

Reports 02-03

Breaking News

What a huge year for COASST! Not only did lots of birds come in (1,405 individuals of 57 species!)—but many volunteers went *out* (262 people in almost 2,600 hours)! COASST now surveys over 100 beaches on at least a monthly basis. From July 2002 through June 2003, COASSTers completed more than 1,000 surveys—walking almost 5,000 kilometers *out-and-back* to conduct them. But enough of the hyperbole (although it's deserved), let's turn to the regional highlights.

Puget Sound

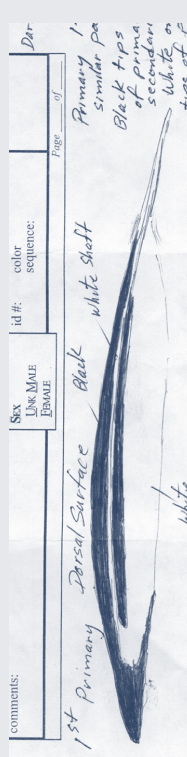
At long last, COASST expanded widely across Puget Sound. Over a dozen new beaches and 25 new volunteers were added from Priest Point to Blaine Marine Park. Thanks to Wendy Steffenson, the North Sound Baykeeper at RE Sources, we added 16 new volunteers in Bellingham alone! Similar efforts on Vashon Island, in West Seattle and in Tacoma are helping us gain a more geographically comprehensive view of the Pacific Northwest's most populous region.

As we expected, seabird deposition rates in Puget Sound were low. Not many species breed in the Sound, and species abundance is low compared to the Outer Coast. Two of our most ambitious volunteers, Bob Merrick and Peter Linton surveying Ebey's Landing and Perego's Lagoon, found only one bird all year—despite surveying two beaches twice a month.

Typically, carcasses do not persist long on Puget Sound beaches because the actions of people, dogs, raccoons and other urban wildlife quickly remove them. So, a Mew Gull refound by Paul Dinnel and Vicki McNeil on Guemes Island for three consecutive

months was somewhat surprising.

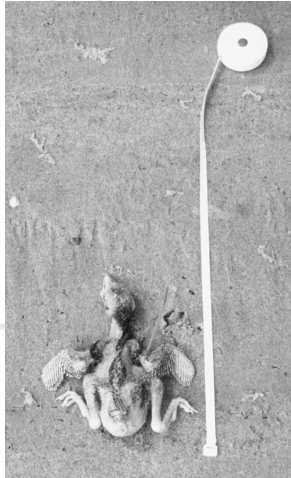
Including Paul and Vicki's Mew Gull, the Larid list for Puget Sound was surprisingly diverse this year, with Bonaparte's and California Gulls tallied along with the more expected Glaucous-winged Gulls. Large immature gulls were found virtually everywhere. Tacoma volunteers found only gulls all year.



Juvenile (left)
 Adult (right)

Vic Nelson's sketch clearly depicts the black-edged outer primaries of the first-winter Bonaparte's Gull he found at Point No Point in October. Note the prominent white wedge in the outerwing of the adult Bonaparte's at right.

This Bald Eagle chick is hardly larger than the COASST measuring tape used to record its size.



Debra Clausen

Former *Adopt-A-Beach* veterans Wayne and Mary Ann Hanson joined COASST in January, and discovered a Common Merganser (bet you thought we'd say murre) on their first beached bird survey since 1998. A Great Blue Heron was the highlight of our COASST home office surveys in Discovery Park.

San Juans

Between mid-August and late September, six of the 16 beaches in the San Juans documented tarballs. Ninety pounds of oiled debris were removed from Tift Rocks Cove, a re-initiated COASST site. To date, none of the oil samples have been analyzed or fingerprinted to determine the possible source(s). No oiled birds were found on COASST beaches during the mysterious spill. However, an oiled sandpiper and an oiled murre were reported during clean-up operations.

We would like to acknowledge that we could not resolve region-wide patterns like the oiling event without the consistent and frequent monitoring of so many of the San Juans volunteers. For example, Jill McKay, and Larry and Bev Leyman survey three beaches per month (each!) and Mike Kaill covers two beaches—twice a month! We are pleased to say that such tenacity is the norm.

Last March, Tina Wyllie-Echeverria and the local 4H club helped COASST add two very isolated beaches, Burget Beach and Prevost Harbor. The



Mike Kaill

Although Mike Kaill found no birds during 41 San Juan Island surveys this year, his beaches again witnessed the highest regional marine mammal deposition with a total of four harbor seals.



Barbara Blackie

COASST's first Band-tailed Pigeon was found on the last day of the COASST year, June 30, 2003.



Dianma Moore

Talons and feathered feet are telltale characteristics of an owl. Unfortunately, the diagnostic nape and underpart feathers of this Spotted or Barred Owl were largely missing.

Stuart Island School is conducting the surveys, and Tristan Delahunt has been the main student contributor.

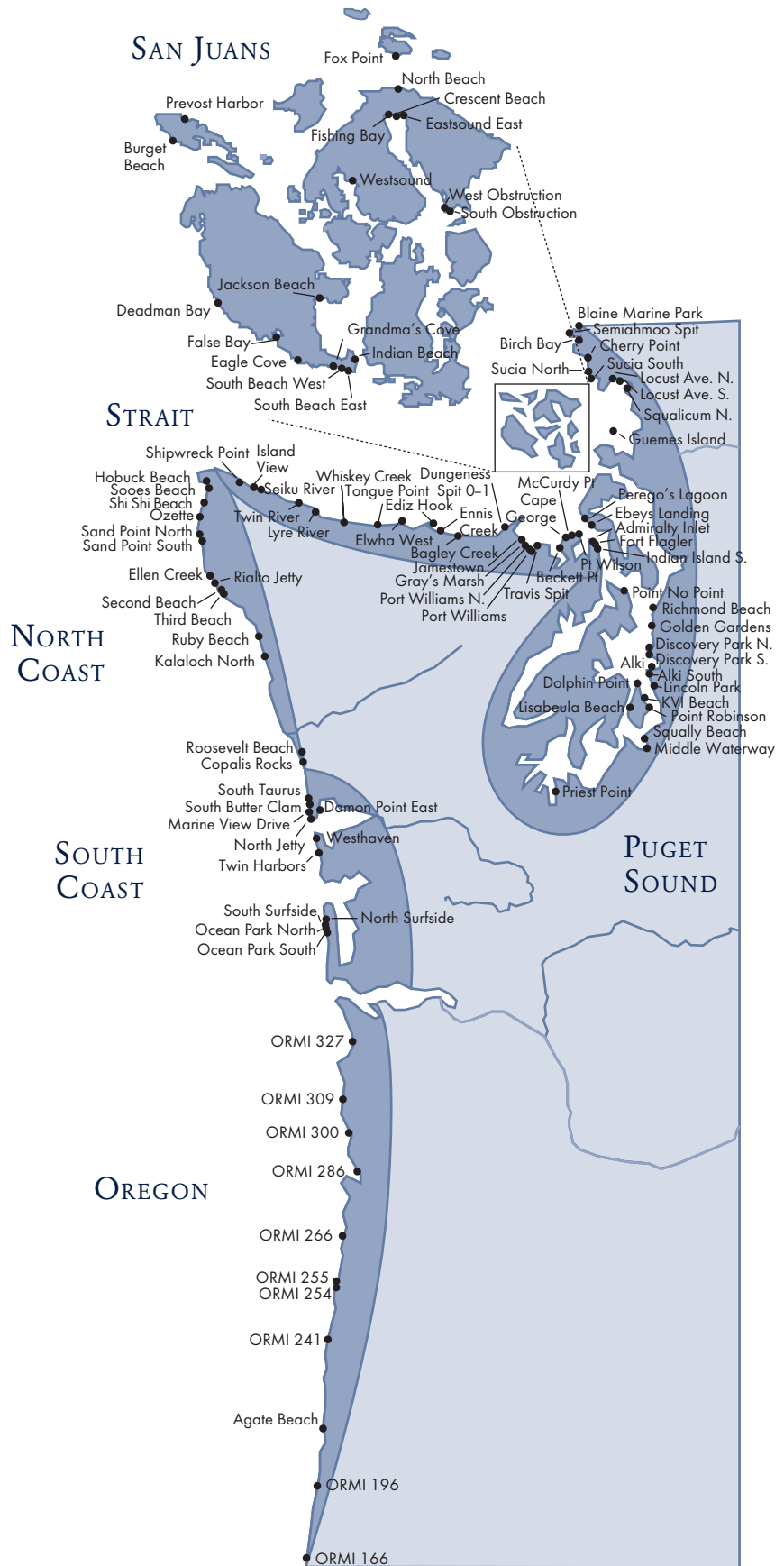
Of the few birds discovered on San Juans beaches, perhaps the most unique was a Bald Eagle chick found under the treetop aerie along False Bay. Wilma Sale and Edi Leonard’s very first discovery, a breeding-plumaged Pigeon Guillemot, was also noteworthy as its arrival in August coincided with another post-breeding adult discovered by Vic Nelson across the Strait at Point No Point.

Strait of Juan de Fuca

Many of the beaches within the Strait were surveyed regularly, yet yielded few birds this year. For example, Sue Nattinger and Nancy Newman conducted two dozen surveys across three different sites and discovered only four birds. In eleven surveys at Point Wilson, Betsy Carlson found a single Pigeon Guillemot. Barbara Blackie devoted similar effort on Whiskey Creek and also found little. However, on the last day of the COASST reporting year, she was rewarded with the program’s first Band-tailed Pigeon! So, keep searching—those zeros are important bits of information, and who knows what oddities will show up.

Beth Bierman, Lynn Dwan and Dave Manson kept busy on the region’s most consistent beach for birds—Ediz Hook—where over half of the surveys revealed one or more birds. Two of them, a Starling and a Pelagic Cormorant, were found under a nearby powerline, begging the question of whether the latter may have been the victim of a collision.

In late January, gunshot casualties appeared on two different beaches. Ken Wiersema speculated that a female Surf Scoter at Grays Marsh might have been



shot from the adjacent hunting area. Almost simultaneously, Ron Frisch discovered a large immature gull with small entry and exit holes in its body. Perhaps it flew through the target range at nearby Murdock Creek..?

On September 1st, Bill and Barbara VanderWerf encountered the Strait's only tarballs. This observation on Dungeness Spit coincided with the widespread oiling of beaches in the San Juans. As hundreds of driftcards released by Terri Klinger (a biological oceanographer at the UW) in the San Juans were recovered on Dungeness Spit, it's quite conceivable that oil from the San Juans could have drifted southwest and been deposited on the Spit.

North Coast

It's impossible not to start this region's annual summary with the phenomenal diversity measured again at Hobuck Beach. Appropriately, this beach serves as a monthly training and refresher site for Olympic Coast National Marine Sanctuary volunteer coordinator Mary Sue Brancato. Over the year, 23 species were recorded by Mary Sue, Barbara Blackie, Katie Brenkman and their rotating crew. Highlights included a *Strix* Owl (Spotted or Barred), a Whimbrel, and an immature Franklin's Gull, a rare migrant to the region!



Dianna Moore

The surprises never stop...unfortunately for our volunteers, chickens do not appear in any North American field guides—including our own.

Monthly surveys by Tom and Deb Cox, Heidi Pederson, and Tim Saskowsky documented the late summer occurrence of beachcast gulls, murres and cormorants on Ruby Beach. Shelley Hall and Bill Ritchie also observed those species on Third Beach, and later saw them replaced by Northern Fulmars and Red Phalaropes in November and December.

An interesting, yet subtle, pattern was revealed by Pelagic Cormorants this year. A total of sixteen individuals appeared on five beaches in September–October. None were found during the rest of the year. Of the thirteen that could be aged, twelve were adults. No analogous die-off was recorded in the South Coast of Washington, but Oregon beaches showed a similar pattern involving eight birds across six beaches. In the previous year, only eight Pelagic Cormorants were found COASST-wide!

