Sea Duck Joint Venture
Annual Project Summary for Endorsed Projects
FY07 – (October 1, 2006 to Sept. 30, 2007)

Project Title: Identification of Beaufort Sea Migration Corridor for Sea Ducks

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Partners: ConocoPhillips, Canadian Wildlife Service, U.S. Fish and Wildlife Service, Sea Duck Joint Venture, Polar Continental Shelf Project.

Project Description: The development of offshore oil production facilities is currently underway in important waterbird migration corridors along the Alaskan Beaufort Sea coast, and more oil and gas development is expected both there and off the Canadian coast. The Beaufort Sea is used by hundreds of thousands of sea ducks, primarily Long-tailed Ducks, King Eiders and Pacific Common Eiders, traveling between wintering areas west of the continent and breeding areas in northern Alaska and Canada. Although there is some information on migration, little is known about the specific migration pathways and habitats used by the sea ducks. Hence, it is difficult to predict the degree of potential threat of expanded oil and gas development to these three sea duck species, all of which have experienced a population decline in recent years. Using satellite telemetry, this study is providing information about the location and timing of use of migration corridors, so that analysts can better predict and mitigate any adverse effects of offshore petroleum development on subject populations. The study is also providing information on affiliations between wintering, breeding and moulting grounds, thereby helping to define populations units. Such information is essential to effectively manage a harvested species.

In June, 2006 we implanted satellite transmitters in 20 Pacific Common Eiders near a nesting colony just east of Bathurst Inlet in central arctic Canada. We are currently still tracking the movement of 5 of those birds using Argos satellites.

To maximize the amount of information obtained on location of Pacific Common Eiders in relation to potential offshore development of petroleum reserves, satellite transmitters were programmed to transmit a location once every day (i.e. duty cycle of 4 h on and 24 h off) during both westward (moult/fall) and eastward (spring) migration across the Beaufort Sea.

Objectives: The primary objectives of the study are: 1) to determine specific migration routes and timing for the Canadian breeding populations of Pacific Common Eiders, 2) to document spatial relationships of migrating Pacific Common Eiders to pack ice, islands and other physical features in the Beaufort Sea, and 3) to identify wintering, staging and moulting areas, and their affiliation with specific breeding areas.

Other incidental benefits include: 1) identification of key marine areas and habitats for Pacific Common Eiders 2) collection of tissues to be used for genetics, stable isotope and contaminant analyses, 3) provision of information to develop more effective survey techniques to monitor the status of common eider populations.

Preliminary Results: In June of 2006, satellite transmitters were successfully implanted in 20 Pacific Common Eiders (10 male, 10 female) near their nesting colony at Nauyak Lake, Nunavut (68° 20.762' N; 107° 40.919' W: Fig. 1). No eiders died as a direct result of the transmitter implantation surgery. Nine males left the nesting area on moult migration in mid-July. The remaining male was still in Parry Bay when its transmitter stopped providing locations in late August. Four males migrated across the Beaufort Sea to moult along the northern coast of Russia (Fig. 2) while three others moulted off of Cape Parry and one male moulted in Bathurst Inlet (Fig. 3). One other male was shot on 10 August near Point Barrow, Alaska during its moult migration. Male moult migration across the Beaufort Sea was rapid and occurred between 16 July and 12 Aug. One male staged off Cape Bathurst for two weeks before continuing across the Beaufort, but overall moult migration across the Beaufort Sea was completed in less than a week. By contrast, all ten females remained within 40 km of the nesting colony to moult (Fig. 3).

Four males and ten females made a fall migration across the Beaufort Sea (Figs 4 and 5). All four males spent less than a week in the Beaufort Sea, crossing between 29 September and 7 October. The females crossed the Beaufort Sea between 17 October and 1 November. Most crossed in less than a week and made only brief stops although one female staged for five days in Harrison Bay along the Alaskan North Slope. All of the eiders had arrived on the wintering areas in the Bering Sea by early December (n=7 males and 10 females). Most were located off the southeast coast of Chukotsk Peninsula, but one female was off St Lawrence Island, while one male was wintering near Nunivak Island (Fig. 6).

By spring only 6 transmitters were still functioning (2 males, 4 females). All 4 females migrated eastward (Fig. 7) across the Beaufort Sea in late May and the first half of June, stopping for 12-18 days in the southeastern Beaufort Sea. Arrival back on the nesting grounds at Nauyak Lake occurred in the second half of June (Fig. 8). The 2 males that still had functioning transmitters in spring 2007 did not migrate eastward across the Beaufort Sea, but rather made short movements along the Russian coast (Fig. 9), presumably following females to other nesting colonies. Both males moulted along the Russian coast in 2007 and did not return to their moulting area from the year before (Fig. 10). All four females again moulted near the breeding grounds and 3 of 4 moulted in nearly the exact same location as 2006 (Fig. 10).

Project Status: Movement of Pacific Common Eiders tagged in June 2006 will be tracked until all transmitter batteries fail which according to the manufacturer will likely be in fall of 2007. Locations will be acquired once every three days until the batteries fail.

Next step will be to implant satellite transmitters in 20 to 30 King Eiders on Banks Island in spring 2008. As was done with the Pacific Common Eiders, we recommend programming the transmitters to provide daily locations during migration across the Beaufort Sea.

