



## **3.0 Status and Current Land Management**

### **3.1 Introduction**

Land use planning and land management on the installation is the responsibility of NSF Diego Garcia. The command ensures that such planning and management both supports U.S. and U.K. military missions and is consistent with their policies. The NSF Diego Garcia RSIP Overview Plan (September 2003) provides an overview of NSF Diego Garcia's mission and functions within the Japan Region, reviews existing facility conditions and provides information critical to planning for future facility improvements.

### **3.2 Land Management Considerations**

The principal plans and policy documents listed in Appendices B and C include goals and objectives for land management. As described in this chapter, all existing land usage accommodates compatible activities, but future expansion may be constrained because of the limited acreage on the atoll. Accordingly, future development planning must ensure that land use actions remain mission-oriented and practice land-use conservation. There are currently plans to enhance airfield and explosive handling safety, protect antenna fields from encroachment, minimize individual facility footprint and acreage requirements through multistory construction and incorporate energy conservation and environmental protection measures. No major changes to outdoor recreation are anticipated beyond modernization of existing facilities and recreation equipment inventories.

#### **3.2.1 Erosion Control**

Erosion is caused by the action of water and wind wearing away the land's surface. The loss and destabilization of soil can have devastating effects on property, ecological processes, water quality, and sensitive species. Federal landowners are required to control and prevent erosion by conducting surveys and implementing conservation measures (Soil Conservation Act).

There are approximately 2.2 square miles (5.7 km<sup>2</sup>) of reef flat at Diego Garcia, approximately 0.4 square miles (1.0 km<sup>2</sup>) of which has been mined for construction and fill materials. The mining activities resulted in modifications to the reef flats surrounding the island and have a potential to cause deleterious,

long-term impacts, including increased beach and shoreline erosion and increased vulnerability of shoreline structures to storm surf. Additionally, dredging activities may have adverse impacts on marine life. The current policy is to avoid coral dredging and mining. Off-island procurement of fill material and aggregate may be pursued following FAR25.302 (c). However, if dredging and mining are unavoidable, the design of mitigation measures should be done in consultation with marine ecologists and engineer-oceanographers.

Periodic evaluation and analysis occurs on the shoreline of the island, with the most recent evaluation was conducted in 2001. The shoreline was evaluated and problem sites were identified and analyzed. Engineering solutions were recommended (Shoreline Erosion Assessment 2001).

### **3.2.2 Water Conservation**

Diego Garcia's water supply depends on freshwater lenses that are recharged by local rainfall. The lenses are subject to saltwater encroachment in response to fluctuating ocean tides, lack of recharge, and ongoing withdrawal via wells. Water supply management is an ongoing base program, and the U.S. Geological Survey assists in monitoring the wells.

NAVSUPFAC Diego Garcia Instruction 11330.1 identifies specific water use restrictions that are required to protect the potable water supply. Conservation measures include restricting the washing of vehicles, building exteriors, and aircraft, and cutting back on base laundry services; reducing water pressure and establishing water hours (preplanned water outages) and conducting annual leakage surveys.

### **3.2.3 Pollution Control**

To support mission requirements and military readiness, NSF Diego Garcia is required to maintain a variety of chemicals classified as hazardous substances and large quantities of petroleum products to fuel and lubricate, military assets and equipment.

A 750-foot (229 m) buffer zone is established around the sewage lagoon complex southwest of the cantonment area to mitigate impacts on personnel berthing and support facilities. A sanitary landfill, originally located behind the PWD Camp south of the cantonment, was incompatible with activities in the adjacent berthing area. It has since been covered, grassed and converted to a 9-hole golf course. The current sanitary (MILCON P-146 Solid Waste Management Center) is expected to be completed by FY07.

In accordance with the supplemental arrangements of 1982, British regulations prohibit dumping of vehicles, machinery, equipment, or HAZMAT/HAZWASTE in Territorial lands and waters of Diego Garcia.

