

American Golden-Plovers on the Seward Peninsula, Alaska: A new longevity record for the species and other breeding ground observations

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Johnson, O.W., Bruner, P.L., Bruner, A.E. & Johnson, P.M. 2007. American Golden-Plovers on the Seward Peninsula, Alaska: A new longevity record for the species and other breeding ground observations. *Wader Study Group Bull.* 114: 56–59.

Keywords: American Golden-Plover, *Pluvialis dominica*, longevity, breeding ground fidelity, nest spacing, nest reuse, replacement clutches

A banded male American Golden-Plover *Pluvialis dominica* returned to the same breeding territory in western Alaska for 13 consecutive seasons setting a longevity record for the species. We report here various features of the bird's nesting including distances between nests, and reuse of nest cups. When this individual's territory became vacant in 2006 (presumably because its occupant had died), an unbanded male *dominica* defended the site for a single season and nested in one of his predecessor's nest cups. In 2007, *dominica* were absent from the site and it was occupied instead by a nesting pair of Pacific Golden-Plovers *P. fulva*. In an area separate from the long-lived plover, we banded both members of four pairs of *dominica* in 2002 and observed the returnees (two males and two females) in 2003. One of the males reoccupied his former nesting territory, the other male selected a nest site that may have been beyond the boundaries of his 2002 territory. The latter male also made a dramatic shift in nesting habitat moving from dense grassy tussock in 2002 to a nearby stony flat with sparse vegetation in 2003. The two marked females mated with new partners at considerable distances from their nests the previous season.

INTRODUCTION

In a previous paper, we documented site fidelity, nesting, and other features of the breeding cycle in marked American Golden-Plovers *Pluvialis dominica* studied over a 13-year period from 1988 to 2000 on the Seward Peninsula in western Alaska (Johnson *et al.* 2001). Of the plovers in this earlier investigation, one male was particularly long-lived and we continued to monitor his survival through recent years. Here we present details concerning this bird along with information gleaned from additional *dominica* marked in 2002. Together, these findings shed further light on the breeding biology of the species.

METHODS

We captured plovers in nest traps during incubation and marked each bird with a unique combination of color-bands placed on its tibiotarsi. The long-lived male (hereafter D5-93) was caught on 15 June 1993 on a nest containing a typical clutch of four eggs. For information concerning the nest of *dominica* (a shallow cup or scrape constructed by the male on the surface of the tundra) see Johnson & Connors (1996) and Byrkjedal & Thompson (1998). The area in which D5-93 was nesting is situated near mile 35 upslope on the east side of the Nome-Teller Highway at approximately 64°49'N 166°03'W. Post-banding, we monitored the survival of D5-93 in subsequent breeding seasons (usually from late May to at least mid-June) and marked the locations of the cups in which he was nesting.

At a different site westward from the Nome-Teller Highway near mile 16.2, we banded both members in four pairs of *dominica* over the period 20–24 June 2002 and mapped the locations of their nests. This site (the approximate center is at 64°37'N 165°43'W) consists of about 150 ha most of which is rocky and xeric. Almost all of the area is covered by low-growth (generally <5 cm tall) lichen/heath vegetation; a small part is mesic with hummocks of dense grasses and sedges. During the 2003 season, we re-visited the site from 15 to 21 June and located banded returnees along with several unmarked *dominica*. We recorded whether marked males had reoccupied their previous territories and measured the inter-season shifts of marked females to new nesting sites.

RESULTS

Observations concerning the long-lived bird

D5-93 occupied the same breeding territory annually for 13 seasons (including the year in which he was banded), and our last records of him were in June 2005.

In 2006, his territory was occupied by an unmarked male *dominica*. Notably, the latter plover nested in a cup that his predecessor had used in both 2001 and 2003 (see below). Thus, this particular nest cup was used three times by two different males. In 2007, *dominica* were absent from the site and in their place we found a nesting pair of Pacific Golden-Plovers *P. fulva*. The age of D5-93 was unknown at the time of his capture in 1993. We make the assumption here that he





Fig. 1. The divergent nesting sites of plover M-2 in successive seasons. Left photo shows the dense, moist tussock habitat in which the bird nested in 2002 (nest was within the circle amidst relatively tall grass and sedge). In 2003, the nest (centre of right photo) was on a nearby dry stony site that had been excavated for gravel. The entire excavated area (about 1.5 ha) had very sparse vegetation like that in the photo.

was in his first nesting season and nearing one year of age when banded (i.e., hatched in late June–early July 1992). Therefore at minimum, D5-93 was 13 years of age at our last contact with him.

