

# Tracker News



## Microwave Telemetry, Inc.

## Small Solutions to Big Mysteries

Dear Customers and Friends,

When we started this company in 1991, it was inconceivable to us that we would one day have a 5g PTT. I once said that it becomes ever harder to reduce the size and weight of devices as we get closer to the Holy Grail of a unit that weighs nothing and lasts forever! With much anticipation and excitement, we took a giant leap forward in January when Jim Fraser and Jonathan Cohen of Virginia Tech deployed our first prototype 5g PTTs on Red Knots. We thank them for their collaboration and for giving us a glimpse of the future.

This issue of Tracker News brings you an overview of three other outstanding projects, each using our smallest PTTs. The Spanish Montagu's Harriers carry our tiny 9.5g solar PTTs from Spain to western Africa. We thank Rubén Limiñana, Alvaro Soutullo, Vicente Urios and Miguel Gallardo for taking us on this 3000 km journey.

Next, we travel on the wings of the Saker Falcons, carrying our 22g solar Argos/GPS PTTs, from Ukraine and Hungary, south through Europe and across the Mediterranean to Sicily and Libya respectively. Thank you Mátyás Prommer and János Bagyura; you showed us that accurate GPS locations can be obtained despite the high level of radio interference in southern Europe.

Although these journeys are amazing in their own right, the epic migration of the Bar-tailed Godwit, told by Lee Tibbits, Bob Gill, Nils Warnock and Phil Battley, is truly unique. It has taken many years to perfect the tiny 26g implantable PTTs used in this project. We would like to thank Bob Gill and Dan Mulcahy of the Alaska Science Center for their patience; we believe the wait was worthwhile!

Last but not least, we are grateful to Bernd and Christiane Meyburg, and Adrian Aebischer for updates on their longest running PTTs. We also share Mimi Kessler's enthusiasm as she updates us on her project with school children in Mongolia.

As this year comes to an end, allow me to thank you, our customers, for the amazing results that your projects yield. We share your enthusiasm and excitement when our PTTs become small solutions to big mysteries!

We wish you happiness, health and joy in 2008.  
Sincerely,  
Paul and the staff at MTI



Photo by Brian Gerber

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Above:  
Red knot with 5g PTT.

# Initial Deployment Tests of Tiny PTTs on the Red Knot (*Calidris canutus rufa*)

Jonathan B. Cohen, Sarah M. Karpanty, and James D. Fraser, Virginia Tech Department of Fisheries and Wildlife Sciences, Blacksburg, Virginia, USA; and Barry M. Truitt, The Nature Conservancy, Virginia Coast Reserve, Nassawadox, Virginia, USA

The Western Atlantic population of the red knot (*Calidris canutus rufa*) has declined by 67-88% since the 1980's. This subspecies undertakes a phenomenal annual migration from wintering grounds in Tierra Del Fuego, Argentina, to breeding grounds in the Arctic and sub-Arctic tundra. Most of the journey is believed to be accomplished in long stretches, including a nonstop journey of over 3,000 miles from the north coast of Brazil to Delaware Bay in the United States, where at least half of the known population stops to refuel by gorging on abundant horseshoe crab (*Limulus polyphemus*) eggs.

There currently is no research linking specific breeding populations to specific stopover popula-



Photo by Brian Gerber

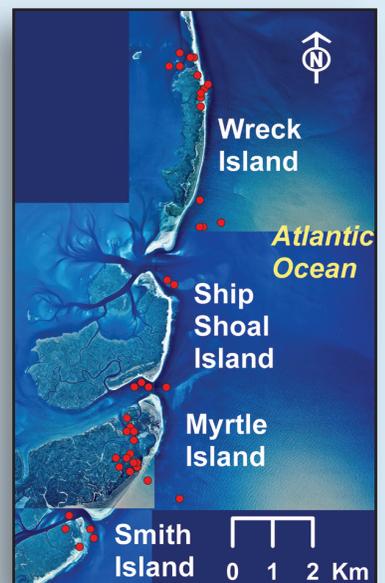
Red Knot outfitted with raised height prototype tiny PTT.

tions, and little information on ecology at alternate stopover sites and food sources outside of the Delaware Bay. Coastal Virginia, for instance, hosts nearly 6,000 migrating red knots each year, but the relationship