### **3.3 Land Use**

Facilities and functions have been planned and developed to avoid mutual interference. The scarcity of land and the high volume of mission and community support facilities leave little room for facility or land use expansion beyond that deemed mission-essential. However, many ongoing activities require safety buffers, decreasing development options in those areas. For example, ordnance storage areas both on shore and at lagoon anchorages require Explosive Safety Quantity Distance (ESQD) arcs that limit the nature of adjoining facilities and activities. The communication sites require zones clear of potential electromagnetic interference (EMI). Safety buffers along transmission sites must be enforced to avoid generating electromagnetic radiation hazards to ordnance (HERO), fuel operations (HERF), and personnel (HERP). The airfield requires areas clear of any obstacle to flight—designated as lateral clear zones and accidental potential zones along approach and departure lanes. Figure 3.1 illustrates these manmade constraints that affect land use.

The Base Master Plan proposes a remote communications station and the infrastructure required to support the projected 300 people who will maintain it. A primary construction criterion was distance; about 17 miles (27 km) must separate the receiver site and the transmitter site. The cantonment was planned near the receiver site. Portions of land between the two antenna farms were selected for the development of an electrical power generating station, maintenance and supply facilities, a small airfield, and ship anchorage. By 1973, planning had incorporated additional mission requirements while maintaining a compact walking and bicycling, landscaped community.

Building two and three story facilities for housing officer and enlisted personnel increased land use density. A new supply area was developed that separated supply functions from industrial functions. Warehouses and POL storage were positioned to favor the cantonment and to reduce transportation requirements. Limited support to the fleet was added to the mission in 1979. As mission capability and population expanded, the 1973 land use concept was maintained and the cantonment developed to house more individuals within permanent structures. Virtually all land not encumbered by natural or a manmade constraint was used.

Beginning in 1971, coral material was dredged from a four-mile-long (6.4 km) expanse of the atoll's seaward reef to provide aggregate for construction. The

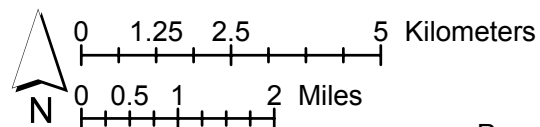
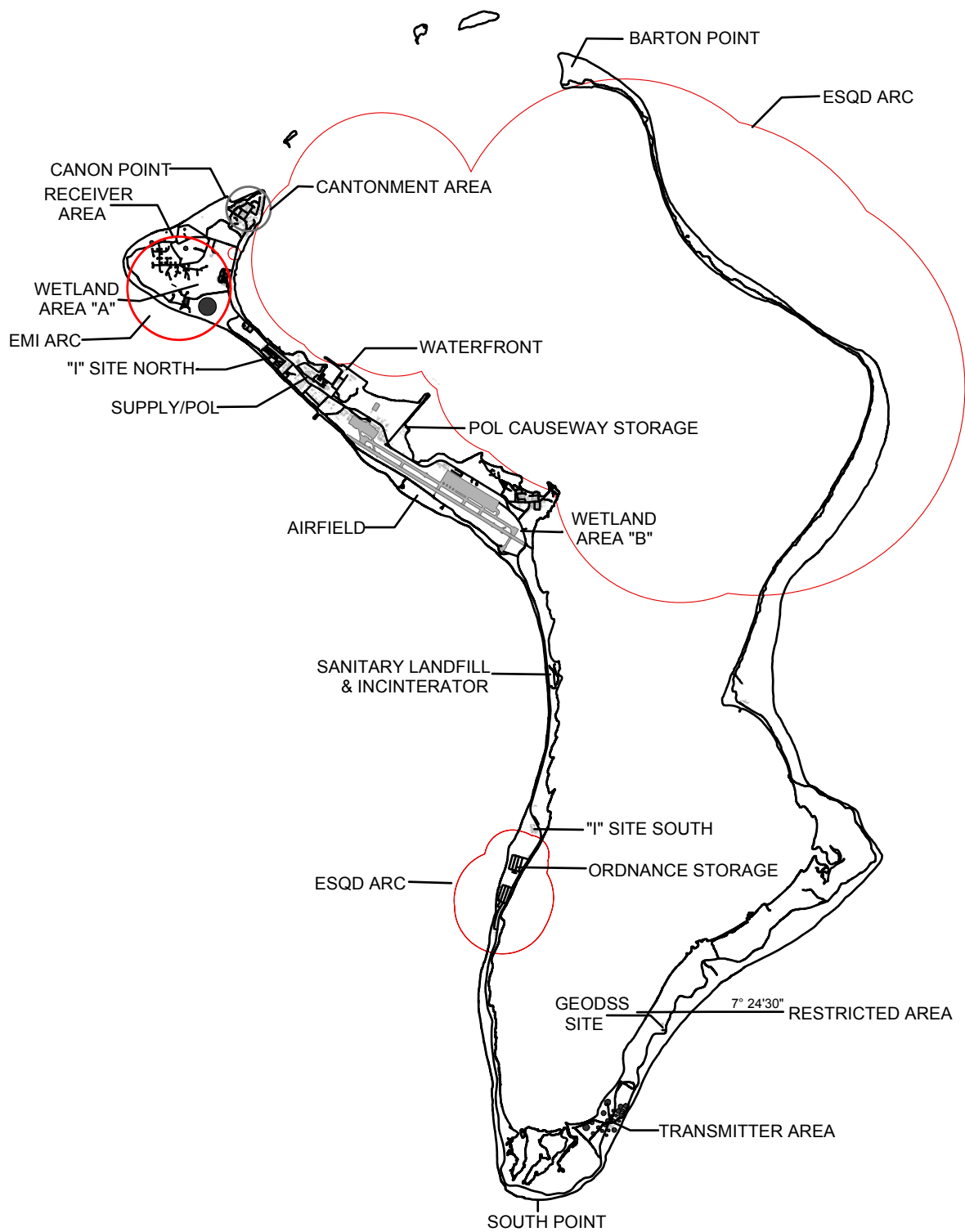
potential effects of such dredging can be significant: live corals destroyed, fish and other swimming animals displaced, normal patterns of sediment deposition disrupted, and beaches eroded. The excavated basins at Diego Garcia were designed so that, in theory, they would recapture sediments and erosion would be minimized. Some land reclamation was necessary to expand the airfield and its 12,000-foot (3,700 m) runway and parallel taxiway. A segment of lagoon reef south of the cantonment in the operational area was widened with coral fill to be used as the aircraft parking apron area. The land reclamation activities also served to develop the wharf area.