The nests in which D5-93 had incubated clutches over the 13 seasons were scattered within an area of roughly 25 ha. In the 2000 season, the bird had two nests because of re-nesting after loss of the first clutch to predation. The first clutch was destroyed sometime after 14 June, the fourth egg of the second clutch was laid on 27 June. Therefore, the entire re-nesting process was completed during a period of no more than 12 days. It is likely that other D5-93 re-nestings went unrecorded because we often left the study site by mid-June. The inter-year distances between D5-93 nests (i.e., from the last known clutch to the first cup in which we found eggs the next season) ranged from 0 (reuse of cup) to 154 m. The distance between the two successive cups in 2000 was 125 m. In two instances D5-93 reused his former nests: the 2001 cup in 2003, and the 2004 cup in 2005.

Unfortunately, we have no useful data on the nesting success of D5-93 (our fieldwork generally ended each season prior to hatching), and almost no information concerning the females that paired with him over the years. Of these females, we captured and banded only his 2002 mate and following that season she was never seen again.

Other breeding ground findings

In 2003, we returned to the site where four pairs were captured the previous season (see Methods), and again found four pairs of *dominica* nesting there. Among these were two marked males (hereafter M-1 and M-2) and two marked females (hereafter F-1 and F-2). All of the returnees were paired with new partners, and both females were nesting at considerable distances from their 2002 nest sites. Female F-1 (her previous mate M-1 was present on his 2002 territory and paired with an unmarked female) had mated with an unbanded male about 1,600 m from her 2002 nest. Female F-2 (her 2002 partner was not found) had shifted approximately 550 m and was paired with male M-2 whose 2002 mate was missing. Male M-1 was observed copulating with his unmarked mate about 50 m from his 2002 nest. We were unable to locate the 2003 nest of this pair as the birds showed no nest-related

behavior during the study period and were perhaps in the process of re-nesting. With one exception, all nesting in both years at mile 16.2 (marked and unmarked plovers alike) was in low-growth lichen/heath vegetation. The exceptional situation involved male M-2 who nested in 2002 on a moist lower slope amidst taller dense grass and sedge. In 2003, the same individual moved about 500 m upslope and nested in dramatically different habitat on a dry stony substrate nearly devoid of plant cover along the edge of an abandoned gravel pit (Fig. 1). Whether the 2003 nest was within this bird's 2002 breeding territory is unknown.

DISCUSSION

In a previous paper written while D5-93 was known to be alive, his minimum age was reported to be a record 11 years (Johnson *et al.* 2004). Strong inter-season fidelity of male *dominica* to their breeding territories has been characteristic of these birds on our study sites over numerous seasons (Johnson & Connors 1996, Johnson *et al.* 2001, Johnson & Bruner, unpubl. data). Given this behavioral pattern, it is reasonable to assume that the failure of D5-93 to appear on his territory in 2006 indicated mortality at a final minimum age of 13 years. While this individual is the oldest known American Golden-Plover, records among congeners (Black-bellied Plover *P. squatarola* 20 yr 4 m, Holland 1992; Eurasian Golden-Plover *P. apricaria* 18 yr, Jukema *et al.* 2001; Pacific Golden-Plover *P. fulva* 21 yr 3 m, Johnson *et al.* 2004) indicate that longevity significantly greater than documented for D5-93 probably occurs among *dominica*. In contrast to territory-faithful males, lack of inter-season site fidelity has been typical of female *dominica* in our studies on the Seward Peninsula (Johnson & Connors 1996, Johnson *et al.* 2001, Johnson & Bruner, unpubl. data).

The laying of a second (replacement) clutch after loss of the first clutch together with between-clutch mate fidelity (both members of the pair banded) was recorded in American Golden-Plovers at Churchill, Manitoba (Klima 2002). Furthermore, a banded *dominica* female (male of the pair not marked) under observation in 2003 laid a replacement clutch at Barrow, Alaska (Naves *et al.* 2007). With respect to re-nesting by D5-93 in 2000, the foregoing records along with the relatively short time between loss of the first clutch and



