

run for a distance of up to 150 feet. Both birds would then stop abruptly and the chase would be repeated in the opposite direction. After perhaps 2 minutes of this performance the birds would resume their feeding, together. Other species present in these display areas included Semipalmated Plover and Wilson's Plover, which *C. collaris* appeared to tolerate. I was not able to locate another nest, and feel that the 2 displaying pairs possibly nested in other marismas nearby. By the end of December they had left the areas where I had been observing them.

References

Amadon, D. and Eckelberry, D.R. 1955. Observations on Mexican Birds. Condor 57: 65-80.  
Clow, W. 1977. A winter check-list of the birds of San Blas. Point Reyes Bird Observatory, Stinson Beach, California.  
Monroe, B.L., Jr. 1968. A distributional survey of the birds of Honduras. Ornithological Monograph No. 7. American Ornithologists' Union.  
Ralph S. Widrig, Box 43, Ocean Park, Washington 98640, U.S.A.

THE SHOREBIRDS OF LEADBETTER POINT

by Ralph S. Widrig

(The following material has been adapted and extracted from THE SHOREBIRDS OF LEADBETTER POINT, A Twelve Month Census with Notes on Other Records from Willapa Bay, Washington, by Ralph S. Widrig, 63 pp., Published Independently, 1979. This publication consists of an introductory description and ornithological history of the Leadbetter Point and Willapa Bay area, which form one of the most important estuaries on the south coast of Washington State an overview of the migration seasons, extensive species accounts for the 38 species using estuarine habitat, and a summary and conclusion section assessing the importance of the area and discussing its future conservation. The report is well illustrated with maps, figures and tables, including the data from all censuses carried out between 8 June 1978 and 4 June 1979: reproductions of drawings of shorebirds by Frank L. Beebe enhance the report. Also included are a plant species list, a bird check-list and an index, as well as an addendum of shorebird records. The report is well produced, well written and well researched, and provides an admirable account of shorebird migration on the south Washington coast. - RIGM)

Introduction and Description of the Area

Since the initial description of the area by British explorer John Meares in 1788, Willapa Bay has retained much of its pristine quality and today is the only major unpolluted estuary remaining in the United States (USF&WS 1975). It is also one of the shallowest. Twenty-five miles in length, more than 65sq.ml.(170km<sup>2</sup>) of mud flats, oyster beds, clam beds, tidal pools, eelgrass, gravel beaches, broad sandy beaches, and salicornia marshes are exposed at low tide creating an incredibly rich and diverse feeding habitat for migrant shorebirds. Warm bay temperatures ranging from 40 to 70 °F (4-21 °C) together with year-round input from freshwater tributaries and a tidal range of 12'(3.7m) stimulate the production and reproduction of a spectrum of shorebird food (Washington State Parks & Recreation Commission 1974, Shotwell 1977, C.S. Sayce pers. comm., pers. obs.). Higher stretches of sand and meadows are available for roosting, making a complete habitat for transient shorebirds and providing the opportunity for migratory staging. Six shorebird species winter regularly at the estuary in substantial numbers, and smaller populations of eight other species winter there occasionally.

Without a doubt the focal point of the Willapa estuary, from the standpoint of avian fauna, is Leadbetter Point. Situated at the tip of a long, sandy peninsula running north from the mouth of the Columbia River, the point hooks eastward into Willapa Bay to include Grassy Island, partially separated by a protected channel that winds through a 500 acre(200ha) salicornia marsh (Figures 1 and 2). Strong ocean currents constantly resculpture the shifting dunes and shoals, and heavy seas occasionally breach the spit which connects Grassy Island to the point. This in turn creates an extensive habitat of sand and drift which is mostly free of vegetation, and it is here that Snowy Plovers return each spring to nest

