Canada Geese Surveys at Nestucca, Nehalem, and Tillamook Bays, Oregon Winter 2013-14

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EXECUTIVE SUMMARY

Six subspecies of Canada geese winter in Tillamook County, Oregon, including delisted Aleutian Canada geese and dusky Canada geese (a species of special concern). The U.S. Fish and Wildlife Service established the Nestucca Bay National Wildlife Refuge in 1991, in part, to protect and enhance habitat for these geese subspecies. Private landowners within the authorized refuge boundary have also committed to protecting short grass habitat for the mutual benefit of the dairy industry and wildlife. Personnel with the Oregon Coast National Wildlife Refuge Complex conducted a weekly census from 21 October 2013 to 24 April 2014 to document numbers and distribution of wintering and migrating Canada geese at Nestucca Bay, Oregon. A comparison of the daily mean number of individual Canada geese counted each year show a steady overall increase since 2002. The number of geese counted at Nestucca Bay during winter 2013-14 ranged from 6 to 7,353 with a daily mean of 4,596 individual birds. The daily mean number of dusky, Aleutian, Taverner's/lesser, cackling, and western was 1,320, 1,096, 1,078, 996, and 63 individual birds respectively. The largest concentration of geese was observed on the Nestucca Bay National Wildlife Refuge with a daily mean of 1,540 individual birds. Oregon Department of Fish and Wildlife personnel conducted goose counts at Nehalem and Tillamook bays and in some cases their surveys were conducted the same day as U.S. Fish and Wildlife Service surveys at Nestucca Bay. The number of geese ranged from 40 to 1,404 at Nehalem and Tillamook bays. The daily mean number of cackling, Taverner's/lesser, Aleutian, western, and dusky was 233, 110, 35, 10, and 8 birds respectively. The daily mean number of individual birds counted of all subspecies combined during the entire sample period was 399. In comparison, fewer birds were observed at Nehalem and Tillamook bays than Nestucca Bay. The maximum total number of geese counted on a single day at Nestucca, Nehalem, and Tillamook bays combined during winter 2013-14 was 7,536 individual birds. Also, a special monitoring effort to document the presence of previously marked Semidi Islands Aleutian Canada geese was conducted by U.S. Fish and Wildlife Service personnel at Nestucca Bay. Fifteen of seventy-eight green-collared Semidi Islands Aleutian Canada geese marked during summer 2008 were resighted. An additional 1 marked Semidi Islands bird with red collar or tarsal band affixed prior to 2008 was also resighted. Marked Semidi Islands birds were observed at the "Pacific City monitoring site" which includes the Semidi Unit (former owner Martella) of Nestucca Bay National Wildlife Refuge, the adjacent Ben Hurliman property near Pacific City, and nearby Nick Hurliman property in Woods. Green-collared Semidi Islands birds were observed at Pacific City and none were documented in Tillamook or Nehalem bays. Cooperative efforts between private landowners, state and federal agencies, along with new land acquisition and future monitoring, will aid in management of Canada geese in Tillamook County.

INTRODUCTION

The majority of pasturelands that surround Nestucca, Nehalem, and Tillamook bays are in private ownership and used primarily to support local dairy farms. These pastures are also important habitat and highly desired by wintering and migrating geese as a food resource. The U.S. Fish and Wildlife Service (USFWS) established the Nestucca Bay National Wildlife Refuge (Refuge) at Nestucca Bay, specifically to provide a safe haven for Canada geese. The Refuge was established in 1991 with purposes to (1) protect wintering habitat for Aleutian Canada geese, listed as federally endangered at the time but now delisted, (2) protect wintering habitat for dusky Canada geese, a federal species of concern, and (3) protect diverse coastal wetland and upland habitat buffers for a variety of waterfowl, shorebirds, marine mammals, raptors, songbirds, anadromous and resident fishes, and other wildlife, including endangered species (USFWS 1990, USFWS 2000, USFWS 2012a, USFWS 2013a). The Refuge currently consists of 1,203 acres, of which 346 acres are actively managed as pasture habitat for wintering geese. The Nestucca Bay Landowners Association has cooperated under a Memorandum of Understanding that recognizes the importance of short grass habitats to geese with a commitment to habitat protection for the mutual benefit of the dairy industry and wildlife (USFWS 1993). However, an increase in the number of wintering geese in Tillamook County over the years has caused serious depredation concerns among dairy farmers. Some farmers now haze geese from their lands to protect their forage crops. Local landowners have reported damage to newly planted pastures and loss of forage for dairy cows to large flocks of geese. Refuge pastures are managed to provide forage and sanctuary for geese and to minimize depredation impacts on private lands.

Canada geese (*Branta canadensis*) consist of eleven subspecies (Mowbray et al. 2002) and six different geese subspecies winter at Nestucca Bay. These subspecies include: western (*Branta canadensis moffitti*), dusky (*Branta canadensis occidentalis*), lesser (*Branta canadensis parvipes*), Taverner's (*Branta canadensis taverneri*), Aleutian (*Branta canadensis leucopareia*), and cackling (*Branta canadensis minima*).

Currently, there is debate to split white-cheeked geese into two species groups, Canada and cackling. The distinctions between the Canada and cackling geese have led to confusion and debate among ornithologists. This has been aggravated by the overlap between the small types of Canada geese and larger types of cackling geese. Cackling geese were originally considered to be the same species or a subspecies of Canada geese, but in July 2004 the American Ornithologists' Union's (AOU) Committee on classification and nomenclature split the two into two species, making cackling geese into a full species with the scientific name *Branta hutchinsii*. However, USFWS continues to consider all previously recognized subspecies of the Canada goose (*Branta canadensis*) as one species. The USFWS choose to include the four subspecies AOU now considers cackling geese in the listing of Canada geese, rather than include them in a separate species (Federal Register Feb 05, 2010, Page 8).

Dusky Canada geese have experienced a drastic population decline since the 1964 Good Friday Earthquake in Alaska and are listed as a species of concern by the USFWS

(Pacific Flyway Council 2008). The 1964 earthquake caused vast expanses of land to rise 1.8-2.4 m above sea level, uplifting the entire breeding range of this species. This change altered the hydrology and habitat the dusky depends upon for breeding purposes. The annual aerial survey of dusky Canada geese at Copper River Delta and Middleton Island, Alaska conducted in May 2014 estimated the total population at 15,049 birds and a 3-year running average of 13,503 birds (USFWS 2014). Analysis of multi-year aerial survey indices and the derived population estimate strongly support a continued long-term decline in population size. However, the 2014 total population estimate was the largest recorded since 2005 and the latest 3-year running average is the largest since 1996. The population increase could be due in part to four consecutive years of high production on Copper River Delta (Petrula 2011). Additional data are needed to confirm if the upward trend (2009-14) represents a change of the long-term (1986-09) decline. This species breeds on the Copper River Delta, Middleton Island, and Prince William Sound, Alaska during the spring and summer, and winters in Oregon and Washington (Petrula 2013). The primary wintering area is the Willamette Valley and lower Columbia River, however, dusky Canada geese have been observed wintering at Nestucca Bay for more than three decades (R. Lowe pers. com.) and the percentage of the population using Nestucca Bay has increased over time. Currently, Nestucca Bay National Wildlife Refuge supports the largest coastal wintering concentration of dusky Canada geese totaling approximately 11% of the population in 2010 (Stephensen 2010). Some of these geese have been marked with red plastic neck collars and tarsal bands to monitor movements and assist with conservation assessments.

Populations of Aleutian Canada geese declined early in the 20th century following the introduction of Arctic foxes (*Alopex lagopus*) to most of their nesting islands in Alaska (Bailey 1993). As a result, the USFWS listed the species as federally endangered in 1967. A formal recovery plan was initiated in the mid 1970's and efforts to re-establish the birds on their nesting islands were implemented, along with a ban on hunting. Personnel from the Alaska Maritime National Wildlife Refuge began eliminating foxes in 1949 from the Aleutian Islands, and spectacular recoveries of bird populations have been recorded. Efforts also included an increased emphasis on identification and protection of important wintering habitat. The Aleutian Canada goose recovered sufficiently to be reclassified as "Threatened" in 1990, and was officially "delisted" in 2001 (USFWS 2001) when recovery was considered complete. A mark-resight study was conducted in the San Joaquin Valley and Humboldt Bay, California regions during January – March 2013 to estimate the Aleutian Canada geese population. The estimated number of Aleutian Canada geese in winter 2013 was calculated to be 166,310 (95% CI = 135,174 – 197,447, SE = 15,886) individuals. This means the population has generally increased from 790 individuals in 1975 to 166,310 in 2013 (USFWS 2013b). This population estimate does not include birds wintering in Tillamook County.

Prior to delisting, the Pacific Flyway subcommittee for Aleutian Canada geese developed a management plan (Pacific Flyway Council 1999) that included specific conservation measures for the Semidi Islands sub-population. This remnant population of Aleutian Canada geese breeds on Kiliktagik and Anowik Islands within the Semidi Islands Archipelago, Alaska, and spends the winter near Pacific City, Oregon (Hatch and Hatch

1983). Recently, an increase in breeding range has been documented since geese have been found nesting on another island within the Semidi Islands group. On 29 May 2013, an Alaska Maritime National Wildlife Refuge field crew stationed on Chowiet Island (an island within the Semidi Islands group) reported finding an Aleutian Canada goose nest with three eggs (N. Rojek pers. com.). This is the first documentation of Aleutian Canada geese breeding on Chowiet Island. During spring 2014, refuge personnel confirmed four nests on Chowiet Island. Currently, the total breeding population of Semidi Islands geese is approximately 150 individuals (V. Byrd pers. com.). During July 2008, USFWS and Alaska Department of Fish and Game (ADF&G) biologists captured and marked 83 Semidi Islands Aleutian Canada geese on the breeding islands in Alaska. Seventy-nine adults and four goslings were captured. Of the adults captured, 78 were marked with a green plastic neck collar with white numeric code, a red plastic tarsal band with white numeric code on one tarsus, and a numbered metal U.S. Geological Survey (USGS) band on the other tarsus. One adult received only the red plastic tarsal band and metal USGS band. Two goslings received both red plastic tarsal bands and metal USGS bands, and two goslings received metal USGS bands only. Prior to 2008, Semidi Islands Aleutian Canada geese were marked with red plastic neck collars and/or tarsal bands with a white numeric code, along with metal USGS tarsal bands (Byrd 2008). As a result, local movement and population monitoring of marked birds on the wintering grounds can be evaluated.

In 2007, after a suspension of two decades, goose hunting resumed in Tillamook County with the exception of a closed zone at Nestucca Bay to specifically protect Semidi Islands birds and duskys and to retain as many geese on Refuge pastures as possible. On 26 May 2009, the Refuge acquired 80.7 acres of the S. Martella pastures (Semidi Unit) near Pacific City, which is one of three sites that together support nearly 100% of the wintering Semidi Islands Aleutian Canada geese (Stephensen 2009, Stephensen 2010, Stephensen and Horton 2011, Stephensen 2012, Stephensen 2013). Monitoring of these geese will aid in evaluating the size and configuration of future hunting closure zones to determine if sufficient protection has been achieved.

Refuge personnel conducted goose surveys and observations at Nestucca Bay throughout the wintering period while Oregon Department of Fish and Wildlife (ODFW) personnel conducted surveys of wintering geese at Nehalem and Tillamook bays. The surveys enable wildlife managers to assist in the management of Canada geese through monitoring of abundance and distribution, and determination of high use areas (Stephensen 2009, Stephensen 2010, Stephensen and Horton 2011, Stephensen 2012, Stephensen 2013).