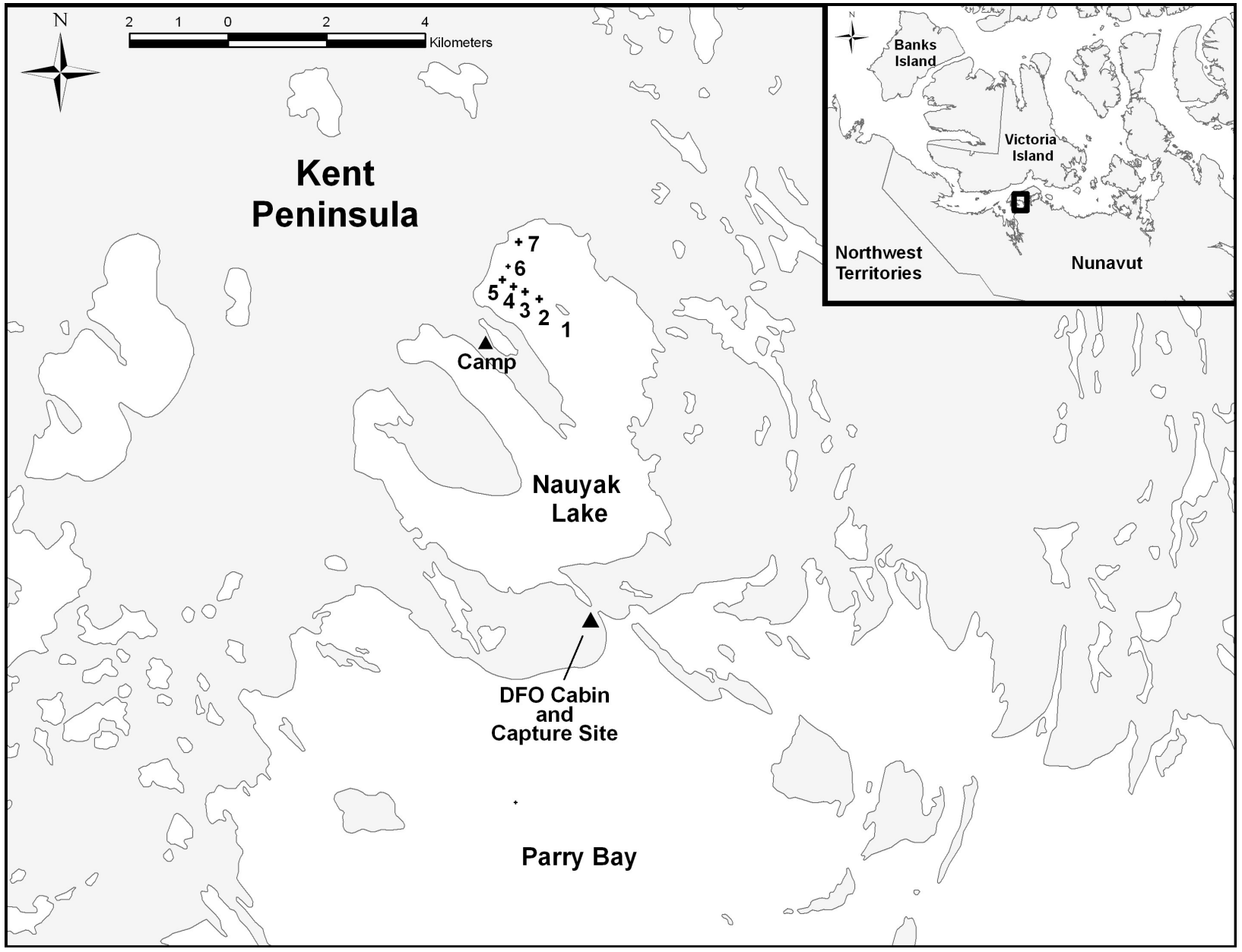

Figure 1. Location of Pacific Common Eider capture site and nesting colony (numbered islands) at Nauyak Lake, Nunavut.