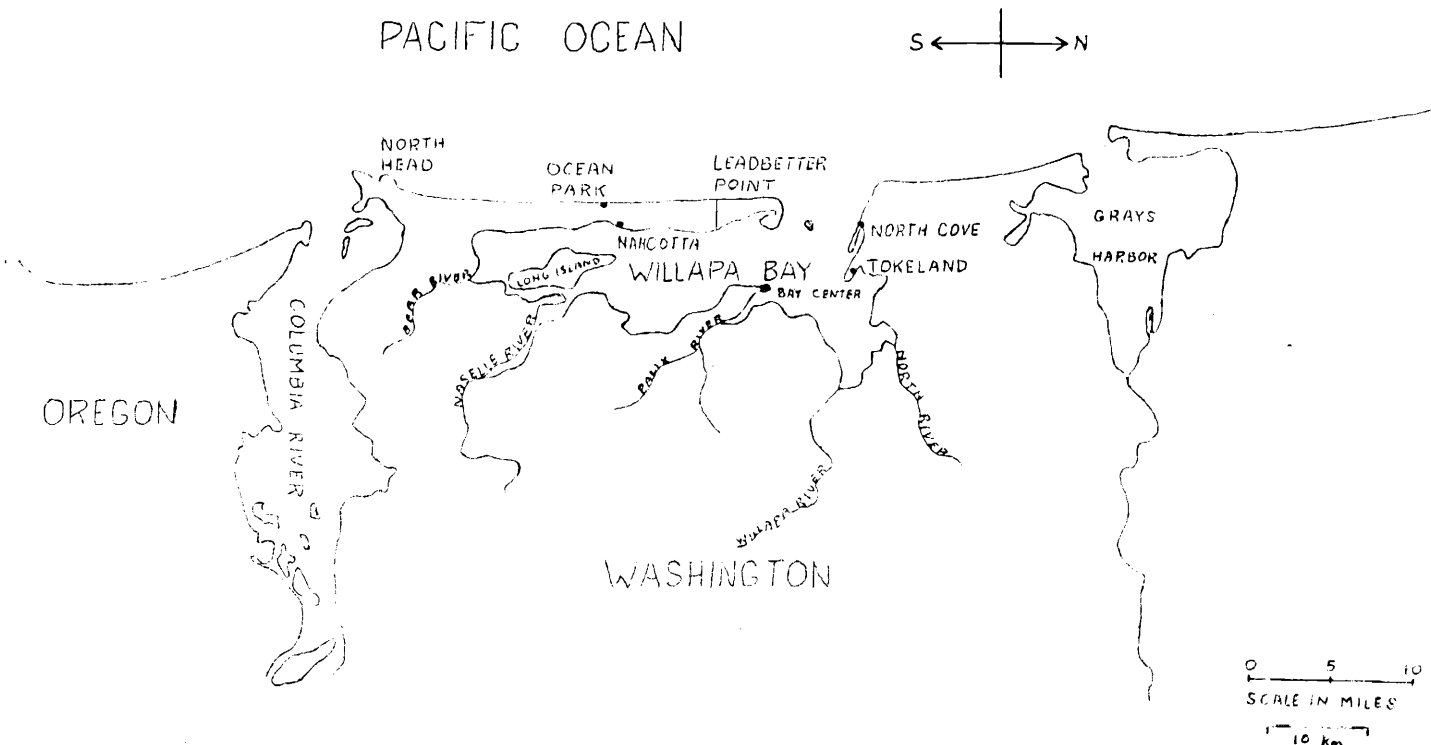


Figure 1 Estuaries of the south Washington coast

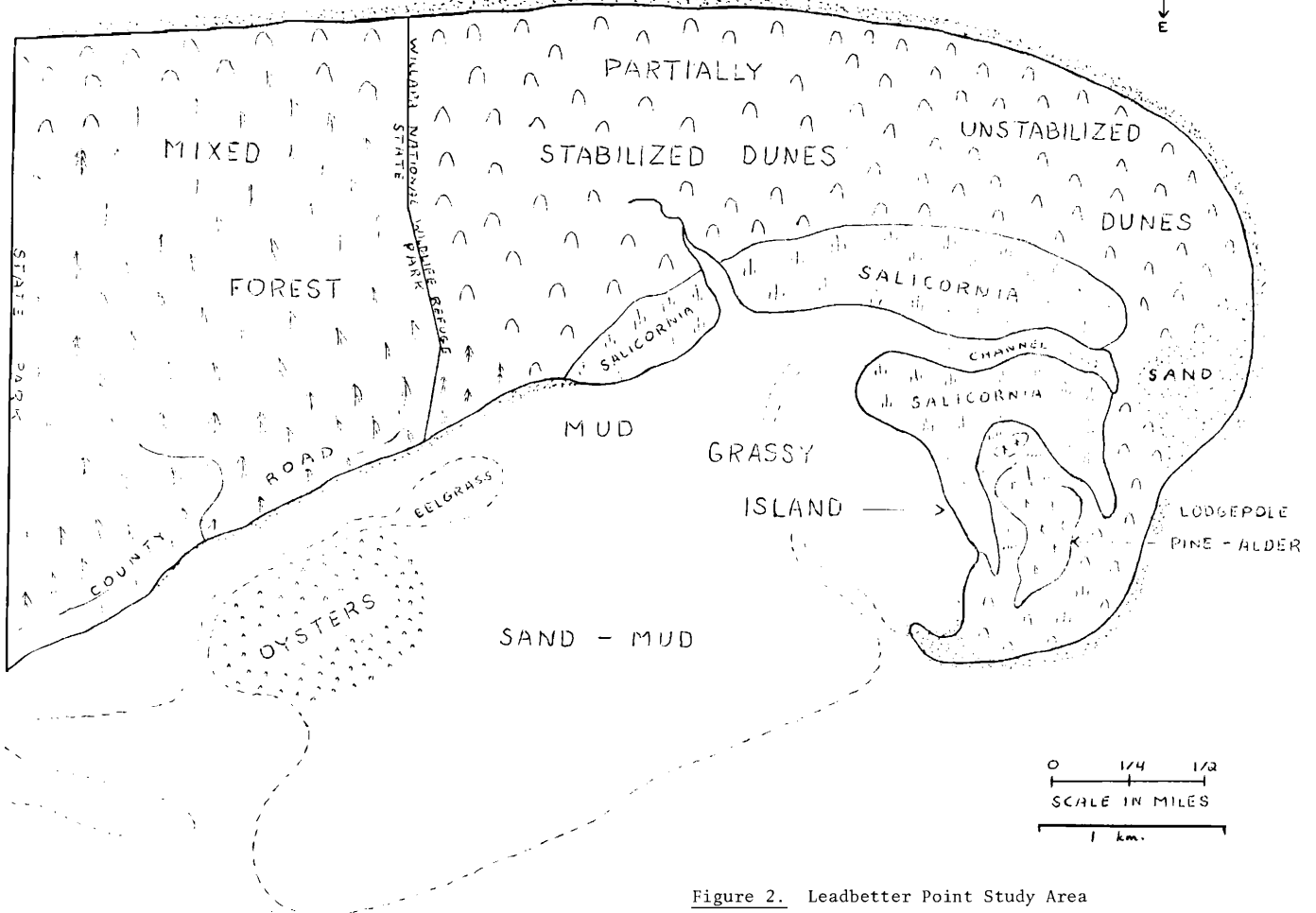
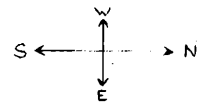


Figure 2. Leadbetter Point Study Area

As late as 1953 Leadbetter Point was not even mentioned in the definitive work *Birds of the State of Washington* by Jewett et al (1953). About a decade later, an active birder from the Portland Audubon Society with a keen interest in coastal areas, Alan Baldrige, discovered the unique value to wildlife of this yet unspoiled habitat. Concurrently, however, other interests foresaw commercial possibilities in the point and an inevitable struggle for its control followed. A proposal to dredge the channel, fill the salicornia marsh, construct a luxury motel on Grassy Island, and level the protecting dunes for an airport was met by a counter-proposal in 1966 by Baldrige to add Leadbetter Point to the Willapa National Wildlife Refuge. At this point conservation organisations, government agencies and officials from all levels, and local residents joined in the fray, and the quiescent status of the area was, to say the least, terminated. At length the insanity of the development proposal was realised by all parties, and in April 1968, 1400 acres (570ha) of dunes, marshes, and wildflowers, including Grassy Island, were added to the Willapa Refuge (Washington State Parks & Rec. Comm. 1974, Nehls pers. comm.). In