METHODS

Canada Geese Census

Canada geese were counted at specific locations at Nestucca Bay (Figure 1) one to two times weekly from 21 October 2013 to 24 April 2014 by Refuge personnel, Shawn W. Stephensen and Amelia O'Connor. Landowners' fields within the survey area were

identified and boundaries outlined to indicate ownership (Figures 2 and 3). If landowners owned multiple fields, each field was assigned a unique number. Fields that were not identified to a specific landowner were listed as "unidentified." Observers positioned a vehicle at a vantage point near each field and remained in the vehicle for the duration of the survey to minimize bird disturbance. Geese were identified to subspecies (cackling, Aleutian, Taverner's/lesser, dusky, western) and counted at each field with the aid of Canon 10x42 Image Stabilizer binoculars and Swarovski Habicht ST80 HD 80mm 20-60X zoom spotting scope. Taverner's and lesser were grouped together and not identified to subspecies due to subtle differences and identification difficulty. If the observer could not determine the subspecies, the birds were recorded as "unidentified." Observers counted birds individually or by groups of 10's dependent upon field size and bird density. Observers recorded the number of birds present, examined, and marked per subspecies within each field. The number of birds present represented a direct count or estimation of the total number of birds observed. The number examined represented birds that were examined for the presence or absence of a neck collar. The number marked indicated the total number of neck-collared geese observed within a flock in the field. We attempted to identify all neck collars and record the alpha and or numeric code, character color, and collar color. This method allowed marked to unmarked ratios to be estimated for other active collaring/mark-recapture studies. Miscellaneous notes including weather conditions, time, disturbance events, location data, and other waterfowl and mammal sightings were recorded but not included in this report. All observation data were recorded onto a survey form (Figure 4) during the survey and entered into an Excel spreadsheet at the office. The census forms and Excel files are archived for future reference at the Oregon Coast National Wildlife Refuge Complex office in Newport, Oregon.

Canada geese were also counted at specific locations around Nehalem and Tillamook Bays (Figure 1). Counts were conducted opportunistically from 13 November 2013 to 13 March 2014 by ODFW employee, Jim Mick. Field or observation locations were generally not identified to landowner, but rather by road name. The latitude and longitude of each observation location was acquired with a Global Positioning System (GPS) unit and recorded. The ODFW observer used the same methods to count geese as the USFWS and is described in the previous section. The USFWS and ODFW observers attempted to coincide counts (i.e. conduct counts on the same day) to obtain an overall goose population estimate for the entire area. All observation data were recorded onto a survey form (Figure 4) during the survey and later entered into an Excel spreadsheet. The census forms and Excel files are archived for future reference at the Migratory Bird Management Office in Portland and the Oregon Coast National Wildlife Refuge Complex office in Newport, Oregon.

Semidi Islands Aleutian Canada Goose Monitoring

Semidi Islands Aleutian Canada geese marked with neck collars and leg bands were the focus of a special monitoring effort conducted by Refuge personnel, Shawn W. Stephensen and Amelia O'Connor, during the winter of 2013-14. Stephensen and O'Connor conducted observations one to two times weekly from 21 October 2013 to 24

April 2014. The study area included the same area as described in the Canada geese census section, however, Semidi Islands Aleutian Canada goose monitoring efforts were concentrated on specific fields within the Nestucca Bay National Wildlife Refuge (NB-21, NB-22 or Semidi Unit), B. Hurliman (M-1, M-3), and N. Hurliman (HU1-9) properties near Pacific City and Woods, Oregon (Figure 3). These fields are referred to in this report as the "Pacific City monitoring site." The fields NB-21, NB-22, M-1, and M-3 within the monitoring site are managed by S. Martella. The NB-21 and NB-22 fields (Semidi Unit) were previously owned by S. Martella and purchased by USFWS in 2009. Martella manages the refuge pastures under the terms of a Cooperative Land Management Agreement. Canon 10x42 Image Stabilizer binoculars and a Swarovski Habicht ST80 HD 80mm 20-60X zoom spotting scope were used to aid in identification of alpha-numeric collar and or tarsal band codes of the marked birds. Observers positioned the vehicle at a vantage point near each field and remained in the vehicle for the duration of the survey to minimize bird disturbance. In addition to the Semidi Islands birds, a total count of all geese subspecies present, including neck collar data were also recorded. All observation data were recorded onto a form (Figure 5) during the survey and entered into an Excel spreadsheet at the office. The census forms and Excel files are archived for future reference at the Oregon Coast National Wildlife Refuge Complex office in Newport, Oregon. All goose data and previous reports (Stephensen 2009, Stephensen 2010, Stephensen and Horton 2011, Stephensen 2012, Stephensen 2013) are available upon request.

RESULTS

Canada Geese Census

Refuge personnel conducted goose counts on 53 different days throughout the sample period, 21 October 2013 through 24 April 2014. The number of geese counted at Nestucca Bay ranged from a minimum count of 6 individual birds on 24 April 2014 to a maximum count of 7,353 on 14 November 2013 (Table 1). The daily mean number of individual birds counted of all subspecies combined during the entire sample period was 4,596. The dusky Canada goose subspecies was the most abundant and the western Canada was the least abundant of the identified species (Table 1). The daily mean number of dusky, Aleutian, Taverner's/lesser, cackling, and western was 1,320, 1,096, 1,078, 996, and 63 birds respectively (Figure 6). Unidentified species had a daily mean of 38 individual birds. The largest concentrations of geese were found on the Nestucca Bay National Wildlife Refuge (NB fields) and Seals Dairy (SE fields) with a daily mean of 1,540 and 622 individual birds respectively (Table 2, Figure 7). No geese were recorded throughout the sample period on the Ferreira (F), GVR Investments (GVR), Hancock (HAN), Hurliman – Carl (HUC), and Trent – Mike (TM) properties (Table 2). The daily mean number of geese varied between landowner, however, the largest concentrations were consistently observed on Nestucca Bay National Wildlife Refuge, Seals, Waldron (Pearns), Martella/Hurliman, Seymor, and Ruby properties (Figure 7). The low number of birds observed on multiple properties was likely due to extensive hazing efforts by the landowners. In addition, the number of birds counted appears to be directly related to the total number of acres owned by each landowner and influenced by

hazing intensity. Nestucca Bay National Wildlife Refuge and Seals have the most acreage in the survey area and birds are not hazed while foraging on these properties. Personal communication with several landowners has revealed intensive hazing efforts have been implemented on their lands and as a result zero or few geese were present during the survey period.

The number of geese observed in the Nestucca Bay area has shown a general overall increase since 2002 (Figure 8), however, fewer birds were present this year compared to the last two years. Nearly four times as many birds were present during winter 2013-14 compared to winter 2002-03. A peak count of 7,353 individual birds obtained on 14 November 2013 was recorded. The largest count ever recorded at 10,765 individual birds occurred 02 February 2012 (Stephensen 2012). Interestingly, fields within the Nestucca Bay National Wildlife Refuge consistently had large flocks of geese grazing on the vegetation. This may be in part due to the recent addition of the Martella (NB-21, NB-22), Hagarty (NB-26 to NB-32), and Lyda (NB-24, NB-25) properties into the refuge system. In addition, since the early 1990's refuge personnel have implemented short grass management strategies and planted forage grass species preferred by geese. As a result, more geese are attracted to refuge pastures and less likely to forage on farmers pastures where they are unwanted due to crop depredation. Hazing on private lands may also be driving the geese to the refuge.

Some marked Aleutian (non-Semidi Islands birds), dusky, cackling, and Taverner's/lesser geese were observed throughout the census period at the Nestucca Bay survey area. Alpha or alpha-numeric codes on neck collars and tarsal bands were identified and recorded in Excel spreadsheets and are not listed in this report. However, the bands were reported to the USFWS, Migratory Bird Management office in Portland, Oregon. Please see archived files at the Oregon Coast National Wildlife Refuge Complex, Newport office for detailed data.

In May 2014, USFWS-Migratory Bird Management Region 7 Waterfowl Management Branch conducted the annual aerial survey of dusky Canada geese on Copper River Delta and Middleton Island, Alaska breeding grounds and estimated the total population at 15,049 providing a 3-year running average of 13,503 individual birds (USFWS 2014). The mean daily count (1,320 individuals) of dusky Canada geese at Nestucca Bay during the 2013-2014 winter period constitutes 9.8% of the entire population and the peak count of 2,451 birds on 28 January 2014 constitutes 18.2% of the entire population based on the latest 3-year running average of 13,503 individual birds. During winter 2008-09 we documented a peak count of 1,290 birds which resulted in 18.3% of the entire population based on 2009 total population estimate (Stephensen 2009). The lowest dusky population ever recorded was estimated to be 6,709 birds during 2009 (USFWS 2010). In 2009-10, we had a peak count of 1,568 or 16.5% of 2010 total population estimate (Stephensen 2010). During 2010-11, the peak count totaled 1,505 birds constituting 16.1% of the latest 3-year running average (Stephensen and Horton 2011, USFWS 2011). During 2011-12, the peak count totaled 1,846 birds constituting 15.8% of the latest 3-year running average (Stephensen 2012, USFWS 2012b). Lastly, the peak count during 2012-13 totaled 2,073 which calculated to be 17.8% of the population based on the latest 3-

year average (Stephensen 2013, USFWS 2012b). This indicates that Nestucca Bay National Wildlife Refuge is a very important wintering area for this species. In addition, the number of dusky Canada geese observed using the area has steadily increased since goose monitoring efforts were initiated in the late 1980's (Stephensen 2009, Stephensen 2010, Stephensen and Horton 2011, Stephensen 2012, Stephensen 2013, USFWS unpublished data, Figure 9).

ODFW personnel conducted goose counts on 21 different days throughout the sample period of 13 November 2013 to 13 March 2014. The number of geese of all subspecies counted at Nehalem and Tillamook bays ranged from a minimum count of 40 individual birds on 10 December 2013 to a maximum count of 1,404 on 21 January 2014 (Table 3). The daily mean number of individual birds counted of all subspecies combined during the entire sample period was 399. The cackling Canada goose subspecies was the most abundant and the dusky Canada was the least abundant of the identified species (Table 3). The daily mean number of cackling, Taverner's/lesser, Aleutian, western, and dusky was 233, 110, 35, 10, and 8 birds respectively (Figure 10). Unidentified species had a daily mean of 3 individual birds. Large goose concentrations (over 400 individuals) were located in the pastures at McCormick Loop and Hwy 101 in the Tillamook Bay area and Tideland Road in Nehalem Bay. The number of geese counted at Nehalem Bay was less compared to the counts at Tillamook Bay, and usually included fewer than several hundred birds on any given day (Table 3). Compared to previous years, the 2013-14 count of geese at Tillamook Bay appears to be low. The low counts may be a result of poor area coverage, observer lack of survey experience, observer error, or bird distribution. One yellow collared cackling Canada goose and one blue collared Aleutian was reported in the Nehalem and Tillamook Bays respectively.

An overall estimate of the total number of geese at Nestucca, Nehalem, and Tillamook bays combined was obtained when counts were conducted on the same day at each location. The total count ranged from 3,792 to 7,536 individual birds during 2013-14 (Table 4). The largest overall count of geese occurred on 14 November 2013 when 183 geese were counted at Tillamook and Nehalem bays, and 7,353 were counted at Nestucca Bay. Therefore, the maximum total number of geese counted at Nestucca, Nehalem, and Tillamook bays combined during winter 2013-14 was 7,536 individuals. A minimum count of birds occurred on 13 November 2013 when 3,461 birds were counted at Nestucca Bay and 331 were counted at Tillamook and Nehalem bays, for a combined total of 3,792 (Table 4). Interestingly, the largest goose count (7,536 birds) recorded at all areas occurred 14 November and the smallest count (3,792 birds) recorded occurred one day prior, 13 November.

Semidi Islands Aleutian Canada Goose Monitoring

A total of 69 surveys of Semidi Islands Aleutian Canada geese were conducted throughout the winter 2013-14 monitoring period at the "Pacific City monitoring site" (NB-21, NB-22, M-1, M-3, HU-1 to HU-9 fields, Figure 3). Refuge personnel observed zero marked Semidi Islands Aleutian Canada geese during the first ten monitoring visits from 21 October to 12 November 2013. The first documented arrival of marked birds

was on 13 November 2013, and the last observation of marked birds was 11 April 2014 (Table 5). Note: Table 5 lists only monitoring visits when marked birds were observed, due to limited table space. Fifteen of the seventy-eight green-collared Semidi Islands Aleutian Canada geese marked during summer 2008 were resighted during the winter of 2013-14. Semidi Islands birds marked (in 2008) with green neck collar numbers 528, 531, 532, 542, 543, 544, 545, 546, 560, 567, 569, 578, 579, 585, and 594 were observed during the monitoring period (Table 5). Zero of three birds marked with red tarsal bands only were observed. Together, these observations constitute a 19% resighting rate of the 2008 marked birds. The number of collared bird present at the Pacific City monitoring site has declined drastically compared to previous years. During 2008-09, we observed 78 of the 81 marked birds (96% resighting rate), during 2009-10 we observed 64 marked birds (79% resighting rate), during 2010-11 we observed 53 marked birds (65% resighting rate), 42 were observed during 2011-12 (52% resighting rate), and twenty were observed in 2012-13 (25% resighting rate) (Figure 11). Five fewer marked birds were observed this year compared to last. An additional one Semidi Islands Aleutian Canada goose marked prior to 2008 with a red collar and leg band was also resighted (red collar number 331). Two red-collared birds were observed during 2012-13, thus a reduction of one red-collared bird in comparison to the previous year. It is unclear whether the green- and red-collared birds have perished or are wintering at other locations. Also, two goslings received USGS metal tarsal bands only during marking effort of summer 2008 and neither of these birds were identified at the Pacific City monitoring site.