of birds stopping in Virginia to birds stopping in the Delaware Bay is poorly understood. Microwave Telemetry provided researchers at Virginia Tech and The Nature Conservancy's Virginia Coast Reserve with an opportunity to fill in these information gaps by tracking red knots throughout their annual cycle. To do this required a PTT light enough in weight that red knots could carry it safely and with a height that keeps the solar cells above the feathers, and a durable attachment method that nevertheless allows for the substantial weight changes the red knot undergoes during migration. In our first field trial, we attached four prototype Microwave Telemetry PTTs to four red knots wintering in Florida in January 2007, using a leg loop harness that held the transmitter just anterior to the tail. This attachment method had been successfully used on sora rails. These prototype PTTs ranged in weight from 5.2 to 6.6 grams. We expected these birds to begin migrating in mid April, and we intended to track their winter movements until that time, then to learn their migratory stopover and breeding sites. Unfortunately, we encountered two problems. The first was that the transmitter height was apparently too low, presumably leading to feathers preened over the solar panel. As a result, the batteries were at approximately 50-67% of full charge at the start of each transmission cycle, and the starting charge dropped with successive cycles. We lost track of all four birds between 1-26 days. The second problem was slipping of the leg loop harness, as it seems at least one bird freed itself from one side of the attachment. This resulted in the transmitter hanging from one flank with the antenna trailing on the ground or in the water, and very slow recharging of the battery such that we received one day of signaling after nearly two months without any.

and little information on ecology at alternate stopover sites and food sources outside of the Delaware Bay. Coastal Virginia, for instance, hosts nearly 6,000 migrating red knots each year, but the relationship

To study the charging and attachment issues, we created styrofoam transmitter mounts with the same dimensions as the original PTTs and attached them to 14 red knots in Virginia during spring migration 2007 with a backpack harness instead of a leg loop harness. We glued conventional VHF radios to each mount, and tracked the birds by air and land for two weeks during the stopover period. We relocated many of these birds several times, and managed to view a small number through a spotting scope. It was clear that the simulated transmitters were being preened almost completely under the feathers. We did not note any slipping or breaking of the backpack harness. Thus, Microwave Telemetry supplied two more PTTs with double the height of the ones used in Florida in the hope of raising them above the feathers, and we attached them to red knots in Virginia in the second week of June. Unfortunately, the activity counter of one of the red knots ceased incrementing after two days, after which time the battery charge began to decline in successive transmission cycles, and we lost the signal entirely after nine days. Lack of movement, and subsequent lack of recharge is suggestive of a detached PTT or bird mortality, as a solar PTT on the ground is rarely in an ideal positions for recharging. However, we successfully tracked the second red knot for three months in the coastal Virginia barrier islands. This red knot did not migrate. We believe that this bird, tagged late in the migratory stopover period, was a nonbreeding bird, as it was resighted in late June in the company of a small number of conspecifics. The activity counter sensed a lack of activity and ceased to increment in late August, we lost the signal soon thereafter. However, the bird had ranged over 36 miles of shoreline during the time we tracked it, and the battery appeared to be fully charged at the start of each cycle. The map shows only the LC3 grade fixes obtained over the approximately 3 month period that the bird was tracked.



Tagged Red Knot locations over a three month period, June to August 2007. Only LC3 locations shown.

This appears to be a successful step in the development of a method to satellite track small long distance migrant birds. We intend to attach more tiny PTTs to some red knots in mid-May of 2008 in Virginia, since red knots tagged at that time should migrate to their breeding grounds within two weeks. We hope in this way to obtain unbiased locations of red knot breeding sites in the North American Arctic and sub-Arctic.

*We are normally very secretive about our future products, but here we make an exception. Our goal has always been to reduce the weight of our PTTs, making them suitable for smaller species. We have recently had many enquires for PTTs in the 5 gram range.*

*Jonathan and Jim's preceding article details their experiences with a few handmade prototypes of such a PTT, proving its feasibility. To put these very tiny PTTs into production is going to be a major undertaking, requiring investment not only in development time but also expensive new equipment to handle the very tiny components.*

*Please be patient, we will make these new units available at the first opportunity.*

*Paul Howey Nov. 2007*

Actual size



# Migration of Spanish Montagu's Harriers (*Circus pygargus*)

Rubén Limiñana, Alvaro Soutullo, Vicente Urios and Miguel Gallardo, Terra Natura Biological Station, University of Alicante, Spain

The Montagu's Harrier (*Circus pygargus*) is a medium-size and long-distance migratory raptor which breeds over large areas within Europe and Western Asia. It is generally assumed that populations breeding in Western Europe overwinter in Western Africa, whereas the populations that breed in Eastern Europe spend the winter in Eastern Africa, and those that breed in Asia presumably travel to Sri Lanka and the Indian subcontinent during the winter. Nonetheless, to date, all studies on migration for this species are based on ringing recoveries and observations at bottleneck points along their migratory routes. Hence, data on the exact winter distribution of European Montagu's harriers in Africa, as well as their migratory routes, are still scarce.

Ten adult Montagu's harriers (six males and four females) were captured between May and June 2006 using dho-gaza nets and a stuffed Eagle Owl (*Bubo bubo*) as a decoy, in inland Castellón (Eastern Spain). The sex of captured birds was determined based on the pattern of colours of the plumage; they were weighed and ringed, and a Microwave Telemetry 9.5g solar-powered PTT-100 platform transmitter terminal (PTT) was affixed to their backs using a Teflon harness. Birds were released within 30 minutes of capture. For the first three months of operation the PTTs were programmed on a 6h on/16h off duty cycle, followed by a 10h on/56h off duty cycle for the following months. All data were retrieved and managed using STAT, the Satellite Tracking and Analysis Tool. Only locations assigned to LCs 3, 2, 1 and 0 by Argos were used for the analyses, as they are the most reliable ones.