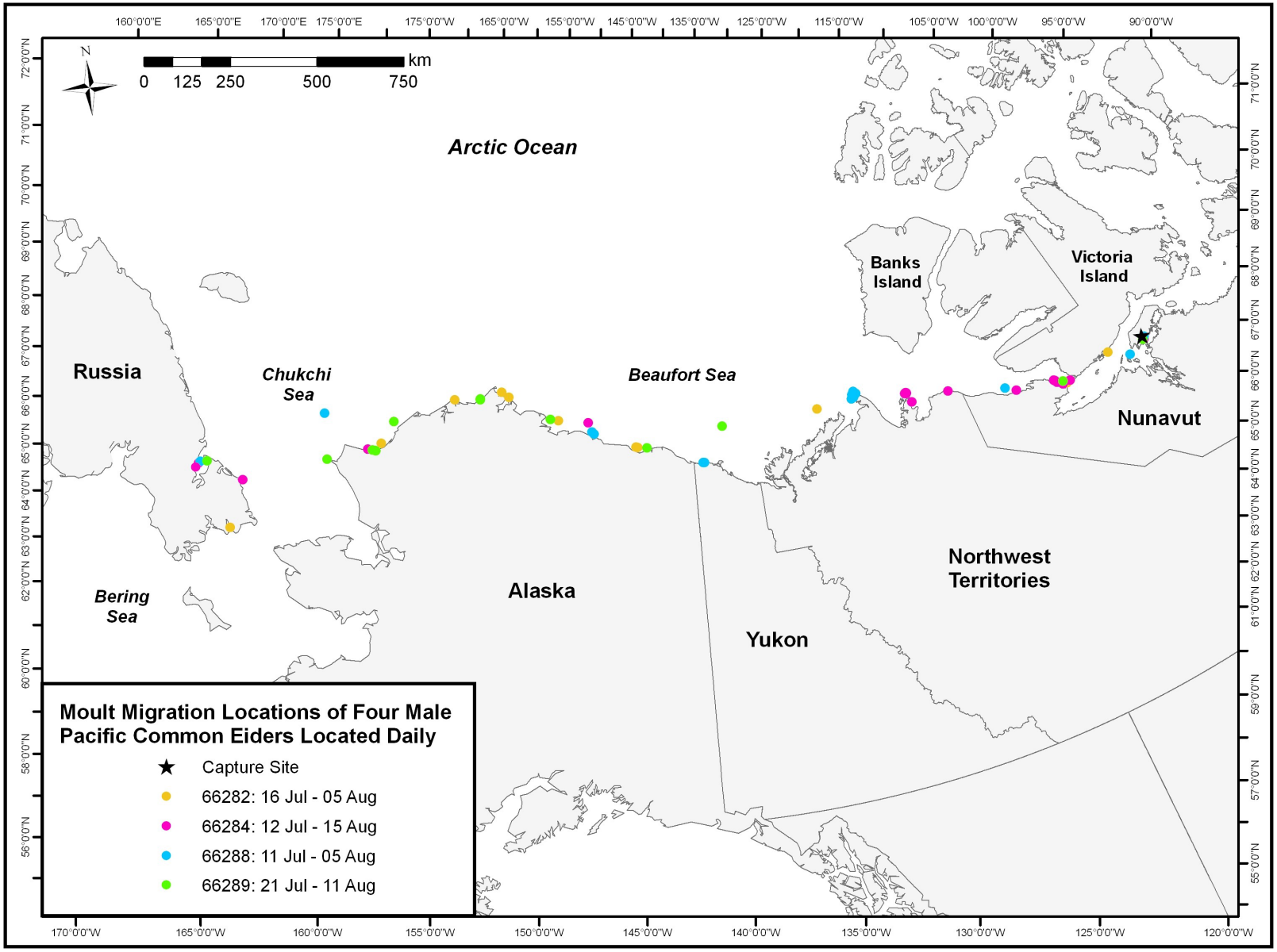

Figure 2. Locations during moult migration of the four male Pacific Common Eiders that moulted west of the Beaufort Sea. Dates include last day on nesting area near Nauyak Lake, NU and first day on moulting area.

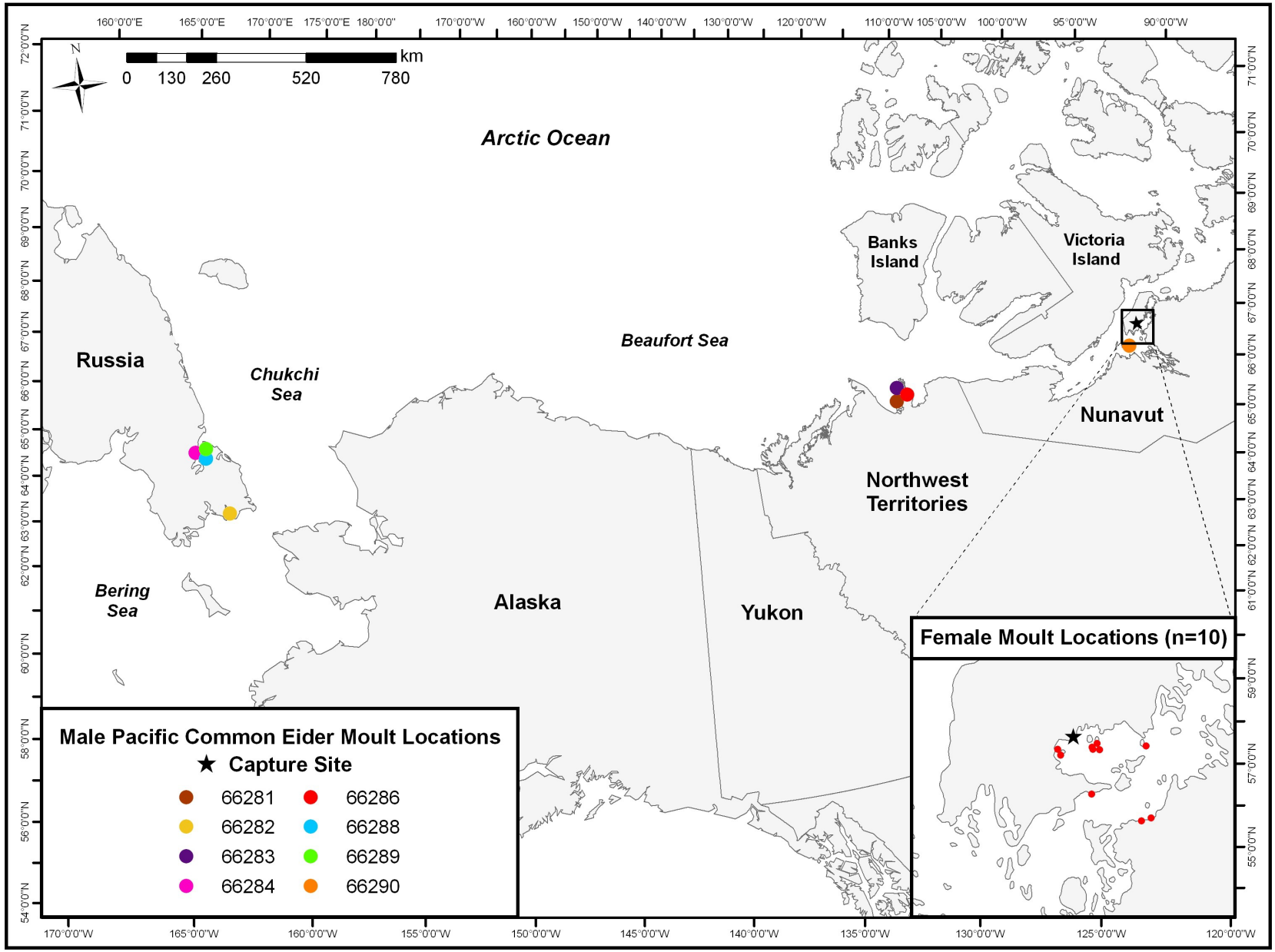

Figure 3. Location of moulting areas for 8 male and 10 female Pacific Common Eiders with satellite transmitters in 2006.

