

# Offshore Pacific Highlights in Summer–Fall 2005: Just Another Year

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## Increasing Our Knowledge of Ocean Events, One Year at a Time

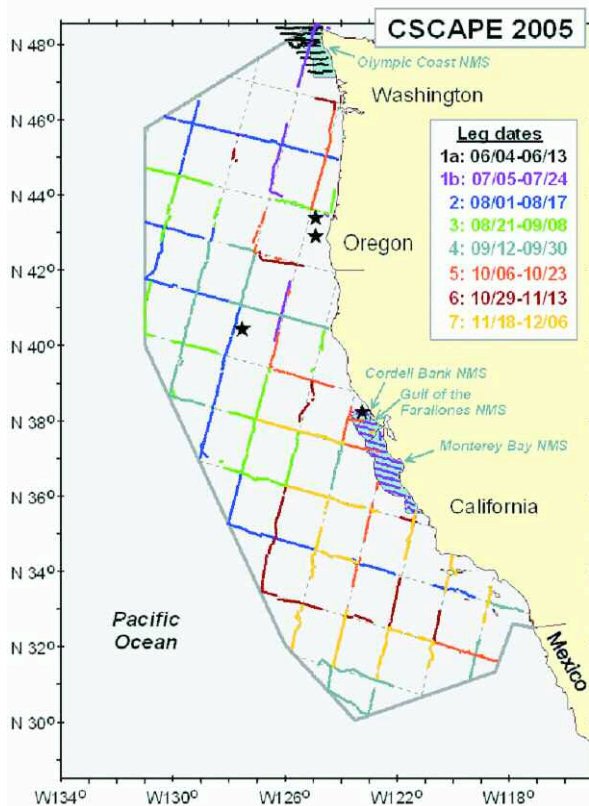
By early fall, the word had spread: 2005 was an unusual year for seabirds off the Pacific coast of North America. But was it that unusual? Many years ago, David Ainley concluded that there was no such thing as a “normal” year in the California Current, and it would follow that there may not be “unusual” years either. Rather, seabird dynamics in the Pacific Ocean are best explained in terms of overlapping climatological and oceanic cycles, which influence complex marine ecosystems and result in chaotic and somewhat unpredictable patchiness in prey resources. Distribution of these resources has everything to do with interannual variation in seabird productivity and dispersal, and our understanding of it all is as yet too meager to characterize any one season with such generalized terms as “normal” or “unusual.”

To be sure, productivity of breeding seabirds, such as those in colonies on the Farallon Islands off San Francisco, was below average in 2005, and for some species—notably Pelagic Cormorant (*Phalacrocorax pelagicus*) and Cassin’s Auklet (*Ptychoramphus aleuticus*)—it bordered on complete failure. Spring northwesterlies and accompanying upwelling were late, resulting in warmer, less-productive waters and reduced prey (especially krill) when adults needed to feed chicks in May and June. By late summer, dead Common Murres (*Uria aalge*) and cormorants were washing up on Pacific Coast beaches in substantial numbers (*North American Birds* 59: 645, 651), leading to much speculation on the declining state of our oceans. “Unusually warm conditions off the West Coast this year are hammering wildlife, and scientists don’t know why—or what it bodes for the future,” began a story in the 23 July 2005 *San Jose Mercury News*. This and similar articles predicted long-term declines and gave the impression that global climate change had begun in earnest in 2005. What these reports failed to note, however,

was that seabird productivity had been average to well above average in the period 1999–2004. For a burgeoned population of younger seabirds, this was a first real test of their foraging abilities, and it is neither surprising nor unhealthy (at the population level) that a die-off should have ensued. Furthermore, offshore

more a question of bad timing than of wholesale disaster.

Seabird population sizes and productivity provide excellent barometers of the state of our marine ecosystems, helping us keep a finger on negative anthropogenic effects such as climate change, oil contamination, and overfishing. But we must be patient to understand such large-scale processes. For these reasons, the National Oceanic and Atmospheric Administration (NOAA) is increasing support for a wide variety of long-term ocean-monitoring programs for seabirds, marine mammals, and other organisms off the Pacific Coast. These include several programs conducted within National Marine Sanctuaries (NMS): *Winds-to-Whales* operated in Monterey Bay NMS by the Center for Integrated Marine Technology and the University of California at Santa Cruz; OPCS (see the Figure captions for full program titles) in the Olympic Coast NMS; CBOMP in the Cordell Bank NMS; and SEAS in the Gulf of the Farallones NMS. Research programs conducted at broader spatial scales include surveys during annual rockfish (*Sebastes* spp.) cruises off central California and intermittent surveys of Heceta Bank, Oregon, by H. T. Harvey & Associates; quarterly CalCOFI cruises off southern (and now central) California by the Scripps Institution of Oceanography and PRBO Conservation Science; and periodic (once every 3–5 years) assessments of marine mammal stocks and seabird distribution along the U.S. Pacific coast by the Southwest Fisheries Science Center (SWFSC) of NOAA. I was fortunate to take part in this last project in 2005, the CSCAPE cruise, which covered Pacific waters out to 552 km (300 nautical miles [nmi]) off Washington, Oregon, and California (Figure 1). This research program takes an ecosystem approach, attempting not only to monitor vertebrate populations but also to correlate their temporal and spatial dynamics with those of prey communities and the physical and biological oceanography of