Prior to the migration onset, the tagged birds showed a pre-migration stage. The extent of this stage ranged between 3 and 72 days. Staging areas used during the pre-migration stage were located at higher altitudes than the breeding areas, and are characterized by the presence of shrublands and extensive cultivation areas, mainly cereals.

These cultivated areas constitute a particular landscape characterised by fallow fields and are maintained by a traditional rotation of cultivations. Montagu's harriers' use of these areas is likely to be related to food availability, as at higher altitudes the peak of abundance of arthropods occurs later than in the lowland breeding area. On the other hand, the search of new good sites for the following reproduction may also play an important role in the pre-migratory movements of the species.

At least six of the 10 birds marked completed their

migration from the breeding grounds in Eastern Spain to Western Africa, three males and three females. For one of these no data were obtained during the migration (we only have locations in the breeding and wintering grounds). The other four either died or the transmitter failed, two before starting the migration and two during. Hence, only five individuals were tracked throughout the whole migration. The harriers



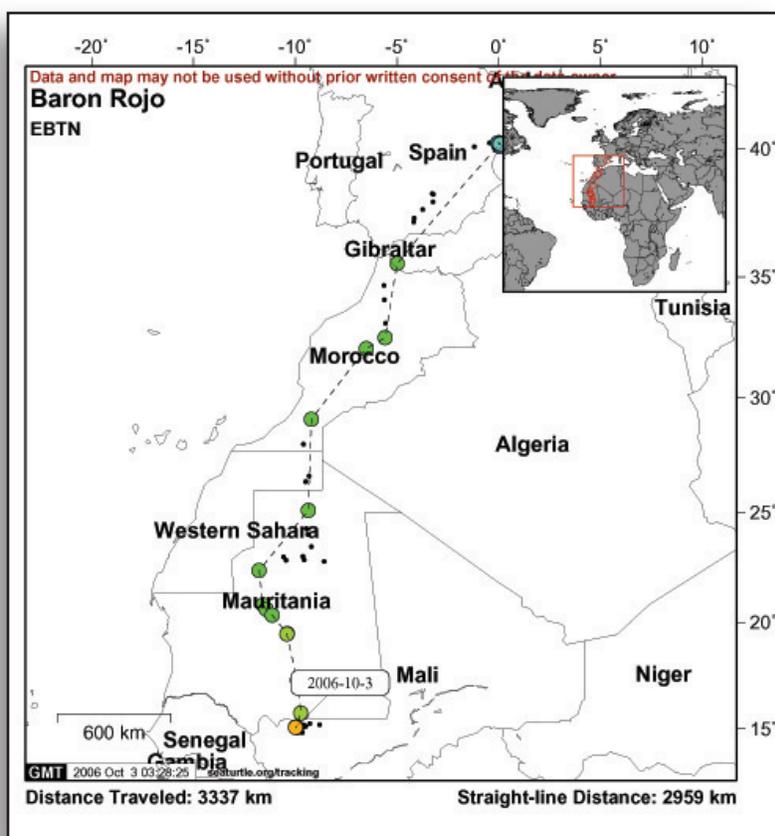
Photo Courtesy of Estación Biológica Terra Natura

An adult male Montagu's Harrier equipped with a 9.5g solar powered PTT.

started the migration in late July-August. The birds followed different migration routes. Some performed stopovers of more than a week, while others barely stayed in the same site for more than a day or two. Ultimately, the tagged birds established bases on the border of Mauritania with Mali and Senegal, a distance nearly 3000 km from the breeding sites, covering this in 10-30 days. These sites are located within a small range of latitudes (14°N and 17°N), although distributed over a wider range of longitudes (-15°E and -4°E), with some birds occupying sites more than 1000 km apart. Distance covered in a day ranged between 93 and 219 km/day, with peaks of travelling speed of up to 65 km/hour. Harriers were recorded travelling only during the daytime and covering the longest distances in the late afternoon,

which suggests that they are daytime migrants. Most of the movements occurred between 3 and 8pm. None were recorded between 8pm and 5am.

This research of the Terra Natura Biological Station is part of a wider focus on raptor behavioural ecology and has been made possible with the support of the Aeropuerto de Castellón and the Terra Natura Foundation. Knowledge obtained on harriers' exact wintering sites may provide insights on the problems the species' face in winter, highlighting the need to take into account what happens in both the breeding and wintering grounds to implement successful conservation measures.



Migratory route of a male Montagu's Harrier tagged in Castellón (Eastern Spain). Map was obtained from seaturtle.org. Colored dots are locations belonging to LCs 3, 2 or 1, and small dots belong to LCs 0 or A.

