



## Migrant Western Sandpipers Entangled on Barbed Wire Fences at Boundary Bay, British Columbia

R. Wayne Campbell<sup>1</sup> and Glenn R. Ryder<sup>2</sup>

<sup>1</sup>2511 Kilgary Place, Victoria, British Columbia, Canada V8N 1J6

<sup>2</sup>302 – 2888-273<sup>rd</sup> Street, Aldergrove, British Columbia, Canada V4W 3M6

Barbed wire fences have long been known to be a source of mortality to birds, flying squirrels and bats in civilized parts of the world (Cornwall and Hochbaum 1971, Hebert and Mark 1995, McNicholl 2007), Allen and Ramirez (1990) listed at least 50 species of birds that have been impaled, most of which were non-passerines. The topic has received more attention recently with the publication of estimates on the impact on species and populations. For example, Booth (2007) estimated that between 100,000 and 1,000,000 birds are killed each year in Queensland, Australia. There are no similar estimates for North America as fence lines are not checked regularly or systematically for carcasses, and, therefore, most reports received are from incidental observations (e.g., Igl 1996).

In British Columbia, birds killed by collisions with fences have also been reported, for example Northern Harrier (*Circus cyaneus*) (McNicholl 2007), Horned Lark (*Eremophila alpestris*), Vesper Sparrow (*Pooecetes gramineus*), and Golden-crowned Sparrow (*Zonotrichia atricapilla*) (Preston 2007), and Snowy Owl (*Bubo scandiacus*) (Campbell and Preston 2009). There are also numerous unpublished observations of similar mortality in the electronic wildlife databases of the Biodiversity Centre for Wildlife Studies for at least another 11 species. This article summarizes historical information for incidents of collisions with fence lines of Western Sandpiper (*Calidris mauri*) in the Boundary Bay region of southwestern

British Columbia.

### Mortality and Collision Incidents

All Western Sandpipers (Figure 1) reported killed by collision, entangled, or snagged by barbed wire fences in this article were found along a narrow eight kilometre stretch of intertidal mudflats and adjacent farmland between 72<sup>nd</sup> Street and 112<sup>th</sup> Street at Boundary Bay, Delta, British Columbia (Figure 2). All observations were made incidental to other personal activities, and, therefore, details vary considerably with each record. Eleven incidents were reported for the 18-year period from 1964 through 1981 as follows:

#### 5 September 1964

RWC found three dead Western Sandpipers, all snared by the wing on the top strand of a barbed wire fence off the south end of 112<sup>th</sup> Street. The four-wire fence, about 1.2 m high, was partially collapsed and stretched from the dyke into the intertidal zone about 40 m. The sandpipers were snagged over a distance of about three metres of fence line over the mud flats. They were estimated to have been dead at least one week.



**Figure 1.** Western Sandpiper is a small shorebird that migrates in large flocks along the Pacific coast of North America each year where it stops at a few key locations to feed on invertebrates in the extensive intertidal mud flats. It has been estimated that in autumn 1.2 million birds pass through the Fraser River delta (Butler and Campbell 1987). *Photo by R. Wayne Campbell, 24 August 2005.*

#### **29 September 1966**

D. Woolgar found a single well-desiccated shorebird impaled by a wing on the top of a long, four-line barbed wire fence leading across farmland

to the ocean. The carcass was collected and later the wing was identified by RWC as a juvenile Western Sandpiper. It was estimated the bird died some time in late August or early September.

#### **10 August 1969**

During a bird watching trip, GRR estimated a total of 4,000 Western Sandpipers feeding and flying over the intertidal mud flats. At times flocks wheeled low over farm fields, returning to the foreshore to feed. During time over land some birds became entangled in wire fences running perpendicular to their feeding areas. Six dead Western Sandpipers were found either hanging by a leg, by a broken wing, speared in the head, or hanging by the bill (Figure 3).

#### **30 July 1970**

M. Nobel reported about 3,000 Western Sandpipers at the east end of Boundary Bay flying and feeding. One small flock wheeled over the mud flats near the dyke and several birds hit a crumbling farm fence that extended into the mud flats. None of the sandpipers was snagged or appeared injured.



**Figure 2.** The extensive foreshore mud flats at Boundary Bay, B.C., provide critical food resources for hundreds of species of migrating and resident birds. *Photo by R. Wayne Campbell, April 1991.*



**Figure 3.** One of six Western Sandpipers found impaled or entangled on a barbed wire fence at Boundary Bay, BC. Sketch by Glenn R. Ryder, 30 September 1969. B.C. Photo 3753 (see Campbell and Stirling 1971).