These monitoring efforts confirm that the Semidi Islands Aleutian Canada geese spend most of their time during the winter primarily at the "Pacific City monitoring site" on the Nestucca Bay NWR (NB-21, NB-22), B. Hurliman (M-1, M-2), and N. Hurliman (HU-1 to HU-9) pastures along the Nestucca River near Pacific City or Woods, Oregon. As has been the case in years past, the resighted birds with collars were observed using these pastures, and few were observed on other landowner's properties. On occasion, a few marked birds were observed on N. Hurliman's property located across the Nestucca River (Figure 3). However, these birds did not remain on N. Hurliman's fields long because of intensive hazing efforts. Other geese subspecies were observed at the Pacific City monitoring site at various densities throughout the monitoring period and were noted. Fourteen different blue-collared Aleutian Canada geese, which were non-Semidi Islands geese, were observed and recorded (Table 5). The total number of all geese subspecies observed at the "Pacific City monitoring site" range from zero on several occasions to 2,740 on 19 December 2013 (Table 5). On several occasions during March and April, the Semidi birds were not at the Pacific City monitoring site and were not present throughout the day. Observers searched the Nestucca Valley and the birds could not be found. It is possible the birds were at Haystack Rock and not detected since the west side and top of the rock cannot be viewed from the beach. Historically, Semidi birds were observed grazing on Haystack Rock during the day in the spring, obtaining grit on the beach in the mornings after spending the night roosting on Haystack Rock, or rafting on the water nearby (R. Lowe pers. com.).

Alaska Maritime National Wildlife Refuge personnel visit the Semidi Islands annually. No collared birds were observed on the Semidi Islands during spring 2014. However,

refuge personnel found four Aleutian Canada geese nests on Chowiet Island, an island within the Semidi Islands group. The Semidi Islands breeding population of Aleutian Canada geese are known to breed on Kiliktagik and Anowik islands, to the northwest of Chowiet. While adult geese are usually sighted annually on Chowiet, they are typically observed in spring or fall during migration. Aleutian Canada geese were first documented breeding on Chowiet Island in May 2012 (N. Rojek pers. com.).

During winter 2009-10, ODFW goose observer G. Garza reported observing Semidi Islands Aleutian Canada geese with green collars in the Tillamook Bay area. There were no reported sightings of green-collared geese during 2013-14 from the ODFW observer or local citizens. Stephensen and O'Connor made several trips to the Tillamook area to look for collared birds, however, none were sighted. The Tillamook area is open to hunting and concerns exist that the Semidi Islands birds could be harvested there. However, this year, no green- or red-collared Semidi Islands Aleutian Canada geese were reported at the Tillamook hunter check station.

CONCLUSION

The Canada geese census and monitoring efforts conducted during the winter of 2013-14 confirm the importance of the Nestucca, Nehalem, and Tillamook bays as wintering areas for six Canada geese subspecies. Over seven thousand geese were observed on Nestucca Bay pastureland during a one-day sample period. The winter population of geese at Nestucca Bay exhibited an increasing overall trend since 2002. Goose numbers peaked at 1,404 birds at Tillamook and Nehalem bays and were fewer than what was observed at Nestucca Bay. Cooperative efforts between USFWS, ODFW, and private landowners to protect these wintering areas, while preventing excessive depredation of privately-owned pastureland, are critical to sustaining viable goose populations and healthy relationships between private landowners and managing agencies. Marked Semidi Islands Aleutian Canada geese continue to occupy the Nestucca Bay National Wildlife Refuge, B. Hurliman, and N. Hurliman pastures (Pacific City monitoring site), which indicate high site fidelity and preference by this group of birds. The current hunting closure zone includes the primary pastures used by the Semidi Islands birds, providing protection from hunting mortality to the majority of the Semidi Islands birds as long as they remain in the closed area. The May 2009 fee title acquisition of 80.7 acres of the Martella property further enhances the survival and management of Semidi Islands Aleutian Canada geese.

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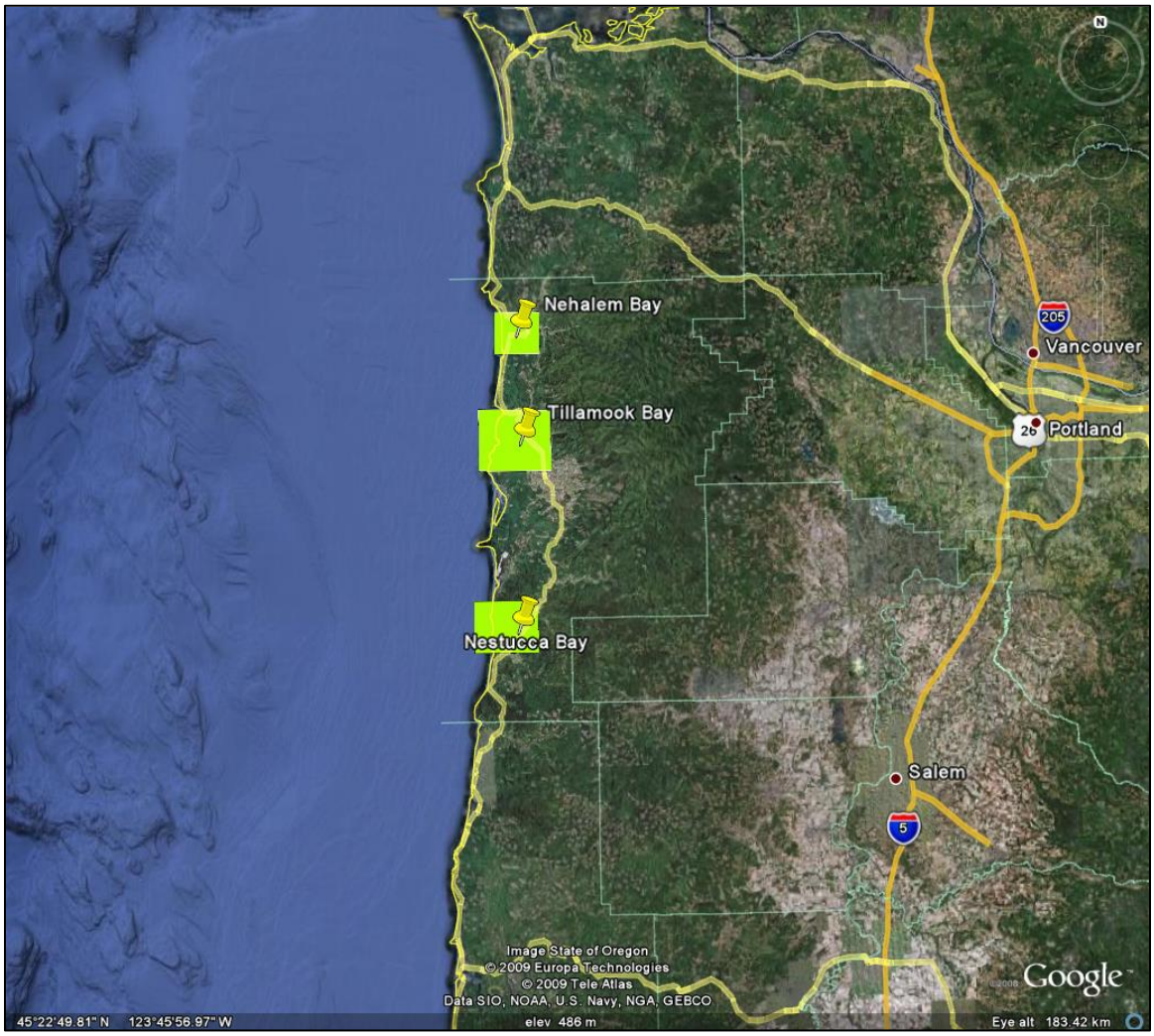

Figure 1. Map of the Oregon Coast with survey areas Nestucca, Nehalem, and Tillamook Bays identified.

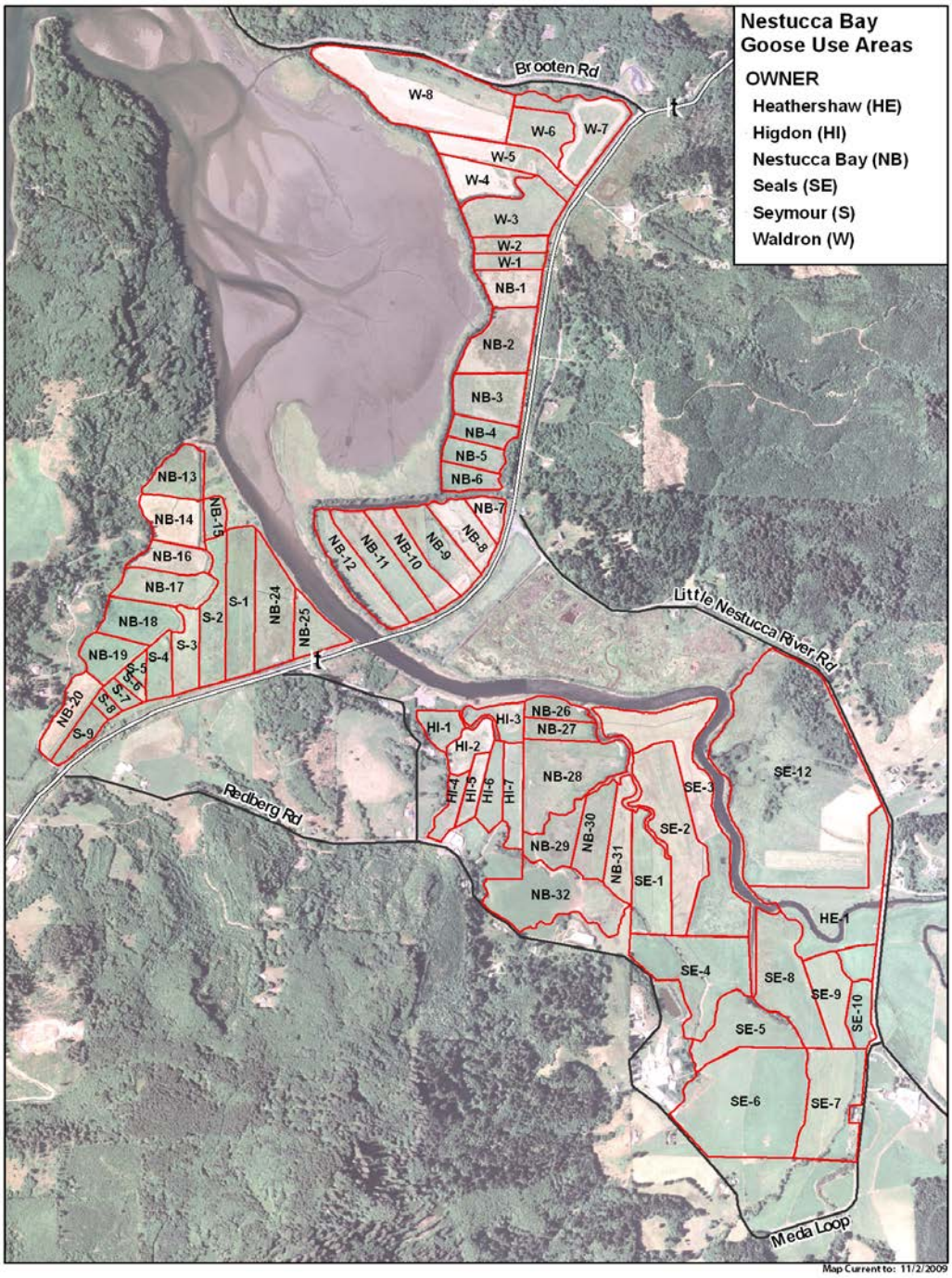

Figure 2. Canada geese survey areas at Nestucca Bay with landowners' fields identified. Waldron (W) fields currently owned by Pearns.