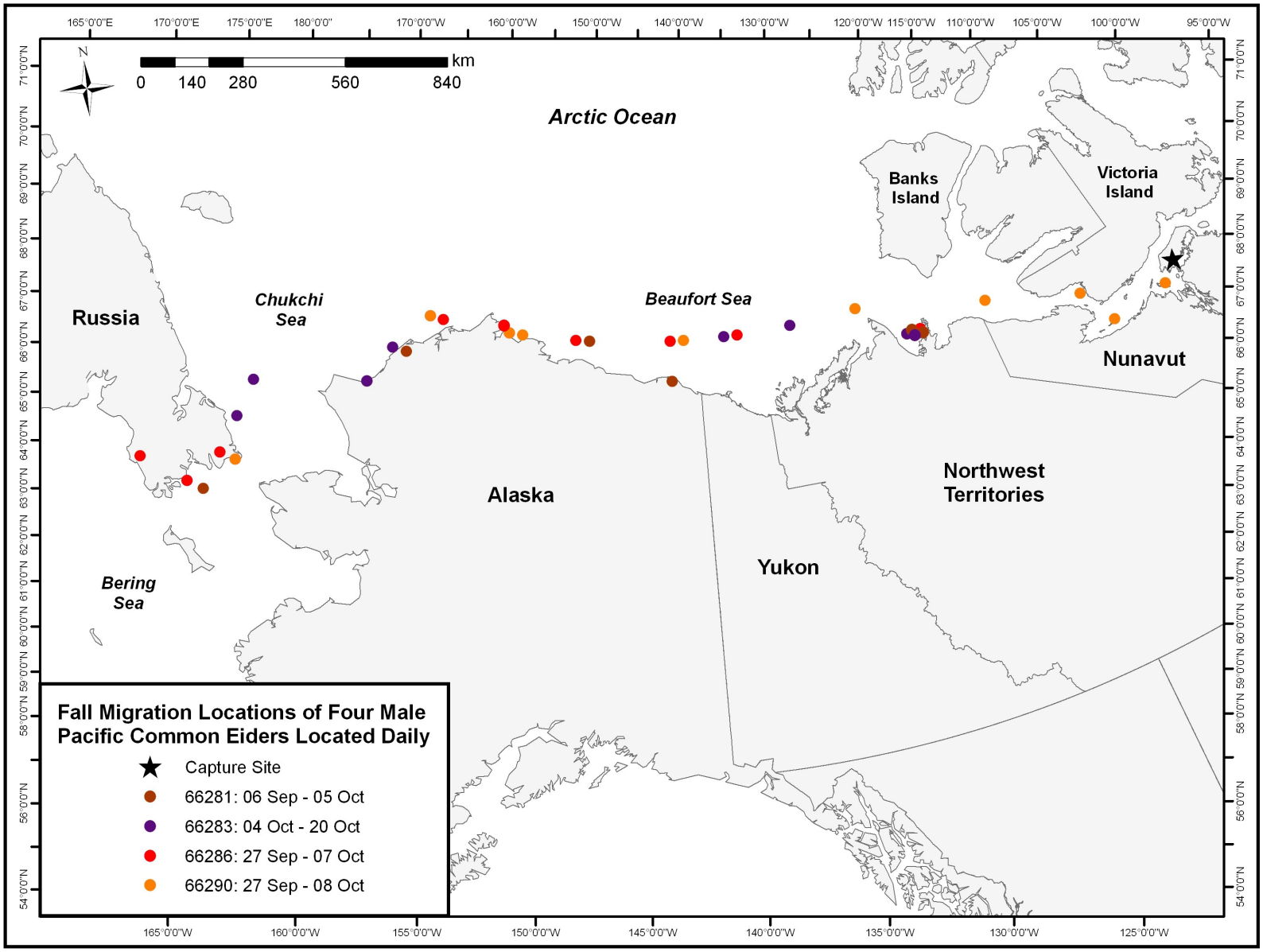

Figure 4. Fall migration locations for the 4 male Pacific Common Eiders that moulted east of the Beaufort Sea in 2006. Dates include last day on the moulting area and first day on the wintering area.