October 1976 an additional 1200 acres (490ha) including a fine mixed forest of Sitka Spruce, Lodgepole Pine, Western Hemlock, Willow, Cascara, Red Alder and Western Crabapple lying immediately south was declared a State Park Natural Area, making the entire end of Leadbetter Point a protected habitat.

Methods

On June 8 1978 I decided to carry out a 12 month census of the area to quantify the seasonal occurrence of shorebirds at this important location on the Pacific flyway. For a study area I chose all of the habitat north of the south boundary of the State Park, or the northern 4mi. (6.4 km) of the point, including Grassy Island (Figure 2). Each census involved walking a route carefully planned to encounter all possible shorebird species. The count was usually started about 3 hours before high tide and continued for about 5 hours. The area covered proved to be a large one, and more than 1000 miles were walked to obtain the data presented.

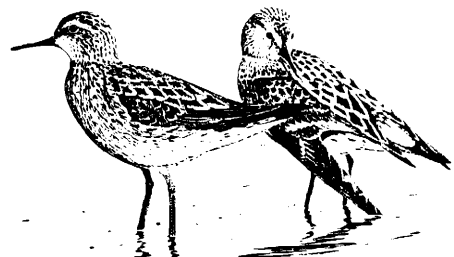
All sight data were obtained with 7x35 Nikon binoculars. The counts recorded should be considered as minimum numbers present as it is never possible to find all of the birds, and a conservative evaluation was always made. Large flocks were usually counted in increments of 100 or 1000. Extrapolation was never used during the census, but at times some of the species could only be estimated - as a substitute for no data at all.