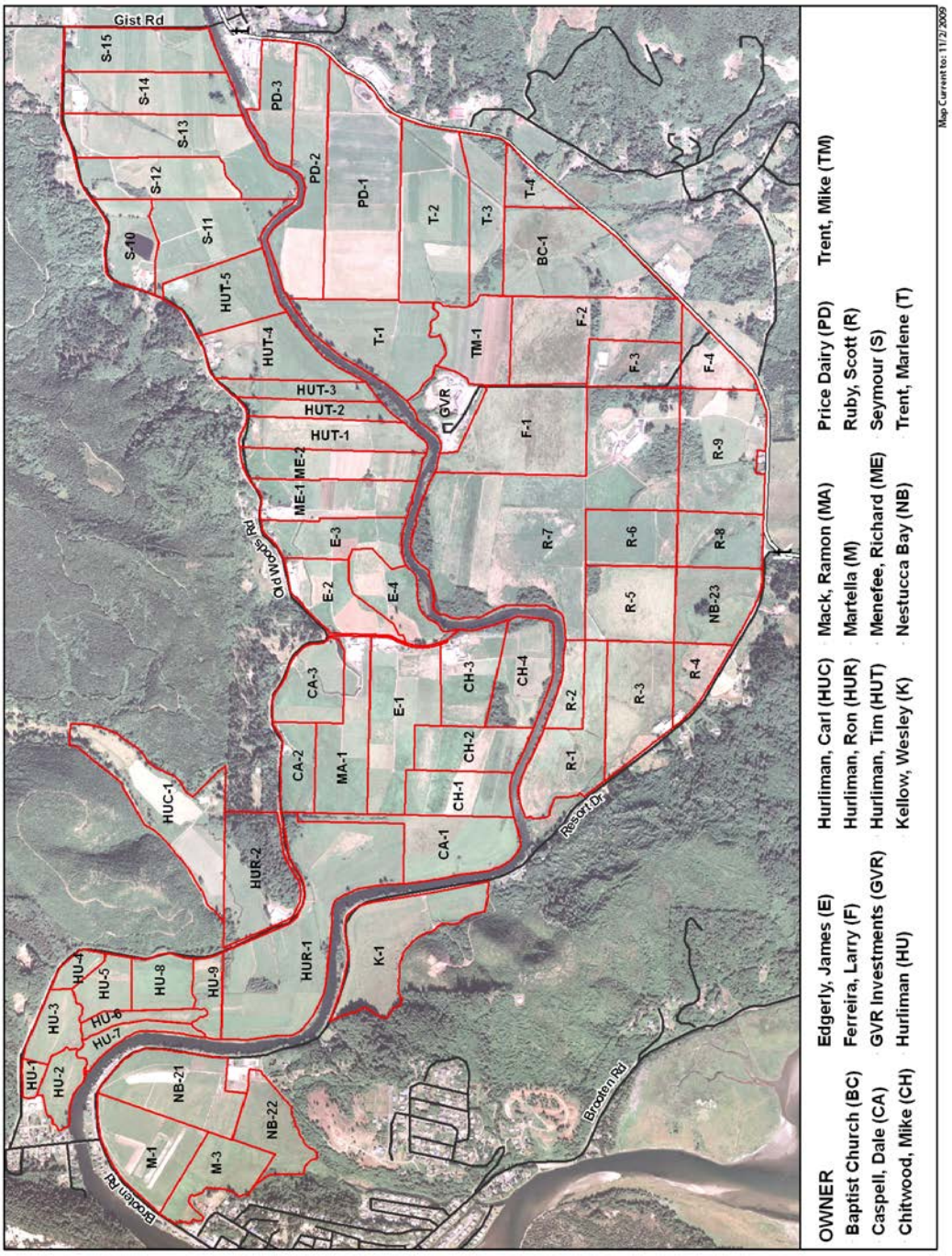

Figure 3. Canada geese survey areas at Nestucca Bay with landowners' fields identified. B. Hurliman properties are fields M-1 and M-3.

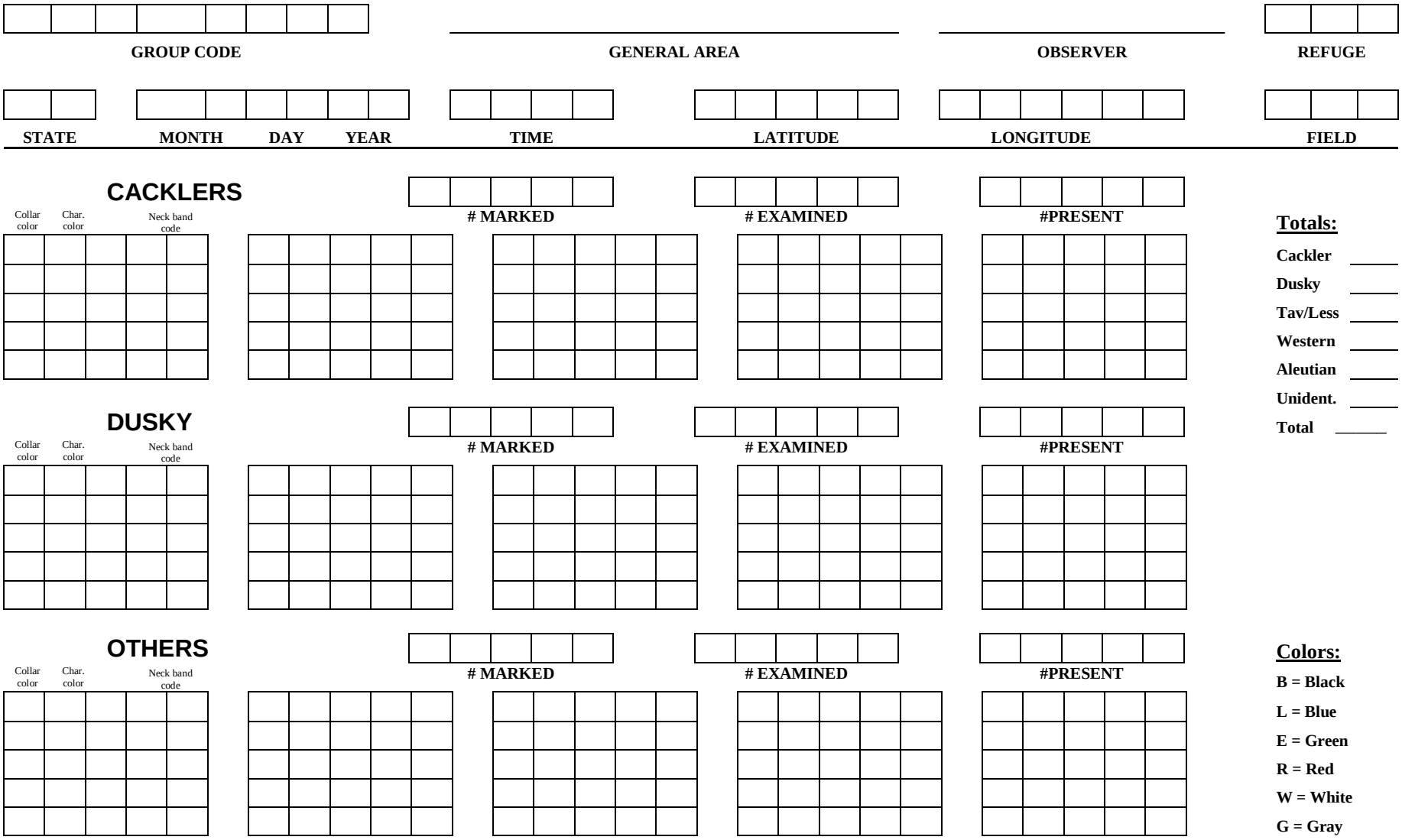

Figure 4. Canada geese survey observation form.

Date: _____ Observer: _____

Temp: _____ CC: _____ Precip: _____ Visibility: _____

Collar	Tarsus		Notes	Collar	Tarsus		Notes	Collar		Notes:
521	**K 02**			**565**	**K 43**			**300**		
523	**K 01**			**566**	**K 44**			**301**		
524	**K 03**			**567**	**K 45**			**302**		
525	**K 04**			**568**	**K 46**			**303**		
526	**K 05**			**569**	**K 47**			**304**		
527	**K 06**			**570**	**K 48**			**305**		
528	**K 07**			**571**	**K 49**			**306**		
529	**K 08**			**572**	**K 50**			**307**		
530	**K 09**			**573**	**K 51**			**308**		
531	**K 10**			**574**	**K 52**			**309**		
532	**K 11**			**575**	**K 53**			**310**		
533	**K 12**			**576**	**K 54**			**311**		
534	**K 13**			**577**	**K 55**			**312**		
535	**K 14**				**K56**			**313**		
536	**K 15**			**578**	**K 57**			**314**		
537	**K 16**			**579**	**K 58**			**315**		
538	**K 17**			**580**	**408**			**316**		
539	**K 18**			**581**	**409**			**317**		
540	**K 19**			**582**	**410**			**318**		
541	**K 20**				**411**			**319**		
542	**K 21**			**583**	**415**			**320**		
543	**K 22**			**584**	**418**			**321**		
544	**K 23**			**585**	**419**			**322**		
545	**K 24**			**586**	**420**			**323**		
546	**K 25**			**587**	**421**			**324**		
547	**K 26**			**588**	**422**			**325**		
548	**K 27**			**589**	**423**			**326**		
549	**K 28**			**590**	**425**			**327**		
550	**K 29**			**591**	**426**			**328**		
551	**K 30**			**592**	**427**			**329**		
552	**K 31**			**593**	**428**			**330**		
553	**K 32**			**594**	**429**			**331**		
555	**K 33**			**595**	**430**			**400**		
556	**K 34**			**596**	**431**			**K 63**		
557	**K 35**			**597**	**437**			**K 67**		
558	**K 36**			**598**	**435**			**K 82**		
559	**K 37**			**599**	**434**			**K 87**		
560	**K 38**			**600**	**438**			**K 93**		
561	**K 39**				**439**			**K 95**		
562	**K 40**							**MBR**		
563	**K 41**							**ARTIST**		
564	**K 42**							**BW 84C**		

Figure 5. Semidi Islands Aleutian Canada goose survey form.

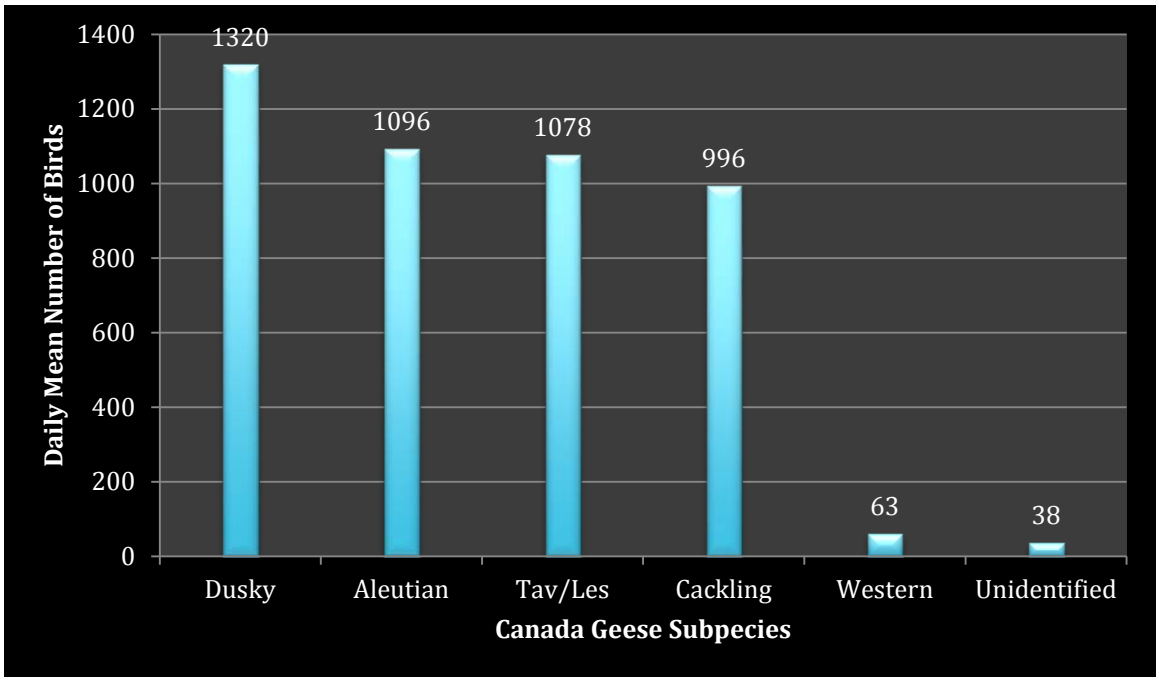

Figure 6. Daily mean number of individual Canada geese by subspecies at Nestucca Bay during winter 2013-14.