# Dangerous Journeys of Sakers of the Carpathian Basin

Mátyás Prommer, János Bagyura, BirdLife Hungary

Hungarians' symbolic bird, the Saker Falcon (*Falco cherrug*) – or “Turul” as it is called in ancient Hungarian myths – is a globally endangered large falcon species. Its original distribution area spreads from China in Asia to the Czech Republic in Central-Europe. However, due to negative human impacts on the populations in the last decades, we can now distinguish two disjunctive areas in the east and in the west. The eastern population is decreasing continuously due to heavy human impact – primarily trapping Sakers for Arab falconry.

Due to conservation efforts of the last 30 years, the number of breeding pairs is slightly increasing in Hungary, Slovakia and Serbia – the countries that make up more than 60% of the stable European population. Now there are about 180-200 breeding pairs in Hungary and another 100 pairs in the neighboring countries.

In 2006, a Hungarian-Slovak Saker conservation project supported by European Union's LIFE-Nature fund was launched. Satellite telemetry co-ordinated by **BirdLife Hungary** (*Magyar Madártani és Természetvédelmi Egyesület*) forms an important part of the project. There will be 46 Sakers equipped with PTTs until 2009 providing vast amounts of data about their movements. We hope to unveil threatening factors by analyzing the data, which will enable us to take appropriate steps towards more efficient conservation efforts.

In early summer 2007 we deployed 10 PTTs on Hungarian Sakers. In the first year, we used 5 Microwave Telemetry 22g solar Argos/GPS PTTs and 5 20g solar Argos PTTs manufactured by NorthStar to compare their performance. We used 6.37 mm wide Teflon ribbon to attach the PTTs to the Sakers.

Our first observations show conventional Argos PTTs provide few usable locations, probably because of the considerable background noise in this part of the world. Conversely, Argos/GPS PTTs gave us more locations with better accuracy.

We have learned from the satellite tracking that juvenile Sakers leave the eyrie about one month after fledging. By then they are able to make long (250-300 km) journeys. Some birds made round-trips and returned to the eyrie, some left the eyrie and never came back. It was typical of all juveniles that they set up temporary bases. They made round-trips from a few kilometers to tens of kilometers exploring the neighborhood, and then, probably when the local food source dwindled, moved on to the next base. Another common feature: they tended to stay in the lowlands, avoiding the mountains.

Apart from those similarities we found a lot of individual differences. Some falcons never left Hungary, others visited 7 countries within 3 months; some headed south, others stayed in the Carpathian Basin.

The three birds that have started migrating went in three different directions. Apparently, neither weather conditions

*Barna with GPS PTT*

nor food supply triggered migration. Though all the birds met very similar conditions, some even in the same region, they acted differently. So far we think that the only explanation is the individual differences among Sakers.

As for the three migrating birds, there is one in Sicily (named **Barna**), one in Egypt (**Emese**) and one disappeared in Libya (**Viki**).

**Barna** travelled about 1535 km in total from his base in Ukraine

to Sicily. Unfortunately 5 days of data were lost due to low voltage of the PTT (from lack of sunshine) just at the start of his migration. We could track him again once he was already on the Croatian coast. Based on the data from the Croatian coast to Sicily (12 location points, 25/10/2007 – 29/10/2007), Barna flew 161 km/day with an average speed of 40-50 km/hr above the sea, and 20-30 km/hr above mainland. He has since remained in Sicily, unfortunately close to the bird killers in Malta. Even Sicily is not the safest place, but hopefully he will be all right.

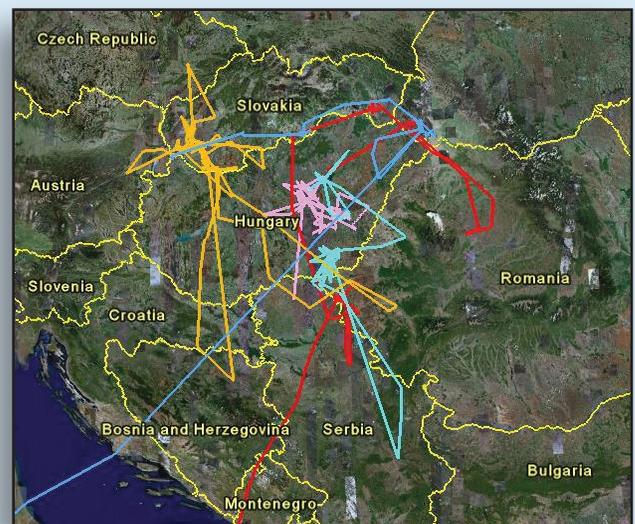
**Viki** completed about 1670 km from South Hungary to the Libyan coast (between 07/10/2007 – 11/10/2007). Based on the data of 16 locations (not counting the ones when she stayed within a few km for a couple

*Continued on page 7*



*János Bagyura with a tagged Saker male.*

Photo by Mátyás Prommer



*Map shows movements of GPS PTT falcons within the Carpathian Basin.*



*Movements of falcons: Green-Emese; Blue-Barna; Red-Viki; others stayed at home.*



# Satellite Tagged Bar-tailed Godwit Circles the Pacific

Lee Tibbitts and Bob Gill, USGS Alaska Science Center, Anchorage, AK, Nils Warnock, PRBO Conservation Science, Petaluma, CA, and Phil Battley, Massey University, Palmerston North, New Zealand.

