The following article is an update to the New Products feature in our summer 2000 newsletter.

Update on New Tiny Solar Powered PTT

by Ken Meyer, Director, Avian Research and Conservation Institute

In 1996, Avian Research and Conservation Institute of Gainesville, Florida, began using Microwave Telemetry's 20 gram battery-powered satellite transmitters to study the long distance migration of the U.S. population of Swallow-tailed Kites, about which virtually nothing was known. Data collected through 1999 described a narrow corridor ending in a small, well-defined winter range in southwestern Brazil. The work also illuminated critical points along the route and helped identify the privately owned ranchlands where the wintering kites concentrate in spectacularly large communal roosts. The finite battery life of these transmitters, however, limited the number and frequency of detections and the range of questions that could be addressed. Solar powered transmitters could solve this problem, but up to now, the smallest available units exceeded the weight limit for Swallow-tailed Kites.

The accompanying map was produced by The Audubon Society of Florida's Center for Birds of Prey as part of a website that can be viewed at adoptabird.org/kitesite. We thank the Center for allowing us to use their map.

In May 2000, project director Ken Meyer and his team deployed a small number of Microwave Telemetry's prototype solar powered, 20 gram satellite transmitters on Swallow-tailed Kites in Florida and Georgia. Although these radios are the same weight as the battery powered transmitters, they are capable of providing essentially continuous data (although the duty cycle was limited to ten hours on/twenty hours off to reduce the costs of data processing by Service ARGOS, Inc.). The solar powered units also can transmit a stronger signal than the battery powered model. Meyer hoped that the greater signal strength and more frequent transmissions might overcome a data-processing problem that developed in recent years. As the birds moved farther into South America, radio interference of undetermined origin greatly limited the number of reliable locations. The lengthening intervals between fixes seemed to exacerbate the problem, gradually resulting in the loss of all contact with the study birds. Would the stronger, more frequent signals from the solar powered transmitters improve this performance?

Apparently so. This map shows the progress of an adult Swallow-tailed Kite tagged near its nest in central Florida. Its migration route is a near-perfect fit with a composite of those determined for previously tagged Swallow-tailed Kites. The difference is that the data are much more numerous than for any bird carrying a battery powered transmitter, allowing for much finer descriptions of timing, movements and habitat use. This is especially helpful for the places where the bird crossed large expanses of water or mountains, or passed through sites where large aggregations of migrating and wintering kites have been previously documented. And of course, it is very exciting to anticipate what this bird will teach us about its movements during the winter, its northbound route in the spring and its breeding destination in the U.S. —not only for this year, but potentially for years to come. Information from the battery powered transmitters could not even begin to hint at the answers to these questions. Although the cost of data acquisition is always a concern with solar powered satellite transmitters, the ability to limit transmissions by programming an appropriate duty cycle makes these radios no more expensive to use than battery powered transmitters. Of course, they will operate far longer than battery powered transmitters, so expenses will accrue over time. The advantages of such long-term data for individual birds, however, obviously can be well worth the cost. ❖