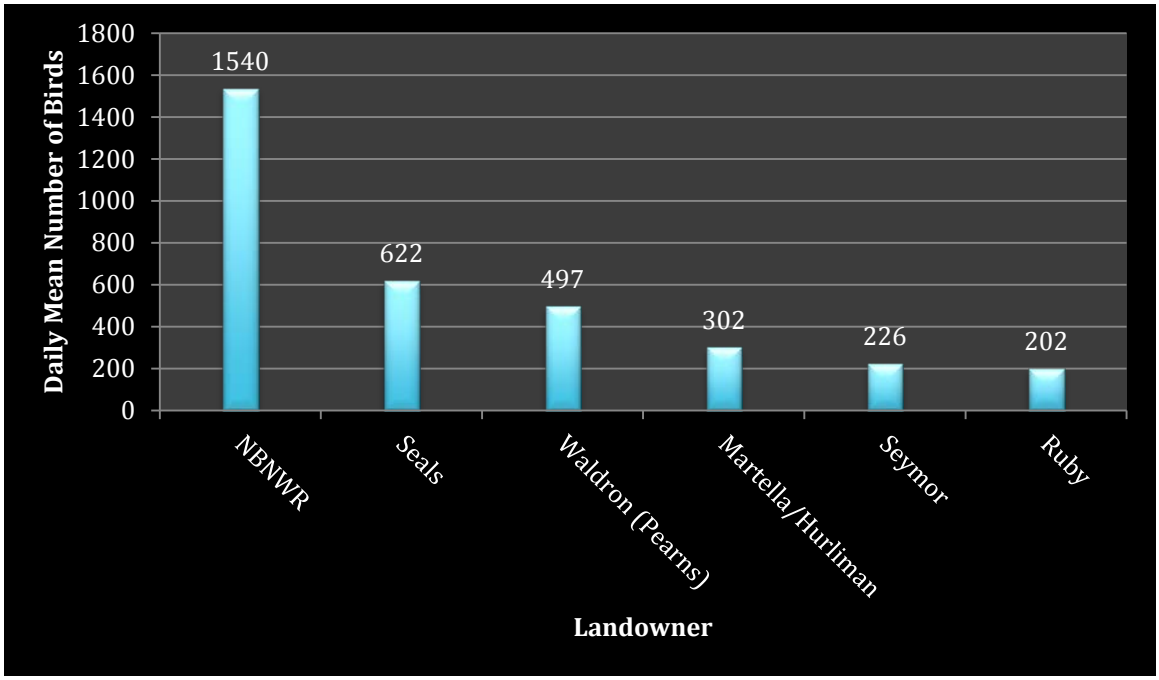

Figure 7. Daily mean number of individual Canada geese (all subspecies combined) counted on landowners' property at Nestucca Bay during winter 2013-14. Only locations with a daily mean of >200 birds listed.

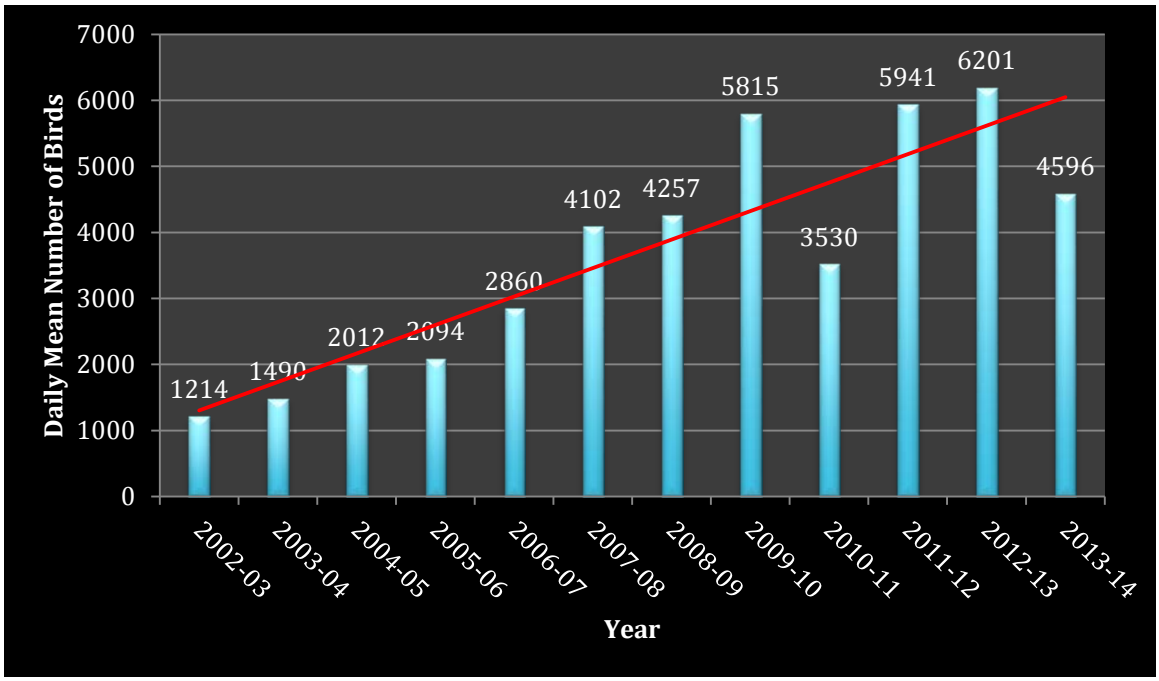

Figure 8. Yearly comparison of daily mean number of individual Canada geese (all subspecies combined) with linear trendline (red) at Nestucca Bay.

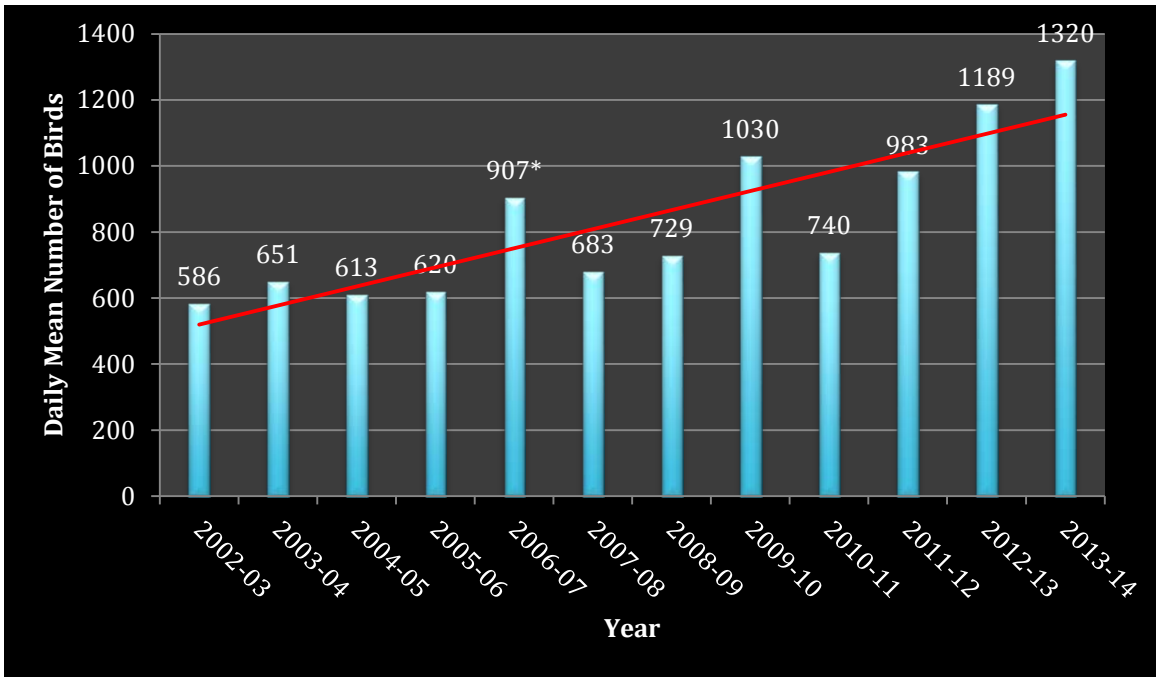

Figure 9. Yearly comparison of daily mean number of individual dusky Canada geese with linear trendline (red) at Nestucca Bay. *Incomplete dataset (two observations).

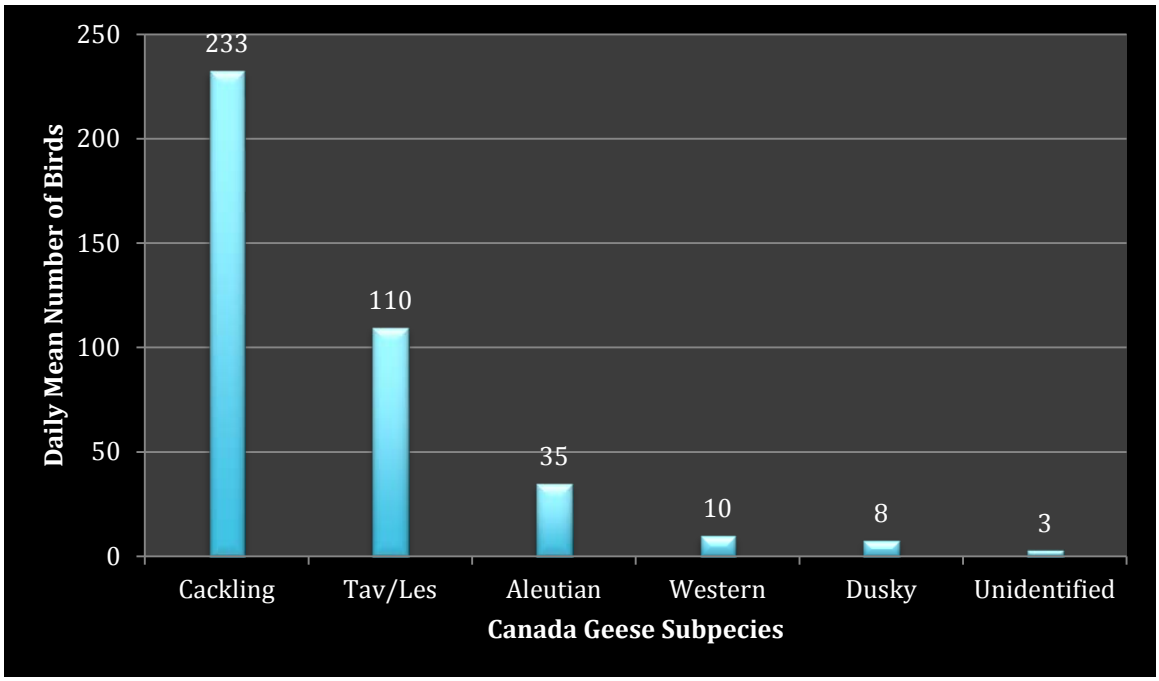

Figure 10. Daily mean number of individual Canada geese by subspecies at Tillamook and Nehalem Bays during winter 2013-14.

