

potential for mechanical damage during a disposal event. The tests at the Scripps Lab were done using hard shell crab, since soft-shell crabs were not available.

Results of the limited testing are inconclusive. In all the tests done, no crabs appeared to be killed or injured by mechanical damage (all crabs removed from the sand mass were alive). The only mortality occurred when they did not dig out of the sand mass. Whether or not this behavior is typical of what occurs in nature is unknown. It seems unlikely, however, that organisms that live in an environment where they are constantly being buried under sand, such as at the mouth of the Columbia River, would have evolved a behavior that would result in their mortality. It seems more likely that the mortality associated with this behavior is an artifact of the testing and that the tests do not accurately represent the conditions that crabs experience in nature.

Crab population levels are affected by a variety of environmental and human factors, including but not limited to: upwelling patterns, onshore currents, wind and commercial fishing. Any of these conditions can have a devastating effect on population numbers in any year. Changes in oceanographic conditions during the larval stage can dramatically reduce survival and the number of adults. While some mortality of crabs could occur during an individual disposal event, only a small percentage of the population present and habitat available at the MCR would be affected by an individual disposal or repetitive disposal events. These mortalities and changes in habitat would be significantly less than mortalities and habitat changes which occur naturally. Additional sampling of both the Deep Water Site and the Shallow Water Site was done in the late spring/early summer and fall of 2002. Preliminary results from these surveys are supportive of the earlier resource assessments (IFR/EIS 1999).

Bathymetric monitoring will be done at and in the vicinity of the proposed Shallow Water site if it is designated. This information will be used by the Corps and EPA to manage placement of dredged material into the site. The proposed Shallow Water site would be located in an area that is dispersive, so while material will accumulate during active disposal, it is expected to be dispersed out of the site by the next dredging season (see also specific criteria 6). Disposal at the proposed Deep Water site will create a permanent mound; however, a mound height restriction and site monitoring and management will preclude interference

with small and large vessel operation. The proposed Deep Water site is primarily within the towboat lane and should receive very limited commercial or recreational fishing use.

Dungeness crab are widely distributed throughout the nearshore area and fishing occurs in most areas north and south of the Columbia River mouth and out into deep ocean water (300+ feet). Throughout the site selection process, the crab fishermen identified specific areas that produce more income for their crab fishing effort. While these areas may not represent the cross-section of all fishermen operating out of the Columbia River, these identified areas were avoided to the extent practicable in the EPA's configuration of the proposed sites.

Mineral Extraction. There are known metallic mineral deposits in the area, principally black sands. While commercial extraction has been proposed and attempted in the past there are no known current proposals to mine offshore. There have been no exploratory wells drilled offshore near the mouth of the Columbia River. Clear conflicts with navigation and endangered species make it unlikely that production facilities would be permitted near the river's mouth or at any proposed site.

Desalination. There are no desalination plants in the area of the mouth of the Columbia River.

Fish and Shellfish Culture. There are no fish or shellfish culture operations in the area of the mouth of the Columbia River that would be affected by disposal of dredged material at any of the proposed sites.

Shipping and Other Legitimate Uses. Conflicts with commercial navigation traffic have been reported at the four 102/103 sites. In the past, disposal operations at Site F, where there was the greatest potential for conflict, were closely coordinated with the bar pilots. Similar coordination is expected to occur if the Deep Water site is used. The proposed Deep Water site is located in the towboat lanes and offshore of the Columbia Bar Pilots' exchange point. The potential for conflict with dredges and tug and barges transiting to the site are recognized but can be managed through coordination with the pilots, the Coast Guard, and others. While commercial navigation traffic is not an issue for the proposed Shallow Water site, placement at the site would be managed to avoid the creation of potential adverse wave impacts resulting from disposal operations, which could affect smaller boats transiting through the area. The proposed site would be located in an

area immediately adjacent to an area that is subject to shoaling and breaking waves. Navigation in this area is known to be hazardous at all times based on natural conditions. Management at the proposed site would be focussed on not worsening the conditions at this naturally hazardous area.

Special Scientific Importance. There are no known transects or other scientific study locations that would be impacted by disposal at any proposed site.

9. The Existing Water Quality and Ecology of the Site as Determined by Available Data or by Trend Assessment or Baseline Survey

Water and sediment quality analyses conducted in the study area and experience with past disposals in this region have not identified any adverse water quality impacts from ocean disposal of dredged material. The ecology of the nearshore and offshore areas is a Northeast Pacific mobile sand community. Neither the pelagic (mobile) or benthic (non-mobile) communities should sustain irreparable harm due to their widespread occurrence off the Oregon and Washington coasts.

10. Potentiality for the Development or Recruitment of Nuisance Species in the Disposal Site

Nuisance species are considered to be any undesirable organism not previously existing at the disposal site. They are either transported to or recruited to the site because the disposal of dredged material creates an environment where they can establish. It is highly unlikely that any nuisance species could be established at the proposed Shallow Water site given the dynamic energy at the site which is expected to discourage the establishment of species not currently adapted to high-energy conditions. Habitat conditions are expected to change somewhat at the proposed Deep Water site because it is expected that disposal of coarser materials will impact limited sections of the benthic communities currently established at the site. While it can be expected that organisms will become established at the site which were not there previously, it is unlikely that this new community would be regarded as a nuisance, or "undesirable," community.

11. Existence at or in Close Proximity to the Site of any Significant Natural or Cultural Features of Historical Significance

Due to the proximity of the proposed Shallow Water site to the Columbia River channel, the cultural resource that