One thing that doesn't show up on the stats sheet every year is the extra effort that so many North COASSTers dedicate to their surveys. Compared to beaches in most other COASST regions, North Coast beaches are distant from population centers. Many of our volunteers drive to the North Coast from the Port Angeles area and then undertake a long or strenuous (or both!) hike to get onto their beach—requiring several hours of extra transit time. Thanks to their exceptional efforts, we are gaining better and better coverage of this remote corner of Washington.

South Coast

A White-tailed Ptarmigan, er, rather, *a chicken* (!) in Ocean Shores provided the most comical identification challenge of the year. We won't go into the hypotheses about how a high alpine bird could have washed down to the shoreline...

Of more grave concern, Pete Seidel discovered a trio of dead Caspian Terns on Long Beach last July. All were still warm when he discovered them, with very obvious broken bones and crumpled wings. Apparently, they were the victims of a purposeful rundown by a car or truck on the beach. Another local resident noted that he had seen a similar pile of birds to the north the previous day. The incidents were reported to the Washington Department of Fish and

Wildlife's Poaching Hotline at 1 800 477 6224. Driving on South Coast beaches is legal, but obviously can be hazardous to the local wildlife.

Five volunteers from North and South Surfside: Linda Bierma, Pete Seidel, Caroline Harding, Ellen Jenkins and Anne Chiller, were responsible for finding over half of the region's entangled birds this year. Six entangled birds were found on all South Coast sites combined (4 lines, 1 net and 1 hook)—compared to three the previous year. Of these six, only Common Murres (3) were found more than once. Elsewhere, all other regions combined noted only three entangled birds.

It was an oily year for COASST. In addition to the oiling event in the San Juans, several South Coast groups, from Ocean Shores to Long Beach, documented oiled birds between December and mid-February. Nine oiled carcasses (five murres, two Western Grebes and two fulmars) were discovered during this window of time. Dianna Moore and Kathleen Wolgemuth smelled a petroleum-like odor on six North Jetty birds on November 21st. As one of these birds was a re-find—which did not smell like oil on its initial discovery—we conclude that these birds probably encountered the oil or other substance *after* landing on the beach, and we have excluded them from the oiling analyses. This observation underscores a key advantage of marking birds individually—namely, that we can track carcass transformations over time.

Oregon

Unlike the deposition diversity displayed by the Washington regions, Oregon beaches all tended to show very similar deposition patterns. Perhaps the only obvious outlier was the heightened deposition along Oregon Mile 327, where Jann Luesse, Mike Patterson, Patrick Reynolds, Lori Sinnen and Debbie Stoller rotate duties and routinely spend over four hours to complete their surveys. In October and November, over 30 new birds were found during each ORMI 327 survey, with juvenile murres dominating the former month, and Northern Fulmars and Red Phalaropes the latter.

The rarest seabird carcass found all year was

probably an out-of-season Parasitic Jaeger identified by Pete and Connie Owston on ORMI 255 on December 21. Although *Pomarine* Jaegers are sometimes seen at sea in the northern hemisphere during winter, there are very few (if any?) verified records of Parasitics—especially at such high latitude. The bird was relatively fresh (intact with pliable feet), and thus not an overlooked ghost of the fall migration. Another two unusual (and somewhat late) “pelagic” sightings, were the Pink-footed Shearwaters discovered on ORMI 327 and 255 in late October and November, respectively (see the Species Profile on page 18).

Western Grebes were widely reported across nine beaches in Oregon from late summer through early spring. This temporal and spatial breadth was reflected along the South Coast of Washington as well. However, the relatively low numbers involved (17 in each region) suggest that this was not a particularly harsh year for the species.



An astonishingly late Parasitic Jaeger was still sporting its long, pointed tail feathers in December. Few records of Parasitics exist for this northern latitude at this time of year—this fairly fresh bird, was a truly significant find!

What's Washed In?

New Species

As you might have expected, the Species List from this year was quite comparable to those from previous years. Most of the players in COASST's "Top-40" appear year after year. Only their exact placement in the rankings seems to vary. For example, Pelagic Cormorants climbed to the seventh position this year, up from #13 in 2001-02. Note that they constituted 2.6% of all finds this year, compared to 1.3% the prior year. Thus, *proportionately* they were twice as abundant (considering the percentages). However, looking at their *absolute* numbers, you will see the total count was more than four times higher this year, 36 versus 8. We'll examine more examples illustrating the differences between relative and absolute counts later in this section.

Many of the smaller coastal birds, such as ducks and shorebirds, tend to be found in some years and missed in others. Bit by bit, COASST's Species List is getting longer as we add these relatively unusual species. There were 15 more this year! Lengthening our COASST List were representatives within the following groups: waders (Marbled Godwit, Whimbrel and Great Blue Heron), ducks (Common Merganser, Green-winged Teal, Lesser Scaup), and gulls (Bonaparte's and Franklin's Gulls, and Parasitic Jaeger). The free-toed birds were also well-represented, with Band-tailed Pigeon, Rock Dove, Starling and Chicken joining the list. We're happy to report that with the obvious exception of a few species, *Beached Birds*, by way of the "Similar Species" sections or full species

Beached Birds Identified to Species

SPECIES	YR 4 #	YR 4 %	YR 3 %	YR 2 %
Common Murre	338	24.0	26.1	10.5
Northern Fulmar	333	23.6	8.5	45.2
Red Phalarope	150	10.6	0.3	0.3
Large Immature Gull	143	10.1	17.9	7.8
Glaucous-winged Gull	47	3.3	3.2	6.0
Western Grebe	41	2.9	7.2	1.5
Pelagic Cormorant	36	2.6	1.3	0.9
Sooty Shearwater	30	2.1	7.4	5.1
Brandt's Cormorant	28	2.0	2.6	0.9
Western Gull	25	1.8	2.4	1.5
Surf Scoter	22	1.6	0.5	0.3
Cassin's Auklet	21	1.5	2.1	0.9
California Gull	19	1.3	1.8	1.5
Rhinoceros Auklet	18	1.3	1.9	1.5
Pacific Loon	12	0.9	0.6	
Pigeon Guillemot	12	0.9	0.2	
White-winged Scoter	12	0.9	1.0	0.3
Caspian Tern	11	0.8	0.6	
Double-crested Cormorant	8	0.6	0.5	0.6
Black-footed Albatross	6	0.4	0.8	2.7
Black-legged Kittiwake	6	0.4	1.8	4.5
Heermann's Gull	6	0.4	0.3	
Short-tailed Shearwater	6	0.4	1.3	0.6
Brown Pelican	5	0.4	0.3	0.3
Canada Goose	5	0.4	0.5	
Common Loon	4	0.3	0.5	
Herring Gull	4	0.3	0.3	
American Crow	3	0.2	1.0	0.3
Ancient Murrelet	3	0.2	0.5	
Greater Scaup	3	0.2	0.2	
Mallard	3	0.2	0.3	0.6
Marbled Murrelet	3	0.2	0.8	0.6
Mew Gull	3	0.2	0.8	
Northern Pintail	3	0.2	0.3	0.3
Red-throated Loon	3	0.2	0.3	
Bald Eagle	2	0.1	0.3	
Great Blue Heron	2	0.1		
Green-winged Teal	2	0.1		
Marbled Godwit	2	0.1		

SPECIES	YR 4 #	YR 4 %	YR 3 %	YR 2 %
Pink-footed Shearwater	2	0.1		
Ring-billed Gull	2	0.1	0.2	
Rock Dove	2	0.1		
Sanderling	2	0.1		0.3
Spotted/Barred Owl	2	0.1		
Black-bellied Plover	2	0.1	0.2	0.3
Bonaparte's Gull	1	0.1		
Brant Goose	1	0.1	0.2	
Chicken	1	0.1		
Common Merganser	1	0.1		
Dunlin	1	0.1	0.2	
European Starling	1	0.1		
Franklin's Gull	1	0.1		
Lesser Scaup	1	0.1		
Parasitic Jaeger	1	0.1		
Whimbrel	1	0.1		
Band-tailed Pigeon	1	0.1		
Fork-tailed Storm-Petrel	1	0.1	0.5	1.8
Black Scoter	1	0.1	0.2	
Leach's Storm-Petrel			0.5	0.6
Bufflehead			0.3	0.3
Tufted Puffin			0.3	
Black Oystercatcher			0.2	
Clark's Grebe			0.2	
Glaucous Gull			0.2	
Greater White-fronted Goose			0.2	
Horned Grebe			0.2	
Red-breasted Merganser			0.2	
Red-necked Grebe			0.2	0.3
Western Sandpiper			0.2	
American Coot			0.6	0.9
House Finch				0.9
Mottled Petrel			0.3	
Ring-necked Pheasant			0.3	
Snow Goose				0.3
TOTAL	1405			

Species totals, excluding unknowns and refinds. Note that major species—accounting for greater than 5% in any year—are in bold type.

accounts, includes most of these rarities.

Also surprising were the two *Strix* (Spotted or Barred) Owls reported this year. Most of you are probably aware of the Spotted Owl's decline in the Pacific Northwest. You may not be aware, however, that one of this species' greatest threats is the ever-expanding range of its bolder competitor, the Barred Owl. Habitat alteration and the opening of Northwest forests are thought to be improving conditions for the latter species to become established. Coexistence of the two species over the same territory is rare, as Barred Owls are much more aggressive and are thought to actively exclude Spotted. We are submitting the photos to the Burke and Slater Museums for official identification. Keep in mind that either identification is probably bad news: that is, we are either seeing the direct mortality of an endangered species, or indications that the range of its competitor is expanding.

Conservation Concerns

COASST volunteers encountered ten species of conservation concern this year, representing over 32% of all identified carcasses. Most notably, Common Murres, Western Grebes, and Brandt's Cormorants (all State of Washington Candidate or Concern Species) topped the list and accounted for nearly 90% of our conservation concern list. Cassin's Auklets, a State Candidate and Federal Species of Special Concern, were fourth-most abundant. Documenting changes in species that appear to be in decline or are especially vulnerable to human

activities is a vital contribution from our COASST surveys. Recently, the Washington Department of Fish and Wildlife has elevated the Western Grebe to State Concern status. Its population numbers in Puget Sound have dropped more than 90% during the past 20 years, and State biologists have asked COASST to pay close attention to any trends.

Oil and Entanglement

The number of oiled and entangled birds found by COASST rose somewhat this year, at 13 and 9 birds, respectively. Last year, the totals were 5 and 5. Since overall deposition rates on the outer coasts were more than 150% higher than those of the previous year, the slight rise in the counts of oiled and entangled carcasses is hardly surprising.

Of all species, Common Murres were hit the hardest, with eight oiled and four entangled carcasses. Murres are known to die both in oil spills and as bycatch in net fisheries, in high numbers relative to their representation in the breeding seabird community, so these COASST findings are expected, if not welcomed.

This year, almost 70% of the oiled and entangled individuals were encountered on the South Coast of Washington, yet that region was responsible for finding only about half of all COASST birds identified this year. It is somewhat alarming that all of the South Coast's oiled birds appeared between December and mid-February. We will continue to monitor this pattern in future years to see whether any long-term regional oiling or entanglement bias is revealed. Note that no

South Coast beaches documented tarballs or other forms of oil. In fact, of the thirteen beaches reporting oil this year, ten were in inshore waters. On a positive note, our carcass oiling rate of less than 0.9% (0.7% the previous year) remains substantially lower than the >5% long-term levels found by the Gulf of the Farallones National Marine Sanctuary in California.

Major Species

While survey effort (total hours) increased by 30% this year, the count of identified carcasses more than doubled. This means that the deposition rate, or the rate at which carcasses hit the beach monthly, increased by 1.5 times.

