

# Microwave Telemetry, Inc.



## It's Our Anniversary!

Celebrating Ten Years  
1991-2001



### *Dear Customers and Friends,*

*Next year will be a special one for us as we celebrate our tenth anniversary. We would like to thank you all for your support over the years. It has truly been a privilege to work closely with you all and help bring success to your projects. We are honored to have been part of the revolution in satellite telemetry throughout the last ten years. The many discoveries you have made using our equipment are very encouraging.*

*We especially thank Mark Martell, Charles Henny, Pete Nye and Mathew Solensky for their article on the migration of North American Ospreys. We would also like to thank Ken Meyer for his update of the new tiny solar powered PTT and Rob Paswaters for sharing with us his experience in working with school children while tracking Herons.*

*We invite you to celebrate with us throughout 2001. In the spring, we will award two scholarships to graduating students bound for university and planning to major in Biology (see pg. 6). In the summer, we would like to support a joint project with school children by donating free transmitters (see pg. 2). In addition to the free PTT given to the winner of our photo contest, we will close the year with a drawing for one of our ARGOS/GPS units and one of the new tiny solar PTTs. You will all be invited to an open house and holiday party in December. Details will be published in our summer 2001 newsletter.*

*We wish you the best in 2001 and look forward to continuing to work with you. Be sure to look us up on the web at [www.microwavetelemetry.com](http://www.microwavetelemetry.com) after January 1.*

*Sincerely,*

*Paul and the staff at MTI*

## New Products

### New Versions of the Archival Pop-Up Tag for Fish

Our latest version of the Archival Pop-Up Tag now incorporates a pressure sensor. Standard versions of this improved tag will record a pressure reading every hour along with the temperature measurements. The SiV™ (Satellite in View) option pioneered on our bird PTTs has also been incorporated to enhance the data collection.

The tag is now rated to withstand 3000 psi (6500 ft or 2000 m) and a pressure initiated pop-off will soon be an option, allowing the tag to pop off and start transmitting if it descends below a predetermined depth or is at the surface for over a predetermined time.

A special short term, high sample rate version of the software is now also available. This version is suitable for studies of less than a month, and would be particularly good for mortality studies. ❖



*Archival Pop-Up PTT*

## Free Transmitters

Over the last ten years, we have had the pleasure of working with several researchers who carried out projects involving school children. Most recently we were proud to sponsor Neptune Middle School in Florida where the students deployed three PTTs on Blue Herons last April. We have also sponsored children in Israel tracking birds migrating through their homeland. Are you involved with your local middle or high school and wish to involve the students in bird tracking?

As part of our tenth year anniversary celebration, we would like to donate a couple of transmitters for you to carry out a project involving school children.

Email us at [microwt@aol.com](mailto:microwt@aol.com) for a copy of the rules and an application form. The deadline for application is March 29, 2001. The winner will be announced in the spring newsletter.



Photos courtesy of Rob Paswaters

## Middle School Students Have a Successful Learning Experience

by Rob Paswaters, Science Resource Specialist, Osceola County, Florida

In 1996, my students and I began to study a wading bird breeding colony in Central Florida. For three years, the students, with the aid of Audubon volunteers, became experts in bird speciation and behavior. They conducted detailed species counts each year and came to love and appreciate the birds they studied. In 1998 we decided to embark on a mission to track immature Great Blue Herons. I began to call environmental groups and scientists asking how this dream could become a reality. I was overwhelmed at how eager each contact was to offer support in terms of expertise, time, equipment and advice. I eventually came into contact with two incredible individuals who offered to help with the capture and banding of the birds – Mary Platter-Rieger a Navy biologist and Bill Everett a Master Bander with the Endangered Species Recovery Council.

With all of the expertise in place, there was still one vital piece of the puzzle missing. We needed to obtain high quality telemetry equipment with which to track the birds. In all of my contacts, one name kept coming up—Microwave Telemetry, Inc. I called Microwave Telemetry and the dream became a reality. They embraced the project with enthusiasm and donated high quality satellite transmitters. Microwave Telemetry then assisted us in obtaining a lease with the ARGOS satellite.

