

Spotlight On A Region

Science in the North Atlantic Region

The science program was established with the inception of the North Atlantic Region in 1974 as the Office of Scientific Studies. From a one-man operation (P.A. Buckley) it has grown to include a deputy chief (and limnologist, Michael Soukup), an air quality specialist (Mary K. Foley), research biologist (John Portnoy), a coastal geomorphologist (James R. Allen), a water resources specialist (Nora Mitchell), an environmental protection assistant (Barbara Dorn), and a computer trainee (Elba Rivera). It now includes a growing water resources program as well.

Although we have several cooperative agreements with local universities, we have no NARO scientific staff stationed at CRUs; except for John Portnoy, (duty-stationed at Cape Cod NS) there are no scientists stationed at NAR parks. Consequently, we serve our parks directly from the regional office. To keep in close touch with our parks, as well as to maintain credibility with our academic colleagues, NARO scientists maintain small but active research programs in NARO parks. They also are active in their own professional scientific organizations, and publish in their disciplines' primary scientific literature on a regular basis. Since 1974 many areas of management concern have been addressed by the Office of Scientific Studies.

Our most extensive series of studies has been associated with evaluation of off-road vehicle (ORV) impacts in the Coastal ecosystem. Culminating in a 13-volume treatise with a management overview (by Drs. Paul Godfrey and Steve Leatherman, UMass/NPS/CRU), the results quantify the effect of various levels of ORV traffic in such habitats as the *Amphiphila* (beach grass)/dune system, the salt marsh intertidal mudflat/sand flat, etc. These results were the foundation for the recently adopted regulations excluding ORVs from among areas previously open within Cape Cod National Seashore. Monitoring of ecologic recovery following ORV trail closure is now underway.

Colonial Waterbird Management, the specialty of

Dr. Buckley, has been an area of active research along the Northeast coastline. Many of the results have been incorporated into the *Guidelines for the Protection and Management of Colonial Nesting Waterbirds* (by P.A. and Francine Buckley) which has been adopted as USFWS policy and is in its 4th printing. This work has filled a surprisingly wide need and stimulated worldwide reprint requests. Detailed annual helicopter censuses of colonial waterbirds populations at Gateway NRA and Fire Island NS, when integrated with similar data for the entirety of Long Island, have resulted in active management programs at both parks relating to these animals. Basic information on their biology, especially on colony site utilization patterns (including development of a new statistic for site-use trends also has resulted from the Buckleys' work. It was this research that pinpointed the danger confronting North American roseate terns; their regression models predict extirpation by about the year 2000, given present conditions.

Water-related problems within the region generally are approached from a classic limnological perspective. Characterization by locals of the kettle ponds of Cape Cod NS as public health hazards has been disproven by the UMass CRU and by our limnologist Dr. Soukup.

One major project nearing completion is a mathematical model of groundwater/lake interactions combined with phosphorus and nitrogen budgets for Gull Pond; the biogeochemical impact of use of this seepage kettle by large populations of gull species also is being quantified. Soukup has furnished the research basis for the Service's first Water Resource Management Plan with full environmental compliance documentation and public involvement. "The Analysis of Water Resource Management Alternatives - for Cape Cod NS," with our water resource specialist, Nora Mitchell, as senior author, is now undergoing public review. It addresses critical problems such as water supply deficits in abutting towns, pond eutrophication, and mosquito control impacts. Other re-

gional problems such as avian botulism (at Gateway NRA), benthos population surveys at Jamaica Bay, landfill impacts at several parks, deer impacts at Acadia NP, impacts from municipal wells and mosquito ditching also are under study, and additional Water Resource management plans now are in progress.