**Figure 1.** Planned (dashed line) and completed (colored solid lines) transects surveyed during the Collaborative Survey of Cetacean Abundance and the Pelagic Ecosystem (CSCAPE) Cruise, undertaken by the Southwest Fisheries Science Center and the National Marine Sanctuary Program aboard NOAA research vessels in June–December 2005. Fine-scale transects were surveyed in the Olympic Coast, Cordell Bank, Gulf of the Farallones, and Monterey Bay National Marine Sanctuaries, each of which conduct year-round surveys as well. Stars indicate locations of high productivity, from north to south: off Cape Blanco, over Perpetua/Heceta Bank, the outer reaches of the Mendocino Escarpment, and Cordell Bank (see also Figure 2). These cruises occur once every three to five years. For more information on CSCAPE, including weekly summaries of biological and oceanographic observations as well as photographic highlights, see <<http://swfsc.nmfs.noaa.gov/PRD/PROJECTS/CSCAPE/default.htm>>.

monitoring programs (see below) found exceptional fish prey and marine mammal and seabird abundance off California in July–August, indicating that the poor productivity was

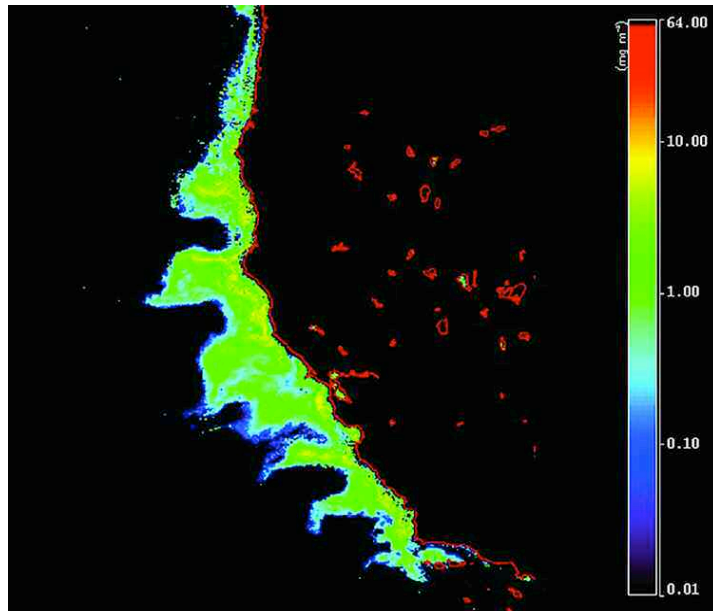
the region.

It has been tempting to equate warmer ocean temperatures with increases in the appearance of unusual seabirds. Certainly, 2005 was a banner year for observations of pelagic rarities: as many as three new seabird species for North America and California, up to four new state records for Oregon, as well as good numbers and diversity of the elusive and enigmatic *Pterodroma* petrels were detected. But I would question any suggestion that 2005 was an *unusually* good year for vagrants, or that the new records necessarily related to this season's oceanic anomalies, which actually were closer to "average" for most of the fall. Rather, I believe that increasing reports of vagrant seabirds has more to do with increased coverage, enhanced knowledge of seabird identification criteria, and recent advances in digital imagery, which can provide substantial assistance with species confirmation. Although several unusual species were observed

during the CSCAPE cruise in 2005, these records were made during 145+ full days of sampling, which included near-constant scanning of the horizon with 25-power, mounted binoculars; on the vast majority of these days, nothing unusual was noted. In addition to expanded coverage by trained observers aboard scientific cruises, there has also been an increase in the frequency of pelagic trips for birders, as well as an increase in the expertise of those who operate and lead them.

### Upwelling Centers, Subsurface Features, Counterclockwise Eddies, and Biological Hotspots

I have long been lured by pelagic waters off northern California and Oregon, where the California Current and upwelling centers are clearly defined, and where such features as



**Figure 2.** Satellite imagery showing levels of chlorophyll-a, on 21 June 2001, indicating concentrations of phytoplankton and productive waters. Note the upwelling plumes off Cape Blanco, Cape Mendocino, Point Arena, and Point Reyes, and the counter-clockwise eddies extending westward from each plume. These whorls of productivity appear to be created via the bisection of the California Current by subsurface features (e.g., Heceta Bank, Gorda Escarpment, and Cordell Bank), attracting pelagic species such as gadfly petrels to their westward reaches. For good discussions of this and related topics, see <<http://www.mbari.org/staff/ryjo/cosmos/it/ite.html>> and <[http://ono.ucsd.edu/pages/pubs/eos\\_miller.et.al.\\_1999/CCS\\_final.text.html](http://ono.ucsd.edu/pages/pubs/eos_miller.et.al._1999/CCS_final.text.html)>. Image courtesy of Raphael Kudela, University of California Santa Cruz. Original data from the SeaWiFS Project (NASA) and © Orbimage, Inc.

