NATURAL AND CULTURAL RESOURCES MANAGEMENT

The role of the Resources Management division is to:

- Increase knowledge of the natural and cultural resources, and to predict the impacts of actions on those resources,
- Restore natural systems which have been altered by European peoples,
- Mitigate damage to natural and cultural resources, and,
- Maintain natural systems which require human intervention in order to duplicate natural events which no longer occur.

The following positions in resources management were occupied during 1992 to carry out the above role:

Chief, Resources Management	GS-025-12
Archeologist	GS-193-11
Maritime Historian	GS-170-11
Archeological Technicians (seasonal) *	GS-102-05
Marine Biologist	GS-401-11
Seabird Biologist	GS-401-09
Seabird Technician (seasonal) *	GS-401-07
Marine Biologists (seasonal)	GS-401-07
Marine Technician (seasonal)	GS-404-05
Secretary *	GS-318-05
Database Administrator *	GS-408-11
Terrestrial Biologist *	GS-401-11
Vegetation Biologist *	GS-430-07
Wildlife Biologist	GS-401-09
GIS Specialist *	GS-401-09
Marine Biologist *	GS-401-09
Biological Technicians (seasonal)	GS-401-07
Range Conservationist *	GS-454-08
Librarian *	GS-1441-05

* denotes positions added in 1992

The resources management division budget for FY92 was:

ONPS (base funding)	$ 664,887
Eradicate Fireweed	$ 4,600
Remove exotic pigs from SRI	$ 178,000
Survey archeology of SRI	$ 79,000
Marine Debris survey	$ 4,000
Monitor shipwrecks	$ 50,000
	$ 980,487

Division activities during 1992 resulted in progress in the following areas of park operations:

a. Acquire knowledge of system dynamics and processes

Inventory & Monitoring: Channel Islands was selected as one of four prototype inventory & monitoring parks. This designation resulted in the addition of $320,000 to the park's budget in FY92 to fund expansion of the ongoing monitoring. Seven new positions for the expanded I&M program were described and filled during 1992.

The park and cooperators continued the ongoing marine monitoring protocols: kelp forest, rocky intertidal, pinnipeds, and seabirds. Personnel were hired and the groundwork laid to begin terrestrial monitoring in 1993.

Rocky intertidal: RM staff and volunteers monitored 14 permanent sites according to the monitoring handbook. We began black abalone transplant experiment (in cooperation with Calif. Dept. of Fish and Game and personnel from UCSC and UCSB) to test the efficacy of transplanting abalone into areas where they have been depleted, and to see if the withering syndrome affects transplanted healthy abalone. We cooperated with staff at the University of California Santa Barbara to identify the geographic range of black abalone mortalities. We worked with California Department of Fish and Game biologists to identify extent and cause(s) of black abalone mortality. Significant findings: Declining numbers of black abalone populations in the park appear to be due to a disease previously unknown.

Kelp forest: Park staff, cooperating agencies, and numerous volunteers monitored kelp forests at the 16 permanent sites as per the monitoring handbook. In addition, we now have eight stations with sets of recruitment modules for monitoring abalone, seastar, and urchin recruitment. Temperature depth recorders were placed at three stations this summer. We assisted researchers at San Diego State University with a larval recruitment experiment at Anacapa which should provide valuable data for the Kelp Forest Monitoring. We made random surveys for white abalone along Anacapa and Santa Cruz Islands. Significant progress has been made in updating the monitoring handbook to reflect new computer programs and techniques in the monitoring procedures. A two-year term marine biologist (GS 7/9) position was filled in October 1992. Significant findings: In 1992 we documented the extent of the sea star wasting disease that occurs with prolonged warm temperatures. We recorded for the first time, the effects of what may be the same disease in sea urchins. Large numbers of sea urchins lost their spines and showed deformities or lesions at Santa Barbara, Anacapa, and Santa Cruz Islands. Associated with El Niño, was a range extension of a spotted porcupinefish that were found at Santa Barbara Island.

Pinnipeds: The pinniped monitoring program is carried out by the National Marine Fisheries Service and the California Department of Fish & Game. There are six species of pinnipeds that occur in the park; four of which breed there. The monitoring program

serves to document long term changes in the distribution and abundance of each of the pinniped species. Monitoring has continued on a regular schedule for over ten years. In addition, a number of research projects have been completed during this time.

Significant findings: Stellar sea lion populations declined at San Miguel Island, coincident with the decline of northern populations of the species. They have not been seen on SMI in several years. Research on the movements of elephant seals found that they are extremely deep divers (up to a mile) and they migrate over extensive distances (between southern California and the Aleutian Islands). Harbor seals interchange with the mainland groups and swim as far away as San Francisco. Elephant seals and California sea lions have increased their population in recent years.

Seabirds: The population dynamics of six seabird species and one shorebird are monitored each year. Enough data now exists for some species (Brown Pelican, Double-crested Cormorant, Western Gull, Xantus' Murrelet) to begin to look at population trends.

