on the rocks at Cape Romanzof and on Nunivak Island, near the northern extent of their range. Only a small part of the Steller's eider Pacific population, at most a few thousand pairs, breeds in Alaska, with the majority continuing on to Russia. However, the waters adjacent to the refuge are extremely important to a large portion of the population. Each spring, tens of thousands of eiders stage on the Kuskokwim Shoals along the refuge's southern coastline prior to moving to their arctic breeding grounds. Each fall, tens of thousands migrate south past Cape Romanzof, with several thousand stopping at the Kuskokwim Shoals and along the shoreline of Nunivak Island to molt.

Spectacled eiders historically nested along much of the western coast of Alaska. From the 1970's to the 1990's, the breeding population on the Yukon-Kuskokwim Delta declined by more than 96%. Currently, the delta is one of three primary nesting areas. Only about 5,000 pairs nest there today.

21. Social, economic and cultural values:

a) Describe if the site has any general social, economic and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

"The delta has approximately 25,000 residents. 85% of these are Alaska Natives, both Yupik Eskimos and Athabaskan Indians. The main population center and service hub is the city of Bethel, with a population of around 6,000. Bethel is surrounded by 49 smaller villages, with the largest villages consisting of over 1,000 people. Most residents live a traditional subsistence lifestyle of hunting, fishing, and gathering, and over 30 percent have cash incomes well below the U.S. federal poverty threshold. The area has virtually no roads; travel is by Bush plane, or by river boats in summer and snow machines in winter."

Source: Wikipedia

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? (Double-click the checkbox to check and choose "Checked" under "Default Value" from "Check Box Form Field Options" window)

"The Y-K Delta is rich in subsistence resources, which explains the cultural persistence of indigenous groups. The area is, however, poor in terms of formal employment. There are few jobs except those provided by village schools and administrative offices. Cash is critical for a subsistence way of life because people need it to purchase gas and equipment to go out on the land. Gasoline can cost $8.00 per gallon and this restricts the range and frequency of hunting and fishing trips. Subsistence activities are also shaped by the geography of the Y-K Delta. Coastal communities rely more heavily on marine resources such as seals and herring while inland villages depend mostly on salmon and moose. There is customary barter and exchange among villages as those near the coast trade seal oil for dried salmon with interior villages. Seasonality also plays a role as certain fish and game are available only at specific times of year due to migration patterns. Thus, there is a seasonal calendar for hunting, fishing, and gathering. If a village is unable to catch enough salmon during the summer

when these anadromous fish travel upstream to spawn, it makes up for this deficit by harvesting more whitefish in the winter."

Source: Argetsinger and West. 2009. Yupiit Subsistence in Western Alaska: The Intersection of Formal and Local Institutions. Ecological and Environmental Anthropology, Vol. 5, No. 1.

If yes, tick the box ❑ and describe this importance under one or more of the following categories:

I. Sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland: ☐
II. Sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland: ☐
III. Sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples: ☐
IV. Sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland: ☐

22. Land tenure/ownership:

Of the more than 26 million acres of land and water within the Yukon Delta boundary, private landowners have title or claims to several million acres.

Source: USFWS, 2004, Land Conservation Plan, Yukon Delta National Wildlife Refuge

23. Current land (including water) use:

All lands proposed for inclusion as a EAAFP network site are located on the National Wildlife Refuge. Land and water resources are primarily left in their wild state. The purposes of the refuge, as stated in the Alaska National Interest Lands Conservation Act, include: "to conserve fish and wildlife populations and habitats in their natural diversity, including, but not limited to shorebirds, seabirds, tundra swans, emperor, white-fronted and Cackling Geese, black brant and other migratory birds, salmon, muskox, and marine mammals; to fulfill treaty obligations; to provide the opportunity for continued subsistence uses; and to ensure water quality and necessary water quantity."

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

(See Section 23.)

25. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Flyway Network site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

The site is designated a National Wildlife Refuge, a unit within a US national system of more than 500 designated by the US Government. It is land set aside in perpetuity for its wildlife value. Unless changed by the US Congress, its status and purpose will remain as such.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate, see Annex 3):

Ia ☐; Ib ☐; II ☐; III ☐; IV ☐; V ☐; VI ☐; N/A ☐

c) Does an officially approved management plan exist; and is it being implemented?:

If yes, is it being implemented?: If no, is one being planned?

d) Describe any other current management practices:

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

N/A

27. Current scientific research and facilities:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Numerous field studies occur annually by Refuge staff, other FWS personnel, U. S. Geological Survey researchers, University professors and students. The National Wildlife Refuge manager oversees the permit program that tracks activities occurring on those lands. Well over 100 papers have been published on the ecological and cultural values of the resources managed on this refuge.

28. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

The National Wildlife Refuge employs staff to work with local communities to enhance public awareness of the operation of the refuge. The refuge headquarters houses a visitor center that depicts not only the wildlife that inhabit the region, but a historical perspective on the use of the refuge by the Yup'ik Eskimo population in the area. There is a small museum that exhibits wildlife, interprets the uniqueness of tundra and includes a relief map showcasing the expanse and ecological diversity of the refuge. A small sales outlet of the *Alaska Geographic Association* is available with wildlife-related educational and interpretive products.

The environmental education program on the refuge is focused mainly upon introducing and sharing wildlife curricula with the schools and residents in the many villages that are located in and around the refuge. Many of the educational materials produced are culturally inclusive to better serve the Yup'ik populations in these villages. The headquarters office has a conference room that is used for viewing films during the work week and on Saturday afternoons.

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Hunting

All refuge lands are open to all hunting consistent with state and federal regulations. A State of Alaska hunting license is required for all hunting activities on the refuge. Opportunities for big game hunting are limited because of low populations, reflective of the available habitat on the refuge for these species. Several big game guides do provide opportunities for bear, caribou, and muskox hunting. Waterfowl hunting is allowed with appropriate State and Federal Duck Stamps along with a State of Alaska hunting license.

Fishing

Subsistence fishing far exceeds sport fishing use throughout the refuge, although all of Yukon Delta's waters are open to fishing consistent with state and federal regulations. A State of Alaska fishing license is required to fish on the refuge. Several rivers provide angling opportunities for all five North American species of Pacific salmon, rainbow trout, grayling and other species. Aircraft, power-boats and river rafts are the most common vehicles for accessing the refuge to fish.

Trapping

Refuge lands are open to trapping of furbearing animals consistent with state and federal regulations. Appropriate State of Alaska trapping licenses are required.

Wildlife Observation & Photography

Although there are many opportunities for observing and photographing wildlife on the refuge, this almost always involves expensive travel from the hub village of Bethel. Muskox and reindeer occur on Nunivak Island; the coastal portions of the refuge support large concentrations of waterfowl and shorebirds; inland river corridors provide habitat for moose and black bears; and the Kilbuck mountains are home to brown bear, caribou, and occasionally wolves. However, visitors must realize that locating these species can be both expensive and time consuming on this large and remote refuge. For more information about visiting the refuge contact the office or visit the *Alaska Geographic* online bookstore.

30. Threats *:

Which of the following threats is present historically – when the threat stopped but the effects are still there (H), currently (C) or potentially (P)?

	Historically	Currently	Potentially
Residential and commercial development			
housing and urban areas	☐	☐	☐
commercial and industrial areas	☐	☐	☐
tourism and recreation areas	☐	☐	☐
Agriculture and aquaculture			
annual and perennial non-timber crops	☐	☐	☐
wood and pulp plantations	☐	☐	☐
livestock farming and ranching	☐	☐	☐
marine and freshwater aquaculture	☐	☐	☐
Energy production and mining			
oil and gas drilling	☐	☐	☐
mining and quarrying	☐	☐	☐
renewable energy	☐	☐	☐
Transportation and service corridors			
roads and railroads	☐	☐	☐
utility and service lines	☐	☐	☐