COASST uses two approaches to examine such species data. First, we consider the abundance patterns of species in relation to one another. Essentially, we are identifying which species switched from minor to major players, and vice versa. This is particularly useful in evaluating the less-than-common species. Red Phalaropes showed the largest change in relative ranking—jumping from #36 to #3! This uptick was so interesting that we've dedicated a special analysis to the event (see A Focus on Phalaropes, page 10). Pigeon Guillemots climbed thirty-two spots to #17. Was this a bad year for them, or did this increase correspond to the growing number of sites and surveys in Washington's inshore waters? Only continued monitoring will allow us to tell.

Other notable list-climbers included Surf Scoter and Pelagic Cormorant. The latter edged out Brandt's



Murre entangled in book, line & spinner



Oiled murre



Oiled fulmar

l to r: Caroline Harding, Linda Bierma, Susan Clark

State and Federally Listed Species

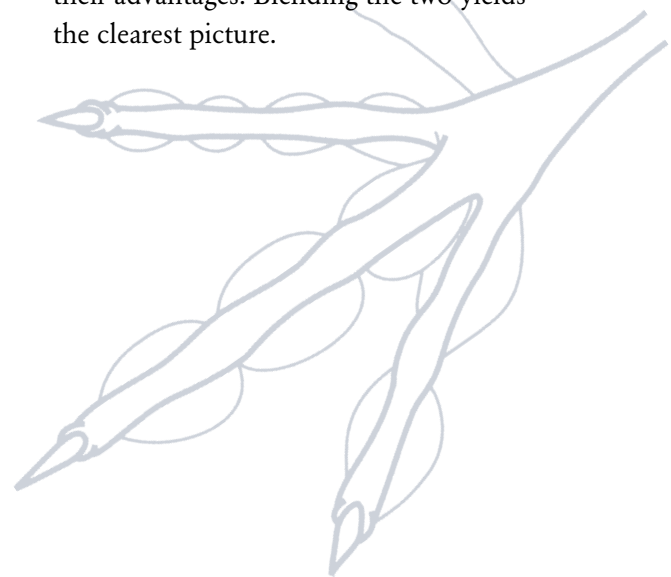
SPECIES	#	CONSERVATION STATUS
Common Murre	338	State Candidate
Western Grebe	41	State Concern
Brandt's Cormorant	28	State Candidate
Cassin's Auklet	21	State Candidate, Federal Species of Special Concern
Caspian Tern	11	State Monitored
Brown Pelican	5	State and Federally Endangered
Common Loon	4	State Sensitive
Marbled Murrelet	3	State and Federally Threatened
Bald Eagle	2	State and Federally Threatened
Great Blue Heron	2	State Monitored

Mortality Related to Human Activities

SPECIES	TOTAL	BEACH (# FOUND)
OILED BIRDS		
Common Murre	8	North Jetty (3) Kalaloch North (2) Ocean Park South (1) South Surfside (1) Ruby Beach (1)
Western Grebe	3	North Jetty (2) OR Mile 241 (1)
Northern Fulmar	2	Ocean Park-South (1) North Jetty (1)
ENTANGLED BIRDS		
Common Murre	4	North Surfside (2) OR Mile 327 (1) Marine View Drive (1)
Northern Fulmar	2	OR Mile 327 (1) South Surfside (1)
Western Grebe	1	OR Mile 286
Western Gull	1	North Surfside
Large Immature Gull	1	South Butterclam

Cormorant in abundance and made it into the Top Ten. As mentioned in the Regional Reports, adult Pelagic Cormorants on the Outer Coast were hard-hit in the late summer. Owing to the long lives and delayed reproductive maturity of most seabirds, any bias toward adult mortality (rather than juveniles) is of particular management concern. Cassin's and Rhinoceros Auklets were found relatively infrequently this year, managing to drop out of the Top Ten altogether. Keep in mind that whereas the auklets' abundance in relation to other species decreased, their *absolute* abundance climbed as the total number found was 1.5 times higher!

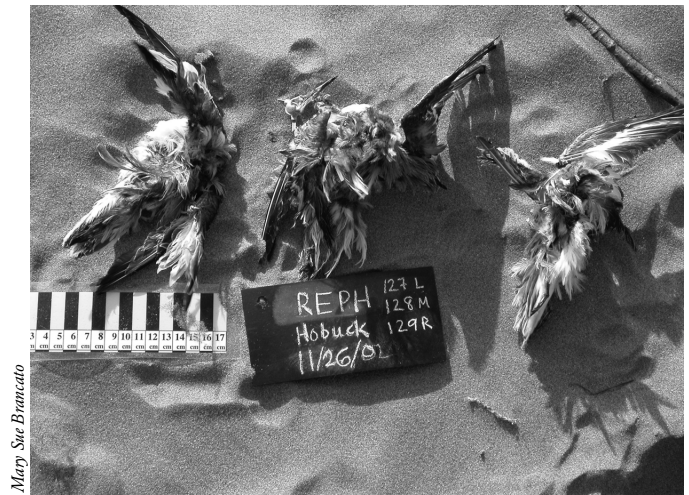
How can we tell whether there is a real difference in being #3 one year and being #2 the next? This brings us to our second way of viewing the data—the rate at which carcasses are beached. To some extent, the exact number rankings are meaningless. Case in point, large immature gulls fell from #2 to #4 in 2002–03. However, because deposition rates were higher, the total count of immature gulls was greater. Northern Fulmars climbed only one spot, from #3 to #2; however, this represented a 6-fold increase in the total number identified! You can see that both approaches to viewing the data, ranking and rates, have their advantages. Blending the two yields the clearest picture.



A Focus on Red Phalaropes

Red Phalaropes are shorebirds of the open ocean. Despite their diminutive size, only 55 grams on average, phalaropes are nonetheless hardy birds that manage to make a living in a seemingly inhospitable environment. When seas are tranquil, they plop down on the water and use their lobed feet to spin around in circles, at approximately 50 revolutions per minute. The vortex they create draws small zooplankton and other floating food up to the surface within easy bill reach. At other times, these birds pick flotsam trapped in surface slicks.

Red Phalaropes nest in Alaska and migrate to offshore waters in North and South America. Adult females depart Alaska first, in late June, followed by adult males in July and juveniles in August. While the species is relatively abundant in pelagic waters of the Pacific Northwest from mid-August to mid-November, they are seldom seen come winter. Dennis Paulson, curator at the Slater Museum of Natural History in Tacoma, reports that there are two migratory peaks in Washington waters. In late August through early September, a peak of adults moves south through our area,



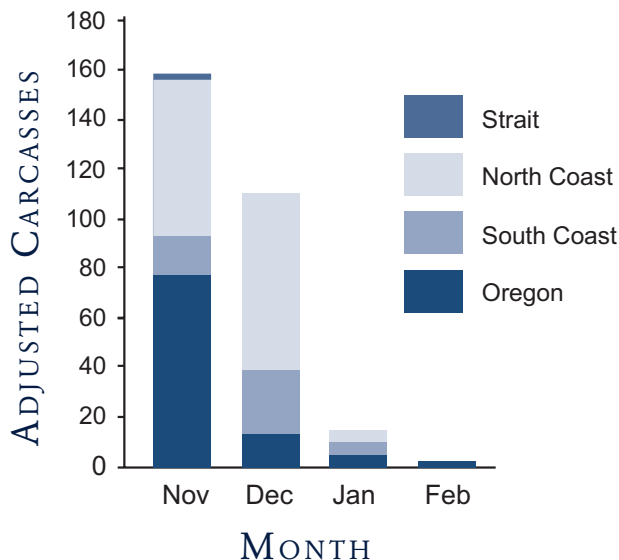
Three of the 55 Red Phalaropes in the North Coast region were found together (!)

with a juvenile peak in late October to early November. Much higher counts have been recorded in Oregon, where the species is thought to be more common.

How and why did so many phalaropes wash ashore *this* year? In early November (9th and 10th), University of Washington students on the annual Marine Biology field trip to the South Outer Coast discovered nine dead and two dying phalaropes in 10.6 km of surveys. All were emaciated, weighing only 34 grams (60% of normal) on average. Over the course of the next two months, COASST-wide, just over 150 phalaropes were found. This is a huge number compared to the two found in the preceding year. Whereas a few individuals with broken skulls and scraped breastbones appeared to be victims of Merlin or Peregrine Falcon predation, the majority of the carcasses were clearly fresh finds without signs of foul play.

The weather preceding (and during) this period was harsh. In past years, strong winds have often delivered tens of phalaropes (alive) to the Ocean Shores Sewage Treatment ponds or other suitable patches of aquatic habitat. However, the strength of last Fall's storms did not appear to be that far out of the ordinary when compared to the average monthly wind speeds of past Novembers—it appears that November is always moderately blustery. Consistently bad weather and rough seas can be devastating to small birds, especially during energetically costly migration periods. Even a day or so

Red Phalarope Deposition



High deposition of Red Phalaropes was sustained for two months along Washington's outer coast, while Oregon showed its most pronounced deposition in November.

without food and individuals will start to die. This explains why many of the carcasses found were both fresh and thin—they literally landed on the beach, unable to continue flying. Such massive mortality events, usually ascribed to natural causes, are known as wrecks.

The graph on page 10 is an amalgam of COASST Red Phalarope finds by month and region. We adjusted the total numbers to reflect slightly different levels of effort by region, measured as total kilometers surveyed within the month, by bringing all effort levels up to the region with the highest effort (always the South Coast). Thus, the adjusted carcasses are the total number that *would have been found* within each region, if the kilometers walked had equaled those of the South Coast for that month. If this is confusing, focus on two elements of the graph. First, the relative height of the stacks from month to month. This describes the pattern of phalarope deposition over time. Second, the relative height of individual boxes within a stack. This describes the pattern of phalarope deposition over space, that is, from region to region.

How many Red Phalaropes died in this wreck? Of course, exact numbers are impossible to pin down, but we offer a “back of the envelope” try. Because so many of the carcasses were fresh, we can infer that the deposition was daily. That is, each day new carcasses were deposited. Deposition rates probably weren’t consistent in time, there were probably peaks and valleys corresponding to local weather. However, our monthly adjusted total likely gives an average idea of the daily rates. Multiplying by the number of days in the month and by the percent of total beach within the region surveyed, we estimate that as many as 56,000 phalaropes may have died. To put this in perspective, the Pacific population of Red Phalaropes is between 1 and 2.5 million. This year’s wreck represents >5% of the more conservative total. If we pare down this number by only considering adults (82% of November finds and 36% of December finds) estimated adult mortality equates to 37,000, or 3.7% of the population total.

COASST data indicate that Oregon mortality spiked in November and then tapered off, whereas Washington showed high mortality through December. We found this pattern interesting because the birds are migrating



Only a single Red Phalarope was documented in the Strait of Juan de Fuca

south, not north. In fact, we would have expected the opposite pattern. Another curiosity is that the South Coast recorded relatively few phalarope carcasses compared to the North Coast. This is unexpected as the regional deposition rates for almost all species are consistently greater in southern Washington.

Todd Hass salvaged three of the Marine Biology carcasses for the Slater Museum in Tacoma where Curator Dennis Paulson discovered that all of the individuals were females and two were adults. Collections of Red Phalaropes in December by Slater staff revealed similar trends—all six birds collected were females, but only one was an adult. Twelve of sixteen (75%) phalaropes aged from COASST volunteers’ close-up photographs were also adults. The photos suggest there was an age-shift in the population over time, as nine of eleven November birds were adults, while only one of three December birds was adult. Dennis reports that 42 phalaropes collected from a similar wreck in Oregon in late October of 1934 (!) were all immature, with an even sex ratio. These earlier findings made him hypothesize that the adult migration passed by the Pacific Northwest by early Fall. However, our COASST results suggest otherwise. Furthermore, the recent data, including the Slater collection, indicate that there may be a difference between male and female migration timing and perhaps migration route.