Perpetua, Heceta, and Cordell Banks further swizzle the waters, giving us spectacular ocean productivity that attracts marine mammals and seabirds from both near and far. The closest point of U.S. land to the southern and tropical Pacific Ocean is not in southern California, as one might expect, but Cape Mendocino in Humboldt County, which protrudes over 166 km (90 nmi) farther west than San Francisco and 607 km (330 nmi) farther west than San Diego. About 25 years ago, I was examining a marine chart and noticed the Gorda Escarpment and Mendocino Ridge, a fault zone of upthrust crust, up to 3000 m in height, that extends about 368 km (200 nmi) west of Cape Mendocino to a protuberance called the Steel Vender's Seamount. As the south-bound California Current passes

over these features, internal tides and waves create oceanic flux, investing cold, nutrient-rich water to the surface and creating biological "hotspots" (see Figure 2). Thanks to the CSCAPE cruise, a 25-year dream of mine was realized this fall, to obtain a glimpse of a hotspot over the outer reaches of the Mendocino Ridge.

On 8 August 2005, the NOAA ship *David Starr Jordan* covered about 212 km (115 nmi) in a north-northeasterly direction, from positions about 394 km (214 nmi) southwest of Point Gorda, California, to 313 km (170 nmi) west of Cape Mendocino, directly above the Mendocino Ridge. For 12 hours, we stared at seemingly lifeless seas, with few fluctuations in the 18.3° C temperature, as is typical of offshore waters, recording roughly two birds per hour, primarily Leach's Storm-Petrels (*Oceanodroma leucorhoa*) and Cook's Petrels (*Pterodroma cookii*). But in the last hour of the day, the surface temperature dropped to 16.2° C, and the horizon was suddenly dotted

with albatrosses, petrels, phalaropes, and jaegers, all milling over scattered blows of Sperm Whales (*Physeter macrocephalus*). We camped on the ridge for the night and the next morning were treated to more of the same: Sperm Whales and birds lined the ridge from the western to the eastern horizon. As we continued on our course, the activity quickly vanished, and we were back into 18° C waters with empty horizons. But

**Figure 3.** Common Murre adult with recently fledged chick, 3.7 km (2 nmi) north of Point Reyes, California, in the Gulf of the Farallones National Marine Sanctuary, 19 July 2005. Unlike many specialist seabirds that breed off the West Coast, Common Murres have a Plan B: when the rockfish do not spawn early enough to provide food for chicks (as happened in 2005), they head for the coast to dine on Northern Anchovies (*Engraulis mordax*), which migrate northward in larger numbers during warmer-water years. Fathers and offspring leap off of breeding cliffs when the chicks are just 21-25 days old and swim up to 55 km (30 nmi) or more to molt and find food.

Photograph by Peter Pyle © Protected Resources Division, Southwest Fisheries Science Center, La Jolla, California (hereafter PRD, SWFSC; see <[swfsc.nmfs.noaa.gov/PRD/](http://swfsc.nmfs.noaa.gov/PRD/)>).



in the brief three hours of daylight above the ridge, we had recorded five Cook's Petrels, three Murphy's Petrels (*Pterodroma ultima*), two Galapagos/Hawaiian Petrels (*P. phaeopygia/sandwichensis*), and one probable Solander's Petrel (*P. solandri*).

An unusual concentration of rarities? Almost certainly not. Further study of Mendocino Ridge waters needed? Most definitely. Once enough data have been collected by programs such as CSCAPE, we will be able to look at the causal factors for such seabird and

marine mammal hotspots (see Figure 2), and be in a better position, for instance, to recommend their inclusion within marine protected areas.

### Acknowledgments

I thank Lisa Ballance and Karin Forney of SWFSC and Jan Roletto of Gulf of the Farallones NMS for invitations to participate in the 2005 CSCAPE Cruise; Rich Pagen, Thomas Staudt, Gary Friedrichsen, Sophie Webb, the marine mammal observers, and the officers

and crews of the NOAA ships *David Starr Jordan* and *McArthur* for being great shipmates; Terry Wahl, Mike Force, Rich Rowlett, Guy McCaskie, Scott Terrill, Debi Shearwater, Greg Gillson, and Steve Mlodinow for information; David Ainley, Lisa Ballance, Steve N. G. Howell, and Karin Forney for reviews of the manuscript; all of the photographers for use of their images; Karin Forney for help with the graphics for Figure 1; and Raphael Kudela for help with and permission to use the image in Figure 2..