shipping lanes	☐	☐	☐
flight paths	☐	☐	☐
Biological resource use			
hunting and collecting terrestrial animals	☐	☐	☐
gathering terrestrial plants	☐	☐	☐
logging and wood harvesting	☐	☐	☐
fishing and harvesting aquatic resources	☐	☐	☐
Human intrusions and disturbance			
recreational activities	☐	☐	☐
war, civil unrest and military exercises	☐	☐	☐
work and other activities	☐	☐	☐
Natural system modifications			
fire and fire suppression	☐	☐	☐
dams and water management/use	☐	☐	☐
other ecosystem modifications	☐	☐	☐
Invasive and other problematic species and genes			
invasive non-native/alien species	☐	☐	☐
problematic native species	☐	☐	☐
introduced genetic material	☐	☐	☐
Pollution			
household sewage and urban waste water	☐	☐	☐
industrial and military effluents	☐	☐	☐
agricultural and forestry effluents	☐	☐	☐
garbage and solid waste	☐	☐	☐
air-borne pollutants	☐	☐	☐
excess energy	☐	☐	☐
Geological events			
volcanoes	☐	☐	☐
earthquakes/tsunamis	☐	☐	☐
avalanches/landslides	☐	☐	☐

Climate change and severe weather			
habitat shifting and alteration	☐	☐	☐
droughts	☐	☐	☐
temperature extremes	☐	☐	☐
storms and flooding	☐	☐	☐

Please write here any additional threats and comments/queries you have on the threats.

Annex 1: Criteria for the inclusion of sites in the Flyway Site Network

(From the Partnership Text)

To be considered for inclusion in the Flyway Site Network, this Partnership adopts the following criteria:

a. Convention on Wetlands (Ramsar, Iran, 1971) criteria for internationally important sites for migratory waterbirds. That is:

   Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.

   Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.

   Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

b. The staging criteria as applied under the Asia - Pacific Migratory Waterbird Conservation Strategy. That is:

   i. A staging site should be considered internationally important if it regularly supports 0.25% of individuals in a population of one species or subspecies of waterbirds on migration.

   ii. A staging site should be considered internationally important if it regularly supports 5,000 or more waterbirds at one time during migration.

c. Under exceptional circumstances a site can be nominated if it supports migratory waterbirds at a level or stage of their life cycle important to the maintenance of flyway populations. Justification of such nominations will be considered by the Partnership on a case by case basis.

Annex 2: Ramsar Classification System for Wetland Type

The codes are based upon the Ramsar Classification System for Wetland Type as approved by Recommendation 4.7 and amended by Resolutions VI.5 and VII.11 of the Conference of the Contracting Parties. The categories listed herein are intended to provide only a very broad framework to aid rapid identification of the main wetland habitats represented at each site.

To assist in identification of the correct Wetland Types to list in section 19 of the RIS, the Secretariat has provided below tabulations for Marine/Coastal Wetlands and Inland Wetlands of some of the characteristics of each Wetland Type.

Marine/Coastal Wetlands

A -- **Permanent shallow marine waters** in most cases less than six metres deep at low tide; includes sea bays and straits.

B -- **Marine subtidal aquatic beds**; includes kelp beds, sea-grass beds, tropical marine meadows.

C -- **Coral reefs**.

D -- **Rocky marine shores**; includes rocky offshore islands, sea cliffs.

E -- **Sand, shingle or pebble shores**; includes sand bars, spits and sandy islets; includes dune systems and humid dune slacks.

F -- **Estuarine waters**; permanent water of estuaries and estuarine systems of deltas.

G -- **Intertidal mud, sand or salt flats**.

H -- **Intertidal marshes**; includes salt marshes, salt meadows, saltings, raised salt marshes; includes tidal brackish and freshwater marshes.

I -- **Intertidal forested wetlands**; includes mangrove swamps, nipah swamps and tidal freshwater swamp forests.