On May 7, 1999, students, volunteers and scientists gathered in this breeding colony at Gatorland of Central Florida. By the end of the day four Great Blue Herons had been captured and fitted with wing tags. Three of these birds were also fitted with satellite transmitters. The entire experience was a complete success and a learning experience that not one

of us will ever forget. Now Microwave Telemetry wants to replicate this experience and give other students the same wonderful opportunity for field research and learning. ❖



*"The entire experience was a complete success and a learning experience that not one of us will ever forget."*



Second in a series of *Feature Articles*

(Printed with permission)

## Migration Strategies and Wintering Areas of North American Ospreys as Revealed by Satellite Telemetry

Mark Martell<sup>1</sup>, Charles Henny<sup>2</sup>, Pete Nye<sup>3</sup>, and Mathew Solensky<sup>1</sup><sup>1</sup>The Raptor Center at the University of Minnesota, 1920 Fitch Avenue, St. Paul, MN 55108 USA,<sup>2</sup>USGS-Forest & Rangeland Ecosystem Science Center, 3200 SW Jefferson Way, Corvallis, OR 97331 USA<sup>3</sup>NYDEC, Wildlife Research Center, Delmar, NY 12054 USA

Since 1995 we have trapped and tagged 110 Ospreys (*Pandion haliaetus*) from 12 study sites in 8 states (Fig. 1). This total includes 71 females, 32 males and 7 juveniles. Our study areas encompass the major Osprey population concentrations found in the United States including the Western States, the Great Lakes region and the Eastern Seaboard.

Tagging of nesting pairs along with three complete family groups revealed that departure times from nesting areas varied by gender; with females leaving before the juveniles and the males departing last. Neither nesting pairs, nor families, migrated or wintered together (Fig. 2). Departure dates from the breeding areas ranged from 12 July to 1 October. Migration routes differed between populations but not gender (Fig. 3). Western Ospreys migrated through California and to a lesser degree other western states and then into Mexico. Minnesota Ospreys migrated along three routes; 1) through the central U.S. and then along the east coast of Mexico, 2) along the Mississippi River then across the Gulf of Mexico, or 3) through the Southeastern U.S., then across the Caribbean. East Coast birds migrated along the Eastern Seaboard of the U.S. through Florida and across the Caribbean.

North American Ospreys winter from the southern United States south through Central and most of South America (Fig. 4, see page 4). Western nesting Ospreys wintered in Mexico (88 percent), El Salvador (6 percent), and Honduras (6 percent). Midwestern birds wintered from Mexico south to Bolivia, while East Coast birds wintered from Cuba to as far south as Brazil. Western birds traveled a shorter distance than either midwest or eastern Ospreys. Females traveled further than males from the same population, which resulted in females typically wintering south of the males. Ospreys remained on the same wintering area for about 168 days until



Figure 1. Study areas where Ospreys were trapped and fitted with satellite telemetry units.



North American Osprey tagged with a 30 gram PTT.



Figure 2. Fall movements and wintering sites of Ospreys from a 1999 nest in Minnesota. Male (blue triangle) wintered in southern Mexico, female (red circle) wintered in Venezuela, and juveniles (blue and green square), both of whom crossed the Gulf of Mexico, wintered in Panama and Colombia.



Figure 3. Fall migration routes of Ospreys from three areas of North America.

## Useful Tips

### Finding a lost PTT—Part 2

In our last newsletter I described some of the techniques that can be used to find a lost PTT. This time I would like to describe in a little more detail a technique that has been successfully used to find lost PTTs using a simple scanner receiver such as the Radio Shack Pro-75.

First of all, one must know roughly where the PTT is (from averaging whatever locations given by ARGOS) and when it is going to transmit, using the transmission times recorded by ARGOS (remember they are in GMT) and the duty cycle of the PTT.

Program two channels of the scanner to 401.650 MHz and go to the location calculated by ARGOS at the beginning of the ON part of the duty cycle. With luck you should hear the PTT transmit about once every 60 to 70 seconds; each transmission will sound like a short burst of data lasting less than a second. If you do not hear the PTT either you are too far away from the PTT or you are too early to hear it, i.e., the ON part of the duty cycle has not started. So either move to a new location or wait until later. Once you can hear the PTT then you can start to search for it.

Once you hear the PTT, remove the scanner antenna. Do you still hear it? If so, you are already close. From this point walk to points 50 meters North, South, East, and West from the start point, and listen for the PTT at each

location. Do you hear the transmissions? If you hear it at each of the four points extend the legs to 100m and try again. The aim is to determine which quadrant the PTT is in relative to the start point. Once you have determined this then set up a 100m grid of points in that quadrant and repeat the process, mapping on a sheet of graph paper where the PTT can be heard. Although it is laborious, because the PTT transmits so infrequently, a pattern should become apparent.