All species monitored (except Cassin's Auklet) experienced low to average reproductive effort (number of nesting pairs) and very low productivity (fledglings per nest attempt). This was likely the result of a strong El Nino event from January through June, 1992, which decreased food availability for birds during the nesting period. Cassin's Auklets may have lessened impacts on reproduction by the El Nino effect by delaying breeding.

The park contracted with the Point Reyes Bird Observatory to study the Western Snowy Plover, a federal candidate threatened species, on Santa Rosa Island. Counts of adults, nests, and fledglings were made throughout the summer. The investigator found that nests were lost to wind, ravens, island foxes, and cattle.

The Point Reyes Bird Observatory mapped the area used by Snowy Plovers breeding on the east end of Santa Rosa Island. A preliminary assessment of disturbance and predation factors was made.

Terrestrial monitoring: The objective of the terrestrial monitoring program at CHIS is to initiate and implement long-term monitoring of selected terrestrial resources, in order to give park managers access to data regarding population status and trend. Such information is needed to make management decisions. Population trend monitoring will be initiated in 1993 for terrestrial vegetation, mammals, landbirds, reptiles, amphibians, and invertebrates. A GS-11 Terrestrial Biologist and GS-07 Botanist were hired by the park to guide implementation of the terrestrial monitoring program.

Charles Drost, University of California, Davis CPSU, continued

his 12 year study of Santa Barbara Island deer mouse densities. Significant findings: Deer mouse densities in September on Santa Barbara Island were among the highest recorded during this long-term study, probably due to favorable weather conditions (sufficient winter and spring precipitation).

The park funded a preliminary survey of Santa Rosa and East Santa Cruz Islands for bats. On East Santa Cruz Island the contractor, Dr. Patricia Brown-Berry, found that the only population of Townsend's Long-eared bats roosted in an old adobe ranch building which is used for equipment storage by private owners. The bats are foraging up to several miles from the roost site. The fall survey on Santa Rosa Island was hampered by high winds, which made mist-netting difficult (one California myotis was caught). Pallid bat guano was found in an abandoned radar station building, indicating a possible roost or maternity site for this sensitive species.

Santa Rosa Island Archeological Survey: During the 1992 field season the survey recorded more than 135 additional sites on Santa Rosa Island. These encompass entire new categories of sites (e.g., lithic scatters) and occupation of island zones previously reported as unoccupied. Significant findings: New C14 dates indicate occupation of Bechers Bay more than 7000 years ago, more than tripling the known area of the island settled at this time. Work on the far western end of the island has recorded highly eroded, thickly clustered coastal site complexes, some over 400 meters in extent. In contrast, sites in the mountainous interior, even at higher elevations, occur on broad, open ridges and in east facing rock shelters high up on canyon walls. Rock shelter sites which are inaccessible to cattle are in pristine condition - unbroken mussel shells, still attached at their hinges, are present on the surface of at least four of these sites. In addition to prehistoric sites, crews have recorded Chinese abalone fishing camps (1880's - 1910) and shore camps and cargo stockpiles relating to the historic wrecks of the *Goldenhorn* (1892) and the *Aggi* (1915), and an early oil exploration camp.

Exploration of Daisy Cave, San Miguel: Dr. Jon Erlandson assembled field notes, analyzed material with associated documentation, and unchecked samples from Daisy Cave in his laboratory at the University of Oregon. Cataloging of the materials, using SPMA funds and matching work study funds from the University of Oregon has commenced. Work is approximately 50% complete.

Significant findings: Limited testing at the site in the fall of 1992 retrieved masses of sea grass cordage which are 9000 years old, among the oldest perishable vegetal materials recovered in North America. Curation and study of this material to determine the artifacts that this cordage represents. A limited number of chipped stone specimens recovered from level G, which dates to 11,000 years ago, strengthens the case for human presence on the

island at this time. Daisy Cave has yielded material which provides comprehensive evidence for the early occupation, lifestyle, and environment of the Channel Islands.

Shipwreck Studies: Work began on this project in August with the employment of a maritime historian to systematically examine existing archival sources to gather information of shipwrecks within the Point Mugu Test Range, which includes nearly all of Channel Islands National Park. Enough new records of shipwrecks within the park have been encountered that release of the draft of the Submerged Cultural Resources Assessment for Channel Islands National Park has been delayed in order to incorporate this new material. The park now knows of twenty-four new wrecks as a result of this study. An outstanding oral history was collected from a woman who spent the first seven years of her life aboard the *Jane L Stanford*, whose remains lie at Skunk Point on Santa Rosa Island.

b. Apply knowledge to maintain and restore park resources

Feral pig eradication from Santa Rosa:

The feral pig eradication program on Santa Rosa Island has been a milestone for alien species eradication and ecological restoration. The damage that was apparent from pig behavior, root damage to island oaks, soil erosion, siltation in watersheds from wallowing, has been greatly diminished. Removal of feral pigs has restored some of the visual aesthetics of the island and removed a major negative impact on the ecosystem as a whole.

