

A sordid affair: shorebird mating systems

by Toby Burke

On a recent outing to Skilak Lake my kids discovered several medium sized shorebirds while walking along the lake's cobble shoreline. The birds were approximately seven to eight inches long, brown above, and white below with bold black spotting. They constantly bobbed their tails or "teetered" while they foraged along the lakeshore. When flushed they flew low over the water and shoreline with stiff shallow wing beats and soft weet, weet, weet vocalizations could be heard as the birds cavorted about. With this information in hand we could readily identify the birds as Spotted Sandpipers.

The Spotted Sandpiper (*Actitis macularia*) is a fairly common yet often-inconspicuous breeding shorebird of the Kenai Peninsula typically encountered along the shorelines of local rivers, lakes, and ponds where it forages and breeds. While it has the distinction of being the most widespread breeding shorebird in North America its greatest renown is due to its unique mating system—polyandry, where one female commonly mates with two or more males, sequentially in the Spotted Sandpiper's case. Polyandry is an uncommon mating system occurring in less than one percent of bird species worldwide.

Shorebirds as a whole are notable for the variety and often-complex mating systems they exhibit. Among the 73 species of shorebirds recorded in Alaska, as with the majority of bird species worldwide, the most common mating system is monogamy, where one male mates with one female and forms a pair bond. The majority of oystercatcher, plover, godwit, curlew, and sandpiper species are principally monogamous.

There are a variety of nonmonogamous mating systems employed by shorebirds. Of these the most common breeding system is polygyny, where one male mates with two or more females. White-rumped, Curlew, and Sharp-tailed Sandpipers, for example, are polygynous. The counterpart to polygyny is the uncommonly exhibited polyandry, which is occasionally observed in Red, Red-necked, and Wilson's Phalaropes and nearly universally in the Spotted Sandpiper. Polygamy is where both polygyny and polyandry occur together in the same species. This occurs most frequently in Snowy Plovers.

Promiscuity is where males and females, often in groups, consort briefly, mate, and do not form pair bonds. It occurs regularly in Pectoral and Buff-breasted Sandpipers as well as Ruffs. The male simply fertilizes the female's eggs and she rears the offspring without the male's assistance. In other mating systems the male may contribute in one or more ways such as nest construction or defense; mate, territorial, or resource defense; incubation of eggs; or brooding, feeding, or defense of young.

It must be noted that in an otherwise monogamous species it is not uncommon to have a regularly occurring minority of polygynous males and conversely there will be a regularly occurring minority of monogamous pairs among otherwise polygynous species.

Often a single individual may employ several mating systems during the course of their breeding life or even within a single breeding season depending on environmental conditions. For example, Snowy Plovers east of the Rocky Mountains are monogamous, both male and females attend the nest and together produce one brood of young per breeding season. West of the Rockies Snowy Plover females will desert their young a few days after hatching while the male remains with the brood until they can survive independently. After deserting the first brood, a third of the females will renege with a new male to establish a second brood. And after rearing their first brood, half of the males will renege with a new female to establish their second brood.

Likewise, Phalaropes, contrary to popular belief, are monogamous the majority of the time. In fact some populations have no documented cases of polyandry. But in other populations a minority of females, usually less than 15%, may be polyandrous if there is a surplus of available breeding males. Interesting enough in years where climatic conditions are favorable and the breeding season is protracted many males may also mate a second time with a new female after rearing their first brood.

Thus while populations of Snowy Plovers and all three species of phalaropes commonly employ monogamy as their principal mating system, they are also known to employ polyandry, polygyny, and

polygamy as opportunities permit. While these four species may seem exceptional, with shorebirds there are many exceptions to the rule.

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intrigued by the status and distribution of Alaska and Kenai Peninsula birds and enjoys birding with his wife and family. Previous Refuge Notebook columns can be viewed on the Web at <http://www.fws.gov/refuge/kenai/>.