On 7 September 2007 an international group of scientists and shore-bird enthusiasts eagerly awaited transmission from a PTT deployed on an adult female Bar-tailed Godwit *Limosa lapponica baueri*, a large shorebird that nests in Alaska and migrates to New Zealand and eastern Australia. The bird (dubbed 'E7' after the code on her leg flag) had just been tracked on a non-stop, 8-day-long flight south across the



Male Bar-tailed Godwit in Alaska in May.

Photo by Ted Swern

Pacific Ocean and was due to land in New Zealand where her odyssey began almost six months previously. Upon touching down in the Firth of Thames on the North Island, E7 became the first migratory shorebird to have been tracked throughout an entire annual cycle.

Prior to this study, the routes and timing of migration of *baueri* godwits were largely unknown, although researchers had long suspected the birds flew non-stop between their far-flung destinations. E7's movements were remarkable in many ways, not only because they included some of the longest non-stop flights (> 10,000 km) ever recorded for a bird, but also because they demonstrated that satellite telemetry could be used to study flight behavior of relatively small (400–500g), long-distance migrants. This was made possible by the recent development of small, lightweight (22–26g) PTTs and, in our case, the development of the surgical procedures necessary to implant them. Since 2005 we have deployed 40 implantable MTI PTT-100 units in 17 Bar-tailed Godwits and 23 Bristle-thighed Curlews *Numenius tahitiensis*, acquiring complete or partial transoceanic migration tracks from 29 of them. Externally mounted PTT-100 units



Bristle-thighed Curlew.

Photo by Bob Gill.

have also worked well for us, but only on the short-distance migrant shorebirds, like the Long-billed Curlew *N. americanus*.

Long-distance migrants, with their greatly fluctuating body mass, appear to walk out of their harness following long flights.

E7's tracks provide a wonderful example of the types of information attainable only through satellite telemetry. E7 was one of 8 godwits captured in New Zealand in February 2007 and implanted with a 26g PTT. Our initial hope was that we would be able to track these birds over the next two months as they made their way to the breeding grounds. Fortuitously, the performance of E7's PTT exceeded

all expectations, providing a 9-month record of her remarkable movements that encompassed both her seasonal migrations and local movements at staging and breeding sites. E7 embarked on her northward migration on 17 March in what would turn out to be a non-stop transoceanic flight of > 10,000 km to the Yellow Sea coast. After departing the Firth of Thames she flew northwest over New Caledonia (19° S), then crossed the equator just north of the Solomon Islands before veering west and reporting again over the Philippine Sea (18° N). From there she proceeded northwest to the Yellow Sea and the Yalu Jiang Nature Reserve in China (39° N).

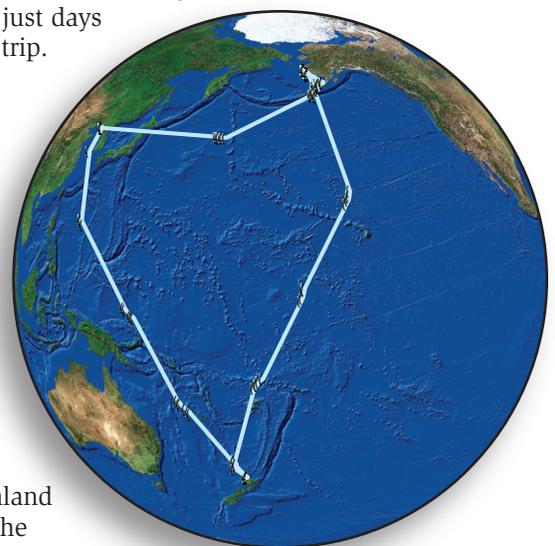
E7 refueled at Yalu Jiang for several weeks before flying to Alaska in early May via another long-distance (> 6,500 km) transoceanic flight. This route took her due east into the middle of the North Pacific before she turned northeast near the date line. Upon reaching Alaska (54° N) she stopped briefly at two major lagoons and then flew along the coast of the Bering Sea to the central Yukon-Kuskokwim Delta (61° N) where she presumably nested. In late July, E7 joined several other satellite-tagged godwits along the southwest coast of the Yukon-Kuskokwim Delta (59° N) where her positions alternated between traditional roost sites on offshore barrier islands and presumed feeding sites on nearby mudflats.

