

Marine Debris Monitoring

Editor's Note: This is the first of several articles on the marine debris monitoring program. The next will summarize the results of the first year of study.

By Nicholas J. Chura

Of growing national concern is the increased abundance of marine debris, particularly plastic debris, being found at sea and littering beaches. When discarded at sea, various forms of plastic can not only entangle and kill marine life, but also disable ships and degrade beaches.

The National Marine Fisheries Service (NMFS) has conducted a long term study on Alaska beaches since 1972, primarily to monitor derelict fishing gear and entangling debris. Elsewhere along our nation's shorelines, where data on the types and volumes of debris are generated largely from voluntary beach cleanup efforts, beach litter has been perceived as more of an aesthetic and/or health problem. While useful for media and public education purposes, the data collected during these cleanups are, for the most part inadequate for scientifically assessing the overall problem or for developing solutions. Proper quantitative data are needed for this purpose, ideally from each region of the country, to take into account various sources and effects of debris, which differ from area to area.

Survey One Year Old

In this regard, as fiscal year 1989 came to a close last September, so did the first year of the National Marine Debris Survey and Monitoring Program. This is a major five year effort to learn more about the amounts and kinds of materials littering our nation's beaches and to evaluate the long term trend in ocean pollution. It is being conducted under an interagency agreement, signed in August 1988, between the NPS and NMFS.

The agreement obligates NMFS to provide (1) on-site training in survey methods, (2) funds not to exceed a specified amount each year to cover expenditures incurred by the NPS to complete identified tasks, and (3) review and approval for release of NPS annual reports on the results and findings of the surveys conducted each year.

NPS in turn will (1) provide coastal study sites with a minimum of 5 kilometers of accessible shoreline not subject to cleaning; (2) assign permanent employees to be responsible for the surveys at each location; (3) have these employees attend on-site training on methodology prior to beginning the required quarterly surveys; and (4) compile, analyze, and report survey results in an approved format, for each site within four months of the end of each fiscal year.

Jim Coe is designated the Contracting Officer's technical representative for NMFS. Scott Johnson is his alternate. Al Greene and Nick Chura are the NPS Project Officers. The agreement expires Jan. 1, 1994 unless amended or renewed.

Two parks in each of four geographical regions designated by NMFS were chosen as study sites. These are Olympic and Channel Islands NPs (West Coast), Padre Island and Gulf Islands NSs (Gulf Coast), Canaveral and Cape Hatteras NSs (South Atlantic Coast), and Assateague Island and Cape Cod NSs (North Atlantic Coast.)

Training Sessions Held

Scott Johnson, headquartered at Auke Bay, AK, conducted training sessions for personnel at various

coastal parks in the program, focusing on the survey methods to be used. The methods are the same for all beaches. A minimum of five 1-km sections of accessible shoreline are utilized. These sections are not subject to cleaning, have minimal visitor impact, contain representative oceanic debris, have uniform substrate and topography. The designated survey area is from the water's edge to the seaward extent of vegetation. Debris visible from walking height is counted, and when possible, debris is removed from the beach or marked at the end of each survey.

The first two quarterly surveys served as a shake-down period, whereby survey personnel became acquainted with sampling procedures and learned of possible problems. In general, the surveys appeared to be more time consuming and required more manpower than anticipated. Also, costs for conducting the surveys, processing the data, etc., seemed to run higher than what was being made available by NMFS.

A noteworthy early problem occurred at Padre Island, where the amount of debris deposited on beaches far exceeds that of any of the other parks in the study. Here, it was quickly determined that surveying marine debris deposition along the entire length of each of the five 1-km transects was simply not feasible. Because of this, the transects have to be surveyed on the basis of statistically representative subsamples (100 meters in length).

Pre-Survey Workshop Held

Other questions raised as a result of these first surveys concerned modification of the NMFS data collection form; data processing, tabulation, and analysis; reporting requirements, and related subjects. These were recognized as needing resolution in a group setting. As a result, a workshop was held in Washington, DC in June 1989, attended by representatives of the eight parks, a rep from NPFS, and two Washington Office (WASO) people.

The first day of the workshop featured presentation of a summary report on program activities to date by each park rep, allowing the reps to gain familiarity with one another's work and to identify unique and common problems. The next two days were spent developing protocols needed to foster standardization of procedures for all eight parks. Small (2-3 member) committees (1) drafted material on assigned subjects, (2) presented their material to the other workshop participants for discussion and assistance, (3) made changes in or additions to the draft material based on comments received, and (4) arrived at group concurrence on the developed material.

Then guidelines for handling, analyzing, and presenting data were prepared by Andy Cole (CAHA), David Manski (CACO), and Tim Morgan (CANA), instructions on the format and content of the annual park report and the annual NPS report to NMFS were prepared by Gail Bishop (GUIS), Jennifer Bjork (PAIS), and Dan Richards (CHIS), and modified data collection forms with a set of definitions of terms were developed by Chuck Janda (OLYM), and Jack Kumer (ASSA).

Ted Merrell, although retired, represented NMFS at the workshop and shared his knowledge and experience. Ted is credited with initiating the marine debris surveys of beaches in Alaska and has several scientific papers published on the subject. Through his efforts others came to realize the extent of the marine debris problem, and it is upon his work that our marine debris survey and monitoring methodology is based.

Continued on page 21

Official Approval Given

Ted hand-carried a copy of the modified NMFS data collection form back to Alaska, where it was officially approved by NMFS officials, clearing the way for a final format to be put to immediate use in the parks. (The original NMFS form was based on the kinds of debris found on Alaskan beaches and was not fully applicable to the kinds of debris found elsewhere along the U.S. coastline.) The definitions developed for the modified form help clarify the meaning of the items listed and prevent their misinterpretation.

Thanks to the efforts of Andy Cole, all the data generated by the surveys can be stored and processed at North Carolina State University, where the Department of Recreation Resources Administration in the College of Forest Resources has agreed to serve as central storage and retrieval location. For a nominal fee the University will accept, enter, and store the data collected quarterly from the eight parks and produce the tabulations, analyses, and graphs:charts required for the annual reports.

Instructions drafted on the form and substance of the annual park reports and the annual NPS report to NMFS will help insure that information from the various parks is presented in a similar and compatible manner. With all the annual park reports in hand at the end of the calendar year, a mini-workshop was held to help prepare the NPS annual report to NMFS, due Feb. 1, 1990.

Getting everyone on the same wave length, so to speak, was accomplished primarily through the workshop. If turnover of park personnel is not too great, if the parks continue to commit resources to the program, and if WASO helps to ease the financial burden on the parks, then the remaining four years of work should go smoothly. The obvious dedication of field personnel involved has carried the program through a successful first gear of a long term program of national significance.

Chura is a biologist with the NPS Wildlife and Vegetation Division, WASO.