Deposition Rates

In order to distinguish some of the subtle and local geographic trends, COASST splits the deposition analyses according to region. The graphs on page 13 depict the average carcass deposition rates in carcasses per kilometer for each COASST region. Deposition is defined as the new arrival of a carcass (so this does not include refinds). The fact that some beaches are surveyed twice or more in a month means that we have to introduce a correction factor. Specifically, we wish to avoid underestimating deposition rate simply because of survey timing and the existence of refinds deposited earlier *that same month*. Suppose you found two birds in early May, and then refound those birds in late May plus four more...what is the deposition rate? If you had only gone out the first time, you'd say two birds per month, and if only the latter, six (because the "refinds" would have been finds). To calculate average monthly deposition, COASST treats finds and refinds equivalently. Thus, using the above example, the average deposition for May would be $2 + 6$ divided by $2 = 4$. Deposition *rate* is average deposition divided by beach length.

As in past years, it is obvious that the Outer Coast (Washington's South and North Coasts, and Oregon) witnessed higher carcass deposition than the inshore coastline. Notice that all of the graphs aligned on the left have Y-axes that are far larger than the graphs aligned on the right, 7 versus 1. Each month's count is higher, and at least a few birds are found every month of the year. Within the inshore waters of Washington, the Strait acts as a transitional zone between the Outer Coast and the more protected waters of Puget Sound. Not surprisingly, the Strait shows far lower deposition than the Outer Coast, but carcasses do tend to be found in all months—unlike beaches in the Puget Sound and San Juans where deposition occasionally drops to zero.

Deposition rate was somewhat higher this year compared to previous years. We suggest that you take out *COASST Reports '01-02* and compare the graphs side-by-side for visual confirmation. Compared to last year, the South Coast saw about 50% more birds per km year-round, especially during the late summer to early winter period. Oregon also showed heightened deposition of similar scale, although the magnitude of change

is harder to gauge due to missing data from fall 2001. With the exception of December, when there was considerable phalarope and fulmar fallout, North Coast deposition levels were similar to 2001-02. Deposition in the San Juans was similar between years at approximately one bird per km per year, while Strait deposition fell slightly (~30%). In contrast to all other regions, annual deposition rate in Puget Sound actually doubled! Because COASST added so many beaches in Puget Sound last year, we can't yet discern whether it was an "up" year, or whether we simply added relatively high-deposition sites to our previously limited roster.

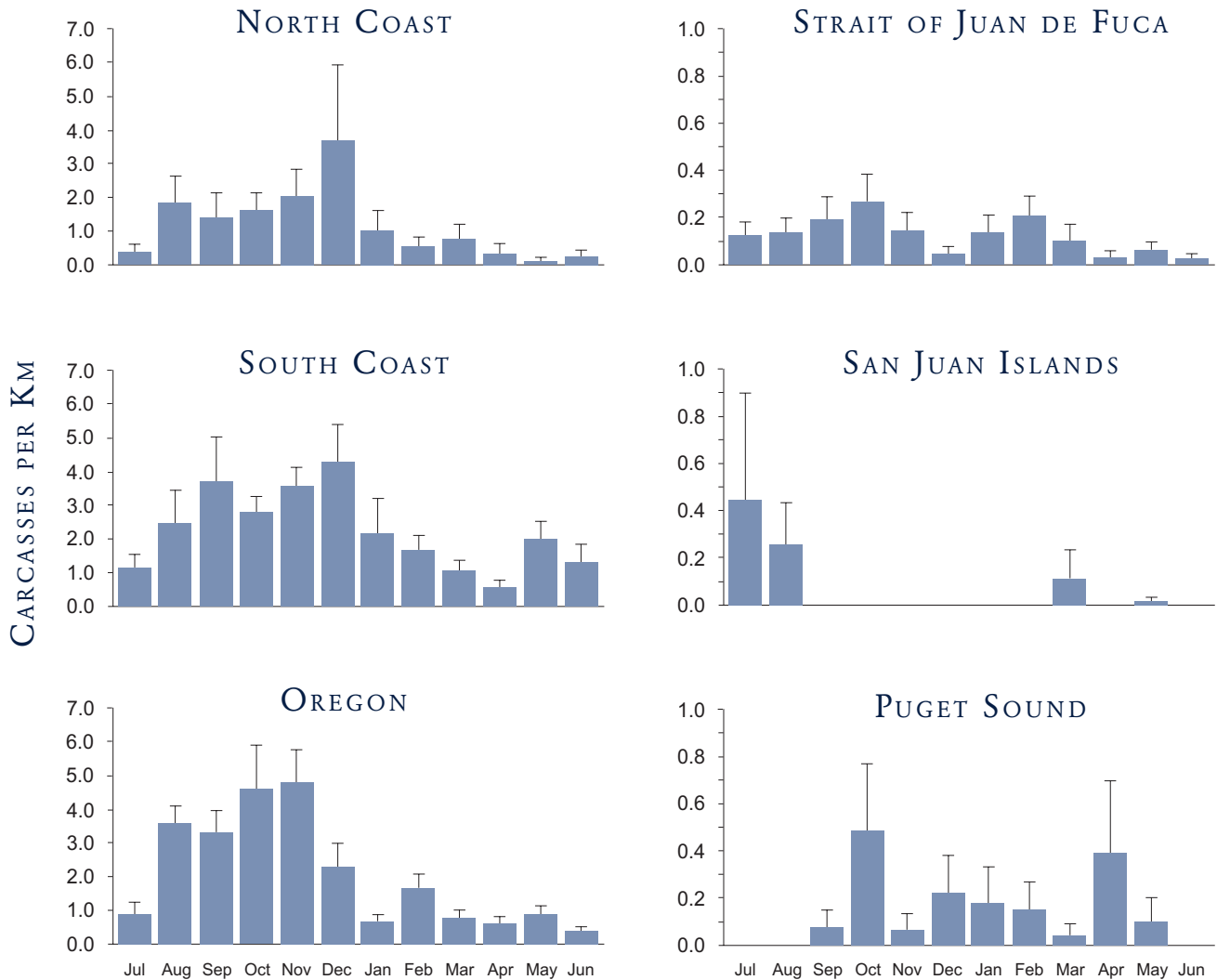
Inshore waters enjoyed their most consistent and thorough coverage in COASST history. While we recognize that finding 'no birds' is sometimes a letdown—by combining all of your efforts, COASST can finally start to resolve subtle patterns *despite* the rarity of inshore carcasses. As a result of this region-wide approach, we recorded low (but not zero!) deposition rates across almost all months in the Strait and Puget Sound.

Midsummer (June–August) saw no deposition in Puget Sound. By contrast, the San Juans experienced their most substantial deposition of the year over the same period. Carcass deposition in Puget Sound spiked in October and April and mainly consisted of beached gulls—which also predominated the rest of the year.

COASST now routinely monitors over 100 sites annually, more than enough to allow us to get a handle on how many beached birds occur along the entire Pacific Northwest coastline in a year's time. In an ideal world, we would know the exact number of carcasses deposited on each beach over each month. The deposition rate graphs on page 13 are reported by month, but they are *not* actually monthly deposition rates. Instead, they represent an index of relative deposition from month to month. Calculating monthly rates would require our volunteers to monitor their sites daily, adding up the new birds as they come in, and we think that's a bit much to ask! Therefore, we need to make some simplifying assumptions.

We already know that the rates we report by month are lower than true monthly rates. This is because those of you going out more than once a month often find new carcasses on the second survey. Therefore, we feel safe in using these rates as a lower (that is, conservative)

Deposition Rates by Region



Outer Coast regions (left side) had 5 to 10 times as many beached birds as inside waters (right side).

bound. What is a reasonable upper bound? For the calculations in our Focus on Phalaropes analysis (page 11), we assumed a *daily* deposition rate because the persistence time of “tiny” carcasses on the beach is so short-lived and many of these birds were very fresh when found. As a result, our estimate of phalarope deposition was relatively high (>56,000 birds). If we assumed our rates represented weekly deposition, we

would have to divide total estimated birds by 13, the number of weeks in November through January, for a much lower total of 4300. Assuming our average rates represent daily deposition of carcasses is inappropriate in most cases (with the exception of infrequent wrecks, such as the phalarope wreck), therefore, we’ve chosen the slightly more conservative weekly interval as our upper bound. Here’s an example of our calculations:

Annual Carcass Deposition by Region

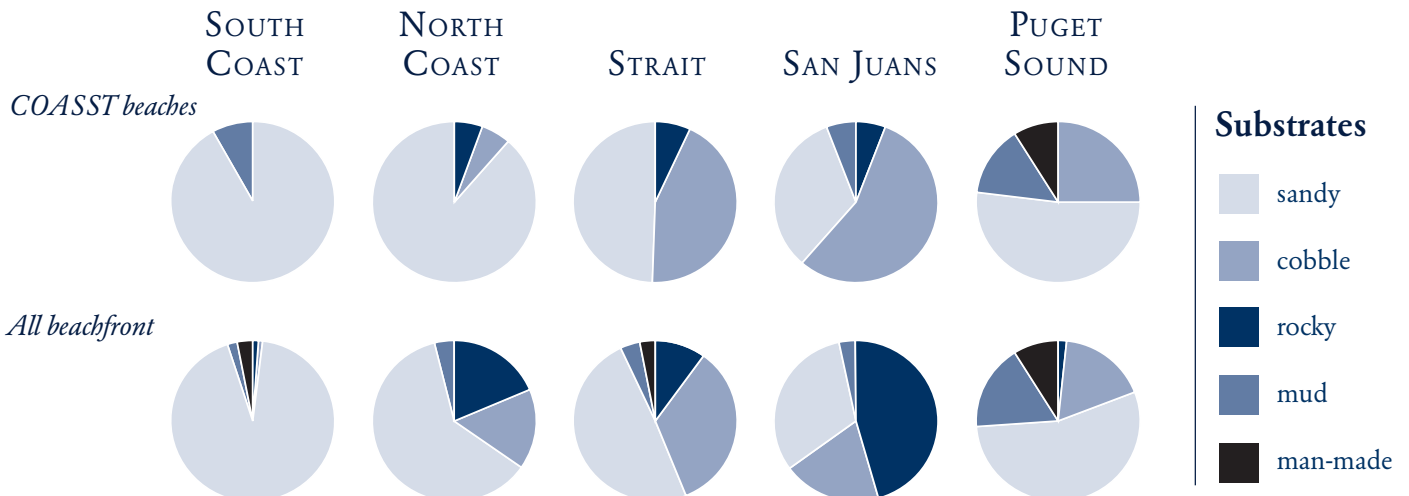
REGION	KM of COASTLINE	LOWER BOUND	UPPER BOUND
Oregon	480	11664	50544
South Coast	90	2426	10511
North Coast	170	2381	10316
Strait	329	488	2115
San Juans	352	297	1286
Puget Sound	1105	1913	8290
ESTIMATED TOTAL		19149	82980

In Oregon, deposition ranged for a low of 0.35 birds/km in June to a high of 4.8 birds/km in November. Adding up these rates over all 12 months equals 24.3 carcasses/km/year. This is our lower bound. Dividing by 12 and multiplying by 52 gives us the upper (weekly) bound of 105.3 carcasses/km/year. Multiplying each of these numbers by the number of

kilometers of shoreline in Oregon (480) allows us to estimate the total number of carcasses deposited on Oregon beaches: 11,664 – 50,544. Excepting wrecks which would temporarily push these numbers even higher, the actual number of marine birds washing ashore in Oregon probably falls somewhere between these values.