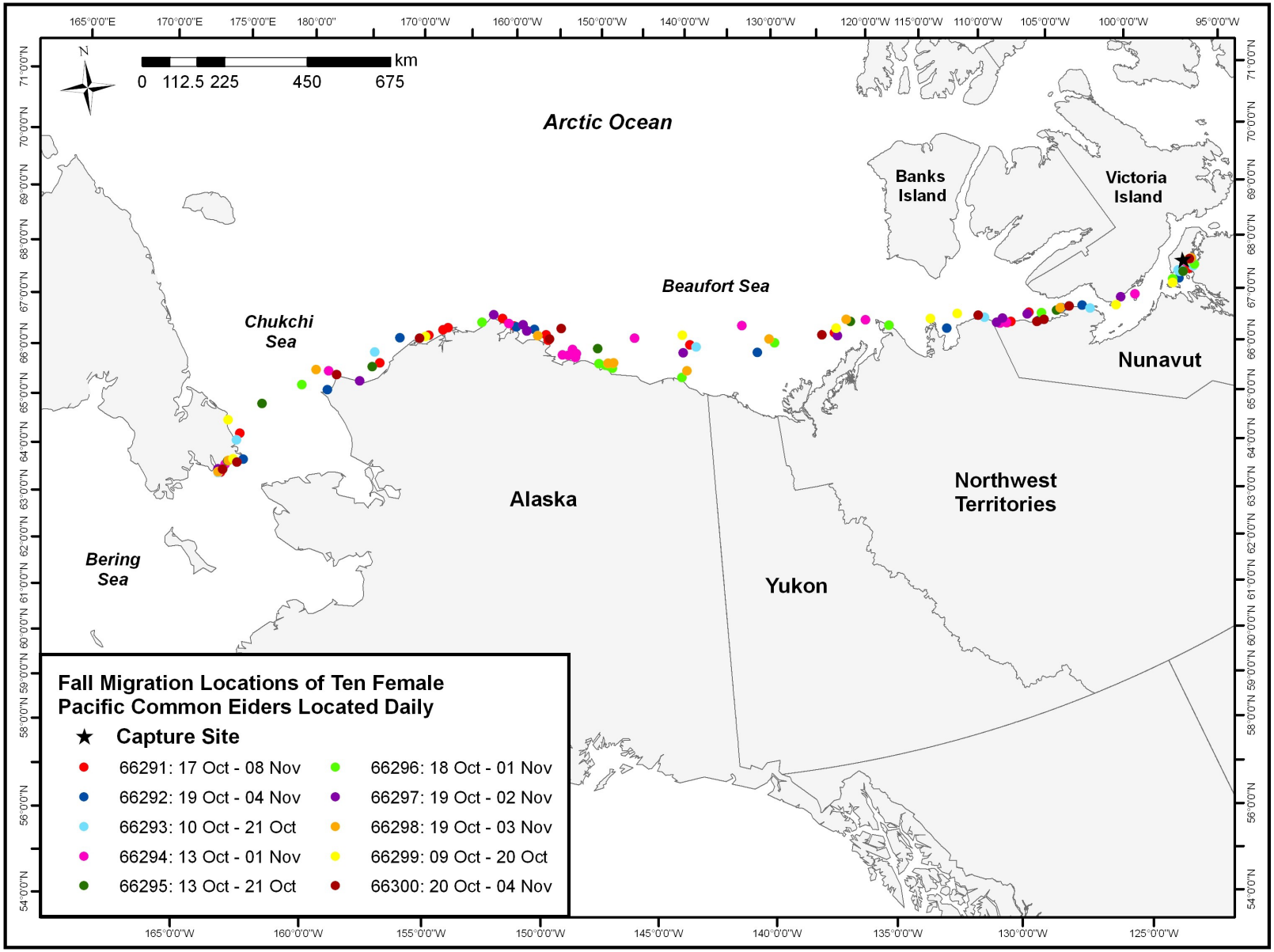

Figure 5. Locations of 10 female Pacific Common Eiders with satellite transmitters during fall migration in 2006. Dates include last day on the moulting area and first day on the wintering area.

