

PAIS-N-018

**MOVING SAND STABILIZATION****1.0 Statement of Problem**

Sand, set in motion by <sup>denudation</sup> man-caused <sup>erosion</sup> devegetation (usually construction activities or historical overgrazing) or ~~by~~ natural forces and blown by constant southeast winds, encroaches on visitor use facilities and access roads creating hazardous conditions for visitors and persistent maintenance problems for the park. There are several moving sand fields within the park. Only those ~~which are~~ encroaching on developed areas will be dealt with here. The remaining sand fields are located in remote areas and, given time, will stabilize on their own. Moving sand which threatens developed areas must either be relocated or stabilized if the facilities are to be maintained in a safe, usable condition.

**1.1 Background Information**

*Structure* (Construction activities associated with ~~both~~ the establishment of the park and oil and gas production facilities, <sup>together</sup> with overgrazing in the 1960's and early 1970's, <sup>denudation</sup> combined with predominant southeasterly winds, resulted in the creation of many moving sand fields within the park.) Also, <sup>denudation</sup> devegetation caused by natural forces (hurricanes) <sup>is</sup> are responsible for the creation of moving sand fields. Despite their origin, these fields move across the island in a northwesterly direction during the summer months and ~~in~~ the opposite direction during ~~the~~ winter months. Their net movement, however, is in a northwesterly direction and they will eventually move into the Laguna Madre. Moving sand and sand fields located in natural areas do not create any problems and their movement across the island is unrestricted. It is only when their movement brings them into contact with developed areas that visitor and maintenance problems arise. Although current problems are limited to <sup>the</sup> Malaquite Campground; Malaquite Pavilion and parking area; beach access points through the foredunes; Bird Island Basin Road, and the Pan Am (oil and gas) Road, encroachment could occur at any location. Whether the movement of sand is a natural phenomenon, or a result of man's actions, the same possibilities for corrective action are available. The sand can be relocated; ~~it can be~~ stabilized; or the facility (road, building, etc) can be relocated. All possibilities have been considered in the past <sup>when undertaking</sup> corrective action. None has proven totally <sup>prior to carrying out</sup>

*denudation is not human*

effective, but the <sup>proper</sup> choice of technique can improve the chances of a satisfactory solution. Research (Dahl, et al., 1975) has provided satisfactory techniques for dune stabilization.

Configuration and movement predictions have also been researched by Price (1965).

## 1.2 Current Management Action

When moving sand has resulted from <sup>human</sup> ~~man~~ related activity, the preference has been given to stabilization, the prerequisite to natural condition reestablishment. At Malaquite Pavilion, sand fencing and sprigging with native vegetation is in progress, so that the preexisting foredune system will be reestablished. Where excess walkways are available, the sand has been allowed to cover the walkway and stabilize <sup>naturally</sup> itself. At the campground, where it is not possible to reestablish preexisting conditions, the sand is moved back to the beach and deposited just north of the campground. Foredune road cuts are managed in the same manner.

Where <sup>natural</sup> migrating sand dunes ~~not resulting from man's activities~~ are encroaching on access roads and facilities, the preference is given to relocating the sand along the line of its natural movement. This is the current action on the Bird Island Road. Sand fencing and sprigging with native grasses is currently being tried in this area with mixed results.

The Pan Am Road has been rerouted in the past, but this action was not effective. The dune field is once <sup>again</sup> ~~more~~ encroaching, and sand fencing has been installed (1984) along the roadside in an effort to halt the sand's movement long enough for it to stabilize with native vegetation. Until a better solution is found, sand fencing and some relocation appear to be the answer.

## 1.3 Legal Authority

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## 2.0 Alternative Actions and Probable Impacts

### 2.1 No Action

No action would imply letting nature take its course regardless of the

cause. At Malaquite this could either mean a continuation of past practice of relocating sand or simply letting the sand cover the facility. Neither of these is economically feasible nor do they offer realistic long term solutions. No action at the campground would result in an unusable facility. The Bird Island and Pan Am roads would close for a few years, open, then close as new dunes moved through the area. The results could deprive the public of access or result in greatly added costs to oil and gas operators.

## 2.2 Continue Current Action

The current action recognizes that establishment of preexisting conditions <sup>where</sup> possible is the better alternative. Where not possible, it accepts that certain costs must be borne in order to continue use of existing facilities.

Where conditions are not man related, it recognizes that some <sup>impact</sup> effects on the natural system must be accepted in order to utilize the area. The effects are mitigated to the maximum extent possible (relocating sand along natural movement lines or back to the beach, sand fencing and sprigging with native grasses) and do result in a higher cost. Relocating roads may be less expensive in costs, but more expensive in resource impacts.

Malaquite Pavilion is scheduled to be replaced in 1986. The accompanying construction activities, together with the demolition and removal of the pavilion, will <sup>denude</sup> ~~devegetate~~ a large area of stabilized dunes. Sand fencing, sprigging, and irrigation procedures will be necessary to prevent moving sand from adversely impacting the new facility.

## 3.0 Recommended Course of Action

### 3.1 Continue Current Management Action

This alternative appears to be more consistent with results of research and past experience.

## 4.0 Requirements to Accomplish Action

### 4.1 Research

Only required where new construction or oil and gas operations are

contemplated.

4.2 Operations

\$15,000 for maintenance and transplantation of stabilizing beach grasses.