Results

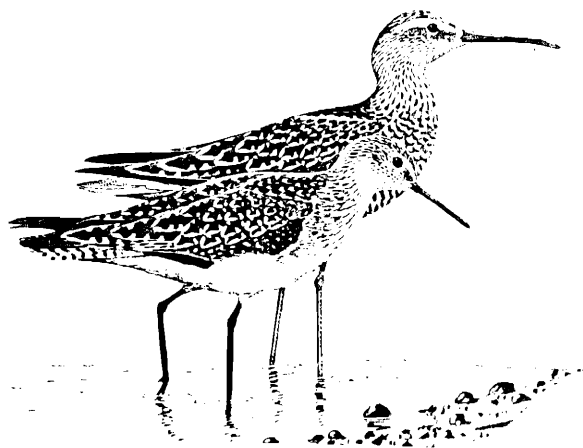
Results of counts showing maximum numbers per month are presented in Table 1 and Figures 3 and 4. These are considered in the descriptive overview of the shorebird migration season and the summary and conclusion sections below.

A. The Seasons of the Census - A Descriptive Overview

Of shorebirds it has been said that the last migrants of spring must almost pass in flight the first flocks to return from the north. An influx of southbound migrants at Leadbetter Point showed up as early as the 25th of June, when 1300 Western Sandpipers suddenly arrived. A wave of Short-billed Dowitchers followed close behind and by early July the fall migration was well under way. New species then appeared on practically every count during continuing unsettled weather and by the third week of August twenty-six shorebird species had been recorded at the point, most of them occurring in



characteristic migration waves. Then an intense low pressure system developing in the Gulf of Alaska brought rain and recurring southerly gales to the Washington coast for the following nine days, and the first Willets and Pectoral Sandpipers appeared in the rain-soaked salicornia marshes. A second storm with heavy rain and southeast gales struck the coast on September 8th and 9th, followed by a period of unsettled weather with light winds. It was during this unsettled period that the number of shorebird species observed in a single day at the point reached its peak of 24 on 12th September.



The morning of 29th September broke clear and very warm. For the next four weeks summer-like weather prevailed, with light easterly winds and temperatures occasionally exceeding 70 °F (21 °C). During this protracted period of Indian summer, the last of the Whimbrel departed, the first Snipe was flushed, Dunlin appeared in clouds of thousands, and a flock of six Sharp-tailed Sandpipers lingered in the warm autumn sun on Grassy Island. The point had produced 30 species of shorebirds during the fall migration, but now an early flock of Snow Buntings suggested that winter was soon to come. November frosts changed the colour of the marshes to amber, and with the last of their Golden Plovers and Pectoral Sandpipers having flown, wintering flocks of Dunlin and Sanderlings gathered in compact roosts along the bleak and windswept outer beaches to await the nocturnal ebbing of winter tides.