The table at left allows a comparison of total estimated annual deposition region by region. Notice that total birds along the Washington Outer Coast regions are lower than Oregon, even though the deposition graphs on page 13 are similar. This is because the Oregon coastline is longer than either Washington region. The inner water regions of Washington host much lower deposition rates, but quite different amounts of shoreline. Because a high percentage (>25%) of Puget Sound beachfront is man-made or mud (see pie chart, page 14)–substrates with limited deposition potential–and the total estimate of Puget Sound beachfront is so huge, we’ve adjusted the Puget Sound coastline downward by 50% (from 2210 km to 1105 km) to provide a more conservative estimate of the upper and lower bounds of annual deposition in the region. Thus, the projected total annual deposition across Puget Sound beaches was between 1913 and 8290, nearly four times higher than the much smaller Strait. To eliminate any similar bias in the South Coast, we’ve omitted the

Substrate Composition in Washington (% by total length)



estuarine beachfront of that region (Willapa Bay and Grays Harbor) from our calculations because COASST’s survey coverage there is limited to a single beach with low deposition. In total, COASST estimates that between 19000 and 83000 birds probably washed ashore from July 2002 through June 2003.

Substrate and Orientation

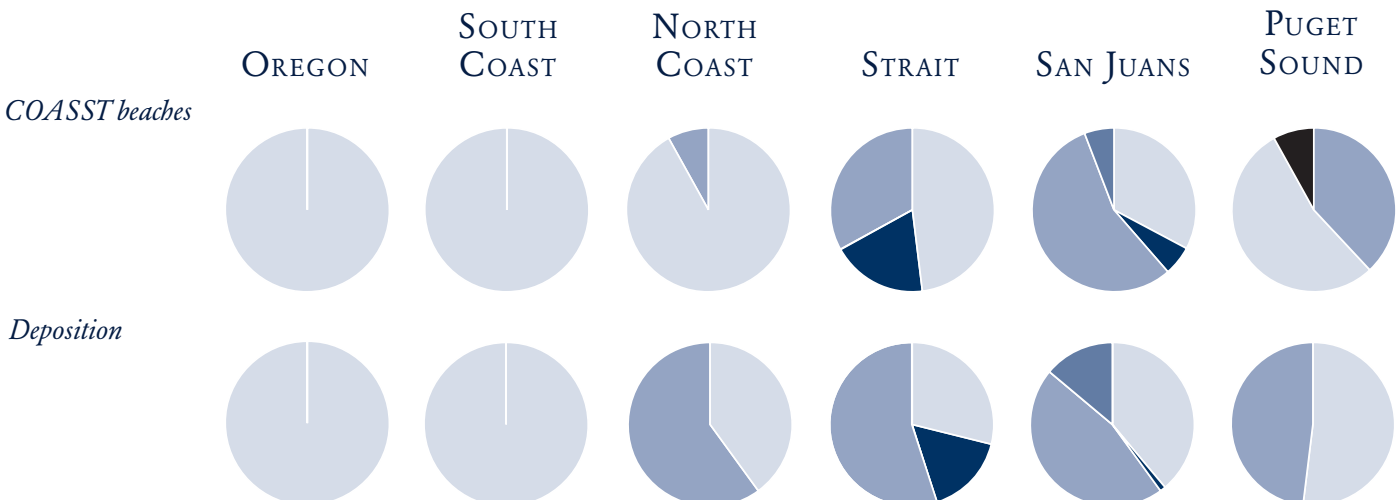
COASST initiated two new analyses this year. Using publicly available information on the composition of beaches from the Washington Department of Natural Resources, COASST intern Jane Dolliver characterized the overall Washington coastline according to beach substrate and orientation. Using this information, as well as data from the ‘Beach Characteristics’ forms you submitted, we can examine whether the handful of COASST beaches offers a fair representation of beach types region-wide.

In the bottom figure on page 14, the bottom row of pie charts represents the distribution of beach type in Washington, whereas the top row shows the division of COASST beaches. In this analysis, we are calculating percent of the total length. That is, the total length of all beaches in a region, or of all COASST beaches within a region. As you might imagine, we found that the more sandy the region (i.e., convenient or easy to walk), the closer our COASST beaches (a subset) match

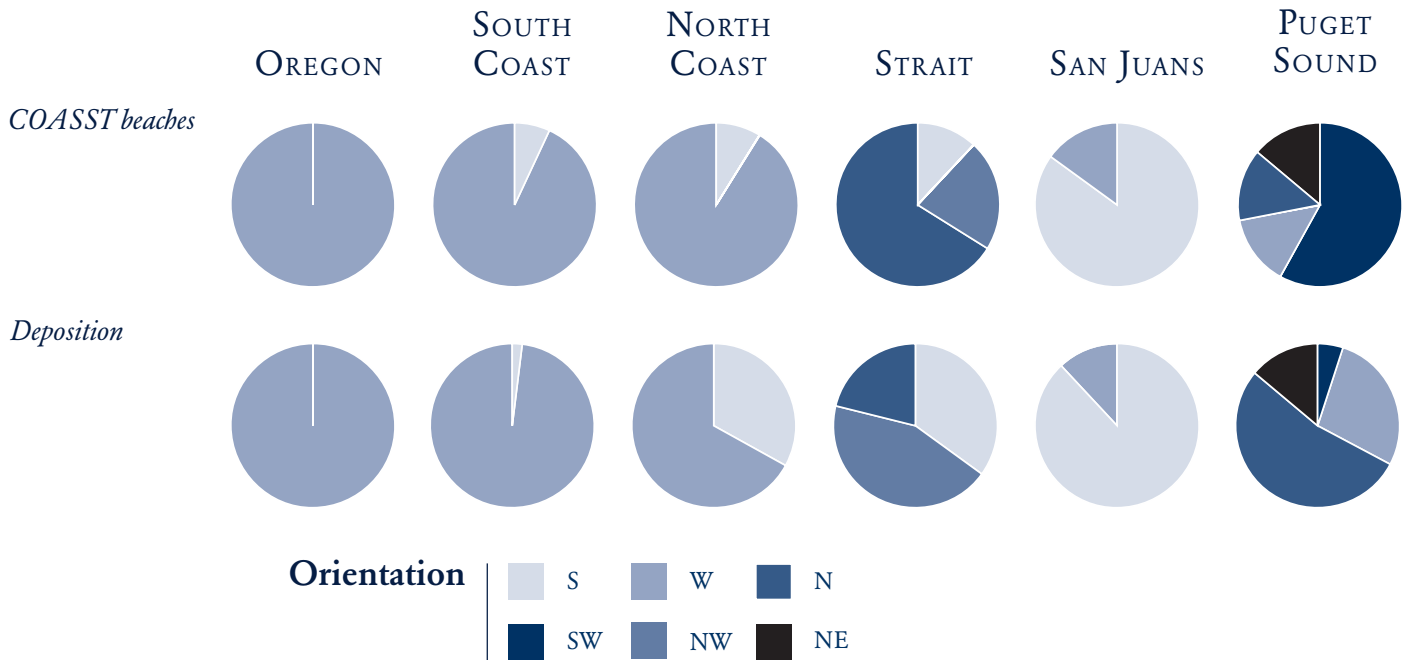
the composition overall. On the whole, a relatively small percentage of the beachfront COASST surveys is rocky. This bias makes sense, as rocky beaches are more treacherous to walk and usually offer very little settlement space for carcasses. Regionally, the San Juans contain the greatest proportion of rocky beaches at nearly 50%, yet COASST’s proportional coverage is 6%. Similarly, COASST’s coverage of rocky and cobble beaches along the North Coast is substantially lower than their proportional representation in the region overall. One of our goals is to incorporate new sites to more accurately represent regional patterns.

One of the more interesting questions we can ask of these new COASST data is whether there is a bias in deposition as a function of beach type—either substrate or orientation. How do we make percentages out of the massive complexity of beach and month-specific deposition rates? First, we only use beaches with ten or more months of surveys, so we don’t skew our results. This eliminates about 30% of the beaches COASST surveys. Next, we calculate the average deposition rate across all months, for each beach. This is the average annualized monthly deposition rate. After that, we can average annualized deposition rates across all beaches of a similar type, say all sandy beaches in the North Outer Coast region, or all north-facing beaches in the Strait. Okay, we’re almost there. Once we have these values—

Deposition by Substrate (% by # of beaches)



Deposition by Orientation



one per beach type, per region—it’s easy to ask what percentage of the total deposition each value is. Essentially, we’re simply assuming all beaches are the same length (remember that deposition rate is calculated in carcasses per kilometer, so this assumption is technically correct) and we’re asking the question—what percentage of carcasses are deposited on beaches with given characteristics, such as substrate and orientation?

In these cases, we calculate the beach type percentages a little differently. Instead of using beach length, we simply count the number of beaches as a function of the total count of beaches in the region. This is because we’ve made the simplifying assumption in our rate analysis that all beaches are—theoretically—one kilometer long. You’ll notice that the pie charts showing COASST beach type at the bottom of pages 14 and 15 are different—this is because actual COASST beaches are not all of uniform length (with the exception of Oregon beaches, where the vast majority are 1.66 km long).

First, we examined the proportion of carcasses found in each region according to beach substrate type: sand, cobble, rocky, mud, and man-made; and compared that to the percent of total beaches of each type. As almost

all COASST beaches in Oregon and on the South Outer Coast are sandy, it’s not too surprising to learn that 100% of bird deposition occurred on sandy beaches—a “sun rising in the east” conclusion.

Along the North Coast, cobble beaches constitute less than 10% of COASST beaches, yet they accounted for 60% of the birds—quite a positive bias! A closer examination of the data indicates that this result may be an effect of the law of averages. Of the 11 beaches in the region, only Ruby Beach is cobble. And although its deposition rate is high, averaging 1.4 carcasses per kilometer, there are a few sandy beaches with higher annualized deposition rates. However, there are also several sandy beaches with much lower rates. Thus, the overall sandy average is low. Adding more cobble beaches to the COASST program will address this problem, allowing us to separate reality from math.

A cobble-bias also occurred along the Strait. Out of 21 beaches, ten are sandy, seven are cobble, and four are rocky. Thus, we are more convinced that any bias patterns are real. Cobble beaches make up only one-third (33%) of the beaches, but attract just over half (55%) of the carcasses. This comes at the expense of the sandy beaches, for which these percentages are almost exactly

reversed (48% and 29%, respectively). Rocky beaches have no bias in this region.

In the inside waters, the proportional deposition was a much closer match to the proportion of substrate types. For instance, cobble beaches make up roughly 50% of San Juans beaches, and garner almost 50% of the carcasses. The same can be said for sandy and cobble beaches in Puget Sound as well.

In a similar fashion, we examined the proportion of carcasses found in each region according to beach orientation, including the major compass directions (north, east, south, and west) and the minor directions (northeast, southeast, southwest, and northwest). We compared the proportion of annualized deposition rate to the percentage of COASST beaches facing each direction. As with the substrate graphics, the top row of pie charts on page 16 is the division of COASST beaches and the bottom is the division of deposition rate.