On 31 August, she again launched out over the Pacific Ocean on what would be the last leg of her annual journey and the third over ocean flight. Tail winds helped propel her across the Gulf of Alaska and 36 hours later she was about 600 km due north of Hawaii (30° N). From there her track veered southwest where she made a beeline for New Zealand. Four duty cycles later E7 had come full circle, arriving on the same mudflat in the Firth of Thames that she had departed from in March. Along this route she had flown an awe-inspiring 29,500 km, travelled in four hemispheres, and visited three countries. Her PTT performed admirably, providing more than 590 positions over 123 duty cycles before quitting just days after she finished her trip.

E7 is one of many ( $n = 61$ ) satellite-tagged shorebirds tracked by the Pacific Shorebird Migration Project.

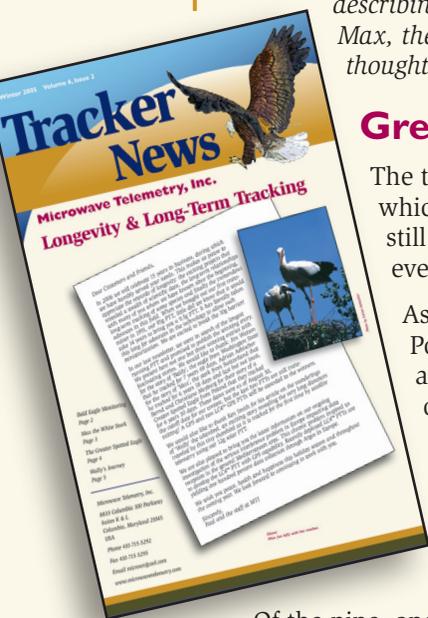
This effort is being led by the USGS Alaska Science Center and PRBO Conservation Science in collaboration with Massey University in New Zealand, the New Zealand Wader Study Group, the Global Flyway Network, and the Australasian Wader Studies Group.

Our goal is to provide detailed information on the migration strategies of large-bodied shorebirds—a group whose populations are declining worldwide—that can be used to guide conservation efforts. The odyssey of E7 and the public's captivation with individual birds like her can greatly aid this effort by raising awareness of the challenges faced by migrant birds and highlighting the shared responsibilities for their conservation. Funding was provided by the David and Lucile Packard Foundation and US Fish & Wildlife Service.



Migration tracks of Bar-tailed Godwit "E7" determined using satellite telemetry.

In 2005 MTI went in search of the longest running PTT's and was rewarded with 3 great success stories from our customers. Our readers may recall the original articles in the Winter 2005 issue of Tracker News describing the tracking of one record holder— a female Greater Spotted Eagle; and introducing Max, the stork from Switzerland who, at that time, had been tracked for 6 years 58 days. We thought you might be interested in an update on these birds.



## Greater Spotted Eagle

The transmitter of the adult female Greater Spotted Eagle which I trapped in Summer 1999 is still working and we still get locations. The transmitter is programmed to transmit every 10 days.

As part of a long-term research program in northeast Poland, we are endeavouring to raise the level of knowledge and thereby the protection of this species, by making use of the most advanced technology, i.e. satellite telemetry, to investigate its migration and overwintering.

Between 1995 and 2003 we equipped nine adult Greater Spotted Eagles (GSEs) with solar-powered satellite transmitters (PTTs) in the Biebrza river valley in northeast Poland and tracked them using the Argos satellite system.

Of the nine, one adult female, trapped on 13 July 1999 and tagged with PTT 08138, is our record holder for long-term tracking, having now transmitted for more than 8 years.

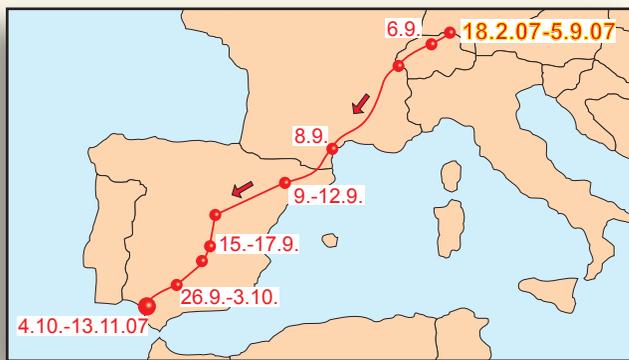
Bernd-U. & Christiane Meyburg, *World Working Group on Birds of Prey*  
[www.Raptor-Research.de](http://www.Raptor-Research.de)      [WWGBP@aol.com](mailto:WWGBP@aol.com)

## Max

Max, our White stork, was fitted by the Museum of Natural History of Fribourg (Switzerland) with a 35 gram solar PTT on July 5, 1999 and is still being tracked. It is certainly the animal that the Argos system has tracked for the longest period ever.

Max, who was born in May 1999, has wintered since then in Northern Morocco and started breeding in 2002 in Southern Germany. Every year since then, she has produced between 2 and 4 young.