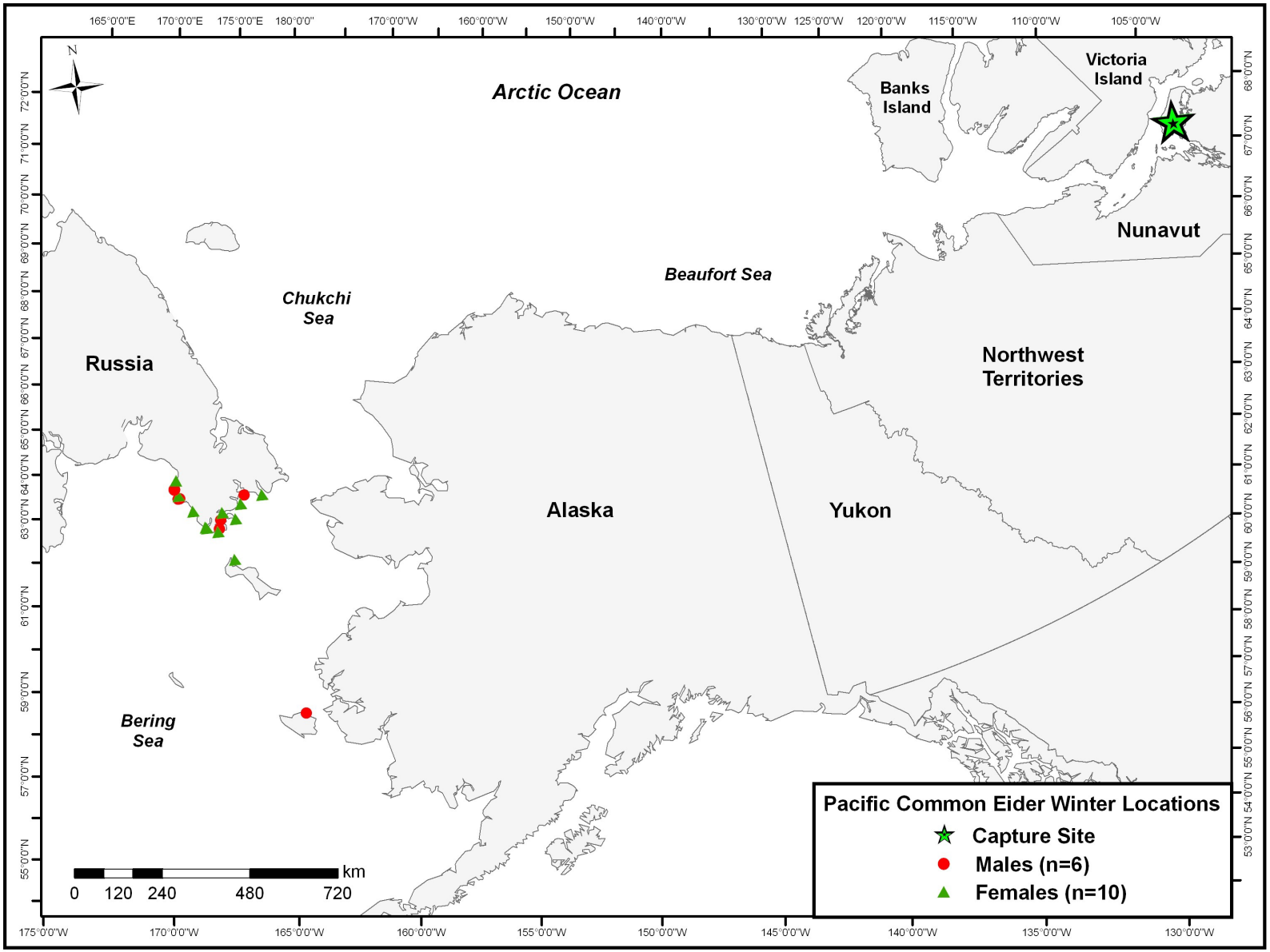

Figure 6. Mid-December 2006 locations of 6 male and 10 female Pacific Common Eiders with satellite transmitters on the wintering area.

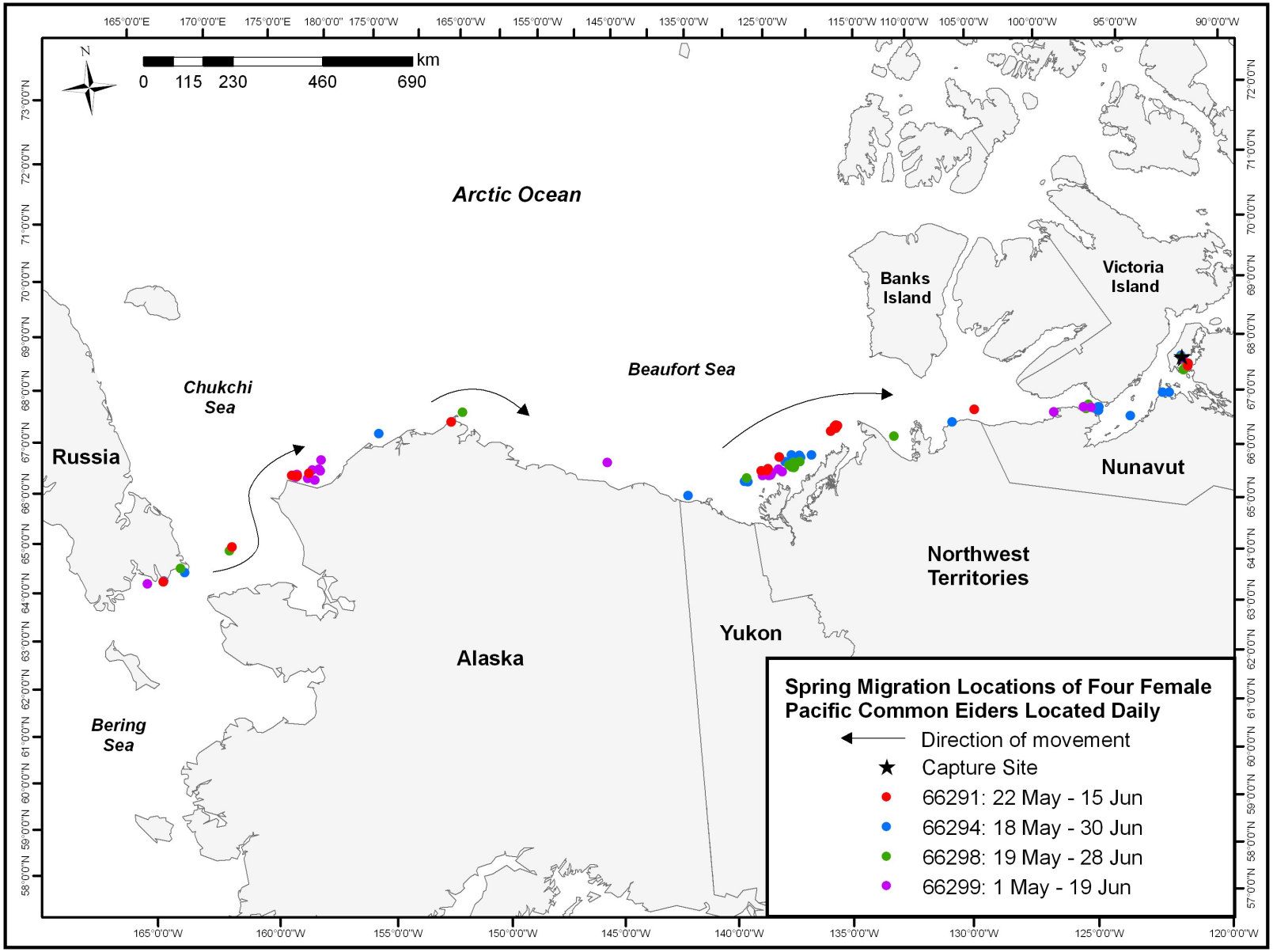

Figure 7. Locations of 4 female Pacific Common Eiders with satellite transmitters during spring migration in 2007. Dates include last day on the wintering area and first day on the nesting area.