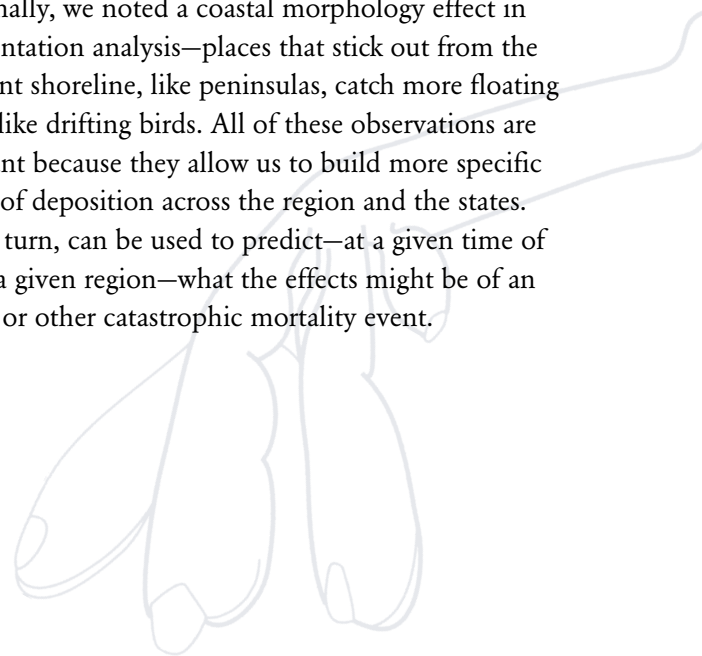
In Oregon and the South Coast, the percentages were closely matched; most beaches have a west exposure and most birds occur on west-facing beaches. Not too surprising... On the North Coast, south-facing beaches represent less than 10% of the total but capture over 30% of the birds. This is Sand Point South. And you guessed it, the law of averages is at work again. There is only one south-facing beach on the North Coast, but there are ten west-facing ones. Thus, even a high deposition rate on a west-facing location, like Hobuck Beach (which averages almost six times as many carcasses per average month as does Sand Point South) will be “swamped” by much lower annualized monthly averages of beaches like Kalaloch, Second Beach, and Shi Shi Beach.

The pattern becomes more interesting, and realistic, in the inside waters. In the Strait of Juan de Fuca, south- and northwest-facing beaches capture a disproportionately high percentage of birds compared to those that face due north (the majority). Such a trend is not surprising, as northwest-facing beaches like Dungeness Spit and south-facing beaches like Ediz Hook are on small necks of land that jut out into the Strait and capture birds drifting with the prevailing currents. It would be interesting to test this theory by adding Vancouver Island beaches to COASST. The majority of these beaches face south, allowing us to test the effect of

direction (south versus north) from the effect of coastal morphology (peninsula versus predominant beach perpendicular to the longshore current).

Patterns in the San Juans and Puget Sound are somewhat difficult to pin down, as deposition rates are extremely low or beaches face in all directions. Eighty-five percent of COASST’s effort in the San Juans was allocated to south-facing beaches, which yielded a similar fraction (88%) of carcasses. In Puget Sound, the majority of beaches (58%) face southwest, but the majority of carcasses are delivered to one north-facing (50%) and one west-facing (28%) site—Discovery Park North and South, respectively. Is it direction or is it something else about these sites? Although the COASST office would surely like to claim credit for “our beaches” receiving a disproportionate number of the carcasses, we suspect that, just as in the Strait, this peninsula of land which juts out into Puget Sound collects all sorts of floating material which drifts back and forth with the tides.

In summary, our beach type analysis suggests three things to us. First, we need to up the number of “minority” beaches in all regions to rid ourselves of the law-of-averages problem. Second, we found some evidence that cobble beaches may recruit more carcasses than sandy beaches. This hypothesis could be followed by a more systematic study examining deposition and persistence rates. Perhaps sand buries carcasses more quickly. Perhaps cobble beaches contribute to faster mummification. Finally, we noted a coastal morphology effect in our orientation analysis—places that stick out from the dominant shoreline, like peninsulas, catch more floating objects like drifting birds. All of these observations are important because they allow us to build more specific models of deposition across the region and the states. This, in turn, can be used to predict—at a given time of year in a given region—what the effects might be of an oil spill or other catastrophic mortality event.



Species Profile: Pink-footed Shearwater

Oregon COASSTers found two Pink-footed Shearwaters on their beaches during September and October this year. Like other shearwater species and the Black-footed Albatross, Pink-foots migrate to the Pacific Northwest from distant locations. During the southern hemisphere (or austral) summer, Pink-foots return to only three known breeding islands, all in Chilean waters. In the non-breeding season, these birds migrate up the coast of the Americas, some as far north as the Gulf of



Mitchell Weinstein

A close-up of the geolocation tag.



Peter Hodum

A Pink-footed Shearwater on the colony.

Alaska. The beached individuals may very well have been on their way back to Chile to find their mates and raise a chick.

At-sea surveys show that Pink-foots tend to migrate farther offshore than other shearwaters, such as the Short-tailed or more common Sooty. This difference in behavior may be the reason we rarely see Pink-foots on COASST surveys. From offshore locations, Pink-foot carcasses would tend to drift for longer times and distances, trapped in longshore currents, preventing coastal deposition. However, the rarity of Pink-foots on our beaches may also be due to the fact that this species is significantly less abundant worldwide (estimated population <50,000 individuals) than Sooty and Short-tailed Shearwaters.

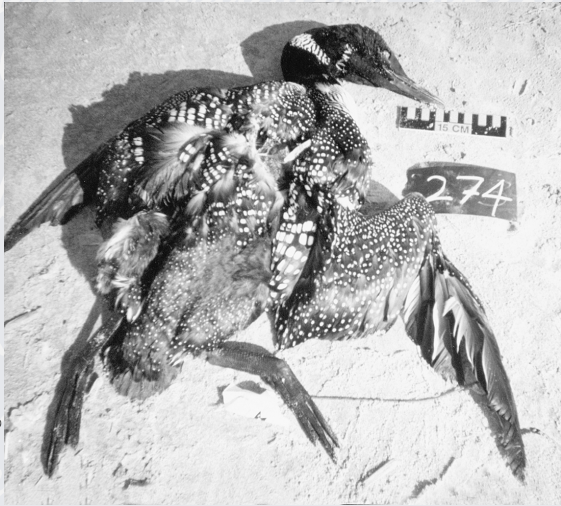
Teasing apart these relationships is of particular interest to another conservation organization based at the University of Washington, the Juan Fernández Islands Conservancy (JFIC). Biologists from the Conservancy study Pink-foots on two of the three islands where they breed, Santa Clara and Robinson Crusoe in the Juan Fernández Archipelago. JFIC monitors native seabird populations and breeding behavior, works to minimize the effects of introduced cats and rats on threatened seabird populations, and is involved in environmental education in the island communities.

One of the Conservancy's newest research projects includes deploying small instruments called geolocation tags on individual shearwaters to track their migratory voyages. These five-gram tags (top right photo) record location, temperature and pressure, allowing biologists to piece together the large and fine-scale patterns of Pink-foot migratory behavior. What migratory routes do the birds use? How much time do they spend flying, sitting on the water, or diving beneath the surface?

How deep beneath the surface are they fishing? Though we certainly hope not, you may just encounter a tagged Pink-footed Shearwater on your beach some-day. More importantly, combined with JFIC's research effort, COASST data tracking mortality off the U.S. West Coast can help generate a complete picture of the natural history and biology of this vulnerable species.

Quiz: You know we love to give quizzes...so take out your field guide and try to i.d. these birds.

A



Rich Albright

vital stats

found 1/20/02

Oregon Mile 255 (Neskowin)

Bill: 69 mm

Wing: 19 cm

Tarsus: 68 mm

B



Maxine Centala

vital stats

found 4/18/03

Oregon Mile 218 (Agate Beach)

Bill: 90 mm

Wing: 37 cm

Tarsus: 90 mm

C



Bert Johnstone

vital stats

found 8/31/02

Oregon Mile 196 (Smelt Sands)

Bill: 67 mm

Wing: 39.5 cm

Tarsus: 46 mm

answers on page 26

COASST People

Volunteers

In our fourth year, COASST grew by one-third in almost all measurable dimensions—volunteers, beaches, total surveys, and birds found. This is incredible, considering the fact that we had already climbed to the number one position of beached bird surveys in the world by last year. COASST now routinely monitors more than 100 beaches (see map on page 3) from the midpoint of the Oregon coast to Bellingham Bay in north Puget Sound. Our volunteer ranks currently stand at about 240, of which 180 are regular monthly participants. The sheer size and scope of COASST, and the commitment of all of you, make our program truly comprehensive, and an integral part of marine resource monitoring and management in the Pacific Northwest.

Up nearly 40% from last year, COASST volunteers logged 1,014 surveys, almost 2,600 hours on the beach and 5,000 kilometers. And if we included walking to and from your sites—especially for our intrepid North Coast volunteers—the kilometer total would stretch from Seattle to the center of the Earth!

Of course, COASST relies on everyone's effort—large and small—to make the program work. Sharing a beach with other COASSTers to ensure regular monthly coverage can be a way to meet personal demands on your time and COASST program goals. Our main office staff share duties at the Discovery Park sites in Puget Sound. However, we'd like to take a little space to mention a few volunteers by name. Wolter Van Doornink has been a huge pillar of COASST in the South Coast region, surveying 90 km on Copalis Rocks outside his house in Copalis, Washington. Kathleen Wolgemuth and Andy Gruse surpassed the 50 km mark again this year—the Ocean Shores crew is truly in great shape! Stuart MacRobbie may not have found as many birds along the Strait, but he too walked almost 45 km in search of them. No one surveyed longer than Dianna Moore—almost 85 hours searching the sands of North Jetty and Marine View Drive, and that doesn't include the many hours devoted to entering her data online. North Coast and Strait volunteer Coleman Byrnes,

—continued on page 24

Volunteer Spotlight

Bert Johnstone—Oregon

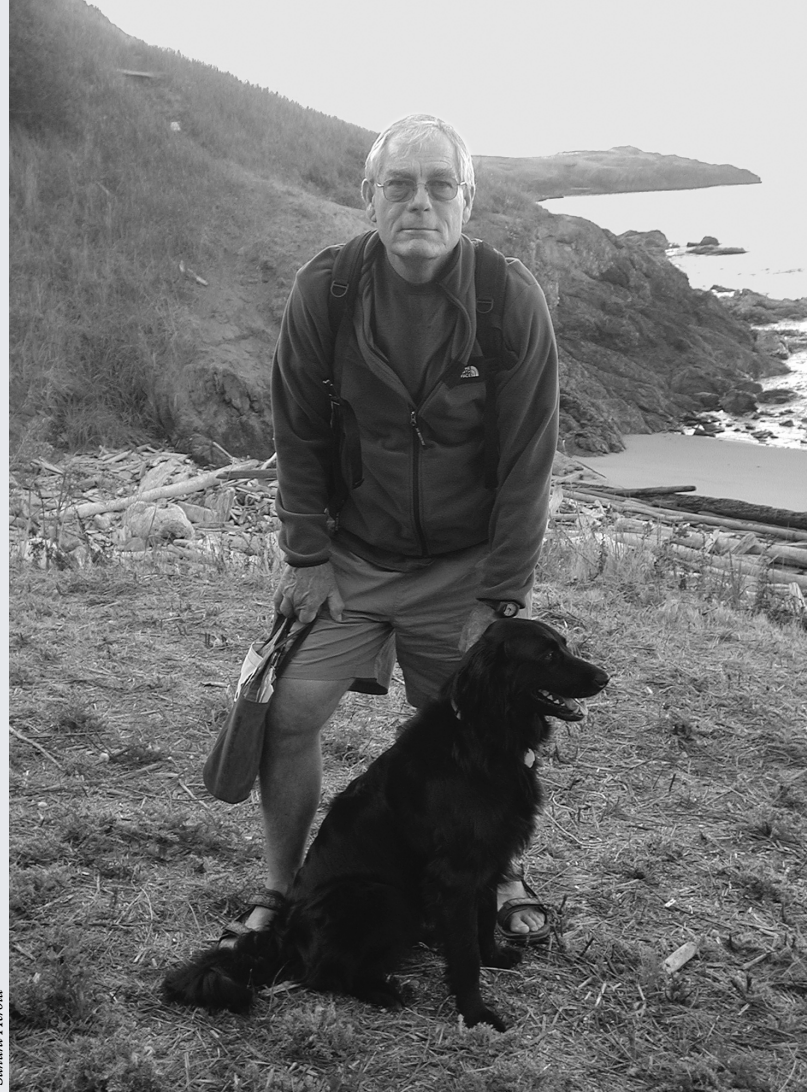
Bert Johnstone of Yachats, Oregon is our Outer Coast spotlight volunteer. Like most of our volunteers in Oregon, we recruited him from CoastWatch (where he is a four-year volunteer). He shares Oregon Mile 196 with a great team of volunteers (many pictured below), including Martha Holmberg, Betty Sparks, Jerry Gibson, and John Burton. A retired philosophy professor (from Oregon State University and Western Oregon State College) and avid beachcomber, Bert came to COASST in October of 2001 with extremely limited bird experience. Why do we point that out? Because despite his group's relative inexperience, the team turns in very accurate data; identifying 88% of their birds to species, and another 9% to family, which leaves only 3% unidentified. Their photos and measurements have allowed us to confirm well over 95% of the birds from their mile—a fantastic feat! The group has been particularly adept at facing the identification challenges presented by the various female and juvenile scoters they've found. Bert is also a monthly surveyor for the Ocean Conservancy's



national Marine Debris Study. In that effort, he's found that "the amount of plastic on Mile 196 can be astounding." Occasionally, over the span of 300 meters he has collected several bags full of trash, and admits, "it's more than we can pick up!" Bert sees the two programs as useful and complementary in documenting baseline patterns and "creating databases so that you can see what's unusual and if anything is wrong."