completion of the second (within 12 days), strongly suggest that the same female produced both clutches. Moreover, this female, though not banded, had distinctive white feathering on her cheeks that made identification almost certain (Johnson *et al.* 2001). Pairs remaining together for re-nesting have been recorded in at least eight other species of monogamous shorebirds breeding in the arctic and subarctic: Black-bellied Plover (Ryabitshev 2000, Tomkovich & Soloviev 1994), Pacific Golden-Plover (Schekkerman *et al.* 2004, Sviridova 2000), Semipalmated Plover *Charadrius semipalmatus* (Flynn *et al.* 1999), Black Turnstone *Arenaria melanocephala* (Handel & Gill 2000), Semipalmated Sandpiper *Calidris pusilla* (Gratto-Trevor 1992), Western Sandpiper *C. mauri* (Holmes 1971a), Rock Sandpiper *C. ptilocnemis* (Gill *et al.* 2002), and Dunlin *C. alpina* (Holmes 1971b, Schekkerman *et al.* 2004, Soikkeli 1967). Clearly, females of tundra-nesting shorebirds (including *Pluvialis* plovers) are capable of producing a second clutch when the first is lost, but to what extent such replacement laying actually occurs is poorly understood (see Naves *et al.* 2007).

Between-year nest spacing and the reuse of nest cups were reported in *dominica* nesting in northern Alaska (Moiteret *et al.* 1996), on the Seward Peninsula of western Alaska (Johnson *et al.* 2001), and at Churchill, Manitoba (Klima 2002). Collectively, the foregoing studies show inter-year distances ranging from 0 (same cup in successive seasons) to 500 m. Our distance measurements for D5-93 and M-2 fall within this range. In the most unusual instance of reuse by *dominica*, Moiteret *et al.* (1996) found the birds nesting in the previous cup of a Stilt Sandpiper (*C. himantopus*). Our record of an unmarked male *dominica* using (in 2006) a nest previously used by D5-93 in both 2001 and 2003 further indicates that nesting cups in this species are not necessarily constructed by the bird occupying them. Moreover, we have no way of knowing whether D5-93 actually built the nest in question. Both intra- and interspecific nest cup reuse have been variously reported in a number of other shorebirds (e.g., Gratto-Trevor 1992, Handel & Gill 2001, Holmes 1971a, Jehl 2006, Klima & Jehl 1998, Moiteret *et al.* 1996, Schekkerman *et al.* 2004, Skeel & Mallory 1996, Tibbitts & Moskoff 1999, Warnock & Gill 1996).

Of the four pairs of *dominica* banded in 2002, the one-year return rates (50% for each sex) are less meaningful than our long-term studies at other sites along the Nome-Teller Highway. Our previous findings indicated rates of 80% for males and 15% for females over 12 post-banding seasons (Johnson *et al.* 2001). The nests constructed in successive seasons by *dominica* male M-2 were at the opposite extremes of potential nesting habitat on our study site: dense grass/sedge in the first year, switching to rocky substrate with almost no vegetation the second year. On the Seward Peninsula where Pacific and American Golden-Plovers breed sympatrically, the former typically nest in relatively dense vegetation, the latter on dry slopes amidst sparse vegetation (Johnson & Connors 1996). The tussock nest site chosen by M-2 in 2002 was unusual for the species in this region, and his rocky nest site the following year indicates that at least some male *dominica* may show substantial inter-season variability in their choice of nesting habitat.

The inter-season shifts in nesting sites of F-1 and F-2 support our earlier speculation that missing females may actually be returning to a general nesting locale, but they are often not site-specific enough to be detected (Johnson *et al.* 2001). Fortunately, these two females moved to new nest

sites within the study area. Had similar movements been directed outward from the area we might not have found the birds. Among *Pluvialis* plovers such outward movements of site-unfaithful females can be lengthy making their detection unlikely and fortuitous as shown by Klima (2002) who located a marked female *dominica* nesting at "slightly over 1 km" from her study area, and by Ryabitshev (2000) who found two *squatarola* females (these had been missing from his study plot on the Yamal Peninsula for two years) nesting at distances of 2 km and 4 km, respectively.

ACKNOWLEDGMENTS

These studies were variously funded by the National Geographic Society, Minnesota State University at Moorhead, Brigham Young University Hawaii, the Hawaii Audubon Society, and the U.S. Fish & Wildlife Service. Since 2001, the National Park Service in Nome, Alaska has graciously provided a vehicle and other logistical assistance. We thank Paul Brusseau, Mark Johnson, and Ronald Kienholz for help with finding plover nests and trapping the birds. Joanna Klima and Richard Lanctot (see Naves *et al.* in References) kindly shared unpublished data with us. Richard Lanctot and Jim Johnson offered helpful comments on an earlier draft of the manuscript.

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