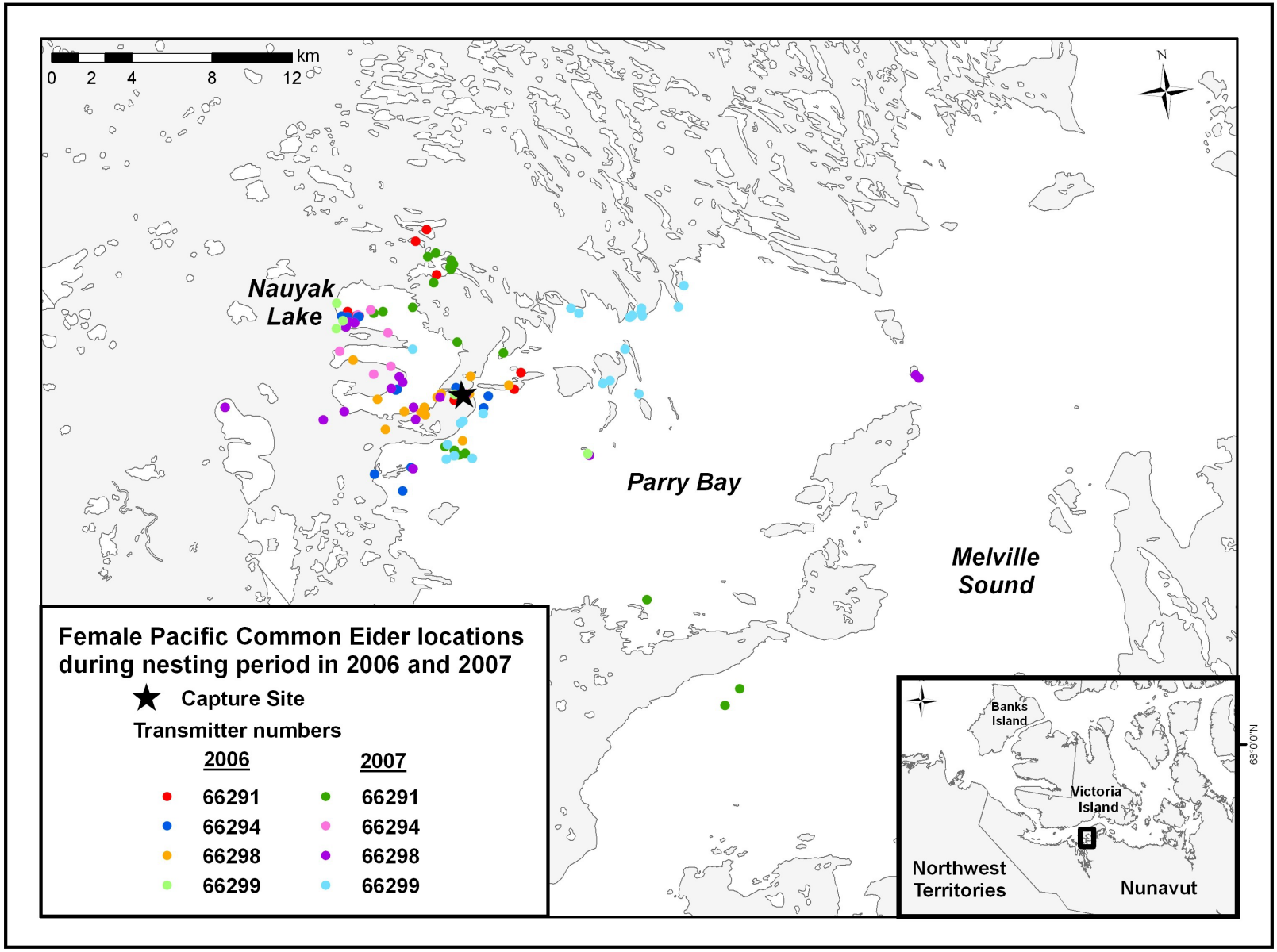

Figure 8. Locations of four female Pacific Common Eiders with satellite transmitters during the nesting period in 2006 and 2007.