Max's journeys were followed by thousands of people on the Internet. In 2006 the localizations were being received less often and the accuracy of the fixes was worse than in the first years. The bird was checked at the breeding site and it was found that the antenna of its PTT was damaged. Unfortunately, Max couldn't be captured before she started a new journey to Africa. But in summer 2007, Max was eventually caught and her PTT was replaced with a new one of the same type (35 gram solar). Since then, the tag is localized daily again with high accuracy. Max started her ninth (!) journey to Africa on September 6, 2007 and reached Andalusia in Southern Spain four weeks later. It seems that she wants to spend the winter for the first time in Spain. The researchers from the Museum of Natural History in Fribourg optimistically hope that this famous bird will be tracked for many more years.



The track of Max's most recent journey.

Max with the new PTT in July '07.

Adrian Aebischer, *Musee d'histoire Naturelle*  
[www.fr.ch/mhn](http://www.fr.ch/mhn)      [adaebischer@dplanet.ch](mailto:adaebischer@dplanet.ch)

## Interference to the Argos System

### Europe

As many of you are aware, a broad band radio transmission source (or sources) located somewhere in the northern Mediterranean area has severely reduced the ability of the Argos receivers to "hear" PTTs in that area for many years. (See our previous notes in Tracker News Winter 2005 and Spring 2006 issues, posted on our website.) CLS is now very aware of the problem and appears to be making some progress at identifying the source. We hope that this situation will soon be resolved.

### Asia

A similar situation has recently developed over eastern Asia, affecting China, Mongolia, northern Malaysia and to some extent Japan. CLS has

recently mapped the area using data from the satellites. Their findings match the field observations already known to us.

As Lee Tibbitts' Bar-tailed Godwits flew north from New Zealand on their way to Alaska, they skirted the edge of this new interference zone; the number of messages received and the grade of the fixes obtained was significantly reduced as they flew through the southern China seas and passed by Japan. Closer to northern China, the presumed source of the interference, it appears that reception of Argos transmissions is nearly completely blocked.

We hope that this "plague" does not spread to other parts of the world, robbing us of this precious research tool, Argos.



The female Greater Spotted Eagle with PTT 08138 six years after fitting the transmitter at her breeding ground, Biebrza National Park, Poland, April 3, 2005.

Photo by Dariusz Kowalczyk



Photo Courtesy of the Museum of Natural History of Fribourg

## X-Tag News

### DTF™ - Digital Tide Filter

This new feature enhances the operation of the constant pressure popoff. As many of you know, the sensitivity of the constant pressure popoff feature is limited by the need to ignore tide induced pressure changes, especially on a tag trapped on the bottom attached to a dead fish. When activated this digital filter notches out the low frequency tidal pressure changes, monitoring only those caused by vertical movement of the

fish, so allowing a much tighter depth band setting.

Together with a programmable delayed activation and constant pressure time window, the DTF™ should be especially helpful for those of you studying fish that stay near the surface for extended periods or inhabit shallow waters.



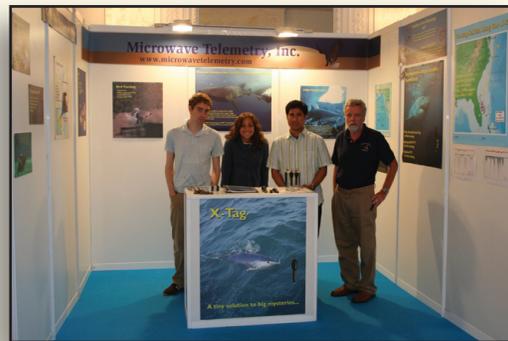
## Spain Conference

We at Microwave Telemetry, Inc. would like to thank everyone who visited our booth at the *Second International Symposium on Tagging and Tracking Marine Fish with Electronic Devices* in San Sebastian, Spain last month. We hope you enjoyed it.

### MTI Conference!

We are considering hosting our own 3-day Bird Conference in the fall of 2008. The conference would include scientific papers, speakers, and workshops relating to bird tracking.

If you would be interested in attending or presenting at this conference, please contact us by March 2008. If there is enough interest, we will post more information in the next issue of Tracker News.



Russell, Lucy, Ricardo and Paul at the Microwave Telemetry booth in Spain.

