

goals: resource protection, research, interpretation, and visitor use. The sanctuary staff have identified 3 key uses of a geographic information system (GIS) that will help achieve these goals: site characterization, monitoring, and disaster preparation. A GIS, in this case, a marine GIS, is a tool that the sanctuary staff can utilize to map resources and analyze the effects of man or nature on the environment of the sanctuary.

Natural History of Mainland and Island Populations of the Deep Water Elk Kelp (*Pelagophycus*) (Laminariales, Phaeophyta): How Many Species? Kathy Ann Miller^{*1}, and Harold W. Dorr². department of Biology and Slater Museum of Natural History, University of Puget Sound, Tacoma, WA 98416, (206) 756-3132, ²Mt. Carmel High School, 9550 Carmel Mountain Road, San Diego, CA 92129, (619) 484-1180.

The elk kelp, *Pelagophycus porra* (Leman) Setchell (Phaeophyta, Laminariales) is endemic to the coastal waters of southern California and northwestern Baja California, Mexico. This species grows at a depth of 20-50 m, often along the seaward margins of *Macrocystis pyrifera* beds. Suites of morphological characters (stipe and holdfast dimensions, number and texture of blades) are consistently correlated with habitat: exposed, rocky substrate on the mainland vs sheltered, soft substrate on the leeward of the Channel Islands. These morphs have been recognized as separate species in the past, but are currently considered to be ecological variants of a single, phenotypically plastic species. Studies to date have focused exclusively on the biology of the "sheltered" morph at Santa Catalina Island. Our studies of the distribution of *Pelagophycus* document extensive beds of the "exposed" morph off the mainland and identify for the first time populations of this morph in the California Channel Islands. Our data on growth rates, phenology and longevity of the "exposed" morph off Point Loma reveal substantial differences when compared to those on the "sheltered" morph reported in the literature. While the latter have been shown to be annuals, we find that the Point Loma population is composed of perennial plants. We report inconclusive results from a reciprocal transplant experiment and discuss the question: Are the "sheltered" and "exposed" forms expressions of habitat-specific phenotypic variation in a single species, or do they represent separate species?

Insects of the California Channel Islands: Status of Systematic and Biogeographic Knowledge. Scott E. Miller. Bishop Museum, Box 19000-A, Honolulu, HI 96817, (808) 848-4193.

The compilation of a database on insects and related arthropods of the California Channel Islands allows the first overview of the entire fauna. The database, compiled by

Scott Miller and Caitlin O'Connell, with data from the literature, museum collections, and specialists, includes more than 7,000 records representing more than 2,500 taxa. Some taxa (e.g., Orthoptera, Coccoidea, and larger Hymenoptera) are now relatively well known. However, many taxa, especially those that require specialist collecting, remain very poorly known (e.g., soil fauna, leaf miners). More than 130 species or subspecies are considered endemic to the islands; their status and biogeographic patterns are discussed.

Diversity of the Higher Fungi of Santa Rosa Island (Channel Islands, California): Implications for the Survival of Associated Endemic Tree Species. Florence Nishida. Natural History Museum of Los Angeles County, 900 Exposition Boulevard, Los Angeles, CA 90007, (310) 455-2231.

The collection of higher fungi representing 39 genera of Basidiomycetes and Ascomycetes from Santa Rosa Island in habitats ranging from open pasture land, dry canyons, wooded canyons, and ridgetops reveals a surprising fungal diversity for an island with very limited forest. Nine out of 28 terricolous/humicolous basidiomycetous genera are presumed ectomycorrhizae-formers (plant root symbionts) and 19 genera are saprophytic. Mycorrhizal fungi have been shown to improve the survival capabilities of associated plants growing in stressed conditions. In this survey, they are most abundant and diverse in habitats with the most extensive tree cover. Comparisons of this island's habitats in terms of fungal species richness suggest factors which influence the success of fungal colonization and fruiting and thus, enhanced survival of oak and pine species. These are presence of ectomycorrhizal fungi, presence of a substantial soil-covering leaf litter or woody debris, shallow or terraced slopes, slope direction, and shading by steep canyon walls or tree canopy. Potential remedial action to restore plant communities in stressed habitats would include efforts to ameliorate conditions for mycorrhizal fungi.

Animal Husbandry on the Three Southernmost Channel Islands: A Preliminary Overview, 1820-1950. Penelope G. O'Malley. Channel Island Archives, Santa Barbara Museum of Natural History, 6761 Wandermere Rd., Malibu, CA 90265, (310) 457-9384.

Study provides comparative analysis of 120 years of animal husbandry on 3 southernmost Channel Islands—Santa Catalina, San Nicolas and San Clemente. Compared to large mainland sheepherding operations, the island industry was small, much less professional and mostly established when the mainland wool industry was in decline. Sheep grazing on the islands appears not to have developed as a stable regional economy or to have contributed to the art of wool raising in California. The cattle operation on Santa Catalina, which began in the late 1800s, is perhaps most significant

The Fourth California Islands Symposium: Update on the Status of Resources

Abstracts

William L. Halvorson and Gloria J. Maender, Editors

Santa Barbara Museum of Natural History
Santa Barbara, California