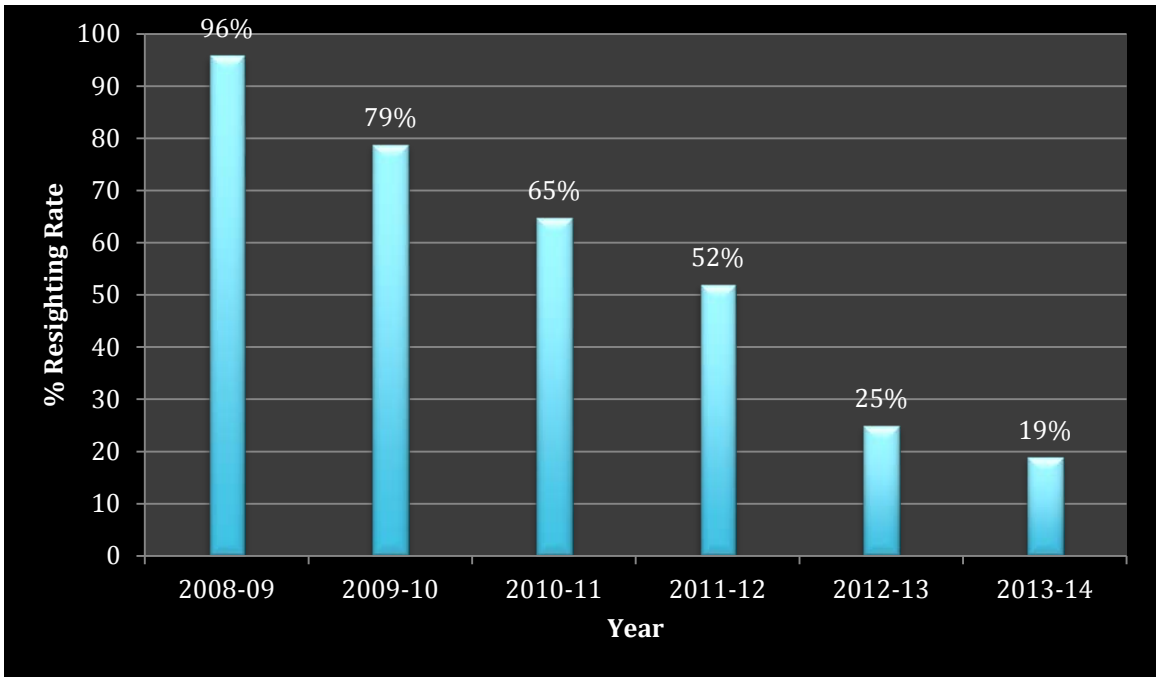

Figure 11. Yearly comparison of percent resighting rate of Semidi Islands Aleutian Canada geese marked in 2008 at the Pacific City monitoring site.

Table 1. Canada geese subspecies abundance at Nestucca Bay during winter 2013-14.

Census Date	Canada Geese Subspecies						Daily Total
	Dusky	Aleutian	Taverners/Lesser	Cackling	Western	Unid	
21-Oct-13	420	412	266	652	110	0	1860
22-Oct-13	584	128	504	297	24	40	1577
24-Oct-13	122	70	916	1051	12	0	2171
28-Oct-13	759	243	1031	414	36	0	2483
29-Oct-13	531	330	1224	345	95	0	2525
31-Oct-13	628	179	480	1083	0	0	2370
04-Nov-13	664	722	967	966	89	0	3408
05-Nov-13	587	1104	1071	1418	40	0	4220
07-Nov-13	716	250	649	1382	15	300	3312
12-Nov-13	2122	830	1408	1160	56	0	5576
13-Nov-13	1162	752	966	578	3	0	3461
14-Nov-13	1607	498	3183	2038	27	0	7353
18-Nov-13	2028	661	1371	1289	19	0	5368
19-Nov-13	1763	465	994	1387	30	30	4669
21-Nov-13	1549	484	1296	723	96	0	4148
25-Nov-13	1970	470	2105	1930	68	0	6543
27-Nov-13	1525	570	1726	916	192	0	4929
02-Dec-13	1664	462	1476	1030	50	0	4682
09-Dec-13	1467	406	1451	896	76	0	4296
12-Dec-13	1784	588	1545	1769	160	50	5896
16-Dec-13	2005	401	1142	891	72	0	4511
19-Dec-13	1376	735	1732	2179	156	0	6178
23-Dec-13	1734	764	2061	2008	104	26	6697
02-Jan-14	2106	461	1745	2084	164	201	6994
07-Jan-14	1801	596	571	626	38	140	3772
13-Jan-14	1657	633	1182	573	69	0	4114
16-Jan-14	1586	868	1797	1159	70	0	5480
21-Jan-14	1900	1306	1015	1032	28	10	5291
23-Jan-14	1800	1983	970	1149	64	0	5966
28-Jan-14	2451	2230	1203	718	144	40	6786
31-Jan-14	1601	1934	1131	1665	64	0	6395
03-Feb-14	1751	1712	904	965	215	0	5547
10-Feb-14	1244	2349	1022	1304	100	130	6149
13-Feb-14	1550	3171	891	857	260	0	6729
18-Feb-14	910	915	1090	1076	32	480	4503
19-Feb-14	1351	1602	1450	651	38	0	5092
24-Feb-14	1879	2286	601	954	183	11	5914
26-Feb-14	1715	2912	1224	1373	75	0	7299
03-Mar-14	1819	1652	849	973	91	140	5524
06-Mar-14	1303	2534	802	948	20	0	5607
10-Mar-14	1420	1346	1379	655	47	170	5017
13-Mar-14	1301	2675	1171	477	14	0	5638
17-Mar-14	1070	1876	1006	908	15	0	4875
20-Mar-14	1608	2421	783	716	11	0	5539
24-Mar-14	1065	1519	909	687	28	10	4218
27-Mar-14	1453	1669	739	922	7	0	4790
31-Mar-14	860	1662	421	452	8	170	3573
03-Apr-14	1454	1205	660	785	3	0	4107
07-Apr-14	1129	1074	990	632	12	60	3897
11-Apr-14	1378	1488	939	885	10	0	4700
14-Apr-14	39	282	89	925	1	0	1336
17-Apr-14	11	227	16	228	2	0	484
24-Apr-14	1	0	0	0	5	0	6
Daily Mean	**1,320**	**1,096**	**1,078**	**996**	**63**	**38**	**4,596**

Table 2. Number of Canada geese observed on landowners fields at Nestucca Bay during winter 2013-14. Landowner: Baptist Church (BC), Caspell (CA), Chitwood (CH), Edgerly (E), Ferreira (F), GVR Investments (GVR), Hancock (HAN), Heathershaw (HE), Higdon (HI).

Date	BC	CA	CH	E	F	GVR	HAN	HE	HI
21-Oct-13	0	0	0	0	0	0	0	0	0
22-Oct-13	0	0	0	0	0	0	0	0	0
24-Oct-13	0	0	0	0	0	0	0	0	0
28-Oct-13	0	0	0	0	0	0	0	0	0
29-Oct-13	0	0	0	0	0	0	0	0	0
31-Oct-13	0	0	0	0	0	0	0	0	0
04-Nov-13	0	94	0	380	0	0	0	0	0
05-Nov-13	0	0	0	0	0	0	0	0	0
07-Nov-13	0	0	0	12	0	0	0	0	0
12-Nov-13	0	0	0	0	0	0	0	1180	0
13-Nov-13	0	0	0	0	0	0	0	0	0
14-Nov-13	0	0	0	0	0	0	0	0	0
18-Nov-13	0	0	0	0	0	0	0	70	1167
19-Nov-13	0	0	0	12	0	0	0	1036	267
21-Nov-13	0	260	540	0	0	0	0	0	49
25-Nov-13	0	0	0	0	0	0	0	810	347
27-Nov-13	0	0	164	0	0	0	0	0	0
02-Dec-13	0	311	0	0	0	0	0	1010	247
09-Dec-13	22	90	0	0	0	0	0	0	155
12-Dec-13	50	0	123	0	0	0	0	0	247
16-Dec-13	75	0	0	0	0	0	0	0	105
19-Dec-13	0	0	53	0	0	0	0	0	47
23-Dec-13	0	0	76	0	0	0	0	0	464
02-Jan-14	0	0	0	0	0	0	0	250	176
07-Jan-14	30	0	0	170	0	0	0	97	158
13-Jan-14	5	0	640	0	0	0	0	125	243
16-Jan-14	0	0	0	0	0	0	0	240	117
21-Jan-14	0	0	0	0	0	0	0	128	214
23-Jan-14	0	260	0	0	0	0	0	750	342
28-Jan-14	0	0	0	0	0	0	0	401	115
31-Jan-14	28	34	0	0	0	0	0	0	247
03-Feb-14	9	39	490	0	0	0	0	72	129
10-Feb-14	0	0	20	11	0	0	0	400	59
13-Feb-14	0	360	202	0	0	0	0	266	81
18-Feb-14	0	0	0	0	0	0	0	31	134
19-Feb-14	0	1712	0	59	0	0	0	0	40
24-Feb-14	20	0	170	1470	0	0	0	15	54
26-Feb-14	0	0	0	2072	0	0	0	0	33
03-Mar-14	0	0	0	0	0	0	0	0	247
06-Mar-14	76	4	0	0	0	0	0	0	219
10-Mar-14	0	336	60	5	0	0	0	195	99
13-Mar-14	20	2	0	1270	0	0	0	0	130
17-Mar-14	0	0	0	204	0	0	0	0	200
20-Mar-14	0	2	0	0	0	0	0	0	250
24-Mar-14	0	0	0	0	0	0	0	0	32
27-Mar-14	0	2	0	76	0	0	0	0	272
31-Mar-14	0	0	0	0	0	0	0	0	340
03-Apr-14	0	2	0	0	0	0	0	0	197
07-Apr-14	0	1	0	0	0	0	0	290	0
11-Apr-14	0	0	0	0	0	0	0	0	89
14-Apr-14	0	0	0	0	0	0	0	0	0
17-Apr-14	0	2	0	0	0	0	0	0	0
24-Apr-14	0	2	0	0	0	0	0	0	0
Daily Mean	**6**	**66**	**48**	**108**	**0**	**0**	**0**	**139**	**138**

Table 2 (cont.). Number of Canada geese observed on landowners fields at Nestucca Bay during winter 2013-14. Landowner: Hurliman – Nick (HU), Hurliman - Carl (HUC), Hurliman - Ron (HUR), Hurliman - Tim (HUT), Kellow (K), Martella/Hurliman - Ben (M), Mack (MA), Menefee (ME), Nestucca Bay NWR (NB).

Date	HU	HUC	HUR	HUT	K	M	MA	ME	NB
21-Oct-13	0	0	0	0	0	0	0	0	1034
22-Oct-13	0	0	0	0	0	0	0	0	357
24-Oct-13	0	0	0	0	0	0	0	0	1487
28-Oct-13	0	0	0	0	0	0	0	0	1823
29-Oct-13	0	0	0	0	0	0	0	0	1074
31-Oct-13	0	0	0	0	0	0	0	0	1686
04-Nov-13	0	0	0	0	0	0	510	0	1781
05-Nov-13	0	0	0	0	0	0	2570	0	1650
07-Nov-13	0	0	0	0	0	0	0	420	1852
12-Nov-13	0	0	0	0	0	89	0	0	2769
13-Nov-13	0	0	0	0	0	0	0	0	1909
14-Nov-13	0	0	0	0	0	165	0	0	4180
18-Nov-13	0	0	0	0	0	0	0	0	2337
19-Nov-13	0	0	0	0	0	0	0	0	1709
21-Nov-13	0	0	0	0	0	36	0	0	1600
25-Nov-13	0	0	0	0	0	30	83	0	3663
27-Nov-13	0	0	0	0	0	356	0	0	2379
02-Dec-13	0	0	0	0	0	851	0	0	804
09-Dec-13	0	0	435	0	0	368	0	0	668
12-Dec-13	512	0	0	0	0	940	0	0	1184
16-Dec-13	71	0	0	0	0	1040	0	0	1328
19-Dec-13	416	0	0	0	0	1360	0	0	2519
23-Dec-13	106	0	0	0	0	32	0	530	2863
02-Jan-14	310	0	15	0	0	171	0	0	2635
07-Jan-14	0	0	0	0	0	17	0	0	1102
13-Jan-14	27	0	0	0	0	820	0	0	904
16-Jan-14	256	0	0	0	0	520	0	0	2010
21-Jan-14	211	0	0	0	0	1035	0	0	1217
23-Jan-14	169	0	0	0	0	884	0	0	1054
28-Jan-14	300	0	2	171	0	130	26	148	984
31-Jan-14	29	0	1760	0	111	411	0	0	726
03-Feb-14	108	0	27	30	1370	474	0	0	1252
10-Feb-14	85	0	656	278	0	0	0	0	1815
13-Feb-14	0	0	614	0	0	530	0	0	595
18-Feb-14	0	0	60	9	0	0	12	0	871
19-Feb-14	21	0	350	0	0	550	0	0	1373
24-Feb-14	729	0	0	400	0	0	0	0	1709
26-Feb-14	810	0	0	0	0	0	0	144	2630
03-Mar-14	0	0	0	370	0	390	0	0	1649
06-Mar-14	215	0	225	0	0	4	0	0	1401
10-Mar-14	40	0	228	0	0	0	1236	0	875
13-Mar-14	4	0	0	0	0	1300	0	0	921
17-Mar-14	1	0	0	0	0	990	0	0	820
20-Mar-14	0	0	0	0	0	460	0	0	1243
24-Mar-14	0	0	0	0	0	532	0	0	2208
27-Mar-14	0	0	0	0	0	650	0	81	1844
31-Mar-14	9	0	0	0	0	0	0	0	1551
03-Apr-14	0	0	0	0	0	338	0	0	1728
07-Apr-14	2	0	0	0	0	167	0	0	1390
11-Apr-14	0	0	0	0	0	0	0	0	2281
14-Apr-14	0	0	0	0	0	0	0	0	174
17-Apr-14	0	0	0	0	0	380	0	0	27
24-Apr-14	2	0	2	0	0	0	0	0	0
Daily Mean	**84**	**0**	**83**	**24**	**28**	**302**	**84**	**25**	**1540**