#### 16 August 1970

A dead Western Sandpiper, hanging by its wing from the top strand of a fence line, was reported to W. H. Hesse by W. S. Rae. The bird had not been dead for more than a day or two.

#### 1 September 1971

A sandpiper, found “dead on a farmer’s fence a couple of days earlier at Boundary Bay,” was brought to Bob Harris, a biologist with the Canadian Wildlife Service in Vancouver, B.C., for identification on 1 September. The following Tuesday, on 7 September, the carcass was given to RWC at the Cowan Vertebrate Museum at the University of British Columbia for identification. The bird was a juvenile Western Sandpiper, moderately fat, and had died recently.

#### 9 July 1972

Large flocks of Western Sandpipers, estimated at a total of 15,000 birds (Campbell et al. 1974)

were observed flying and feeding at Boundary Bay, mostly over the mudflats. Much smaller “satellite” flocks occasionally wheeled low over farm fields but did not land. On one occasion two birds became entangled in a fence line, both caught by the wing and later released from the barbed wire unharmed by K.C. Boyce.

#### 23 July 1972

R.W. Phillips reported an injured Western Sandpiper to E.W. Taylor, Canadian Wildlife Service in Vancouver, B.C. The bird was flopping on the ground below a wire fence and was assumed to have recently collided with it.

#### 19 August 1972

A single Western Sandpiper, identified by telescope by G. Arnold and G. Stewart, was hanging from the upper strand of a wire fence about 15.3 m (50 ft) from the dyke. It appeared dead but did not show signs of deterioration. A Common Raven (*Corvus corax*), also on the dyke, noticed the sandpiper and flew to the fence, plucked it from the wire, and flew to the middle of the field, where it ate the carcass.

#### 6 September 1972

A shorebird carcass was removed from a farmer’s fence by R. W. Phillips and given to the senior author for identification. It was a Western Sandpiper and was estimated to have died two to three weeks ago.

#### 28 July 1981

B. Leach was given a Western Sandpiper that was found dead on the ground at the base of a fence near the dyke by a local farmer while he was mending a fence line in the afternoon. It was presumed to have died from a collision with the fence earlier in the day.

## Discussion

Most of the world's population of Western Sandpiper migrates along the Pacific coast of North America (Wilson 1994). In British Columbia, the species is a very abundant spring, summer, and autumn migrant through the Fraser River delta, where it forages in huge flocks on intertidal mud flats and roosts on adjacent upper beaches (Butler and Campbell 1987). The spring passage is short and peaks in late April, whereas the passage of southbound birds is much more protracted and may commence in late June, peak during the third week of August, and continue into mid-October (Butler and Campbell 1987, Campbell et al. 1990).

Western Sandpiper mortality from barbed wire fences at Boundary Bay has been reported only during southbound migration and primarily for the years 1970 through 1972. During this period, birders and other naturalists were encouraged to submit bird sightings for annual bird reports for the Greater Vancouver region (see Campbell et al. 1972a, 1972b, 1974). Over the three years, hundreds of thousands of records were compiled and published but incidents of mortality were rarely included in the individual species accounts.

Ten of the 11 reported incidents of Western Sandpipers and encounters with farm fences occurred during the period when migrants are most common in the area, mainly from early July to early September (Butler and Campbell 1987, Campbell et al. 1990). Individual Western Sandpipers are agile fliers and probably can avoid fences whereas larger flocks, twisting and turning in synchrony, may be unable to avoid them.

The death of Western Sandpipers from entanglement on barbed wire fences appears to be the first reported instance of such mortality for the species (Wilson 1994) and the sandpiper (Scolopacidae) family with only two other shorebirds, an unspecified European avocet or stilt species and a plover species (Northern Lapwing, *Vanellus vanellus*), being documented (Allen and Ramirez 1990).

## Mitigation

Most casualties of wildlife on fences go unobserved and unreported. However, when an animal is found dangling from a wire fence knowing it has succumbed to a lingering and cruel death, the incident becomes an animal-welfare issue. At Boundary Bay, two non-functional fence lines jutting into the intertidal mudflats were removed by biologists in winter 1982. Western Sandpipers have been recorded in collisions with this fence.