Additional land reclamation and development to the north or south of the airfield are limited due to the presence of EMI and Electromagnetic Radiation (EMR) zones. The combined constraints of EMI/EMR arcs at antenna sites, ESQD arcs surrounding each ammunition supply and issue point, and the safety clear zones at the airfield virtually eliminate any additional area development.

Two small arms ranges (oriented seaward) were developed to the south end of the atoll within the EMR arc at the transmitting site; there is no HERP hazard at either range. The U.S. Navy's small arms range is located one mile (1.6 km) past the donkey gate; the Royal Marines rifle range is located 0.7 miles (1.1 km) past GEODSS. There is a third recreational MWR skeet range located near the Air Operations Area. Construction of the GEODSS facility was purposely accomplished to the south, at some distance from the cantonment, to provide dark sky environment.

Close to the cantonment and on the lagoon, a marina and fleet recreation (FLEETREC) area has been developed for on-island and ships' crew outdoor recreation. A 9-hole golf course and driving range are nearby in Palmsville. The golf course was expanded and the project was completed in April 2001. A Rest and Recreation (R&R) area has been developed on the lagoon close to the East Point Plantation.

Two other disturbed areas at Diego Garcia are the dredged portions of the lagoon and the seaward portion of the fringing reef flat. The first area was developed as an anchorage and turning basin, and much of its coral was relocated as part of the dredging effort. The second activity was conducted to provide construction aggregate. An estimated 11.9 square miles (30.8 km<sup>2</sup>) of lagoon and 0.2 square miles (0.5 km<sup>2</sup>) of reef flat were dredged. With the possible exception of lagoon maintenance, no additional dredging activities are anticipated.



**FIGURE 3.1 EXISTING LAND USE**

Diego Garcia

Integrated Natural Resources Management Plan

Prepared by EV3 Natural Resources Branch, NAVFAC Pacific, September 2005



### 3.3.1 Improved Grounds and Military Use Areas

Please see Figure 3.1 for the locations described below.

#### 3.3.1.1 Facilities

The Navy constructs and owns quarters for all personnel living and working on Diego Garcia. This includes quarters for assigned and transient U.S. military and civilians (DoD civilians, contractors, BOS contractor management personnel,



Figure 3.2 Cantonment Area south of the cantonment. USAF Deployed Forces occupy Camp Justice – a tent city of 190 tent pads built in 1990 at Point Marianne.

The command headquarters for both the BRITREP and NSF Diego Garcia are collocated in a two-story administration facility that is within walking distance of Public Works Department administration. The fire station is south of the cantonment in a centrally located position between the cantonment and BOSC housing areas.



Figure 3.3 Command Headquarters

NSF Diego Garcia has a wide variety of recreation and support facilities, all within walking distance of the cantonment's bachelor quarters. These include, a gymnasium, swimming pool, bowling alley, outdoor movie theater, chapel and religious education, ship store, gift shop, barber shop, laundry drop-off station, museum, t-shirt print shop, dining facility, medical center, bank, credit union, library and post office. Enlisted and officer clubs also exist, including the Brit Club. Cable and Wireless provides long distance telephone and television service for Diego Garcia. The Naval Broadcasting Service provides radio and cable television to quarters.

### **3.3.1.2 Industrial Complex**

There are two major potable water treatment plants on Diego Garcia. One is located near the cantonment and the other is located at Air Operations. Separate wells and water treatment systems exist for "I" Site South, the transmitter and GEODSS sites.

Two centralized sewage treatment plants complete with collection lines, septic tanks, leaching fields and ocean outfalls serve the occupied areas of the atoll.

Electrical generation comes from two sites. "I" Site has the newest dual-feed electric power station and powers the consolidated PWD transportation and equipment maintenance shops; supply and storage facilities; the POL tank farm; and the construction contractor support area. "I" Site North is immediately adjacent to waterfront operations and the airfield. Electrical power from "I" Site goes as far as the airfield.

"I" Site South—the former Public Works complex—has the older electrical generating station, weapons shop and warehouse. Electrical power from "I" Site South serves all facilities to the south. Emergency electrical generation exists for airfield operations and communications.

### **3.3.1.3 Airfield**

Diego Garcia has a 12,000-foot (3,700 m) by 200-foot (61 m) wide runway, and a parallel taxiway constructed to serve as a backup runway. The airfield has an operations building, aircraft maintenance hangars for Navy and Air Force support, passenger and cargo terminals.

Across from the Air Mobility Command Office is a helicopter-landing pad for missions to anchored ships.

#### **3.3.1.4 Classified/Restricted Areas**

GEODDS satellite communications and tracking station and the transmitter site are remotely located for operational and safety reasons. Close to the cantonment are the Receiver and Communication sites that house the NCTAMS and Naval Security Group Detachment (NSGD) respectively. A surface radar facility is also located about 1.5 miles (2.4 km) south of the Donkey Gate.

A large ammunition storage area is located halfway between the airfield and the transmitter site to the extreme south tip of the atoll. The remote location ensures that all occupied facilities are clear of the ammunition storage ESQD arc of 1,520 feet (463 m) to 3,150 feet (960 m) radius as measured from various missile and bomb storage magazines.

Access to classified and restricted areas is controlled.

#### **3.3.1.5 Training Areas and Ranges**

Limited areas suitable for military field training exist for resident U.S. Navy and Royal Marines. The Navy and Royal Marines have established a small arms range and a rifle range to the east and west of the GEODSS site, with their respective Surface Danger Zones (SDZ) over the ocean.

#### **3.3.1.6 Outdoor Recreation Facilities**

Ball fields (softball, soccer, volleyball, baseball, tennis and basketball) and tennis courts are located near the BQs and by the FLEETREC area. The Marina located on the lagoon just south of the cantonment, has boats and equipment suitable for waterskiing, windsurfing, kite boarding, sailing and kayaking. Boats, tackle, and guide services are available for fishing expeditions in the lagoon and the open ocean. On weekends and holidays, the East Point



Figure 3.4 Marina

Plantation in the controlled area is available to individuals and groups for daytime recreation. BIOT maintains the R & R site and East Point Plantation.



### 3.3.1.7 Cemetery

The Point Marianne Cemetery is one of three cemeteries located on Diego Garcia with origins during the plantation period. None of the cemeteries are now used for new burials.



Figure 3.5 Point Marianne Cemetery

### 3.3.2 Undeveloped Grounds

Undeveloped areas on the land leased by the U.S. Navy serve as buffers between various developed areas. Many remain pristine and provide the required safety distances for communications transmissions, aviation operations, and ordnance storage. There is no U.S. Navy development of the east side of the island, and any access for authorized recreational activities is controlled by the BRITREP.

#### 3.3.2.1 Marsh/Wetland Areas

The marsh/wetlands in area "A" are maintained by grounds keepers and serve as a freshwater lens recharge zone and wildlife habitat—two key functions. Area "A" is a receiver antenna farm, and the antenna bases are constructed on built-up areas within the low-lying wetland. One type of marsh is dominated by *Typha domingensis*, an introduced species that forms dense clumps in standing water and on the edges of ponds and ditches. Presumably, it was brought to Diego Garcia from Louisiana and grown in a large patch near the North power plant. When the site was threatened by development, the cattails were reseeded in the drainage ditch east of the Air Terminal Building (Topp, J. M. W. 10/88). Despite the fact that the cattails are not native, they may have a beneficial impact on cleansing and clarifying polluted water. Cattails have been shown to reduce or remove heavy metals (such as iron, copper, lead, and zinc) from wastewater flows (Mitchell and Karanthanasis, 1995).

The marsh/wetlands of area "B," near the Point Marianne Cemetery (see Figure 3.1), are more pristine and are noted for species of ferns, aquatic plants, fish, and eels. Small wetlands exist between both of the larger areas and on both sides of DG-1. Picturesque wetlands are found at the entrance to the airfield passengers' terminal, and at the nine-hole golf course. Additionally, as signatories to the Migratory Bird Treaty Act, Britain and the U.S. are committed to protecting the migratory seabirds that frequent Diego Garcia. Many visiting seabirds use the small wetlands on the atoll as nesting and resting sites. Important wetlands have been identified along the east side of the runway, at the stabilization ponds and in the vicinity of the receiver antenna field.

### **3.3.3 Unique Natural Resource Areas**

The restricted area beyond East Point Plantation serves as a “de facto” natural resource area. Signs denote boundaries and access is limited primarily to personnel engaged in natural resource protection and management actions, safety and personnel accountability. Except for the navigational aids, there is no U.S. Navy development on the east side of the island.

Access to the three islets and their reefs at the lagoon entrance is completely off-limits. Human activity is also restricted within the lagoon’s replenishment zones to protect marine life and coral communities. Turtle Cove may be visited, and is a site that is populated by juvenile sea turtles, manta rays, and black-tipped sharks.

## **3.4 Current Natural Resources Management**

### **3.4.1 Coordination and Protection**

As the representative for BIOT, the BRITREP has the authority to enforce existing British environmental regulations at Diego Garcia. (See Appendix B). The Public Works Department conducts an environmental indoctrination briefing for each new Commanding Officer. In order to perpetuate a coordinated U.S.-U.K. effort, the BRITREP and U.S. Installation Commander (or their designated representatives) meet quarterly to discuss natural resources-related matters. Either party may request special or more frequent meetings to address any urgent natural resources-related matters as they arise.

Coordination between the BRITREP and the Commanding Officer will ensure that:

- each party is made aware of the other's policies concerning natural resources management;
- any shortcomings are addressed with respect to resource protection or enforcement of existing policies; and
- both parties cooperate in achieving the objectives of natural resources management.

Specific BIOT Wildlife Protection Regulations (FGS 2001) prohibit:

- taking or possessing any live seashell or coral;
- taking, damaging, or destroying any bird nests while in use or being built, disturbing nesting or brooding birds, their eggs, or young; and
- taking or possessing any animal or plant except as allowed in the Fishery Limits Ordinance.

Additionally, under BIOT regulations, introduced species, including the donkeys and chickens, are also afforded protection. As discussed elsewhere in this document, protection of such exotic species, from an ecological standpoint, is at best of secondary importance, and in fact may be counterproductive.

### **3.4.2 Native Species Management**

#### **3.4.2.1 Native Vegetation**

Native species propagation was begun in 1999 at a nursery built near Palmsville in support of the 1997 NRMP recommendation of using native plants for landscaping. Native and decorative plants are currently being cultivated at this nursery.

#### **3.4.2.2 Marsh/Wetland Type Habitat**

The wetlands adjacent to the east side of the airstrip are maintained by clearing encroaching vegetation, as necessary, while maintaining a screen of tall fringing vegetation.

The marsh/wetlands in the area of the antenna fields are not disturbed, however the surrounding area is mowed regularly. This management aids in providing short-grass areas for species that utilize short-grass habitats, such as migrant shorebirds and waterfowl. Water monitoring occurs in this area in order to ensure that water resources are not being overtaxed.



Figure 3.6 Nursery



### 3.4.2.3 Turtles



Figure 3.7 Wildlife caution sign

Turtle Cove (near the parking area) is the main area within the turtle sanctuary that people visit. A warning sign has been posted at the entrance to Turtle Cove (Fig. 3.7) cautioning visitors to avoid harassing turtles. In addition, an educational sign created with the assistance of Chagos Conservation Trust/Fauna and Flora International is posted (Fig. 3.8) near the parking area. The sign describes basic turtle (and any other species that visitors may be likely to observe with the waters of Turtle Cove) natural history.

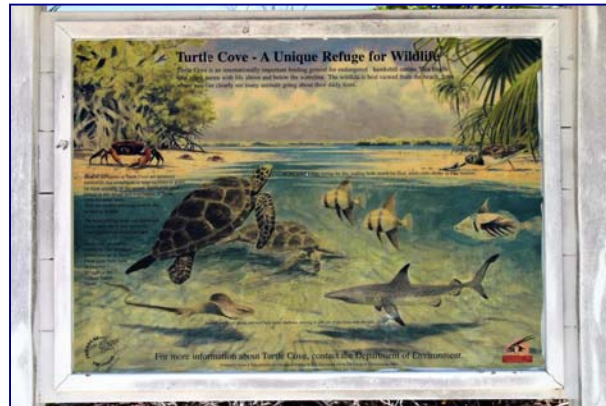


Figure 3.8 Wildlife information sign

In November of 2004, turtle viewing platforms were opened at Turtle Cove. Two platforms were constructed on the shoreline so that visitors would be able look down on the turtles foraging in the water (Fig. 3.9).



Figure 3.9 Wildlife viewing platform

### **3.4.3 Pest and Exotic Species Management**

Pest species are those animals and plants that have a direct or indirect negative impact on military missions, human health and/or the natural environment. Examples would include the most obvious, such as mosquitoes, termites, houseflies, mice and garden weeds, to the more remote, such as plants that may choke a pond, killing fish. Lists of pest species are maintained, and measures that can be undertaken for their control are specified. Exotic species (also called non-native or alien species) are species of plants or animals that exist in a geographic location as a direct or indirect result of human actions. These would include species people purposefully brought to a new areas, such as many ornamental and food plants, birds that escape captivity and form wild populations, fish released into ponds, and species that were accidentally introduced to new habitats, such as many weeds and many pest species. Management actions for the control or eradication of both pest and exotic species can be initiated when unacceptable populations levels are reached and the human or natural environment may be adversely affected.

#### **3.4.3.1 Pest Management**

DoD Instruction 4150.7 establishes the DoD Pest Management Program and describes its general requirements. The Instruction states the DoD's pest management policy and requires a comprehensive Pest Management Plan for all DoD installations. The Instruction discusses the need to control pest outbreaks that affect the military mission, damage property or impact the welfare of people. OPNAVINST 6250.4B outlines the Navy's policies and procedures for implementing pest management programs. In addition to policies outlined in the directive, it includes guidelines "to enhance the natural environment...to maintain optimal biodiversity." This directive, in conjunction with Chapter 11 of the FGS requires that the use of pesticides comply with applicable regulations to prevent pollution.

#### **3.4.3.2 Current Control/Eradication Efforts**

The Integrated Pest Management Plan (IPMP) provides control and eradication methods for weeds, pests including invertebrate animals that are a threat to public health, stored products and real properties, and vertebrates such as rodents and feral cats.

Insect pests, rodents, and weeds are being controlled mechanically, by flame weeding (using a flame thrower to kill plants) or through the use of different chemicals that fall into the four major categories of organophosphates, inorganics, carbamate, and synthetic pyrethroids. For a list of the types and amounts of these pesticides being used on Diego Garcia, see Appendix D.



### 3.4.3.2.1 Invasive/Pest Plant Species

There are two species of invasive sensitive plant that were introduced to the island in a shipment of aggregates in the 1980s. The giant sensitive plant (*Mimosa invisa*) has almost been eradicated from the Point Marianne area through regular hand pulling. It is currently being monitored and pulled when observed. Control of the dwarf sensitive plant (*Mimosa pudica*) is currently being conducted by flame weeding and hand pulling.



Figure 3.10 Giant sensitive plant



Figure 3.11 Dwarf sensitive plant

In order to curtail the spread of both species of sensitive plant, and to reduce the chances that other exotic or pest species may become established on Diego Garcia, representative samples of aggregate that may be imported are quarantined for observation to determine whether or not non-native plant or animal species are present. Any finer aggregates that have been stored at Pt. Marianne are not allowed for use in any self-help landscaping or backfilling projects.

Since 1999, ironwood trees (*Casuarina equisetifolia*) have been removed from the cantonment area, but only if the tree is affecting a building. Outside the cantonment, the BOS Contractor is required to remove at least 70 trees per year, although, in some years, as many as 350 to 4000 trees have been removed by the Contractor. Where native vegetation has grown back in abandoned antenna fields, the removal of ironwood seedlings is an ongoing process. Planting ironwoods is not allowed.



Figure 3.12 Ironwood trees  
Courtesy of <http://www.anbg.gov.au/images>

#### 3.4.3.2.2 Rhinoceros beetle

Rhinoceros beetles (*Oryctes rhinoceros*) are native to India and Indonesia and made their way to Diego Garcia by unknown means. The adult beetles cause detrimental damage to coconut trees. A biological control agent, baculovirus, has been successful in controlling rhinoceros beetles since the mid-1990's.



Figure 3.13 Rhinoceros beetle

#### 3.4.3.2.3 Cats

The Chief of Naval Operations' 10 January 2002 policy letter all Navy installations requires, in part that feral dogs and cats will not be permitted to run at large on Navy's military reservations (Appendix M)

Cats are the primary predators on Diego Garcia and were the major cause for the extirpation of ground nesting birds on the main island. Cat management started in the mid-1980s, but records of captures are available only during the early 1990s. In the beginning, cats were trapped on the U.S. Navy occupied area by Pest Control using a limited number of traps. The animals were then turned



Figure 3.14 Feral cat in a trap

over to BIOT for disposal. From 1990 to 1992, the procedures were changed in that captured cats were turned over to BIOT for subsequent release at East Point Plantation. From 1993 to 1999, cat control was re-implemented and 1,832 cats were eliminated. Ten traps were set daily, 6 days per week. From October 1999 through March 2004, cat control was changed to an island-wide cat eradication project and was put into operation by the U.S. Department of Agriculture (USDA). The project was scheduled to be finished in September 2002 with the anticipation that 90% of the cats would be eliminated during the initial year and the last two years would be dedicated to removing the remaining 10%. However, 90% elimination was not achieved until the third year and the program was then extended until September 2003. During the concerted eradication program a total of 284 cats were removed. Due to budgetary constraints, the cat eradication was converted to control in April 2004 under the BOS Contract.

The current cat control program consists of the following:

- Trap setting, baiting, maintenance and collection by BOS contractors on a regular basis with 110 traps set daily 6 days a week.
- Public awareness and education by BIOT, BOS contractors and PW Environmental by increasing visibility and importance of this issue during customs indoctrination at air terminal and all island indoctrination class.
- The use of various medias (i.e., NMC, the Tropical Times, USAF Newsletter, Diego Garcia Times and San Juan Construction Newsletter) for public education and awareness.
- BIOT to continue the cat bounty of \$100 cash per cat caught and turned in dead or alive and to announce fines/penalties for anyone caught aiding cats or tampering with traps.

#### 3.4.3.2.4 Rats

Regular rat control occurs in the U.S. Navy occupied area. Two methods of employing anti-coagulant baits are used for the control of rodents (NAVFAC Methodology, Appendix N)). Mechanical traps (snap traps) are used around dog kennels and in other areas where rat monitoring is required. Bait stations are also deployed in areas where ground-nesting birds are located. For example, in and around a pandanus bush near the Peace Keeper Inn where wedge-tailed shearwaters (*Puffinus pacificus*) nest and in the naupaka around the soccer field where red-tailed tropicbirds (*Phaethon rubricauda*) nest (See Chapter 4 for location maps).



Figure 3.15 Rat on Diego Garcia