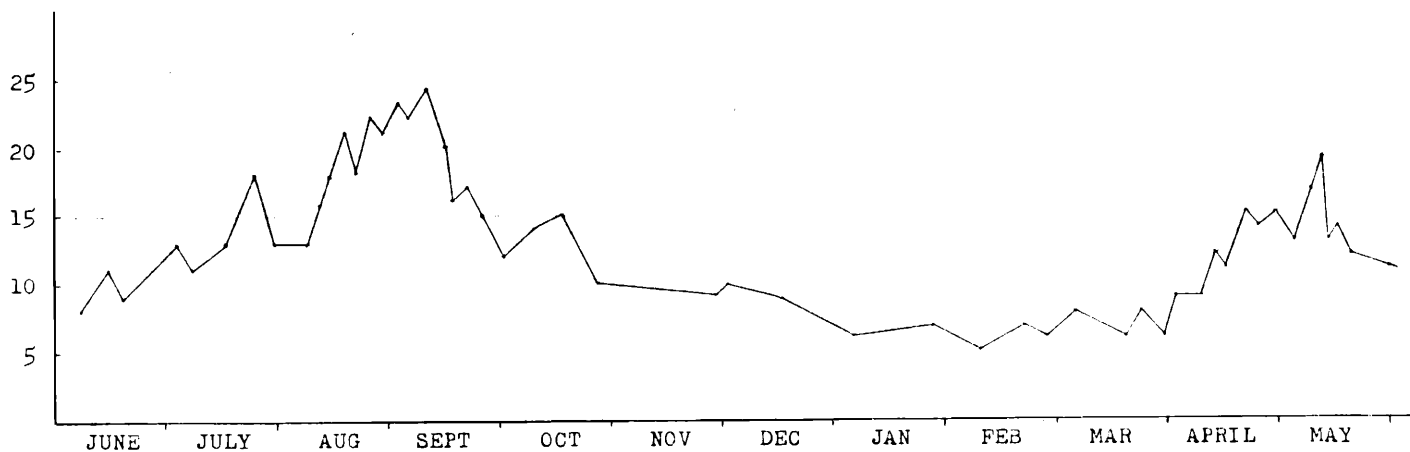


FIGURE 3. Total number of shorebird species observed in one day at Leadbetter Point June 1978 - May 1979

Just when the southward movement of shorebirds ceases and wintering territories are established almost certainly involves a number of variables, among which climatic conditions appeared to have been a strong factor at Leadbetter Point in late December and early January. Uncommonly cold temperatures dropping to 12°F (-12°C) accompanied by gale force easterly winds continued for 13 days, piling up drift ice along the entire western shore of Willapa Bay, and freezing the tributaries and marshes of the eastern shore. Two species which had lingered in small numbers at the point before the onset of this icy blast, the Semipalmated Plover and Snowy Plover, disappeared completely, while numbers of Least and Western Sandpipers were substantially reduced. Killdeer and Common Snipe were eliminated from other habitats in the bay, and populations of Long-billed Dowitchers declined at their favoured channels near the mouth of the Bear River. The departure of these birds was apparently a late, southward migration impelled by the prolonged, sub-freezing conditions. Only Black-bellied Plovers, Black Turnstones, Dunlin and Sanderlings seemed not to be affected on 13th January, when the weather had moderated.

Scarcely two weeks later however, the first influx of northbound shorebirds arrived at Leadbetter Point. Dunlins, which have been found to depart the central California coast in large numbers late in January, suddenly increased - 7200 on 25 January, 12,500 on 31 January, and peaking at 19,000 on 26 February. Torrential rains during February (15" - 38 cm) gave way to warm, spring-like weather in early March with temperatures rising to 65 °F (12 °C) and Song Sparrows and Meadowlarks were in full song in the dunes west of the channel by 10 March. With continuing warm weather later in March many of the Dunlins departed, apparently resuming their northward migration.

By the end of March three pairs of Snowy Plovers had arrived at the point, and one pair produced an early nest of three eggs in a protected hollow behind the dunes by 2 April. However, on 12 April a violent storm swept the Washington coast generating mountainous seas which washed down all of the Snowy Plover nesting habitat and destroyed the early nest. As the gales and rain subsided, thousands of Brant Geese lined the edges of the channel and the first influx of northbound Short-billed Dowitchers appeared.

During unsettled weather following the storm new Western Sandpipers, many in bright plumage, arrived by the thousands and the first Semipalmated Plovers were found on the flats north of the channel of 16 April. Weather conditions favourable for northward migration then hastened the passage of restless waves of shorebird species in quick succession, and the first Knots arrived on southwest winds of early May. On the morning of 14 May hundreds of flocks of Northern Phalaropes in full colour touched down at surf-washed tidal pools along the outer beach, but within a day had moved on almost as quickly as they appeared.

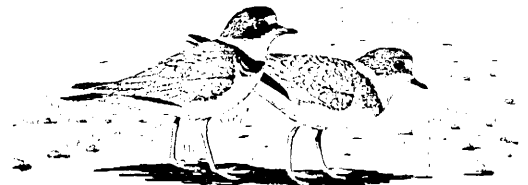
During the night of 21 May a warm wind blew from the south; by daybreak the last of the Dunlins had gone and the marshes and flats were silent. A few discarded feathers blowing across the sand were all that remained of the restless flocks which had hurried northward to perpetuate their species

TABLE 1. Maximum number of each shorebird species observed in any one day at Leadbetter Point June 1978 - May 1979.