Mike Kaill—San Juans

A retired Alaska Fish and Game Biologist, Mike Kaill of Friday Harbor joined COASST over two years ago. Since then he has meticulously documented the distinct absence of birds on the two beaches he covers twice a month, South Beach West and Eagle Cove (sidenote: he finally did find three murre in August 2003!). In contrast, he's found a surprising number of marine mammals on his sites, with Harbor Seals the most frequent. Since joining us, Mike has recruited ten volunteers to help him. His wife, Sandra Harold, has been his most regular survey companion—if you overlook the presence of Arlo, his dog! Last March, we had



Sandra Harold



trouble reading the beach name through all of the blood smeared on one of his data sheets. Mike commented in the margin "barnacle cut. Just a flesh wound, it's ok." Mike's other efforts in the San Juan community include teaching at Skagit Valley Community College (he holds a PhD in Vertebrate Zoology from Cornell) and maintaining the 400-gallon aquarium at the base of the passenger ferry dock in downtown Friday Harbor (the tank features the local marine life and gets its salt water directly from the bay). One of his main reasons for volunteering for COASST is that it ensures that he doesn't take his surroundings for granted. He enjoys going out "rain or shine because *that's* how one sees the beach's personality."

Above: Mike Kaill and Arlo

Left to right: Martha Holmberg, Jerry Gibson, John Burton, and Bert Johnstone

VOLUNTEER*	HOURS	KILOMETERS
Rich Albright	21.9	16.6
Alan Amundsen	15.3	13.3
Ken Arzarian	9.7	23.8
Bill Baccus	7.5	9.2
Tracy Beals	11.6	13.0
Bill Bell	1.7	2.2
Bryan Bell	6.3	6.0
Carol Bernthal	3.7	10.5
Linda Bierma	54.8	28.5
Beth Bierman	20.7	23.9
Barbara Blackie	44.2	28.9
Ed Bowlby	9.0	7.6
Jane Boyden	37.1	29.9
Mary Sue Brancato	35.8	20.9
Katie Brenkman	20.1	9.7
Varn Brooks	7.2	9.0
John Bryson	2.3	2.1
John Burton	3.5	3.2
Kathy Bush	28.1	16.5
Rick Bush	31.5	19.9
Coleman Byrnes	62.0	47.4
Barbara Campbell	21.9	22.1
Betsy Carlson	23.5	34.5
Ricki Carlson	3.4	4.0
Maxine Centala	30.8	32.0
Anne Chiller	12.5	9.0
Judy Chovan	26.9	11.2
Gordon Clark	3.5	3.4
Susan Clark	32.3	32.3
Debra Clausen	21.4	38.4
Jane Comerford	9.2	13.3
Laurel Cook	0.9	0.5
Katie Corcoran	1.1	1.6
Deb Cox	27.5	18.1
Tom Cox	19.3	14.3
Elaine Cramer	11.0	8.0
Bob Davison	7.2	2.9
Tristan Delahunt	4.4	3.2
Pam Dick	37.0	22.9
Kim Dietrich	2.3	1.6
Paul Dinnel	10.9	15.4
Jane Dolliver	6.5	8.0
Liz Donelan	1.2	1.6
Lynn Dwan	4.6	4.3
Ann Edwards	0.9	1.6
Sharon Enga	14.0	11.6
Colleen Engelhard	5.3	10.2
John Epler	14.9	32.0
Laura Epton	1.7	3.4
Annie Farris	1.7	3.4

VOLUNTEER*	HOURS	KILOMETERS
Rebecca Field	30.1	33.6
Joan Fitzjarrald	7.9	3.2
Steven Fradkin	2.2	3.0
Colin French	10.0	13.7
Carl Friedericks	20.9	20.7
Ron Frisch	23.3	25.0
Sue Gabriel	28.3	23.2
Carolyn Germane	3.9	3.3
Jerry Gibson	2.0	1.7
Mary Goff	45.4	38.0
Nina Goff	14.4	10.0
Tom Golding	3.6	1.9
Ann Grangaard	1.2	2.0
Scott Gremel	2.8	3.0
Andy Gruse	20.3	56.0
Guest	15.6	16.6
Shelley Hall	22.2	15.6
Nathalie Hamel	3.4	3.2
Jennifer Hancock	4.2	1.9
Mary Ann Hanson	13.2	30.0
Wayne Hanson	13.2	30.0
Patti Happe	6.7	7.6
Caroline Harding	12.0	10.5
Jean Harmon	13.3	10.0
Sandra Harold	6.7	6.6
Janine Hartz	12.8	8.5
Jon Harwood	12.9	12.0
Todd Hass	4.3	4.7
John Haxton	7.8	8.3
Kristin Hemmelgarn	3.0	3.0
Clem Hoerner	14.9	32.0
Cat Hoffman	3.9	3.2
Roger Hoffman	7.0	6.2
Mary Holbert	11.7	12.8
Nancy Holman	2.7	2.6
Martha Holmberg	13.3	13.3
Nancy Houtzel	54.8	28.5
Gay Hunter	7.2	9.0
Ellen Jenkins	6.3	4.5
Dick Johnson	11.6	16.0
Kathy Johnson	7.8	7.5
Bert Johnstone	36.5	33.2
Mike Kaill	20.2	22.8
Diantha Kelman	0.8	1.6
Christina Kessel	3.9	3.0
Ronalee Kincaid	0.9	0.5
Rick Klawitter	17.0	16.1
Edi Leonard	8.4	4.0
Bev Leyman	4.9	3.1
Larry Leyman	7.0	4.3

VOLUNTEER*	HOURS	KILOMETERS
Peter Linton	24.5	32.3
Kate Litle	1.2	1.6
Christine Loewe	1.2	1.2
Jann Luesse	17.4	19.2
Karen Lull	7.2	9.0
Sanny Lustig	5.3	6.0
Pat MacRobbie	29.3	38.4
Stuart MacRobbie	33.8	44.7
Dave Manson	9.4	9.5
Christina Maranto	0.7	1.6
John Markham	3.5	1.6
Bill Marks	1.3	2.0
Jane Marks	12.7	16.2
Mary Marsh	36.2	22.5
Linda May	23.6	35.1
Chip McBride	2.3	2.1
Jill McKay	11.4	9.4
Vicki McNeil	9.3	13.2
Bob Merrick	21.7	27.2
Ian Miller	7.0	6.0
Susan Molin	1.4	1.9
Dianna Moore	84.7	41.6
Tom Munsey	2.6	3.3
Sue Nattinger	50.7	40.4
Sharon Nelson	6.0	9.1
Vic Nelson	20.1	29.9
Wade Newbegin	23.0	21.6
Nancy Newman	22.4	16.4
Jim Oakland	3.8	2.6
Gerry Odisio	11.7	6.4
John Odisio	11.7	6.4
Joyce Orr	2.3	1.7
Connie Owston	22.6	18.3
Pete Owston	21.3	16.6
Andy Palmer	8.5	10.2
Aaron Parker	16.6	9.7
Julia Parrish	4.9	3.7
Mike Patterson	5.2	4.8
Barbara Patton	10.8	7.2
Mike Patton	10.8	7.2
Josey Paul	2.9	3.9
Laura Payne	0.9	1.6
Heidi Pederson	12.1	15.9
Mollie Peters	7.0	6.6
Paul Raffensperger	13.5	13.3
Barbara Reisman	2.7	2.5
Patrick Reynolds	14.8	9.6
Ginger Ridgway	5.8	2.6
William Ritchie	17.9	11.0
Chrissy Rodgers	6.4	4.8

VOLUNTEER*	HOURS	KILOMETERS
Marilyn Ross	5.7	3.2
Judy Roth	2.5	2.0
Wilma Sale	9.7	4.5
Pam Sanguinetti	5.1	4.8
Carol Sanner	1.9	1.7
Tim Saskowsky	2.8	3.6
Jim Scheller	3.0	4.8
Liz Schlee	4.0	6.5
Robert Schwartzberg	5.3	2.3
Pete Seidel	9.5	3.2
Lori Sinnen	11.0	9.0
Jo Smith	1.8	8.0
Joshua Smith	2.2	3.2
Judy Sorrel	11.5	3.0
Betty Sparks	9.0	11.2
John Spiva	4.5	8.3
Jesse Stewart	15.8	22.0
Debbie Stoller	6.7	3.2
Carolyn Stone	3.7	3.4
Linda Streifeld	1.1	1.0
Eftin Strong	7.7	8.2
Ingrid Strong	7.7	8.2
Ed Strum	8.0	3.8
Stuart Island School	3.7	3.4
Kim Sundberg	18.7	28.8
Vivi Tallman	4.8	4.8
Doug Timmons	8.7	12.0
Linda Timmons	6.9	9.6
Jim Towell	1.3	1.6
Marine Biology Field Trip	10.4	8.7
Anneka van Doorninck	36.3	42.0
Wolter van Doorninck	79.5	93.0
Barbara VanderWerf	27.0	20.9
Bill VanderWerf	27.0	20.9
Pamyla Wadsworth	11.4	10.0
William Wadsworth	14.7	13.3
Darlene Wahl	10.9	27.2
Joanne Wester	0.7	1.0
Ken Wiersema	11.4	11.0
Bob Wilkenson	1.7	2.4
Leigh Winowiecki	1.9	1.0
Beth Winslow	22.7	14.5
Kathleen Wolgemuth	72.6	59.2
Carrie Wooten	3.5	3.2
TOTAL	2598.7	2484.9
*Volunteer effort July 2002-June 2003		

—continued from page 20

as well as the South Coast team of Linda Bierma and Nancy Houtzel (with some 11+ hour surveys!), and Oregonian Sue Nattinger all passed the 50 hour mark—with South Coast newcomer Mary Goff not far behind.