**Figure 4.** Cook's Petrels, 425 km (231 nmi; upper left) and 412 km (224 nmi; upper right) west-southwest of Cape Mendocino, 28 August 2005; over Bodega Canyon, 37 km (20 nmi) west of Bodega Bay, California, 16 September 2005 (lower left); and 147 km (80 nmi) west of Cape Sebastian, Oregon, 20 October 2005 (lower right). Over 239 Cook's Petrels were observed in and just outside of California and Oregon waters during August–November 2005 (with a peak of 55 on 19 October, 166 km [90 nmi] off Punta Gorda, CA), leading some observers to speculate that this was a “big year” for this species. However, 94% of these were observed during the CSCAPE cruise in relatively unstudied offshore waters, and up to 300 were observed from NOAA ships off southern California during a much shorter time period, 2–16 July 1992 (*American Birds* 46: 1117), indicating that similar numbers to those observed in 2005 may occur annually but remain undetected. The left-hand bird in the upper-left image appears smaller, longer-tailed, and darker-backed, characters suggesting the very similar Pycroft's Petrel (*Pterodroma pycrofti*), which migrates to the central Pacific and could occur off California. But further enlargement of the image suggests that these may just be effects of lighting and angle on an otherwise typical Cook's Petrel. The lower-right image represents the first confirmed record from Oregon waters (H. Nehls, pers. comm.). Photographs by Conelia Oedekoven © PRD, SWFSC (upper left and right), © Don Doolittle (lower left), and Peter Pyle © PRD, SWFSC (lower right).

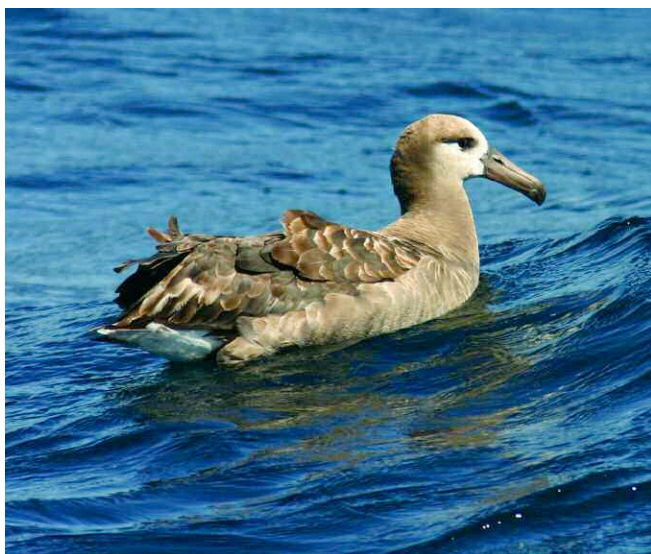




**Figure 5.** Xantus's Murrelet (*Synthliboramphus h. hypoleucus*), 326 km (177 nmi) west-southwest of Cape Mendocino, California, 1 September 2005. *Synthliboramphus* murrelets were observed on the CSCAPE cruise north to Washington waters, where 6 individuals observed 283–298 km (154–162 nmi) off Cape Disappointment, 16 August 2005, appeared to be Craveri's Murrelets (*S. craveri*). Attempts to obtain photographs failed, however, and thus these potential first records for Washington were not conclusively identified. Another pair of murrelets observed 166 km (90 nmi) off Coos Bay, Oregon, 7 July 2005 had completely white faces and were tentatively identified as one-year-old Kittlitz's Murrelets (*Brachyramphus brevirostris*). It is possible that these inconspicuous murrelet species are more regular than we think in these offshore waters, where little previous bird surveying has been conducted in appropriate seasons. Photograph by Cornelia Oedekoven © PRD, SWFSC.



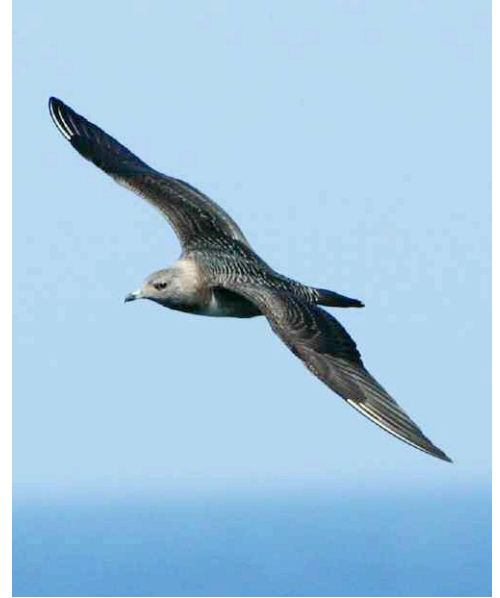
**Figure 6.** Gary Friedrichsen with 25 x 150 mounted binoculars used by marine mammal and seabird surveyors aboard NOAA vessels. Aply referred to as “big eyes,” these binoculars seem to result in 2–3 times the power and illumination of a single 25x telescope, allowing the identification of mammals up to 9 km (5 nmi) away and birds up to 3.7 km (2 nmi) away. Photograph by Peter Pyle © PRD, SWFSC.