	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
Semipalmated Plover	40	525	400	200	55	30	33				550	405
Snowy Plover	22	10	13	17	4	5	9	2	1	7	12	10
Killdeer	3	5	1	5	12	2	1			2	2	2
Golden Plover			18	30	26					1	3	5
Black-bellied Plover	75	300	880	1400	1500	645	515	470	300	350	280	120
Ruddy Turnstone	2	15	150	125	4							75
Black Turnstone		6	8	5			27				55	40
Common Snipe			2	1	7	3	3		1	2	1	1
Long-billed Curlew	8	1	1	3							3	2
Whimbrel	60	260	400	69	8						21	126
Spotted Sandpiper				1								3
Greater Yellowlegs	14	22	12	25	6	3	6	3	20	18	45	6
Lesser Yellowlegs			36	24								
Wandering Tattler		1	3	2								1
Willet		1	4	6								
Surfbird			1									
Red Knot	38	3	65	17	1						8	100
Sh.-tailed Sandpiper			4	2	6						1	1
Pectoral Sandpiper			20	191	187							
Baird's Sandpiper		6	12	11	4						3	
Least Sandpiper	18	200	550	600	700	120	480	80	7	3	300	100
Dunlin	20	6	9	365	12500	14200	8200	12500	19000	17000	4800	4500
Semip. Sandpiper	1	1										1
Western Sandpiper	1800	1500	2550	3600	1800	400	650	1000	1000	1000	25000	7000
Sanderling	175	310	1450	4150	4200	640	650	585	500	650	1500	2000
Sh.-billed Dowitcher	150	1300	150	140							2600	2300
Lo.-billed Dowitcher		1	4	70	45	21	26	1				32
Buff-br. Sandpiper			10	20								
Marbled Godwit			51	55	15						3	7
Hudsonian Godwit	6	30	1									
Northern Phalarope			35	18	1							600
Red Phalarope				1								
Ruff				1								
Total number of species observed	16	21	30	30	20	11	10	8	8	10	19	22

Table 2. Dates and peak occurrences of shorebirds at Leadbetter Point, Washington, during spring migration in 1979.

Species	Date	Number
Dunlin	26 February	19,000
Greater Yellowlegs	16 April	45
Black-bellied Plover	17 April	280
Black Turnstone	25 April	55
Semipalmated Plover	26 April	550
Least Sandpiper	26 April	300
Western Sandpiper	28 April	25,000
Short-billed Dowitcher	30 April	2,600
Whimbrel	10 May	126
Sanderling	12 May	2,000
Ruddy Turnstone	13 May	75
Long-billed Dowitcher	14 May	32
Northern Phalarope	14 May	600
Red Knot	16 May	100



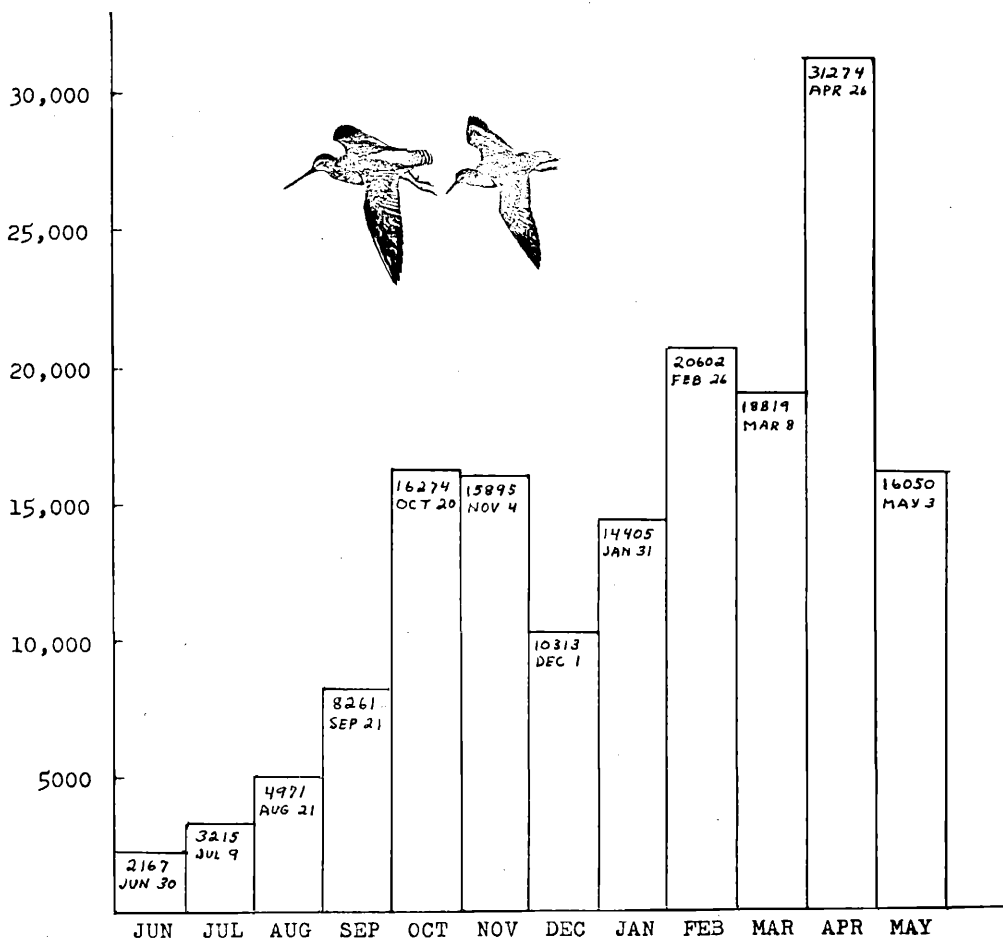
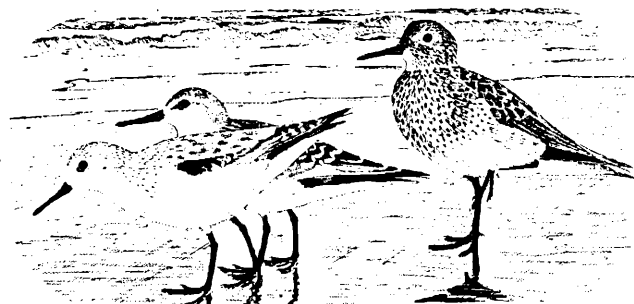


