

## Dutch Sand Ladder

If you have ever climbed a steep sandhill you can appreciate the difficulty involved. The wasted effort of sliding back every other step, with the sand grains always managing a way into your socks. James F. Milestone of Golden Gate National Recreation Area (CA), shares a new device from the Netherlands which is helping park managers minimize erosion on steep sand trails, while at the same time making it easier for the visitor to ascend the coastal trails.

Ancient sand dunes represent much of the surface soil in the San Francisco Headlands. Beach access trails which annually lead millions of visitors down the steep sandy cliffs to the Pacific Ocean are falling victim to accelerated erosion. People side-stepping the gullied trails trample adjacent coastal plants, thus creating new social trails and bringing further degradation to the eroding hillside.

To remedy this problem, the flexible Dutch Sand Ladder is placed directly on the trail. The visitor uses the wooden rungs of the ladder as steps for ascending and descending. The ladder itself is composed of three elements.

The runners of the ladder are made of flexible 1/4 inch aircraft cable. The rungs of the ladder are 2" diameter tree poles cut into four foot lengths. The rungs are drilled to allow the cable runners to pass through on both ends.

*(Continued on page 15)*



Ranger Jim Milestone and members of Audubon Society walking down sand ladder at Fort Funston.

(Continued from page 13)

Wire clamps are fastened to the cable on the downhill side of each rung to maintain equal stepping distance (16 inches) between each rung.

The 25-foot lengths of ladder are anchored at the uphill end to a 4x4 post which is buried beneath the soil. This allows the maintenance person to periodically lift the ladder from the last rung, shake the drifting sand free, and replace the ladder on the surface.

The Dutch Sand Ladder serves three functions. First, each rung acts as a miniature checkdam to hold loose soil in place. This prevents the conveyor belt effect of visitors pushing sand downslope when walking. Second, this simple, aesthetic, and low profile structure helps to designate the trail as the official route up and down the slope, reducing further trampling of the surrounding vegetation. Third, the wooden rungs provide sure footing, and make ascending sand hills easier for the visitor.

In Golden Gate National Recreation Area, the sand ladder is used on both sandy slopes and on mucky serpentine erosional features. The Dutch Sand Ladder is applicable to a variety of soil types, whether it be volcanic, glacial or decomposed rock. Any foot trail on a steep slope with loose soil can benefit from using the sand ladder.

In the dynamic and fragile environment, park managers must find innovative ways to protect the natural resources from



*Cleaning the ladder.*

damage done by the millions of visitors who frequent the park. The Dutch Sand Ladder may not be a Macy's escalator, but it's the next best means of climbing sandy hills.

For further information, contact James F. Milestone, Golden Gate National Recreation Area, Building 201, Fort Mason, San Francisco, California 94123 (415) 556-8371.