**Figure 7.** Black-footed Albatross (*Phoebastria nigripes*), Astoria Canyon, Oregon, 18 August 2005 (left) and light-morph Northern Fulmar (*Fulmarus glacialis*), Perpetua Bank, Oregon, 19 November 2005 (right), observed during offshore pelagic trips operated by Greg Gillson and the Bird Guide Inc. (<<http://thebirdguide.com/pelagics>>). Oregon's pelagic waters can support some of the most spectacular concentrations of seabirds in the world. On 22 October 2005, the CSCAPE cruise transited along the Oregon coastal slope and recorded an estimated 3000 Black-footed Albatrosses and 45,000 Northern Fulmars (not to mention a Parkinson's Petrel) during a 10-hour period. Photographs by © Troy Guy.

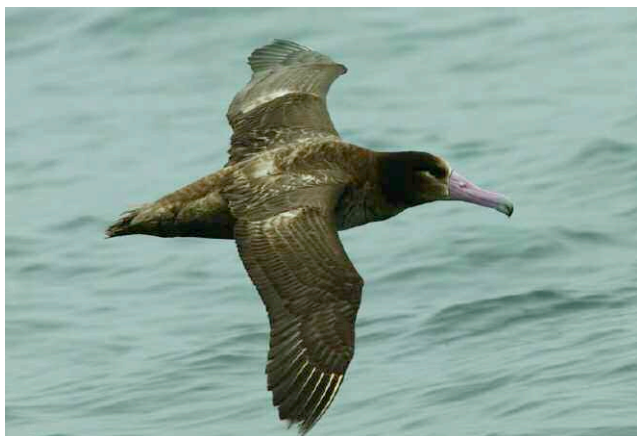


**Figure 8.** Galapagos/Hawaiian Petrel, 30.4 km (16.5 nmi) west of Point Reyes Lighthouse (over the southeastern corner of Cordell Bank), California, 9 August 2005. This individual, one of an unprecedented 10 found in and just outside of North American waters in 2005, was recorded as part of the Cordell Bank Ocean Monitoring Program (CBOMP). At-sea distributional patterns documented from NOAA surveys in the eastern Pacific Ocean suggest that the birds observed off California may be Hawaiian Petrels, but the field identification of these species has not been worked out. When comparing the original specimens of these species, the nineteenth-century ornithologist Osbert Salvin stated that the two were “as alike as any [...] specimens of the same species of petrel that I ever examined” (S. B. Wilson and A. H. Evans. 1899. *Aves Hawaiiensis*. R. H. Porter, London). Thus, it will likely take DNA analysis to confirm which species occurs off North America. Photograph by © Steve N. G. Howell.



**Figure 9.** Juvenile Long-tailed Jaegers (*Stercorarius longicaudus*) 388 km (211 nmi) west-southwest of the Farallon Islands, California, 3 September 2005 (upper left) and 325.7 km (177 nmi) west-southwest of Cape Blanco, Oregon, 23 August 2005 (upper right); and Arctic Terns 149 km (81 nmi) west of Cape Mearns, Oregon, 16 August 2005 (lower left) and 445 km (242 nmi) west of Cape Mendocino, California, 18 September 2005 (lower right). Long-tailed is unique among jaegers in being monomorphic as adults (light morph only) but polymorphic as juveniles (light morph right, dark morph left). Observations during the CSCAPE cruise indicated that these two species (along with adult Red Phalaropes [*Phalaropus fulicarius*]) may have migrated farther off shore than usual during 2005. For example, 45 adult Long-tailed Jaegers were observed flying south near the President Jackson Seamount, 340 km (185 nmi) off Cape Blanco, Oregon, 13 August 2005; 500 juvenile and subadult Long-tailed Jaegers were observed 92–212 km (50–115 nmi) off northern California and southern Oregon, 19–21 October 2005; and 150 Arctic Terns (*Sterna paradisaea*) were recorded 110–147 km (60–80 nmi) off Cape Lookout, Oregon, 16 August 2005. During 29 Shearwater Journeys trips closer to the Central California coast in July–October 2005, by contrast, fewer Long-tailed Jaegers than usual were observed and no Arctic Terns were recorded for the first time in Debi Shearwater’s 30-year history of leading trips in this region. Oceanographic and biological data from the CSCAPE cruise and other surveys will hopefully help us explain such inter-annual variation in migratory routes. Photographs by Scott Mills (upper left), Annie Douglas (upper right), Peter Pyle (lower left), and Cornelia Oedekoven (lower right), all © PRD, SWFSC.





**Figure 10.** Short-tailed Albatross (*Phoebastria albatrus*), 16.6 km (9 nmi) west of Middle Farallon Island, California, 26 July 2005 (top), in Monterey Bay, California, 12 August 2005 (center), and of specimen found dead near Morro Bay, California, 24 August 2005 and deposited into the Natural History Museum of Los Angeles County (LACM 114937; bottom). Feather-by-feather analysis indicates that this was the same individual, recorded from both a NOAA research vessel (top) and from one of many of Shearwater Journeys' birding trips (center) organized each year by Debi Shearwater (<<http://www.shearwaterjourneys.com>>), that then perished as it proceeded to the south (bottom). Other individuals were recorded near Santa Cruz Island, California, 6 July 2005, from a research vessel just outside of Heceta Bank, Oregon, 12 July 2005, and found dead near Bandon, Oregon, 3 September 2005. Study of molt and plumage indicates that the depicted bird was a one-year-old undergoing the second prebasic molt; some individuals of this age do not attain any white feathering (except for a small crescent under the eye) during this molt and thus appear like juveniles during their second year of life. As the population of this species increases, we may expect more records off the Pacific coast of North American. Photographs by © Ben Saenz (top), © Don Doolittle (center), and © Kimball Garrett (bottom).



**Figure 11.** Northern Right Whale Dolphin (*Lissodelphis borealis*), 83 km (45 nmi) southwest of Cape Johnson, Washington, 6 June 2005 (top) and Killer Whale (*Orcinus orca*) flipping a Northern Elephant Seal (*Mirounga angustirostris*), 9.2 km (5 nmi) southwest of Southeast Farallon Island, California, 7 August 2005 (bottom). The dolphin was observed as part of the Olympic Coast Pelagic Survey (OCPS) conducted each year in the Olympic Coast National Marine Sanctuary. The impetus for the CSCAPE cruise is to assess marine mammal stocks in West Coast waters, but the ultimate goal is to correlate all physical and biological oceanic activity using an ecosystem approach. Thus, all associations of seabirds and marine mammals are recorded. Mixed schools of Northern Right Whale Dolphins and Pacific White-sided Dolphins (*Lagenorhynchus obliquidens*) are often accompanied by Pink-footed Shearwaters (*Puffinus creatopus*) and other seabirds, while attacks on seals by Killer Whales and White Sharks (*Carcharodon carcharias*) create slicks that can attract legions of gulls and tubenoses. Photographs by Jim Cotton © PRD, SWFSC (top) and © Beth Branthaver (bottom).

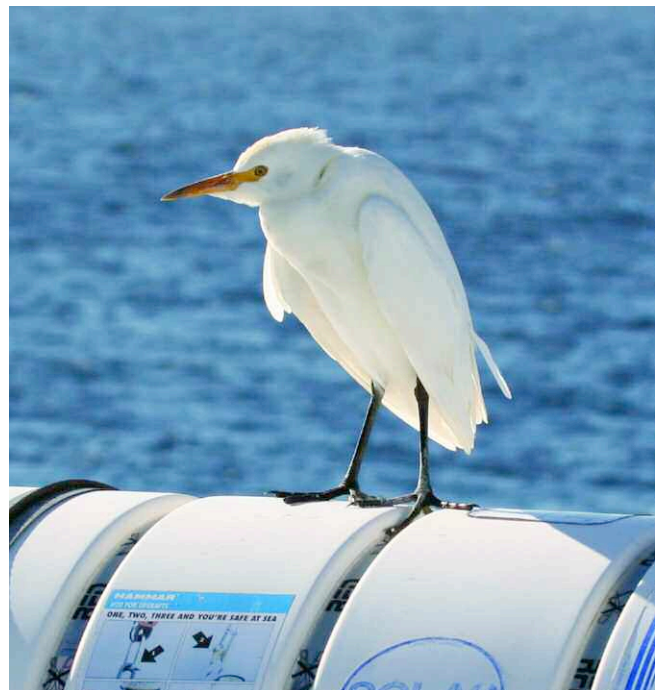




**Figure 12.** Probable Solander's Petrel, 313 km (170 nmi) off Cape Mendocino, California, 8 August 2005, one of four gadfly petrel species recorded in the vicinity of the Mendocino Ridge during three hours of observation 8–9 August 2005. The large-winged posture, long- and high-arching flight, strong hooded effect from both above and below, extent of white above the bill, and pale bases of the primary coverts argue against it being a Murphy's Petrel (Figure 13); however, some features of this individual do not conform to characteristics of Solander's Petrels observed near the breeding grounds. Thus, it may represent a first-year individual, which (if typical of other procellariids) remains away from the breeding grounds for its first 1–3 years of life and thus has little-known molts and plumages. This would represent the first documented record for North America, if confirmed, although several other sight observations from Alaska, Washington, and Oregon waters have been recorded from NOAA research vessels by Terry Wahl, Richard Rowlett, and Michael Force. Photographs by Peter Pyle © PRD, SWFSC.



**Figure 13.** Murphy's Petrels, 178.5 km (97 nmi) west-northwest of Cape Mendocino, California, 9 July 2005 (left) and 296 km (161 nmi) west of Cape Foulweather, Oregon, 31 October 2005 (right). This species was known to be regular (if not common) in North American waters in April–June but not during the fall. During the CSCAPE cruise, they were observed in offshore waters through 11 August off northern California, 31 October–2 November, when 13 were observed off Oregon, and 21 November 2005, when a single individual was observed 355 km (193 nmi) off Point Sur, California. They are fresh in spring, having a grayish sheen to the plumage and a well-defined white throat. By fall, they appeared brownish and show more extensive pale around the bill. Specimen examination confirms that the feathers around the bill and throat are white with dark tips, such that the amount of visible white in this area increases as the feathers wear, similar to what happens in other dark gadfly petrel species and in first-year Black-footed Albatross (*North American Birds* 56: 131–138). Compared to Solander's Petrel (Figure 11), Murphy's has a smaller bill, proportionally larger head, shorter wings, and typically flies with shorter, shallower arcs. Photographs by Peter Pyle (left) and Rich Pagen (right) © PRD, SWFSC.



**Figure 14.** Brown-headed Cowbird (*Molothrus ater*), 436 km (237 nmi) southwest of Cape Disappointment, Washington, 14 August 2005 (left) and Cattle Egret (*Bubulcus ibis*), 200.6 km (109 nmi) west-northwest of Cape Arago, Oregon, 21 October 2005 (right). NOAA ships often provide the only place to land for (sometimes surprisingly) off-course migrant landbirds. The egret was the only one of its species recorded in the Oregon & Washington region in fall 2005. Photographs by Peter Pyle © PRD, SWFSC.

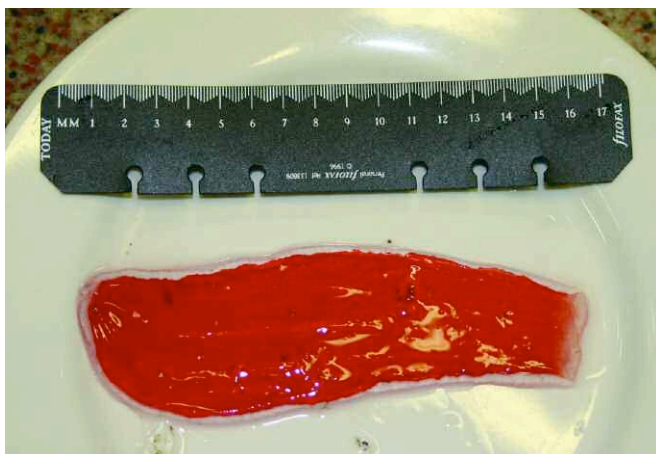




**Figure 15.** Sooty Shearwaters (*Puffinus griseus*), 46 km (25 nmi) west-southwest of Point Sur, California, in the Monterey Bay NMS, 13 July 2005. Large numbers of this species travel from breeding grounds off Chile and New Zealand to the Pacific North American coast to molt. Flocks of up to 500,000 birds were recorded in Monterey Bay during July–August 2005. Photograph by Annie Douglas © PRD, SWFSC.



**Figure 16.** Stejneger's Petrels (*Pterodroma longirostris*), east of O'ahu, Hawaii, 20 September 2005 (top) and 167.4 km (91 nmi) off Fort Bragg, California, 18 October 2005 (bottom). Up to 20 individuals were observed in Hawaiian waters on 20 September, representing only about the tenth state record and indicating how little is known of the distribution of pelagic seabirds in these waters. Southwest Fisheries Science Center is also assessing marine mammal stocks and seabird distribution in Hawaiian waters during HICEAS cruises, conducted every five years, the first of which was undertaken in July–November 2002. The California bird, representing the seventh accepted state record and first since 1992, traveled alongside the research vessel for 5–6 km and was recorded in both Mendocino and Humboldt county waters according to closest point of land. Photographs by Hadoram Shirihai, © *forthcoming* Albatrosses, Petrels, and Shearwaters of the World, A & C Black, London, and Princeton University Press (left), and Peter Pyle © PRD, SWFSC (right).



**Figure 17.** By-the-wind-sailors (*Velevella velevella*) 202 km (110 nmi) west of Cape Blanco, Oregon, 21 October 2005 (top) and the ctenophore *Beroë abyssicola*, 177 km (96 nmi) off Cape Blanco, Oregon, 20 October 2005 (left). Over the period 6–8 August 2005, from 322–414 (175–225 nmi) off the northern California coast, By-the-wind-sailors dotted the ocean, evenly spaced, from horizon to horizon for three straight days of transecting. We estimated 1.5 individuals per sq m and 2–3 billion per day, within our 16 x 120 km survey strip. Bird densities in this area were very low, perhaps because these ctenophores feed on pelagic organisms, including young fish, caught by stinging cells on their tentacles, leaving nothing for the birds to eat. By October, they had clumped up into huge rafts, as shown in the image above. *Beroë abyssicola*, a predator of other marine invertebrates, has backward-projecting “teeth” on the inside of its mouth to help it hold on to prey. This individual was captured in one of the nightly net tows that occur as part of CSCAPE, to correlate invertebrate species and densities with bird and mammal distribution. Photographs by Peter Pyle (top) and Candice Hall (left) © PRD, SWFSC.





**Figure 18.** Mottled Petrel (*Pterodroma inexpectata*), 300 km (163 nmi) west of Yaquina Head, Oregon, 1 November 2005. During the CSCAPE cruise, 31 Mottled Petrels were recorded off Oregon and California 31 October–1 December 2005, with peak numbers observed off northern Oregon during the first week of November. This species may be moving southward from Alaskan waters at this time. Photographs by Laura Morse © PRD, SWFSC.



**Figure 20.** Parkinson's Petrel (*Procellaria parkinsoni*), 32.4 km (17.6 nmi) northwest of the Point Reyes Lighthouse, California, 1 October 2005. This first confirmed record for North America north of Mexico was spotted and identified by Rich Stallcup during one of his regularly scheduled summer and fall trips to the Cordell Bank from Bodega Bay (see article, this issue). This was quickly followed by a second sight record during the CSCAPE cruise on 22 October 2005, 64.4 km (35 nmi) off the Takenitch Creek Estuary, Oregon, and 11 km (6 nmi) south of the Heceta Bank. In 1974, Joe Jehl postulated that observers in the Pacific may have overlooked Parkinson's Petrels due to their similarity to Flesh-footed Shearwaters (*Auk* 91: 687–689). Indeed, the depicted individual was thought to be a Flesh-footed Shearwater until it took wing, revealing its diagnostic long-winged profile and black legs and feet. In addition to having a much more graceful and buoyant flight than Flesh-footed Shearwater, Parkinson's Petrel has a thicker and greener bill. The Oregon bird was also observed chasing and kleptoparasitizing gulls, fulmars, and shearwaters, in the manner of a jaeger or skua, but unlike Flesh-footed Shearwater. Photograph by © Martin Myers.



**Figure 19.** Ashy Storm-Petrel (*Oceanodroma homochroa*), SBC (now AT&T) Park, San Francisco, California, 15 September 2005. This endemic to the California Current is very skittish at the approach of boats and is thus difficult to photograph at sea, perhaps one reason that it has remained unconfirmed from Oregon waters, despite being common at times off Humboldt County (e.g., 600 on 9 September 2001). During CSCAPE, nine Ashy Storm-Petrels were observed off Del Norte County, California, as close as 14.7 km (8 nmi) from Oregon waters, 20 October 2005, and one was observed (but not photographed) 115 nmi west of Cape Lookout, Oregon, on 16 August 2005. The individual in this image was attracted to the bright lights of the baseball stadium on a night when the San Francisco Giants were playing the rival Los Angeles Dodgers, including ex-Giant Jeff Kent (in background). Photographs by © Ron LeValley.



**Figure 21.** South Polar Skuas (*Stercorarius maccormicki*), 88 km (48 nmi) west of Cape Alava, Washington, in the Olympic Coast National Marine Sanctuary, 11 June 2005. Both the CSCAPE surveys and single-day pelagic trips recorded skuas in high numbers off the Pacific Coast in summer and fall 2005, including juveniles observed as late as 30 November off southern California. Photographs by Cornelia Oedekoven © PRD, SWFSC.



**Figure 22.** Red-tailed Tropicbirds (*Phaethon rubricauda*), 443 km (241 nmi) west-southwest of Cape Mendocino, California, 29 August 2005 (top); 480 km (261 nmi) west-northwest of Cape Blanco, Oregon, 26 August 2005 (center); and 454.5 km (247 nmi) west-southwest of the Farallon Islands, California, 3 September 2005 (bottom). At least 42 Red-tailed Tropicbirds were recorded on the CSCAPE cruise in 2005, all but 7 of which were within 184 km (100 nmi) outside of North American waters (as defined by the 368-km [200-nmi] Exclusive Economic Zone). Tropicbirds observed 344 km (187 nmi) off Cape Blanco on 16 September 2005 and 201 km (109 nmi) west-northwest of Cape Arago on 21 October 2001 were almost certainly Red-taileds but were too distant to confirm as Oregon's first records. Red-tailed Tropicbird is regular in outer North American waters in at least July–January but is considered a rarity—based on the distribution of observers rather than that of tropicbirds. Photographs by Susan Chivers (top), Laura Morse (center), and Annie Douglas (bottom) © PRD, SWFSC.



**Figure 23.** Juan Fernandez Petrel (*Pterodroma externa*) at 18.1° N, 164.5° W, 2 September 2005 (top) and Black-winged Petrel (*P. nigripennis*) at 16.0° N, 164.7° W, 20 October 2005 (bottom), both in the central tropical Pacific. Sight records from experienced observers exist in North American waters for both Juan Fernandez Petrel (off Oregon by David Ainley) and Black-winged Petrel (off Alaska by Terry Wahl and Richard Rowlett). These and other tropical and southern Pacific species should be looked for in the future. Photographs by © Sophie Webb.