FIGURE 4. Maximum number of shorebirds observed in one day at Leadbetter Point June 1978 through May 1979

B. Summary and Conclusions

Thirty-eight species of shorebirds have been observed using the estuarine habitat of Willapa Bay, thirty-five of them occurring at Leadbetter Point. Thirty-three of these were found in the study area during the present census (Table 1). Four other species, the Dotterel, Upland Sandpiper, Solitary Sandpiper and American Avocet have been observed at nearby Grays Harbor (see Figure 1) where a higher incidence of birding effort has taken place over the years. There is little doubt that these and other rare shorebird species have occurred in the diverse habitats of Willapa Bay from time to time. The peak period of shorebird activity at Leadbetter Point during the fall migration was from 14 August through 27 September when 15 species or more were found in the study area on every count (Figure 3). The highest number of species found in one day during the entire census was twenty-four on 12 September (Figure 3). The highest daily count of shorebirds during the autumn migration, however, was 16,274 and occurred on 20 October. At the estuary generally, eleven species were found during the winter months in preferred habitat, with Dunlins by far the most abundant. The spring migration was marked by single abrupt peaks or waves for most species and, with the exception of Dunlins, occurred between 16 April and 21 May. The peak sequences for the more abundant species during the spring passage at Leadbetter Point are shown in Table 2.



In terms of the total number of shorebirds present in the study area during the census, the highest count occurred in the month of April when 31,274 were found on 26 April. Of these, 23,000 were Western Sandpipers. February was the second most active month for total shorebird numbers with a maximum of 20,602 present on 26 February, 19,000 of which were Dunlin. A large Dunlin population was also present during early March. The maximum number of shorebirds found in one day in the study area each month is shown in Figure 4.

It must be emphasized that the present census at Leadbetter Point is by no means a census of the entire estuary. An accurate census of all the shorebird habitat at Willapa Bay would be highly desirable. Of particular interest are the Ellen Sands and Snag Islands near the mouth of the Palix River, and the Sand Islands at the entrance to the bay. These isolated habitats may very likely be primary roosting areas from some species, including the Red Knot. In any event, there is no doubt that Willapa Bay is and will remain a shorebird sanctuary of extreme importance as other estuaries along the Pacific flyway are progressively destroyed and contaminated. It today contains more intertidal habitat than any other estuary on the west coast of the United States (C.S. Sayce pers. comm.).

What lies ahead for Willapa Bay and Leadbetter Point? The philosophy of local residents towards the area is encouraging. From public meetings held in 1977 there seemed agreement to: maintain the rural lifestyle of Pacific County, promote only light, non-polluting "cottage-type" industry, preserve existing open spaces including agricultural land, bogs, dunes, and beaches, restrict filling of the estuary, restrict recreational use of the bay, and leave Leadbetter Point in its natural state (Pacific County Regional Planning Council 1978).

The oyster and commercial fishing industries have favoured an estuary management plan which would preserve Willapa Bay as an aquatic resource for the production of oysters, clams, crabs, salmon and sturgeon. They strongly advocate the protection of its tidal wetlands, maintaining the estuary at its present size, restricting recreational boating, protecting tributaries and streamside vegetation, and prohibiting toxic chemicals or radioactive material from entering the bay (Fenske 1978).