On March 13, 1992 the contract phase of the eradication program was completed. For the fiscal year, a total of 2600 man/hrs were expended by contractors, resulting in 42 pigs removed. The search methodology revolved around trained pig dogs to locate remnant animals; a limited amount of aerial searches were conducted. The last confirmed pig death occurred on March 13, 1992. After that date, a small amount of pig sign was found scattered in a number of drainages.

Intensive monitoring for pig sign continued through the summer and into early fall. All monitoring transects were surveyed during August, 1992. No fresh pig sign has been found on Santa Rosa Island within the last quarter of FY 92 and no mortalities have been recorded since 13 March, 1992.

From an estimated population of 1200-1600 pigs, a total of 1170 were killed.

Fireweed eradication from San Miguel: The park hired a temporary biologist to oversee the fireweed eradication project on San Miguel Island. Four eradication trips, with 4 people per trip, were made to the island during the spring. The crews covered approximately 300 acres and found considerable amounts of fireweed.

c. Develop and maintain information management system

Information management is the basis of the CHIS Science program and is the key to timely and appropriate application of inventory, monitoring, and restoration results to management issues. The inherent goal of GIS technologies is the proper access, storage, analysis, and comprehension of data.

During 1992, a Database Administrator and GIS Specialist were hired. The park purchased two SPARC 10/30 stations with associated hard drives, tape drives, modems, plotters, monitors, terminals, software, and other items needed for the GIS system.

The RM annex building was wired for Local Area Network (LAN) technology to facilitate data management and communications. Hardware and software which would link the LAN's between the annex and park headquarters was purchased. Cooperative funding and USGS start-up of digitizing eleven quad maps to provide the basic GIS data layer for the entire park has been completed. The digitized quads are expected in March of 1993.

Use of the existing ERDAS software continues to facilitate ongoing programs such as the feral pig eradication program, and vegetation mapping. Since this system is inadequate for current needs, ERDAS information will be transferred to the SPARC based GIS system once the new system is operational.

Museum Curation: The resources management division continues to fund a temporary position to manage the park's museum collection. The employee has made significant progress in cataloguing and organizing the collections. The number of newly cataloged items, primarily archival photos and documents has reached nearly 2000, exclusive of items to be cataloged from Daisy Cave and other collections held at other institutions.

Disaster struck the collections when a leaking pipe inundated the collections, requiring emergency treatment. Despite setbacks, the collections are improved compared to a year ago.

Park Library: The resources management division funded a temporary librarian during 1992. The librarian began cataloguing the large backlog of new books and reprints in the library.

d. Evaluate resources planning

Resources Management Plan: The resources management staff put considerable effort into the total revision of the Resources Management Plan (RMP). The most recent RMP for CHIS dated to 1985 and was woefully out-of-date. The revision of the RMP has caused the park to review and prioritize the research and resources management programs and projects. The process of RMP revision has included two scoping sessions with non-NPS scientists and land managers to discuss park issues and programs.

The most recent scoping session with The Nature Conservancy was held to develop a stronger working relationship with the largest private inholder in the park, and to identify mutual goals.

e. Identify infrastructure, staffing, and funding needs

The administration of the resources management program centered around acquisition of office space, preparation and classification of position descriptions, announcements, and hiring. The park, through GSA, rented a 4,200 square foot office building to house the expanded resources management staff.

The resources management division participated in the R-MAP (Resources Management Assessment Program) process to identify base natural resources management, protection, and research program levels based on objective and measurable park characteristics. This process identified significant deficiencies in the park's ability to carry out natural resources responsibilities.

The park completed a position management plan which identifies the need for a significant expansion of the resources management division (although not as great as the need identified through R-MAP). The park received a base funding increase of $97,000 for resources management in 1992. These funds were used to fund a permanent Wildlife Biologist GS-9 and to partially fund the Range Conservationist GS-8.

f. Acquire knowledge of uses and impacts

Marine debris monitoring: Channel Islands participates in the national program to determine the types, abundance, distribution, and accumulation rates of marine debris on park beaches. This was the fourth year of monitoring in this program. Six beaches were surveyed three times in 1992. Significant findings: Plastic debris from a variety of sources continues to accumulate on park beaches. After the "March Miracle" rains, it was very apparent that debris from mainland beaches makes its way to the islands and is one of the major sources of debris, something we suspected. Other sources include shipping, commercial fishing, pleasure crafts, and the military.

g. Apply knowledge to maintain and protect park resources

Range Management Plan: The park completed a contract with the University of California to prepare a Range Management Plan for Santa Rosa Island. This is the first such plan for the island which was purchased by the park in December, 1986. The park hired a Range Conservationist to oversee the monitoring of SRI rangelands and make recommendations regarding mitigation of impacts from the ranch operation.