Table 2 (cont.). Number of Canada geese observed on landowners fields at Nestucca Bay during winter 2013-14. Landowner: Price Dairy (PD), Ruby (R), Seymor (S), Seals (SE), Trent - Marlene (T), Trent - Mike (TM), Unidentified (U), Waldron (W - currently owned by Pearns).

Date	PD	R	S	SE	T	TM	U	W	Total
21-Oct-13	0	0	0	0	0	0	0	826	1860
22-Oct-13	0	0	520	0	0	0	0	700	1577
24-Oct-13	0	0	0	0	0	0	0	684	2171
28-Oct-13	0	0	0	0	0	0	0	660	2483
29-Oct-13	0	0	0	0	0	0	0	1451	2525
31-Oct-13	0	0	0	0	0	0	0	684	2370
04-Nov-13	0	201	0	0	0	0	0	442	3408
05-Nov-13	0	0	0	0	0	0	0	0	4220
07-Nov-13	0	1001	0	0	0	0	0	27	3312
12-Nov-13	0	0	112	1332	0	0	0	94	5576
13-Nov-13	0	0	34	0	0	0	0	1518	3461
14-Nov-13	0	0	82	1226	156	0	0	1544	7353
18-Nov-13	0	240	0	1009	420	0	0	125	5368
19-Nov-13	0	368	0	1063	43	0	0	171	4669
21-Nov-13	0	156	26	917	0	0	0	564	4148
25-Nov-13	0	0	51	632	28	0	0	899	6543
27-Nov-13	0	55	122	1366	227	0	0	260	4929
02-Dec-13	0	105	221	492	293	0	0	348	4682
09-Dec-13	380	76	555	666	409	0	59	413	4296
12-Dec-13	556	423	508	1092	0	0	0	261	5896
16-Dec-13	0	106	462	519	156	0	43	606	4511
19-Dec-13	284	256	297	310	0	0	168	468	6178
23-Dec-13	0	246	486	644	820	0	22	408	6697
02-Jan-14	420	800	665	953	137	0	76	386	6994
07-Jan-14	496	91	443	791	0	0	127	250	3772
13-Jan-14	0	437	85	495	283	0	40	10	4114
16-Jan-14	0	886	37	911	0	0	58	445	5480
21-Jan-14	150	264	291	1124	11	0	351	295	5291
23-Jan-14	410	134	268	1231	117	0	74	273	5966
28-Jan-14	0	618	483	1362	1800	0	49	197	6786
31-Jan-14	156	490	355	438	0	0	1310	300	6395
03-Feb-14	18	494	381	145	234	0	0	275	5547
10-Feb-14	1190	304	326	784	167	0	26	28	6149
13-Feb-14	0	1064	117	2270	347	0	56	227	6729
18-Feb-14	1560	423	291	613	220	0	0	279	4503
19-Feb-14	0	84	366	249	0	0	27	261	5092
24-Feb-14	365	256	306	159	0	0	0	261	5914
26-Feb-14	0	7	815	28	156	0	0	604	7299
03-Mar-14	0	41	306	723	1312	0	0	486	5524
06-Mar-14	1909	276	147	968	23	0	0	140	5607
10-Mar-14	0	17	420	384	740	0	0	382	5017
13-Mar-14	0	216	519	226	0	0	0	1030	5638
17-Mar-14	0	0	517	395	575	0	0	1173	4875
20-Mar-14	42	387	38	2198	0	0	31	888	5539
24-Mar-14	0	0	230	822	113	0	0	281	4218
27-Mar-14	0	174	176	548	530	0	24	413	4790
31-Mar-14	0	0	128	644	0	0	0	901	3573
03-Apr-14	0	20	221	1006	0	0	5	590	4107
07-Apr-14	0	0	172	1046	0	0	0	829	3897
11-Apr-14	0	0	422	740	0	0	0	1168	4700
14-Apr-14	0	0	0	365	0	0	0	797	1336
17-Apr-14	0	0	0	75	0	0	0	0	484
24-Apr-14	0	0	0	0	0	0	0	0	6
Daily Mean	**150**	**202**	**226**	**622**	**176**	**0**	**48**	**497**	**4596**

Table 3. Canada geese subspecies abundance at Tillamook (T) and Nehalem (N) Bays during winter 2013-14 collected by Oregon Department of Fish and Wildlife personnel.

Date	Location	C[1]	A[2]	T/L[3]	D[4]	W[5]	U[6]	Total
13-Nov-13	Alderbrook Loop (T)	1	0	200	20	40	0	**261**
13-Nov-13	Tideland Road (N)	0	0	70	0	0	0	**70**
14-Nov-13	Fenk Road (T)	50	100	33	0	0	0	**183**
18-Nov-13	Alderbrook Loop (T)	0	0	49	13	0	0	**62**
18-Nov-13	Alderbrook Loop (T)	0	0	370	10	8	0	**388**
18-Nov-13	McKimmens Road (N)	45	0	0	15	6	0	**66**
19-Nov-13	Gallaway Road (T)	0	0	37	0	12	0	**49**
20-Nov-13	Alderbrook Loop (T)	300	0	20	16	0	0	**336**
20-Nov-13	Tideland Road (N)	30	0	21	0	0	0	**51**
21-Nov-13	Fenk Road (T)	120	0	18	0	4	0	**142**
26-Nov-13	Wilson River Loop (T)	104	0	21	17	0	0	**142**
10-Dec-13	Wilson River Loop (T)	0	0	40	0	0	0	**40**
31-Dec-13	Alderbrook Loop (T)	0	0	90	0	0	0	**90**
07-Jan-14	Tone Road (T)	0	0	0	0	11	0	**11**
07-Jan-14	Nielson Road (T)	230	0	80	0	0	0	**310**
07-Jan-14	Geinger Road (T)	0	0	0	0	0	0	**0**
14-Jan-14	HWY 101 South (T)	650	0	180	0	0	0	**830**
14-Jan-14	Bayocean Road (T)	0	0	0	0	9	0	**9**
15-Jan-14	Tideland Road (N)	0	0	0	0	40	0	**40**
15-Jan-14	Tideland Road (N)	150	0	40	0	0	0	**190**
15-Jan-14	Biak Avenue (T)	0	0	0	0	50	0	**50**
21-Jan-14	HWY 101 South (T)	710	570	50	0	0	70	**1400**
21-Jan-14	Blue Heron (T)	0	0	0	0	4	0	**4**
22-Jan-14	Tideland Road (N)	337	0	90	8	0	0	**435**
22-Jan-14	Possetti Road (T)	48	2	8	0	0	0	**58**
22-Jan-14	Alderbrook Loop (T)	50	0	25	8	0	0	**83**
23-Jan-14	HWY 101 South (T)	377	15	35	3	0	0	**430**
24-Jan-14	Alderbrook Loop (T)	0	0	27	0	0	0	**27**
24-Jan-14	Tideland Road (N)	0	0	285	0	0	0	**285**
24-Jan-14	Tideland Road (N)	0	0	0	0	5	0	**5**
24-Jan-14	Blue Heron (T)	50	0	170	0	0	0	**220**
27-Jan-14	Nielson Road (T)	0	0	0	0	0	0	**0**
27-Jan-14	McCormick Loop (T)	468	0	40	2	0	0	**510**
28-Jan-14	Alderbrook Loop (T)	55	0	12	7	0	0	**74**
28-Jan-14	Tideland Road (N)	0	0	0	0	11	0	**11**
28-Jan-14	Tideland Road (N)	476	0	37	0	4	0	**517**
29-Jan-14	McCormick Loop (T)	240	17	31	0	0	0	**288**
30-Jan-14	Alderbrook Loop (T)	0	0	0	9	0	0	**9**
30-Jan-14	Alderbrook Loop (T)	342	0	33	0	0	0	**375**
30-Jan-14	Tohl Ranch Road (N)	50	40	80	30	12	0	**212**
13-Mar-14	HWY 53 (N)	0	0	110	2	0	0	**112**
	Daily Mean	**233**	**35**	**110**	**8**	**10**	**3**	**399**

[1]Cackling
[2]Aleutian
[3]Taverner's/lesser
[4]Dusky
[5]Western
[6]Unidentified

Table 4. Canada geese abundance at Nestucca Bay, Tillamook Bay, and Nehalem Bay when counts were conducted simultaneously during winter 2013-14.

Date	Location	Count	Total Count of all Areas
13-Nov-13	Nestucca Bay	3,461	**3,792**
	Tillamook and Nehalem Bays	331	
14-Nov-13	Nestucca Bay	7,353	**7,536**
	Tillamook and Nehalem Bays	183	
18-Nov-13	Nestucca Bay	5,368	**5,884**
	Tillamook and Nehalem Bays	516	
19-Nov-13	Nestucca Bay	4,669	**4,718**
	Tillamook and Nehalem Bays	49	
21-Nov-13	Nestucca Bay	4,148	**4,290**
	Tillamook and Nehalem Bays	142	
07-Jan-14	Nestucca Bay	3,772	**4,093**
	Tillamook and Nehalem Bays	321	
21-Jan-14	Nestucca Bay	5,291	**6,695**
	Tillamook and Nehalem Bays	1,404	
23-Jan-14	Nestucca Bay	5,966	**6,396**
	Tillamook and Nehalem Bays	430	
28-Jan-14	Nestucca Bay	6,786	**7,388**
	Tillamook and Nehalem Bays	602	
13-Mar-14	Nestucca Bay	5,638	**5,750**
	Tillamook and Nehalem Bays	112	

Table 5. Semidi Islands Aleutian Canada geese monitoring data collected at the Pacific City Monitoring Site during winter 2013-14.