In contrast, proposals by development interests and government agencies for the "modification" of the estuary have been prolific over the years, including a nuclear power plant using part of the bay for a cooling pond, a pulp plant on the Willapa River, dams across every major freshwater tributary, and the wildest of all - a proposal for a canal or "inland waterway" from the Columbia River to Puget Sound via Willapa Bay, with dredged channels, dams and locks (Shotwell 1977). Somehow, none of these schemes came to fruition; the shorebirds are still drawn to that lonely sandspit as it hooks eastward to Grassy Island - just as they must have been when Meares first viewed it through the breakers so many years ago.

#### Acknowledgements

A full list of acknowledgements appears in the original report (Ed.)

#### References

- Fenske, C. 1978. Willapa Estuary Management Plan. Unpublished.
- Jewett, S.G., Taylor, W.P., Shaw, W.T. and Aldrich, J.W. 1973. Birds of Washington. Seattle: U. of Washington Press.
- Pacific County Regional Planning Council. 1978. Peninsula comprehensive plan control document. South Bend, Washington.
- Shotwell, J.A. 1977. Willapa Bay Estuary - background studies for the preparation of a management plan. Dept. of Public Works, Pacific County, Washington.
- U.S. Fish & Wildlife Service. 1975. Willapa National Wildlife Refuge. Portland, Oregon.
- Washington State Parks & Recreation Commission. 1974. Leadbetter Point Environmental Assessment. Olympia, Washington.
- Ralph S. Widrig, Box 43, Ocean Park, Washington 98640, U.S.A.

#### ABSTRACTS OF PAPERS ON WADER TOPICS FROM THE JOINT MEETINGS OF THE COOPER ORNITHOLOGICAL SOCIETY AND WILSON ORNITHOLOGICAL SOCIETY HELD AT CORPUS CHRISTI, TEXAS, 19-23 MARCH 1980

##### Possible unrecognized spring migration routes of Wilson's Phalarope

R.L. Patterson, Jr., Dept. Biology VPI & SU, Blacksburg, VA 24061, USA

In the past 25 years there has been an increase in the spring sightings of *Steganopus tricolor* in eastern North America. It has been suggested that extralimital sightings may be individuals pioneering new migration routes and breeding areas. Recently, Wilson's Phalarope has been considered a local breeder in eastern Ontario. With new breeding grounds established, it is now important to consider the migration routes. Based on observations primarily from American Birds, the initial migration route was along the eastern Atlantic coast from about 1950 until 1972. After this date the species appeared inland through the Appalachian Mountains as well as along the coast. This suggests a recent broadening of the eastern route or the establishment of a second, inland route. A plot of sightings versus years suggests that both areas are not used with equal frequency and therefore supports the two route hypothesis. This paper is based on the assumption that the increased sightings reflect natural population changes. However, a demanding banding program is needed to support these conclusions.

##### Habitat selectivity in arctic shorebirds

J.P. Myers and F.A. Pitelka, Museum of Vertebrate Zoology, Univ. Calif., Berkeley CA 94720, USA.

Using data on inter-year variation in habitat selectivity by different shorebird species at two arctic coastal plain sites in Alaska, we tested a prediction of the Fretwell-Lucas model of habitat selection. This model predicts that in years of high abundance relative to average, a species should show relatively low habitat selectivity. Data were gathered at Barrow and Atkasook, Alaska, during 1976-1979. Selection was examined separately for each of 3 periods during the summer: display/nesting, brooding, and post-fledging. Abundance was measured by sampling a total of 240 ha of transects every 5 days. Selectivity was calculated using Ivlev's index based on observed habitat distribution of each species with an expected value determined from habitat availability. Territorial shorebirds fit the model during the display/nesting period but did not once defense ceased. Non-territorial species showed no relationship between abundance and selectivity. These results suggest that the inverse habitat selectivity-abundance relationship evident in territorial species is a side-effect of their spacing behavior and not supportive of the Fretwell-Lucas model.

##### Autumn molt and migration of Black-bellied Plovers in eastern North America

Brian A. Harrington, Manomet Bird Observatory, Manomet, MA 02345; and Sarah Groves, University of British Columbia, Vancouver, BC, Canada.

Evidence from banding, museum specimens, and surveys of the western Atlantic seaboard indicates that at least 2 different molt/migration strategies exist in Black-bellied Plovers *Pluvialis squatarola* that use different types of migration routes. One type apparently flies non-stop to Caribbean islands or to South America via a long, overwater flight; these birds tend to have long wings, and few are found in North America with active molt among flight feathers. The second type has a coastwise migration to their wintering grounds, probably in North America; they tend to differ from the first in having shorter wings and in commonly having active molt of flight feathers at migration stopover places in New England.