Dr. Allen, our new (and NPS's only) coastal geomorphologist was active in NAR coastal research during his previous tenure in academia. He was involved in the intensive coastal geomorphic study of Sandy Hook (Gateway NRA) by the Rutgers CRU that has generated more than 20 professional articles. He developed an analytical computer model of spit dynamics that has evolved into a predictive tool for use in management strategy evaluation. Such an evaluation was needed to cope with the critical beach erosion at the end of a seawall which terminates just inside the park boundary. The model predicts that Sandy Hook will become an island if a remedy is not forthcoming soon. Congress, fearing another "Cape Hatteras" situation, has not yet made appropriations to deal with the problem. Jim continues to monitor the dynamics of the beaches at Sandy Hook and is expanding this program to include both short- and long-term changes at all of the recreational beaches in the region, especially where structures are involved.

Currently, our office is involved in the Interagency team (along with US Army Corps of Engineer, US Fish and Wildlife Service, National Marine Fisheries, and EPA) effort "Reformulation Study of Beach Erosion Control and Hurricane Protection on the South Shore of Long Island" (wherein Fire Island NS comprises a major component in the barrier system). Jim is a project officer on the research contracts for metric mapping, aeolian sediment budget, and geologic analysis, all funded by the Corps of Engineers. This scientific study represents a major effort to conclusively evaluate a barrier system in its totality with regard to coastal management and was promulgated by our conflict (and CEQ referral) with the original U.S. Army Corps of Engineer plan for the area.

Air quality has been, not unexpectedly, an issue here in the northeast, especially at Acadia NP - the Region's only Class I area. Proposals for new major emitting facilities and the numerous coal conversions require modeling critiques and constant vigilance to determine possible resource impacts. An extensive climatological investigation of air pollution episodes is being conducted by Mary K. Foley (the Service's first

strategies and tactics to prevent populations from increasing to levels that threaten management goals. These strategies are based on understanding of forest ecosystems and the role of parasites, predators, and climate in controlling the pests naturally.

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A Regional Resource Center, manned by a professional librarian with experience in setting up and operating library facilities is now in place in the Pacific Northwest Regional headquarters, Seattle. Ellen Traxel, librarian, is setting up the Center and will be in charge of film lending, an archival slide and black and white photo file, and the library of science reports and general background material from the individual divisions and branches. The former HCRS people who have joined the PNR have brought with them technical assistance resources that will be added to the Center's store of materials.

Eventually, computer connections with libraries all over the country are planned. Meanwhile, Ellen is

Regional air quality specialist) at Acadia. Fire history research, including paleoclimatological studies at Cape Cod National Seashore and Acadia NP will aid the preparation of the first Fire Management Plans in the North Atlantic Region.

As a means of accommodating regional research projects, the Atlantic Coastal Laboratory (ACL) was carved out of several abandoned Cape Cod buildings, with the help and support of the UMass researchers and the Cape Cod National Seashore staff. Championed by Paul Godfrey, a WAE research biologist attached to Washington, the old MITRE corporation buildings have become a functional support entity within the regional science program. This year it also has become a NADP acid rain monitoring site. One of the heaviest users of the laboratory (along with researchers from UMass, Williams College, Tufts, Yale, Boston University) has been our Cultural Resources Division for their massive and pioneering, scientific approach to archeological surveying at Cape Cod.

Utilizing Denver Service Center's Remote Sensing Team, we are providing up-to-date vegetation mapping as the basis for the fire management plans at Acadia, Cape Cod and Minute Man National Historical Park, as well as other resource management work. One current example of the latter is an investigation by Buckley, Soukup, and Portnoy of 20 years of change in vegetation at Cape Cod, capitalizing on an earlier vegetation map produced during the inception of the Seashore. The Denver Service Center Team's computerized mapping capabilities are being used to determine successional rates for selected populations as well as to sort out induced acceleration in those rates associated with the practice of mosquito ditching.

Routine participation by the Office of Scientific Studies in such varied projects as the Plan for a Pine Barrens Natural Reserve and the Fire Island Master Plan, and environmental documents continues and ensures management the benefit of scientific input to its planning and management strategems.

We will expand on some of these projects in later issues but in the meantime we welcome any questions, discussions, and opportunities for coordination on the above projects in any areas of mutual interest across the Service.

This report was submitted by Mike Soukup. Park Science welcomes such regionwide science round-ups.