J -- **Coastal brackish/saline lagoons**; brackish to saline lagoons with at least one relatively narrow connection to the sea.

K -- **Coastal freshwater lagoons**; includes freshwater delta lagoons.

Zk(a) – **Karst and other subterranean hydrological systems**, marine/coastal

Inland Wetlands

L -- **Permanent inland deltas**.

M -- **Permanent rivers/streams/creeks**; includes waterfalls.

N -- **Seasonal/intermittent/irregular rivers/streams/creeks**.

O -- **Permanent freshwater lakes** (over 8 ha); includes large oxbow lakes.

P -- **Seasonal/intermittent freshwater lakes** (over 8 ha); includes floodplain lakes.

Q -- **Permanent saline/brackish/alkaline lakes**.

R -- **Seasonal/intermittent saline/brackish/alkaline lakes and flats**.

Sp -- **Permanent saline/brackish/alkaline marshes/pools**.

Ss -- **Seasonal/intermittent saline/brackish/alkaline marshes/pools**.

Tp -- **Permanent freshwater marshes/pools**; ponds (below 8 ha), marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.

Ts -- **Seasonal/intermittent freshwater marshes/pools on inorganic soils**; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.

U -- **Non-forested peatlands**; includes shrub or open bogs, swamps, fens.

Va -- **Alpine wetlands**; includes alpine meadows, temporary waters from snowmelt.

Vt -- **Tundra wetlands**; includes tundra pools, temporary waters from snowmelt.

W -- **Shrub-dominated wetlands**; shrub swamps, shrub-dominated freshwater marshes, shrub carr, alder thicket on inorganic soils.

Xf -- **Freshwater, tree-dominated wetlands**; includes freshwater swamp forests, seasonally flooded forests, wooded swamps on inorganic soils.

Xp -- **Forested peatlands**; peatswamp forests.

Y -- **Freshwater springs; oases**.

Zg -- **Geothermal wetlands**

Zk(b) – **Karst and other subterranean hydrological systems**, inland

Note: "**floodplain**" is a broad term used to refer to one or more wetland types, which may include examples from the R, Ss, Ts, W, Xf, Xp, or other wetland types. Some examples of floodplain wetlands are seasonally inundated grassland (including natural wet meadows), shrublands, woodlands and forests. Floodplain wetlands are not listed as a specific wetland type herein.

Human-made wetlands

1 -- **Aquaculture** (e.g., fish/shrimp) **ponds**

2 -- **Ponds**; includes farm ponds, stock ponds, small tanks; (generally below 8 ha).

3 -- **Irrigated land**; includes irrigation channels and rice fields.

4 -- **Seasonally flooded agricultural land** (including intensively managed or grazed wet meadow or pasture).

5 -- **Salt exploitation sites**; salt pans, salines, etc.

6 -- **Water storage areas**; reservoirs/barrages/dams/impoundments (generally over 8 ha).

7 -- **Excavations**; gravel/brick/clay pits; borrow pits, mining pools.

8 -- **Wastewater treatment areas**; sewage farms, settling ponds, oxidation basins, etc.

9 -- **Canals and drainage channels, ditches.**

Zk(c) -- **Karst and other subterranean hydrological systems**, human-made

Annex 3: IUCN Protected Areas Categories System

IUCN protected area management categories classify protected areas according to their management objectives. The categories are recognised by international bodies such as the United Nations and by many national governments as the global standard for defining and recording protected areas and as such are increasingly being incorporated into government legislation.

Ia Strict Nature Reserve

Category Ia are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphical features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values.

Ib Wilderness Area

Category Ib protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.

II National Park

Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities.

III Natural Monument or Feature

Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.

IV Habitat/Species Management Area

Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.

V Protected Landscape/ Seascape

A protected area where the interaction of people and nature over time has produced an area of distinct charcter with significant, ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.

VI Protected area with sustainable use of natural resources

Category VI protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems.