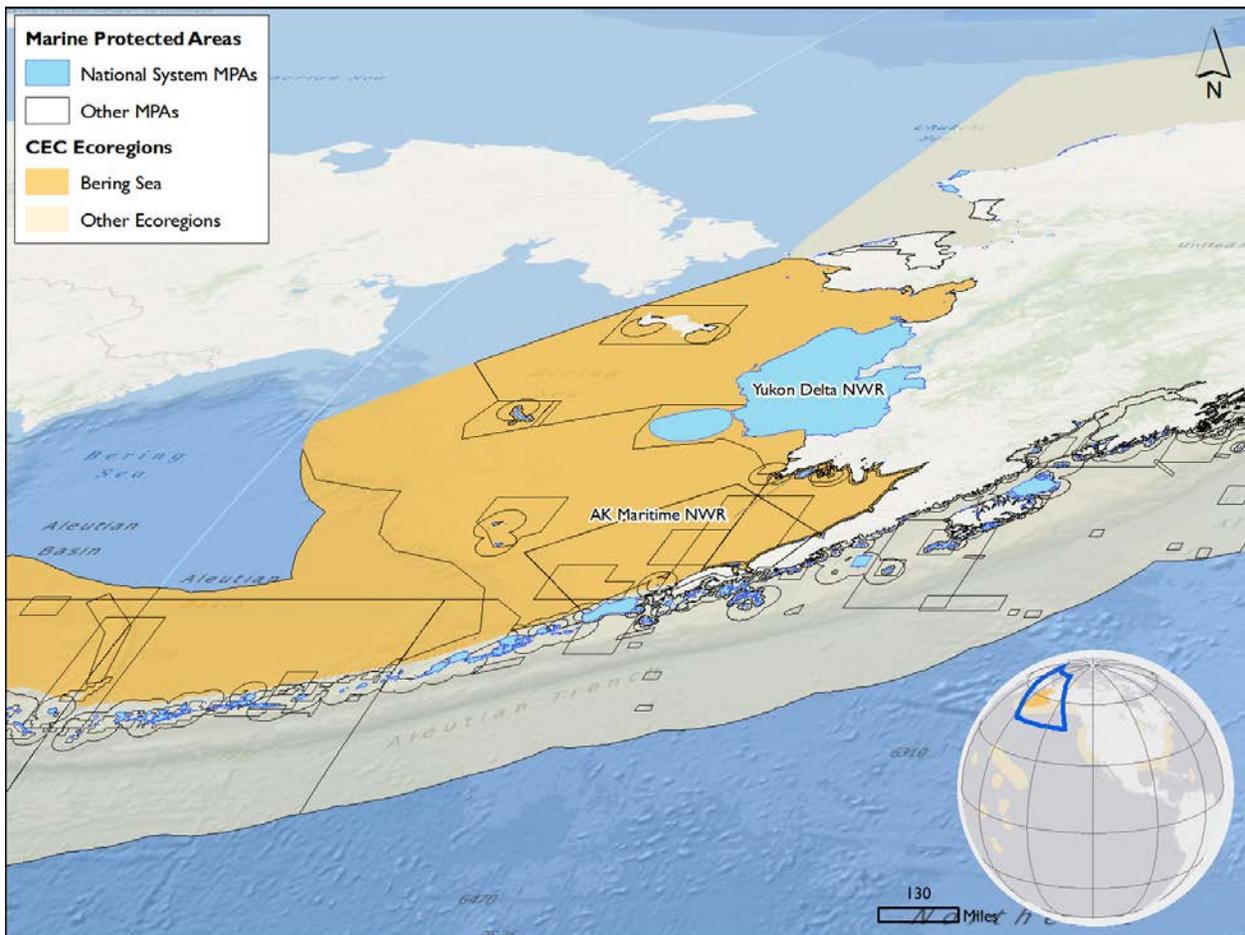


## Bering Sea (Ecoregion 1)

### Background

The Bering Sea is located along the western coast of the State of Alaska and is bounded by the arc of the Aleutian Island chain to the south. The Bering Sea is polar to subpolar, consisting of seasonal sea ice, with highly productive clear waters, that support a productive fishery and importance populations of marine mammals. In 2012, the Bering Sea, Beaufort/Chukchi Seas, Alaskan/Fjorland Pacific and Aleutian Archipelago Ecoregions provided approximately 58% of the total commercial fisheries harvest (by weight) of the United States, with fish and shellfish from the Bering Sea ecoregion representing approximately 40% of this total. The spectacular volcanic islands of the Aleutian chain, the seabird cliffs of the remote Pribilofs, and adjacent lands near the Chukchi Sea provide essential habitat for some 40 million seabirds, representing 80% of all seabirds in North America.



Nutrients from deep cold waters mix with shallower waters of the Aleutian Islands to produce high levels of phytoplankton. In the spring, melting sea ice triggers a phytoplankton bloom. The ecoregion receives considerable freshwater from the Yukon and Kuskokwim Rivers. This

freshwater input, along with seasonality of sea ice and upwelling, makes the ecoregion among the most productive of high-latitude seas.

### MPAs in the Bering Sea

There are 29 MPAs in the Bering Sea Ecoregion, of which two (7%) are National System members, 27 (93%) are eligible but are not currently National System MPAs and none (0%) are not eligible to become National System MPAs (Figure 1). The two National System MPAs within Ecoregion 1, established for ecosystem protection and biodiversity conservation purposes, are the [Alaska Maritime National Wildlife Refuge](#) (NWR) and the [Yukon Delta NWR](#). These refuges primarily protect island (Aleutians) habitat and their associated species (e.g. seabirds). The Alaska Maritime NWR is comprised of more than 2,500 islands, islets, spires, rocks and headlands. The Yukon Delta NWR supports one of the largest waterfowl populations in the world. These two MPAs are primary terrestrial protected areas that extend into the intertidal zone.

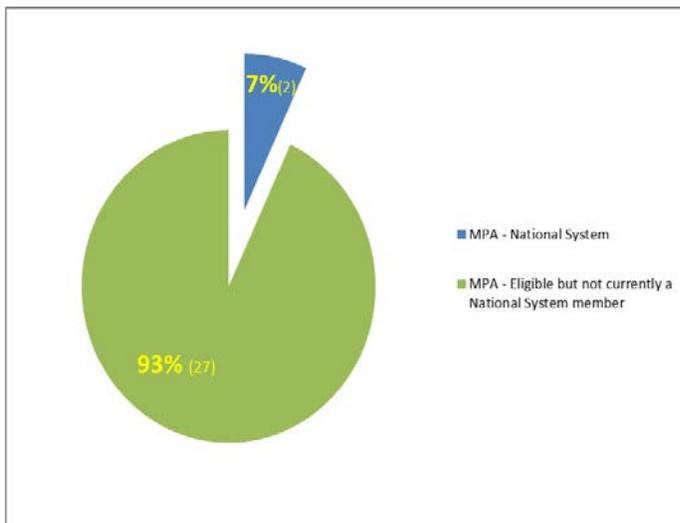


Figure 1. Number and percent of Marine Protected Areas (MPAs) within the Bering Sea (Ecoregion 1) that are members of the National System of MPAs

Managed by the NOAA Fisheries Service and the Alaska Department of Fish and Game, the majority of the non-National System MPAs in the ecoregion are primarily focused on protecting valuable fish stocks and their associated habitats. The [Northern Bering Sea Research Area](#), managed by the NOAA Fisheries Service, is primarily focused on assessing the potential impacts of future commercial trawl fishing may be recommended by the North

Pacific Fishery Management Council. Managed by the National Park Service (NPS), Cape Krusenstern National Monument comprises the coast of the Chukchi Sea and the vast wetlands provide habitat for shorebirds from as far away as South America. The Bering Land Bridge National Park and Preserve is the most northern, western (70 miles from Asia) and remote of America's national parks and contains a diverse flora and fauna due to the presence of icy tundra and volcanic lava flows.

Ecologically important biogenic habitats known to be found in high-latitude seas are found in several of the ecoregion's 29 MPAs, such as seagrass (14%), coldwater corals (7%) wetlands (7%) and kelp/algae (55%) (Figure 2). Non-biogenic habitat such as rocky reefs (59%) and rocky intertidal (286%) also occur in several of the ecoregion's MPAs (Figure 2).

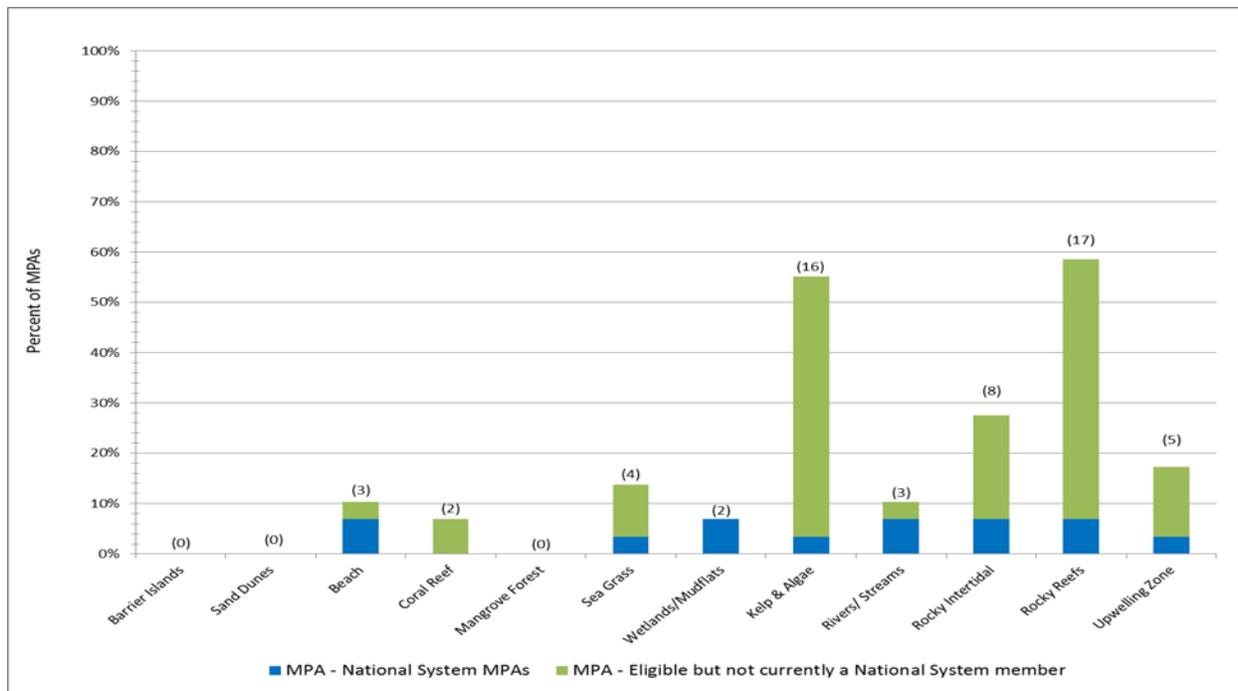


Figure 2. Number and percent of MPAs that contain certain habitat groups in the Bering Sea (Ecoregion 1)

Flowing freshwater from the ecoregion's rivers and streams provides habitat for at least 35 species of fish valued for commercial fisheries, recreation and subsistence, including internationally significant salmon fisheries. Other anadromous fish such as steelhead trout are reported in many (83%) of the ecoregion's MPAs (Figure 3). Various types of marine fishes are found throughout many of the ecoregion's MPAs, including estuarine/coastal fishes in 53%, coastal pelagic fishes in 41% and highly migratory species in 17%. Marine mammals feed in these productive waters, with cetaceans, pinnipeds and fissipeds commonly found throughout the ecoregion's 29 MPAs, occurring in 29%, 76%, and 55%, respectively (Figure 3).

Birds are classified as waterfowl, estuarine and seabirds, signifying where their principal feeding areas occur (e.g., freshwater, estuarine, marine), and are found in 34%, 34%, and 79%, respectively, of the ecoregion's MPAs (Figure 4).

Many of the subtidal invertebrates found in the Bering Sea are of great commercial importance and are found within the ecoregion's MPAs (Figure 5). The more mobile invertebrates such as king, tanner and hair crab are usually restricted to deeper water (> 180m) along the continental shelf. Squid, an important prey item of larger finfish, marine mammals and birds, are largely distributed offshore but their eggs attach to coastal seaweed or the seafloor within coastal waters. Shrimp and scallops, two commercially valuable species, have a wide range of depth ranges (e.g., intertidal to 300m) and may also be found in many of the ecoregion's MPAs.

Ecologically important areas that support where species breed, nest, spawn and rest can be found throughout several of the ecoregion's MPAs. For example, Figure 6 illustrates that most

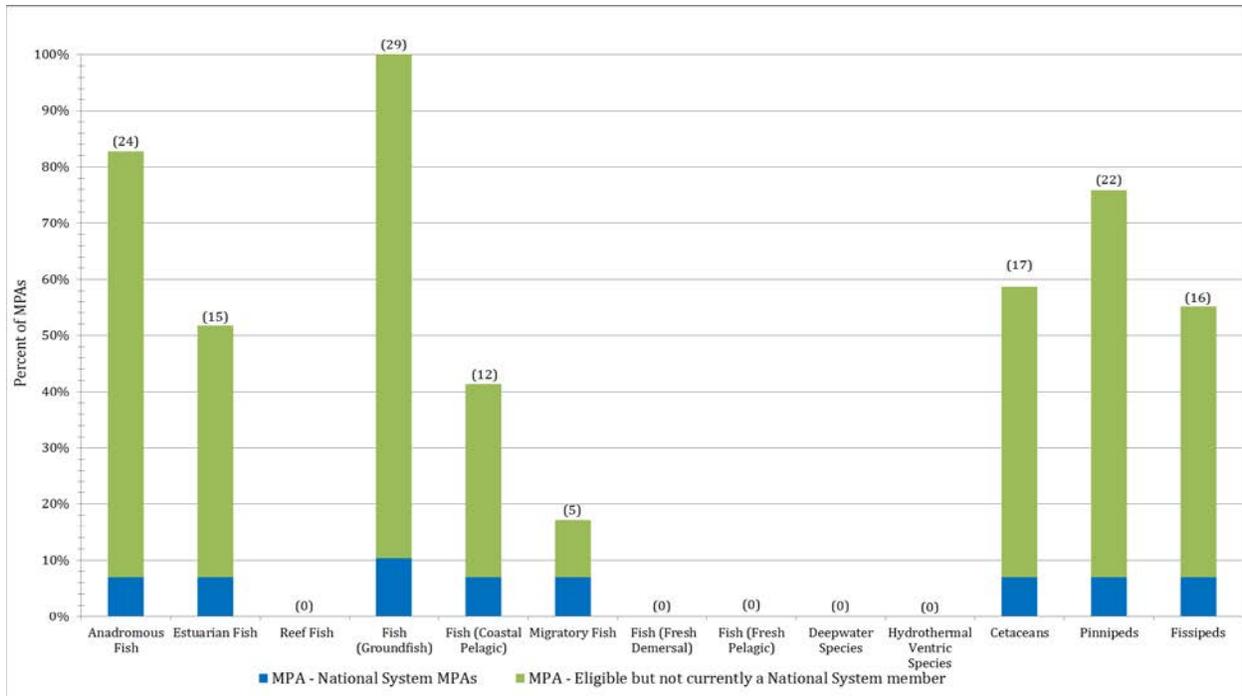


Figure 3. Number and percent of MPAs that contain certain fish and marine mammal groups in the Bering Sea (Ecoregion 1)

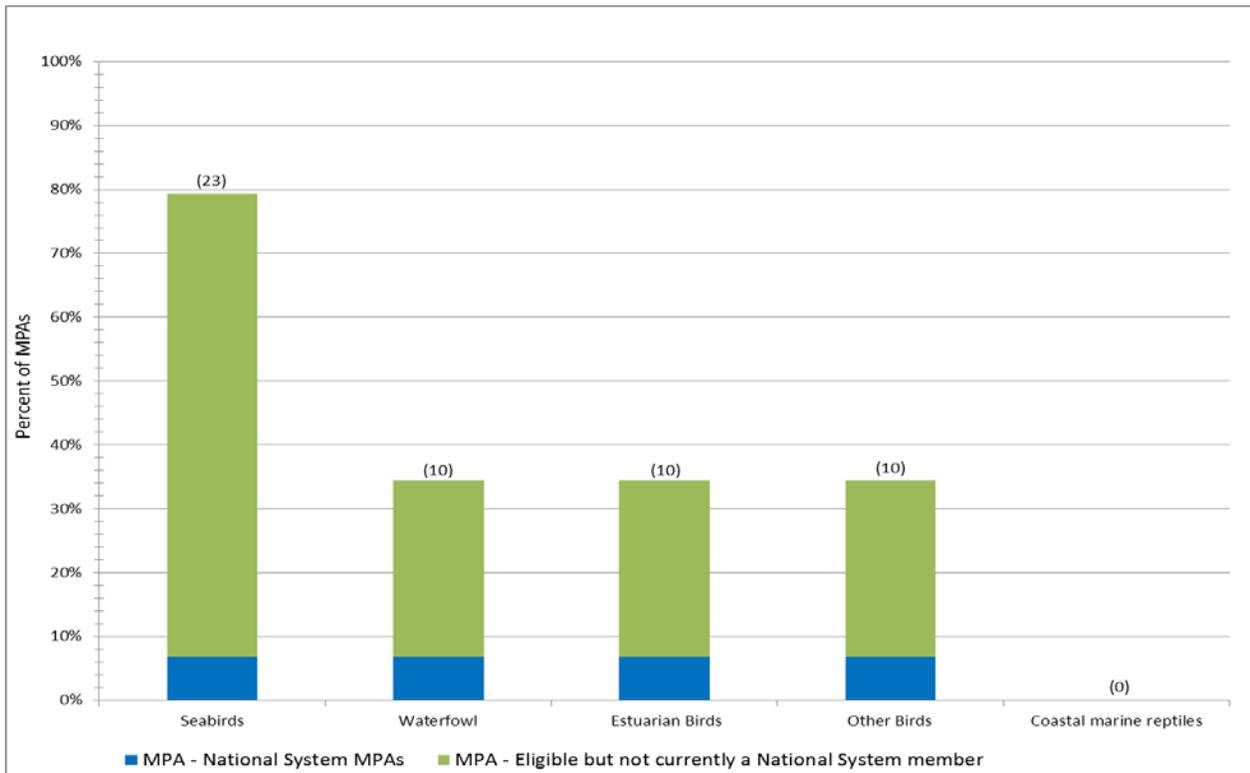


Figure 4. Numbers and percent of MPAs that contain marine birds and reptiles in the Bering Sea (Ecoregion 1)

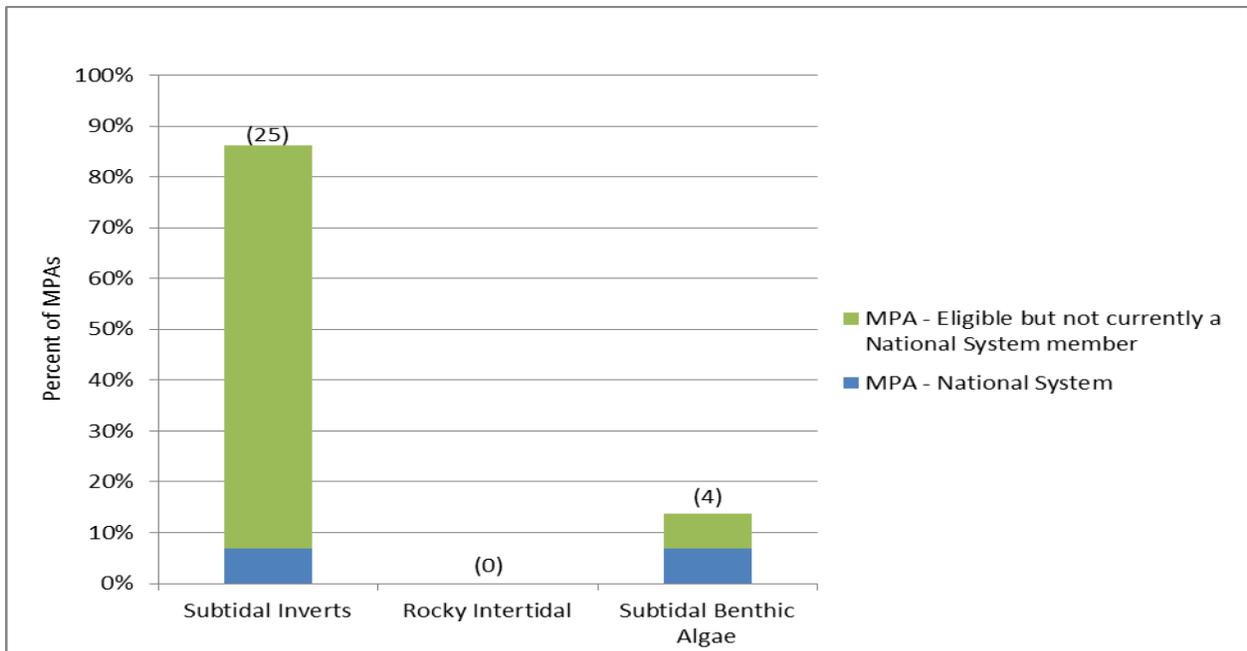


Figure 5. Percent of Benthic Invertebrates and Benthic Algae in the Bering Sea (Ecoregion 1)