		November								December									January												February									March													April			
Collar Code	Tarsus Code	13	14	18	19	21	25	26	27	2	3	9	10	12	16	17	19	23	2	3	7	8	13	14	16	21	23	28	29	31	3	4	10	13	18	19	24	25	26	3	4	6	10	11	13	17	18	20	24	25	27	31	01	03	07	11
Green	Red																																																							
521	K02																																																							
523	K01																																																							
524	K03																																																							
525	K04																																																							
526	K05																																																							
527	K06																																																							
528	K07					X	X	X	X	X	X	X		X		X		X			X	X		X	X	X		X		X		X	X		X		X		X		X	X				X	X	X		X			X			X
529	K08																																																							
530	K09																																																							
531	K10					X	X	X	X	X	X	X	X	X	X	X		X		X	X	X		X	X	X		X	X	X	X	X	X	X			X	X	X	X	X			X	X					X	X		X			X
532	K11				X	X		X	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X		X	X	X	X	X	X	X			X	X	X	X	X			X	X					X	X		X			X
533	K12																																																							
534	K13																																																							
535	K14																																																							
536	K15																																																							
537	K16																																																							
538	K17																																																							
539	K18																																																							
540	K19																																																							
541	K20																																																							
542	K21	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X		X	X	X	X	X	X				X	X	X	X								X		X	X		X			X
543	K22				X	X		X	X	X		X		X	X	X		X		X	X	X		X	X		X	X	X	X		X	X		X		X	X	X	X	X	X		X		X				X	X		X			
544	K23	X			X	X	X	X		X	X		X	X	X	X	X	X		X	X	X		X	X	X		X	X	X	X	X	X			X	X	X	X	X	X	X		X			X	X		X	X		X			X
545	K24				X	X	X	X	X		X	X	X	X	X	X		X		X	X	X		X	X	X	X	X		X			X				X	X	X		X			X			X			X	X		X			X
546	K25				X			X	X	X	X		X		X	X		X	X		X			X	X	X		X		X		X	X			X	X	X	X	X	X	X			X		X	X			X		X	X		X
547	K26																																																							
548	K27																																																							
549	K28																																																							
550	K29																																																							
551	K30																																																							
552	K31																																																							
553	K32																																																							
555	K33																																																							
556	K34																																																							

Table 5 (cont.).

		November								December									January											
Collar Code	Tarsus Code	13	14	18	19	21	25	26	27	2	3	9	10	12	16	17	19	23	2	3	7	8	13	14	16	21	23	28	29	31
557	K35																													
558	K36																													
559	K37																													
560	K38		X			X	X	X	X	X	X	X	X	X		X		X		X	X	X		X	X		X		X	X
561	K39																													
562	K40																													
563	K41																													
564	K42																													
565	K43																													
566	K44																													
567	K45	X	X			X	X	X	X	X	X	X	X	X		X		X		X	X					X	X	X	X	X
568	K46																													
569	K47				X	X		X		X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X
570	K48																													
571	K49																													
572	K50																													
573	K51																													
574	K52																													
575	K53																													
576	K54																													
577	K55																													
(none)	K56																													
578	K57	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X	X		X	X	X
579	K58				X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
580	408																													
581	409																													
582	410																													
(none)	411																													
583	415																													
584	418																													
585	419					X	X	X	X	X	X		X	X			X	X		X	X	X	X	X	X	X			X	X
586	420																													
587	421																													
588	422																													
589	423																													

		February									March													April			
Collar Code	Tarsus Code	3	4	10	13	18	19	24	25	26	3	4	6	10	11	13	17	18	20	24	25	27	31	01	03	07	11
557	K35																										
558	K36																										
559	K37																										
560	K38	X	X	X		X		X	X	X	X	X	X		X		X	X	X		X		X	X			
561	K39																										
562	K40																										
563	K41																										
564	K42																										
565	K43																										
566	K44																										
567	K45			X	X	X	X	X	X	X		X	X		X	X			X		X			X	X		
568	K46																										
569	K47		X	X				X				X				X		X			X	X		X	X	X	
570	K48																										
571	K49																										
572	K50																										
573	K51																										
574	K52																										
575	K53																										
576	K54																										
577	K55																										
(none)	K56																										
578	K57		X	X	X		X		X		X	X	X				X	X				X		X	X		X
579	K58		X	X			X	X		X		X							X		X	X		X			X
580	408																										
581	409																										
582	410																										
(none)	411																										
583	415																										
584	418																										
585	419		X	X				X	X	X		X				X					X	X	X	X			X
586	420																										
587	421																										
588	422																										
589	423																										

Table 5 (cont.).

		November								December									January										February									March												April			
Collar Code	Tarsus Code	13	14	18	19	21	25	26	27	2	3	9	10	12	16	17	19	23	2	3	7	8	13	14	16	21	23	28	29	31	3	4	10	13	18	19	24	25	26	3	4	6	10	11	13	17	18	20	24	25	27	31	01	03	07	11
590	425																																																							
591	426																																																						
592	427																																																					
593	428																																																					
594	429				X	X	X	X	X	X	X		X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X		X	X		X		X	X	X		X	X			X				X			X			X
595	430																																																					
596	431																																																					
597	437																																																					
598	435																																																					
599	434																																																					
600	438																																																					
(none)	439																																																					
Total Green		4	4	1	9	14	10	15	13	13	14	10	13	14	10	14	7	15	2	12	15	13	4	14	14	13	7	13	12	15	5	13	15	4	5	5	14	12	13	8	14	8	0	7	6	5	7	7	0	13	11	2	15	4	1	11
Collar Code	Tarsus Code																																																					
Red	Red																																																						
300	300																																																					
301	301																																																					
302	302																																																					
303	303																																																					
304	304																																																					
305	305																																																					
306	306																																																					
Lost collar	307																																																					
308	308																																																					
309	309																																																					
310	310																																																					
311	311																																																					
312	312																																																					
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316	316																																																					
317	317																																																					
318	318																																																					

Table 5 (cont.).

		November								December									January												February									March													April			
Collar Code	Tarsus Code	13	14	18	19	21	25	26	27	2	3	9	10	12	16	17	19	23	2	3	7	8	13	14	16	21	23	28	29	31	3	4	10	13	18	19	24	25	26	3	4	6	10	11	13	17	18	20	24	25	27	31	01	03	07	11
319	319																																																							
320	320																																																							
321	321																																																							
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327	327																																																							
328	328																																																							
329	329																																																							
330	330																																																							
331	331	X	X			X		X	X		X	X	X	X	X	X		X		X	X	X		X		X		X	X	X		X	X	X		X	X	X	X		X	X		X			X	X			X			X		X
Lost collar	400																																																						
(none)	K63																																																							
(none)	K67																																																							
(none)	K82																																																							
(none)	K87																																																							
(none)	K93																																																							
(none)	K95																																																							
(none)	MBR																																																							
(none)	Artist																																																							
(none)	BW 84C																																																							
Total Red		1	1	0	0	1	0	1	1	0	1	1	1	1	1	1	0	1	0	1	1	1	0	1	0	1	0	1	1	1	0	1	1	1	0	1	1	1	1	0	1	1	0	1	0	0	1	1	0	0	1	0	0	1	0	1
Blue collar																																																								
296																						X																																		
506																								X																																
228																								X	X	X					X																									
247																										X	X																													
OA7																											X	X										X																		
41Y																												X																												
3J7																												X				X						X			X															
4J1																																	X								X															
3J8																																	X								X															

Table 5 (cont.).

		November							
Collar Code	**Tarsus Code**	**13**	**14**	**18**	**19**	**21**	**25**	**26**	**27**
3A2									
451									
A49									
K65									
OA3									
Total Blue		0	0	0	0	0	0	0	0
Species counts at monitoring site									
Aleutian		379	280	490	320	416	470	332	438
Cackling		25	390	55	80	6	800	710	272
Western		0	0	10	0	36	0	6	71
Taverner's/Lesser		105	940	275	0	0	913	284	299
Dusky		14	0	30	0	0	7	210	16
Taverner's		0	0	0	0	0	0	0	0
Lesser		0	0	0	0	0	0	0	0
Greater White-fronted		0	0	0	0	0	0	0	0
Ross' Geese		0	0	0	0	0	0	0	0
Snow Geese		0	0	0	0	0	0	0	0
Other geese		0	0	0	0	0	0	0	0
Totals		523	1610	860	400	458	2190	1542	1096

	December								
Collar Code	**2**	**3**	**9**	**10**	**12**	**16**	**17**	**19**	**23**
3A2									
451									
A49									
K65									
OA3									
Total Blue	0	0	0	0	0	0	0	0	0
Species counts at monitoring site									
Aleutian	460	408	376	386	431	360	370	540	560
Cackling	270	210	275	672	910	570	635	1600	1200
Western	21	0	16	3	0	0	12	0	11
Taverner's/Lesser	100	2	55	126	0	530	156	600	300
Dusky	0	0	21	120	0	85	45	0	21
Taverner's	0	0	0	0	0	0	0	0	0
Lesser	0	0	0	0	0	0	0	0	0
Greater White-fronted	0	0	0	0	0	0	3	0	0
Ross' Geese	0	0	0	0	0	0	0	0	0
Snow Geese	0	0	0	0	0	0	0	0	0
Other geese	0	0	0	0	0	0	0	0	0
Totals	851	620	743	1307	1341	1545	1221	2740	2092

	January											
Collar Code	**2**	**3**	**7**	**8**	**13**	**14**	**16**	**21**	**23**	**28**	**29**	**31**
3A2												
451												
A49												
K65												
OA3												
Total Blue	0	0	0	1	0	2	1	2	2	3	0	0
Species counts at monitoring site												
Aleutian	401	311	274	404	444	508	498	822	700	493	423	410
Cackling	763	851	226	87	216	217	530	428	340	20	33	1
Western	82	19	0	5	25	0	30	0	0	0	0	0
Taverner's/Lesser	114	102	1	3	205	2	110	148	204	0	0	0
Dusky	0	76	26	25	0	5	10	45	4	80	7	0
Taverner's	0	0	0	0	0	0	0	0	0	0	0	0
Lesser	0	0	0	0	0	0	0	0	0	0	0	0
Greater White-fronted	0	0	0	0	0	0	0	0	0	0	0	0
Ross' Geese	0	0	0	0	0	0	0	0	0	0	0	0
Snow Geese	0	0	0	0	0	0	0	0	0	0	0	0
Other geese	0	1	0	0	0	0	0	0	0	0	0	0
Totals	1360	1360	527	524	890	732	1178	621	1248	593	463	411

	February								
Collar Code	**3**	**4**	**10**	**13**	**18**	**19**	**24**	**25**	**26**
3A2									
451									
A49									
K65									
OA3									
Total Blue	1	1	2	0	0	0	0	2	0
Species counts at monitoring site									
Aleutian	460	444	650	530	440	500	437	1048	460
Cackling	250	65	230	0	15	30	0	204	40
Western	0	0	0	0	0	0	0	0	0
Taverner's/Lesser	0	0	0	0	0	20	0	0	0
Dusky	45	46	0	0	0	0	0	0	0
Taverner's	30	0	0	0	0	0	0	0	0
Lesser	0	0	0	0	0	0	0	0	0
Greater White-fronted	0	0	0	0	0	0	0	0	0
Ross' Geese	0	0	0	0	0	0	0	0	0
Snow Geese	0	0	0	0	0	0	0	0	0
Other geese	0	0	0	0	0	0	0	0	0
Totals	785	555	880	530	455	550	437	1252	500

	March												
Collar Code	**3**	**4**	**6**	**10**	**11**	**13**	**17**	**18**	**20**	**24**	**25**	**27**	**31**
3A2	X	X						X					
451							X						X
A49				X									
K65													
OA3													
Total Blue	1	4	0	1	0	0	1	1	0	0	0	0	1
Species counts at monitoring site													
Aleutian	578	1109	580	0	633	1110	810	396	610	440	367	610	550
Cackling	48	105	18	0	76	190	180	163	70	90	162	40	95
Western	60	0	0	0	0	0	0	3	0	23	0	0	0
Taverner's/Lesser	0	0	16	0	0	0	0	9	0	114	0	0	0
Dusky	40	1	0	0	0	0	0	27	0	16	0	0	0
Taverner's	0	0	0	0	0	0	0	0	0	0	0	0	0
Lesser	0	0	0	0	0	0	0	0	0	0	0	0	0
Greater White-fronted	0	0	0	0	0	0	0	0	0	0	0	0	0
Ross' Geese	0	0	0	0	0	0	0	0	0	0	0	0	0
Snow Geese	0	0	0	0	0	0	0	0	0	0	0	0	0
Other geese	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	726	1215	614	0	709	1300	990	598	680	683	529	650	645

	April			
Collar Code	**01**	**03**	**07**	**11**
3A2				
451				
A49				
K65				X
OA3				X
Total Blue	0	0	0	2
Species counts at monitoring site				
Aleutian	373	338	148	320
Cackling	48	0	0	0
Western	0	0	1	0
Taverner's/Lesser	0	0	18	0
Dusky	9	0	0	0
Taverner's	0	0	0	0
Lesser	0	0	0	0
Greater White-fronted	0	0	0	0
Ross' Geese	0	0	0	0
Snow Geese	0	0	0	0
Other geese	0	0	0	0
Totals	430	338	167	320