While it is not feasible to remove all barbed wire fences as suggested by Cornwell and Hochbaum (1971) from agricultural land in the Boundary Bay region, there may be a reasonable and simple solution to most bird casualties there. When recorded, all entangled birds were found snared by the top line of a barb wire fence. Most casualties could be prevented if this strand was replaced with a strand of plain wire. Ideally, all barbed wire fences could be replaced with plain wire fences over time. Marking fences to increase their visibility (Figure 4), as suggested by Fitzner (1975) and Allen and Ramirez (1990), may also reduce their hazard. Barbed wire fences are still used today by farmers to keep animals within an enclosed area and mark boundaries of property. †



**Figure 4.** Marking barbed wire fences with flagging tape, or other visible deterrents, especially in areas of high collision, may help reduce mortality of Western Sandpipers, and other wildlife. *Photo by Mark Nyhof.*

### *Acknowledgements*

All collision and mortality records were extracted from the personal library of the senior author and electronic databases being developed by the Biodiversity Centre for Wildlife Studies. The following people reported Western Sandpiper entanglements or collisions at Boundary Bay: Genevieve Arnold, Kenneth C. Boyce, R. Wayne Campbell, Robert D. Harris, Werner H. and Hilde Hesse, Barry Leach, Malcolm Nobel, Roy W. Phillips, William S. Rae, Glenn R. Ryder, Gordon Stewart, Ernest W. Taylor, and David Woolgar.

We are grateful to Patricia Huet for early editorial comments and Martin K. McNicholl and Spencer G. Sealy for peer-review of this paper.

### *Literature Cited*

- Allen, G.T. and P. Ramirez.** 1990. A review of bird deaths on barbed-wire fences. *Wilson Bulletin* 102(3): 553-558.
- Booth, C.** 2007. Barbs and birds. *Wingspan* 17(4):13-14.
- Butler, R.W. and R.W. Campbell.** 1987. The birds of the Fraser River delta: populations, ecology and international significance. *Canadian Wildlife Service Occasional Paper Number 65*, Ottawa, ON. 73 pp.
- Campbell, R.W. and M.I. Preston.** 2009. Feature species – Snowy Owl. *Wildlife Afield* 6(2):173-255.
- Campbell, R.W. and D. Stirling.** 1971. A photoduplicate file for British Columbia vertebrate records. *Syesis* 4(1/2):217-222.
- Campbell, R.W., N.K. Dawe, I. McTaggart-Cowan, J.M. Cooper, G.W. Kaiser, and M.C.E. McNall.** 1990. The birds of British Columbia: Volume 2 – nonpasserines (diurnal birds of prey through woodpeckers). Royal British Columbia Museum, Victoria, BC. 636 pp.
- Campbell, R.W., M.G. Shepard, and R.H. Drent.** 1972a. Status of birds in the Vancouver area in 1970. *Syesis* 5:180-220.
- Campbell, R.W., M.G. Shepard, B.A. MacDonald, and W.C. Weber.** 1974. Vancouver birds: 1972 report and 1974 check list. Vancouver Natural History Society Publication Number 5, Vancouver, BC. 96 pp.
- Campbell, R.W., M.G. Shepard, and W.C. Weber.** 1972b. Vancouver birds in 1971. Vancouver Natural History Society Special Publication Number 2, Vancouver, BC. 88 pp.
- Cornwall, G. and H.A. Hochbaum.** 1971. Collisions with wires – a source of anatid mortality. *Wilson Bulletin* 83:305-306.
- Fitzner, R.E.** 1975. Owl mortality on fences and utility wires. *Raptor Research* 9:55-57.
- Hebert, E. and L. Mark.** 1995. Avian collision and electrocution: an annotated bibliography. California Energy Commission Publication Number P700-95-001, Sacramento, CA.
- Igl, L.D.** 1996. Western Meadowlark impaled on barbed-wire fence. *Prairie Naturalist* 28(1):25-26.
- McNicholl, M.K.** 2007. Northern Harrier impaled on barbed wire fence. *British Columbia Birds* 16:40-42.
- Preston, M.I.** 2007. New records of bird mortality as a result of collisions with wire fencing. *Wildlife Afield* 4(1):92-94.
- Wilson, W.H.** 1994. Western Sandpiper (*Calidris mauri*). In *The Birds of North America*, No. 90 (A. Poole and F. Gill, eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union. 20 pp.

### *About the Authors*

Wayne is a Director of the Biodiversity Centre for Wildlife Studies and a member of the editorial team for *Wildlife Afield*.

Glenn is an active field naturalist who enjoys all aspects of wildlife observation. He also has a passion for collecting old bottles and telephone wire insulators and exploring the remains of historical sites of human habitation in the Lower Mainland.