As you narrow down the search area you will have to reduce the sensitivity of the scanner. There are three tricks to use:

1. remove the antenna,
2. off tune the scanner “say” 20KHz,
3. replace the antenna with a 50ohm BNC terminator (available at Radio Shack or a computer store).

As you get closer reduce the search grid to “say” 25m, listening 10m from each point. When you get very close you can hopefully find the PTT by simply looking for it.

If you have concerns that you may need to look for a PTT in the future it might be a good idea to practice finding one before you deploy it, and at least get to know what the signal sounds like on a receiver.

I hope you don't need to use this technique!  
Paul

*Continued from page 3: Wintering Strategies—North American Ospreys*

they departed in spring for their nesting grounds.

Departure from the wintering grounds occurred between 25 February and 7 April. Eastern birds had the earliest departure dates we recorded as well as the earliest median date of any group. All East Coast birds left before the Midwest or West Coast birds began their northern migration. Ospreys followed the same routes north in spring as they took south in fall.

We conclude that Ospreys utilize either a “sprint” or “marathon” strategy on migration which is determined by the distance they travel to their wintering ground and the suitability of the habitat through which they migrate.



*Figure 4. Wintering areas of Ospreys tracked by satellite telemetry. Females (triangles) generally winter south of males (circles). Birds from the West (green), Midwest (blue), and East (red), show some overlap, but western birds are found in Mexico and Central America, while eastern birds use eastern South America and the Caribbean. Midwestern birds overlap with both the western and eastern populations.*

Our current efforts focus on the migration patterns of Atlantic Coast Ospreys from Maine to Florida. We are looking at the effect that nesting at different latitudes has on migration. The movement of Ospreys in and out of Florida is beginning to reveal interesting results and will be studied over the next few years.

This project has received the cooperation and support of numerous individuals and organizations including: Mike Scheibel, Kathy Clark, Rob Bierregard, Pam Robinson, Brian Mealy, Mike McMillian, and Mark Westall. The Nature Conservancy-Wings, Canon USA, the Wetlands Institute, TNC-Mashomack Preserve, Doug Dayton and Wallace Dayton have all provided valuable support. ❖

### Customer Alert!

It is crucial that when you give us your ARGOS ID numbers to program into your transmitters, you ensure that you are giving us valid IDs. (That is, the numbers are still assigned to your program and in active mode—not in backup mode!) This is important as problems with the IDs can stall production for days and will definitely delay delivery.

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.

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



*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](http://adoptabird.org/kitesite). We thank the Center for allowing us to use their map.*

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. ❖

# New to Our Staff



**G**lenn joined us at the beginning of the year as a product development engineer to help with all mechanical projects and with finishing the transmitters.

Glenn and his wife Gerry relocated to Maryland from Silicon Valley. They made a conscious decision to get out of the rat race of large research corporations and were attracted to Maryland by the quality of life and job opportunities.

## Scholarship Awards



As part of our celebration for our tenth anniversary, we are offering two \$500 scholarships.

Do you know of a deserving high school student, graduating in 2001, who plans to major in Biology or Wildlife Management and who is involved in community service? If so, please email us at [microwt@aol.com](mailto:microwt@aol.com) for an application form and a copy of the rules. An independent panel of researchers will choose the winners who will be featured in our summer 2001 newsletter. All applications must be postmarked by March 29, 2001.



In his spare time, Glenn builds and flies model airplanes. He also enjoys gardening—especially cultivating unusual varieties of hot peppers (he always employs environmentally friendly gardening methods).

A cat named Toto is an important part of Glenn's life. He describes Toto as a California surfer-cat—because of Toto's appearance, not his recreational habits. Toto was orphaned at three days old and Glenn and Gerry hand raised him and his litter mates. Glenn confides that he has many Toto stories.

### Microwave Telemetry, Inc.

8835 Columbia 100 Parkway  
Suites K & L  
Columbia, MD 21045, USA

phone numbers—

(410) 715-5292

(410) 715-5293

fax number—

(410) 715-5295



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After January 1, visit us on the web at  
[www.microwavetelemetry.com](http://www.microwavetelemetry.com)