Photo by Ted Rollins



## Your Strangest Story.

*Here is the winning "whopper" from the stories that you all sent in!*

Over the past several years we've put out about 150 PSATs on billfish (blue marlin, white marlin, and sailfish), and while I'd like to suggest that all of the deployments have gone off without a hitch, it would be stretching the truth big time to do so. I guess our "strangest" story involves an early tagging experience off the coast of Punta Cana, Dominican Republic. We were deploying PTT 100 tags on white marlin in a pilot study to determine if these smaller billfish (typically 45 - 60 lbs) were capable of carrying PSATs. The weather was rough and white marlin were scarce -- we were lucky to catch a fish a day. Around noon on our second day I was fighting the first fish of the day and my graduate student Andrij Horodysky was standing nearby, ready to tag the white marlin once the mate had control of the leader and the fish was positioned properly next to the boat. With high winds and a confused sea, it was difficult getting the fish in a position where Andrij could deploy the tag. After considerable jockeying of the boat and the fish, Andrij had the right moment and started to deploy the tag, but before the dart could be applied the fish jumped and the leader was pulled out of the mate's hands. Andrij stopped tagging in mid-stroke and in so doing, the tag fell off the tagging pole and into the water. While I was trying to regain control of the fish, the mate was preparing to jump in and rescue the tag. I assured the mate that the tag floated and that all we needed to do was to get a long handled net and move the boat into a position where we could recover the tag. As the boat was slowly backing down into the swells, a free swimming white marlin appeared out of nowhere and started to charge the floating tag. *It was trying to eat our \$3800 tag!* Pandemonium ensued as we screamed at the free swimming fish and used the long handled net to discourage its appetite. We prevailed and in short order the tag was back on the boat and quickly attached to the back of white marlin #1 (as opposed to inside the stomach of white marlin #2).

*John Graves, Professor of Marine Science, Virginia Institute of Marine Science, College of William and Mary, VA*

### Journeys of Sakers *continued from page 4*

of hours), she travelled 334 km/day with an average speed of 40-50 km/hour when crossing the Mediterranean Sea. Her speed was slower over land. Viki's track supported the theory that falcons cross large bodies of water. She took off in Greece on the island of Zakynthos and flew almost straight to North-Africa, traveling almost 600 km and spending more than 12 hours in the air non-stop. Unfortunately, her PTT stopped transmitting on 12/10/2007 for an unknown reason (trapping for falconry?).

*Emese* is our only falcon with a non-GPS PTT that started the migration. She made the most impressive move so far. She travelled about 3100 km from

South Hungary to Libya across Egypt within 14 days (14/10/2007 - 27/10/2007). That means an average travelling speed of 185 km/day. Similarly to Viki, she also avoided the straits - well-known crossing sites for migrating raptors.

The other birds were still in the Carpathian Basin at the time of writing this article.

Of course, there are many open questions which we hope to receive answers to in the coming years with the help of satellite tracking.

We would like to thank our colleagues, who give their best to learn more about the movements of our Sakers.

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## Tracking Our Student Scientists in Mongolia

*With our goal of introducing students to satellite tracking and providing opportunities in field research, last year MTI awarded free transmitters to two student projects. One project, led by Mimi Kessler, doctoral student, Arizona State University, sponsors students from a province in rural Northern Mongolia who have been tracking the Great Bustard breeding in their region.*

Only 1500-2000 Great Bustards, large, ground-nesting birds of open grasslands, are estimated to remain in Mongolia, a country the size of Western Europe with the lowest population density of any nation in the world. Current low Great Bustard population sizes in Central Asia are especially alarming in light of the low reproduction rate of the species and the low total population of the Asian subspecies, in particular.

As human activities, including poaching and mechanized agriculture, play roles in Great Bustard population declines, we carry out public education campaigns in conjunction with our research, focusing our efforts on local children, particularly members of local "EcoClubs" organized by the non-profit Taimen Conservation Fund (TCF).

We take students to the field with us to search for Great Bustards and, in spring, to observe the spectacular breeding display of the male Great Bustard.

Our students have shown a keen interest in the birds. They have many ideas about causes for the species' decline and methods of conservation. They identify poaching as an important issue and understand the destruction of clutches by farm machinery, as this species often nests in agricultural areas.

Our educational programs are already making an impact. It is rare for us to meet someone who is unfamiliar with our research and sometimes strangers surprise us by asking how "our" transmittered bustards are doing!

Next year, we plan to share the migration routes of "local" bustards with the students, practice map-reading, discuss reasons for migration and compare migration timing with local weather phenomena.

We hope that the children will continue to share their enthusiasm about birds, and particularly Great Bustards, with their parents and communities.



*Mimi Kessler and research team with EcoClub students.*



*EcoClub students and Buddhist monks (in yellow) from a local temple. At a summer camp arranged by the non-profit TCF, we play games to introduce children to methods of wildlife research, including GPS, map-reading, and telemetry.*



*Our team has been pleasantly surprised by the students' eagerness to learn about birds at our presentations.*



*Using the 70g Argos/GPS PTTs, our team is collecting information important for conservation, including habitat use patterns, critical habitat, and migration routes.*



*We succeeded in harnessing three Great Bustards with Argos/GPS PTTs. These birds are beginning their migration and one individual has already migrated south over 1700 km.*



*Students run to the binoculars and spotting scopes. We have designed curricula on bird identification, bird ecology and conservation for local schools.*



*TCF's summer camp takes place at a Buddhist temple where a monk and young monks-in-training are resident in the summer. In addition to lessons on ecology and outdoor activities, schoolchildren attend religious services and lectures about Buddhism as part of an effort to revive traditional conservation values.*