Some beaches are long, some beaches are bird-filled, and some are both! Tenacious COASSTers survey long hours in all sorts of weather to make sure we can keep track of patterns of species deposition. You all deserve special mention and praise. But we'd also like to reserve space for those relentlessly positive volunteers who never missed their surveys, even after months of no birds. It is your contributions that are allowing COASST to get the complete picture. Bob Merrick and Peter Linton managed to do 23 surveys on *two different beaches*, Ebeys Landing and Perego's Lagoon, in Puget Sound. Once again, San Juan COASSTer Mike Kaill covered both Eagle Cove and South Beach-West nearly twice-a-month for a total of 41 surveys. Despite a prolonged winter absence, Judy Chovan on Grandma's Cove and Jackson Beach of San Juan Island conducted 38 surveys. Four beaches were surveyed 24 times or more because pairs of volunteers shared the beach and alternated their surveys. Vic Nelson of Point No Point, Puget Sound, was a perfect 24 for 24, without alternating partners. Finally, we'd like to mention Wolter VanDoorninck again. Wolter surveyed Copalis Rocks *every single day* of our October pulse period, giving COASST the only seven-day continuous record to date.

Volunteers' success in identification improved again this year. Considering all carcasses (not just the intact ones), COASSTers correctly identified 86% to species and 6% to Foot-Type Family—leaving only 8% unknown when compared to Todd's identifications based on measurement information and photos. One factor that probably enhanced our program's accuracy this year was that the top four species accounted for almost 70% of the carcasses. By now, almost everyone on the Outer Coast has repeatedly encountered a number of fulmars, murre, gulls, and this year—phalaropes. We hope that as volunteers gain more experience, their accuracy will continue to rise.

Staff

COASST staff have been scrambling to attend to our ever-expanding program. Program Coordinator Todd Hass made nine training and refresher visits to Anacortes, Bellingham, Friday Harbor, Shaw Island, Vashon Island (twice), Ocean Shores, and Tacoma (twice). A growing proportion of Todd's time is now dedicated to data verification and quality control follow-up with volunteers, in addition to managing the COASST main office. Brian Altman continued to supervise our website from Brisbane, Australia, proving that the web truly is a boundary-less environment. Graphic designer Cathy Schwartz adds that special flair to our printed materials. Kate Litle was instrumental in overseeing that the various interns, staff (including Todd!), and contractors stayed on task and remained organized.

Our partners at the Olympic Coast National Marine Sanctuary continued to attract and retain volunteers. Mary Sue Brancato, our North Coast and Strait of Juan de Fuca Volunteer Coordinator, with much assistance from Barbara Blackie, organized two formal training sessions in Port Angeles and Neah Bay gaining 14 and 10 new people, respectively. They also added another 17 people through six "in-the-field training sessions" at Hobuck Beach—a great choice, as it is home to the longest and most interesting species list of any COASST beach! That's a total of 31 new recruits. Great job!

Carol Bernthal, OCNMS Superintendent, began surveying Point Wilson, and Andy Palmer, OCNMS skipper and Advisory Council Coordinator, took over surveys at Cape George. Sanctuary staff Katie Brenkman, Ed Bowlby, and Bob Steelquist were also out there putting in the survey hours. From the COASST main office, thirteen members of the Parrish Lab participated on surveys along Alki Beach and Discovery Park North and South in Puget Sound. And of course Julia Parrish, our Executive Director, took her University of Washington Marine Biology class out to seven beaches for a rousing two days of surveying—71 birds, 15 species, and 25 wet, tired and excited students.

Todd and Julia raised COASST's profile at both the local and national level again this year. In February—

Partner Profile:

Olympic Coast National Marine Sanctuary

At the edge of the world, just off the beaches of our North Coast region in one of the most rugged and pristine environments left along the West Coast, lies the Olympic Coast National Marine Sanctuary (OCNMS), a jewel in our environmental crown and a primary partner in COASST. OCNMS—in the capable persona of Mary Sue Brancato—has been with COASST from the beginning, reviewing early versions of *Beached Birds*, working with Program Coordinator Todd Hass to design the volunteer protocols, and performing as the COASST Volunteer Coordinator for participants in the Strait of Juan de Fuca and North Coast regions. Barbara Blackie and Katie Brenkman also play important roles in COASST, from staffing the ever popular Hobuck Beach site and training volunteers, to designing our special volunteer database (complete with photographs).

What's so special about the Sanctuary? Plenty! In part because of its isolation and in part because of stewardship-minded landowners sharing its watery border (Olympic National Park, three National Wildlife Refuges, and four coastal Indian tribes—the Makah, Quileute, Hoh and Quinault), the Sanctuary includes some of the last remaining wilderness coastline in the lower 48 states.

Encompassing 3,310 square miles from Cape Flattery to the mouth of the Copalis River, the Sanctuary includes most of the continental shelf and many types of marine habitat such as rocky intertidal zones, kelp beds and three deep submarine canyons like the Quinault that plunges to 4,528 feet within Sanctuary

boundaries. Plankton-rich upwelling zones; rocky benches crammed with algae, mussels, and barnacles; and some of the State's richest fisheries typify the area. OCNMS is home to 12 species of nesting seabirds, including Common Murres, Rhinoceros Auklets and Tufted Puffins; haul-outs for Harbor Seals and California and Steller Sea lions; shrimp-rich mud flats for hungry Gray Whale residents; and secluded nest sites for Peregrine Falcons.

Designated in 1994 as the first sanctuary in the Pacific Northwest, OCNMS protects our marine resources—both habitat and denizens—through a combination of research, education and resource protection. Aircraft must abide by a 2,000 foot ceiling, to minimize disturbance to marine mammals and nesting seabirds. Shipping traffic is directed to special lanes outside of the most sensitive regions of the Sanctuary, to help protect against the possibility of damaging oil spills. Active programs to map and monitor intertidal and subtidal habitats, follow Sea Otter populations, and count and identify (live!) seabirds are part of the research agenda of OCNMS. Volunteer programs provide an opportunity for citizens to get their feet “wet” and contribute to our knowledge of the Olympic Coast. But for many people, just knowing that the Sanctuary exists is enough.

If you have not had the opportunity to visit the Sanctuary we highly recommend it. Stop by the OCNMS office in Port Angeles (115 E. Railroad Ave., Suite 301) to meet Mary Sue and the staff and pick up a few tips about choice places to visit.

A beautiful day at Point of Arches

OCNMS



March 2003, Todd presented two lectures in Canada: one at the Puget Sound/Georgia Basin Research Conference in Vancouver and the other at the Pacific Seabird Group meeting in Parksville, BC. The two also shared a paper on seabird-fishery interactions at the Conference of the American Ornithologists' Union in New Orleans in September '02. Closer to home, Julia talked to the Vashon Island Audubon chapter May meeting and Todd presented a COASST seabird program to the Seattle Audubon Master Birder's Program. Finally, Todd participated in The Russell Family Foundation's (TRFF) grantee gathering last spring, reaffirming connections with RE Sources, also a TRFF grantee.

Interns

The importance of our student interns in the COASST main office cannot be overstated. Their hours total over 500, including early mornings, late nights, and weekends! And this is while they are enrolled as full-time students at the University of Washington. Go team!

First off, we wish to recognize Jane Dolliver's one-year anniversary with COASST. If you haven't had the pleasure of speaking with her on the phone, we're sure you've heard her reassuring voice on your answering machine. Among other endeavors, it has been her role

to keep all of you well-supplied with data sheets and cable ties, and well-informed about COASST efforts. Of course, Jane's voice is also the gentle reminder to send your data in promptly. Many volunteers report that Jane is the friendliest of staff, and we couldn't agree more. She loves talking to all of you, and especially appreciates your stories, which she takes great delight in relaying to the rest of the office. Fortunately for COASST, Jane still has her senior year ahead of her and we will continue to have her invaluable help for at least one more year. Thanks Jane!

For three quarters, Diantha Kelman assisted in general data entry and volunteer training, and constructed a number of office rulebooks to guide the efforts of future interns. She left us in June for graduate school at the University of Wisconsin in Madison, where she will study toxicology. We will miss her. Tim Ewing, a Fisheries major and two-quarter intern, helped us track down various essential data from a vast array of library materials and summarized the results into a handy spreadsheet. He also coordinated the selection and purchase of the COASST rewards. Katie Corcoran, who found us by using the online service *VolunteerMatch*, helped organize our slides and participated in our mass-mailings. Thank you all.

Answers to the Quiz

- A. This is a big bird, casting a significant shadow. However, we *can* see that the front toes appear to be webbed and the tarsi are flat and wide. So, at first pass, we know it's a loon. But which one? The bill is longer than 70 mm, which (according to the Loon Family Page in *Beach Birds*) indicates Common Loon. The black head with white necklace and boldly checkered back designate breeding plumage.
- B. This is another big-ish bird with wide, flat tarsi. In this case the toes appear rounded-*lobed*-in fact. From this angle, one can even see the recurvature ("S"-shape) of the wings, and the feet clearly show it to be a grebe. The bill is at least as long as the head, and the eye is in the dark feathers of the face—traits diagnostic of Western Grebe.
- C. Hmm. A gray-mantled bird with blackish wing-tips. Perhaps it's a Larid (gull, tern, or jaeger)...the bill is pointed, not hooked—indicating a tern. The measurements fit within the range of Caspian Tern. The uniformly gray mantle and solid black cap point to an adult in breeding plumage.

COASST Rewards

How can we thank you for your efforts? At the COASST main office, we've spent a year puzzling this matter out. Of course, nothing we can give you comes close to the time, dedication, and effort you put in. However, we've come up with some tokens of our affection and appreciation.

Thanks to a grant from the Washington Department of Fish and Wildlife's Volunteer Cooperative Fish and Wildlife Enhancement Program, COASST has amassed a set of prizes for different levels of volunteer achievement. In the COASST reward system, volunteers will be given a prize(s) whenever they have surpassed the reward thresholds at the time of *COASST Reports*.

COASST will quantify achievement in two ways: by counting total survey hours and total survey number. This system acknowledges the value of collecting beached bird information thoroughly, as well as often. To calculate each individual's totals, we will use only those surveys for which the person was listed as the primary notetaker or data collector. Unfortunately, we cannot do the same calculations for additional persons participating on a survey. We encourage those people who consistently assist established pairs to find another person with whom they can start a new pair. So, now that those details are out of the way...what are the prizes and how do you get them!?

A hard-day's work can be its own reward, but these COASST goodies may make your surveys even more rewarding. If you've surpassed these benchmarks, look for your rewards in the mail. If you're not quite there, keep working! We have quite a stash.

The COASST prizes —you may already be a winner!



Sponsors

Major financial support of COASST in 2002–03 came from several sources. The Russell Family Foundation provided funding for basic operating expenses and continued expansion into Puget Sound. Continued support for *Beached Birds* development came from the National Marine Fisheries Service. A grant from the Washington Department of Fish and Wildlife Volunteer Cooperative Program allowed for the purchase of volunteer prizes and various travel and training expenses. Contributions from the private sector added up to more than \$11,000!

The University of Washington School of Aquatic and Fishery Sciences and Olympic Coast National Marine Sanctuary provide in-kind support in the form of office space and staff time.

COASST also benefits from the continued donation of colored cable ties by Drew Smith of Cable Markers Co., Inc. in California.

A wide array of people and organizations provided training space to COASST last year. We thank: Skagit Valley College (Friday Harbor), Vashon Island Library, Tahoma Audubon Society (Tacoma), Shannon Point Marine Center (Anacortes), the RE Sources Store (Bellingham), the Makah Museum (Neah Bay) and the Fiero Marine Lab (Port Angeles) for being such accommodating hosts. At the Ocean Shores Interpretive Center, Gene Woodwick and Diane Beers provided hospitality for the UW/COASST Marine Biology field trip.

HOURS	# OF SURVEYS	REWARD
40		COASST Water Bottle
	25	COASST Clipboard
150		COASST Raincoat
	75	COASST Messenger Bag

COASST Mission

The Coastal Observation And Seabird Survey Team (COASST) is a citizen science project dedicated to involvement and action. COASST believes that coastal residents know and care about their local resources. With a target of comprehensive beach coverage in Washington and Oregon, COASST volunteers will provide long-term baseline data on seabird beaching and become an active voice in coastal marine conservation.

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