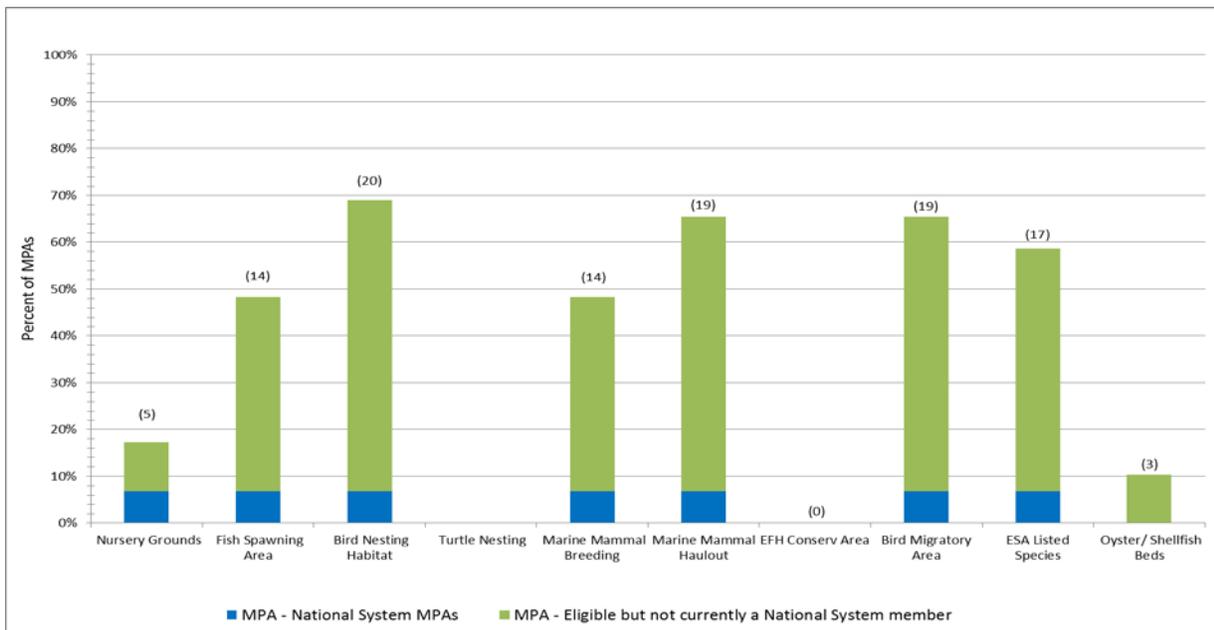


Figure 6. Percent of MPAs with ecologically important areas in the Bering Sea (Ecoregion 1)

of the ecoregion’s MPAs include bird nesting areas (69%), bird migratory areas (66%) and marine mammal haulouts (66%).

### Conclusions

There are no obvious gaps between species groups and habitats present within the ecoregion and the presence of these resources within one or more MPAs in the ecoregion. As various habitats, species groups and ecologically important areas (e.g., fish spawning and marine

mammal breeding areas) are found in several MPAs, this ecoregion has some replication of resources in protected areas, one of the criteria identified by the Convention on Biological Diversity (CBD) in designing effective MPA networks.

Only two MPAs (7%) in the ecoregion are National System members and were established primarily to protect biodiversity and ecosystem function. The overwhelming majority (93%) of MPAs in this ecoregion are managed to protect vulnerable and ecologically important habitat from commercial groundfish fisheries, provide safety for protected resources, reduce bycatch of non-target species, and ensure productive subsistence harvest areas (e.g., sea cucumbers and red sea urchins).

### **Suggested Reading**

National Research Council. The Bering Sea Ecosystem. 1996. National Academies Press. Washington, DC ([http://www.nap.edu/catalog.php?record\\_id=5039](http://www.nap.edu/catalog.php?record_id=5039))