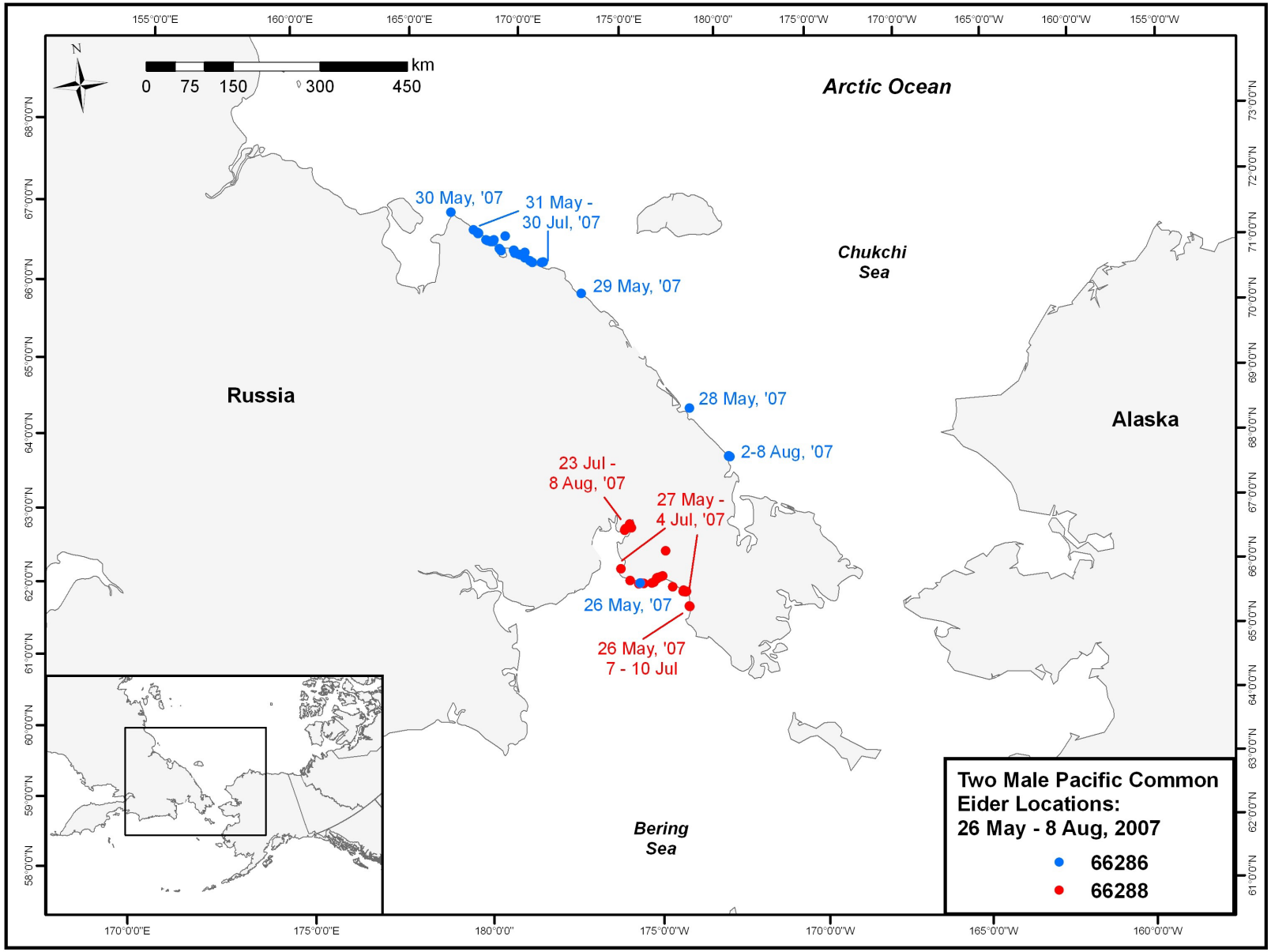

Figure 9. Locations of two male Pacific Common Eiders with satellite transmitters from late May through to early August, 2007.

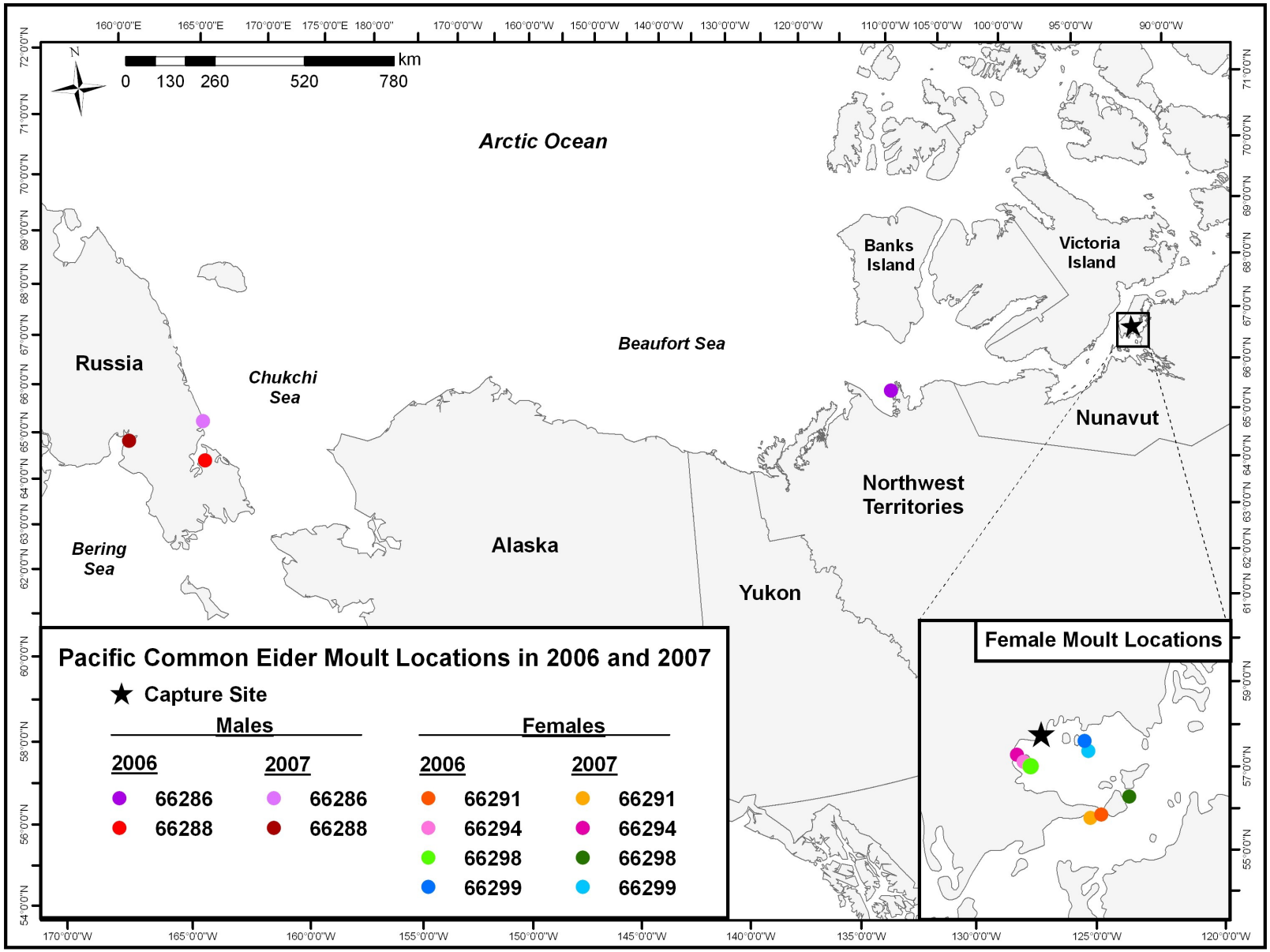

Figure 10. Between year comparison of moulting areas used by 2 male and 4 female Pacific Common Eiders in 2006 and 2007.