WINTER 2008 Volume 9, Issue 2

Tracker News

Microwave Telemetry, Inc.

Satellite Telemetry Shapes Next Generation of Biologists

Dear Customers and Friends,

A couple of months ago, a small package arrived in the mail. We were delighted to receive autographed copies of Roine Strandberg's PhD thesis. His thoughtfulness in wanting to share his success with us and his gratitude for the technical support we gave him touched us. We congratulate him. This led me to wonder how many biologists will launch their careers using satellite telemetry. This "high tech apprenticeship" is a far cry from my own PhD project in the late 70's when PCs were not available; I waded through vast amounts of data, inputted from punched cards, which were then run through an IBM mainframe computer.

In this newsletter, we are delighted to spotlight four graduate students: two recently graduated and two about to complete their degrees. We asked them to give us an overview of their projects. Specifically, how did they use satellite telemetry?

We especially wish to thank: Roine Strandberg for his article about tracking raptors from southern Sweden, Libby Mojica for sharing her eagle work with us, Steffen Oppel for a glimpse into tracking King Eiders and last but not least, Lucy Howey, my own daughter, whose passion for sharks has led her to this path. We wish Roine, Libby, Steffen and Lucy much success in their careers. You inspire us to keep developing the field of satellite telemetry.

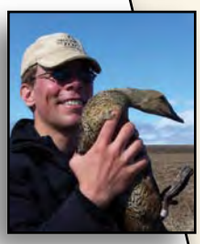
We would also like to thank Urmas Sellis of the Estonian Eagle Club and Abdullah Alsuhaibany for their article on finding Sellis' stork—an excellent example of international cooperation between researchers in Estonia and Saudi Arabia. We certainly need more of this. Perhaps we at MTI can assist in locating researchers in other parts of the world as we have a diversified customer base.

This newsletter also publicizes our MTI Bird and Fish Tracking Conference taking place March 24-March 27, 2009 in Ellicott City, Maryland. We already have quite a few attendees committed but we hope to see you all. Check our website for full details.

We thank you for the opportunity to serve you, our customers, over the last seventeen years and look forward to many more years together.

We wish you happiness, health and joy in 2009.

Sincerely,
Paul and the staff at MTI



Above:
Roine Strandberg, Libby Mojica, Steffen Oppel and Lucy Howey

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Adaptive Migration Strategies of Raptors Tracked from Southern Sweden

Roine Strandberg started his Master's degree in 2002 under the direction of Professor Thomas Alerstam of Lund University, Sweden; Roine studied the migration of birds and conducted fieldwork in the wetlands of Kristianstad in southernmost Sweden where he lives. The studies of Osprey passing the lake Hammarsjön in the centre of the wetlands evolved into a PhD project involving the tracking of raptors. Roine has just completed his PhD.

In May 2003, I started my work with satellite telemetry at the Grimsö Research Area in south-central Sweden together with Mikael Hake and under the supervision of Thomas Alerstam. This was one year before we obtained funding for a PhD project at Lund University, Sweden. During this first season we attached transmitters to the short-distance migrant Common (or Eurasian) Buzzard *Buteo buteo* as we wanted to compare their migration strategies with other long-distance migrants. Hence, during the further studies as a PhD student I tracked four long-distance migrating raptors; Osprey *Pandion haliaetus*, Western Honey Buzzard *Pernis apivorus* (both species tracked by the raptor migration group in Lund since 1995 and 1997, respectively), Western Marsh Harrier *Circus aeruginosus* and Eurasian Hobby *Falco subbuteo*.

Photo by Mikael Hake

Adult male Marsh Harrier at Kristianstad, Sweden in June 2006. This bird was tracked during two years and visited Ngolfagnick, Senegal in November 2006.

The aim of the project was to address questions about how raptors adapt to the fluctuating environments during the transition seasons (the migration) between breeding and wintering. The migration is highly affected by the local prey abundance, the foraging strategies, weather conditions and landscape patterns along the migration routes as well as the navigation and orientation mechanisms and cues that the birds use.

The development of satellite-based radio transmitters has contributed enormously to the advancement of the migration research field, and much of what were only qualified guesses two decades ago, now either have been proven or rejected with the aid of the ever expanding data sets from satellite tracking.

Interesting findings in my studies were how raptors can mix foraging and active migration during their travels. A strategy of fly-and-forage migration is favourable for birds that hunt on the wing, capable of combining foraging with long distance travel. Fly-and-forage migration is, for example, favourable for Ospreys in Europe because benefits (energy intake) more than outweigh costs (reduced flight time) passing through the landscape with abundant fishing opportunities in the many lakes, rivers and fish ponds. With a combination of field studies and tracking with the GPS equipped transmitters, we could detect and explore this fascinating behavior in great detail.

Map showing the male Marsh Harriers' migration routes from Sweden to Senegal. The red track represents spring migration.

I had the good fortune to visit two of our transmitter birds in tropical Africa, both with amazing life-histories partly revealed by the satellite tracking. One of them was an adult male Osprey carrying a 45g GPS equipped transmitter which he was provided with in July 2006. Together with photographer Patrik Olofsson, I travelled to Saint Louis, northwestern Senegal in November 2006 to try to track down the male Osprey at his wintering site in the outskirts of the city. With newly received positions it took us no more than a 15 minute drive from the hotel at the Atlantic coast to locate the bird perched on a branch in the shallow water. The bird spent most of its time the last two winters in an area of only a few hectares at this coastal lagoon, and arrived again to the area the 6th of October this autumn.

Photo by Patrik Olofsson

Adult male Osprey handled by René Dekkers at Grimsö, Sweden in July 2006. This male was visited at Saint Louis, Senegal in November 2006.

The other bird we visited in Senegal was an adult male Marsh Harrier making a post-migratory stopover some kilometers south of Thies, not far from Dakar. This bird was a little harder to locate as it did not have a GPS equipped transmitter. Nevertheless, we managed to find the bird in a small-scale cultivated valley together with twenty other harriers which had a communal night roost in the area. We had truly fantastic moments meeting these two birds in their winter quarters!

I defended my thesis "Migration strategies of raptors – spatio-temporal adaptations and constraints in travelling and foraging" on the 24th of September 2008 during a public dissertation with Professor Martin Wikelski as my opponent. Despite the tricky, questions I was awarded a PhD some hours later.

As a new graduate you need plans for the future to keep your research going. The most important and challenging goal for my future studies of raptor migration will be to track juveniles from their first naïve journeys until they are migrating as experienced adults. This would give a better understanding of the relative importance of genetics versus learning for the birds' migration patterns and strategies.

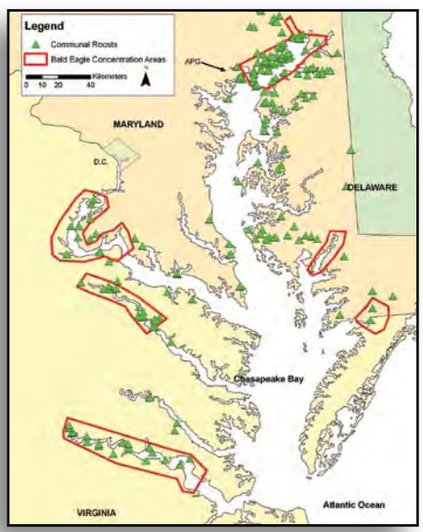
Identifying Important Areas for Bald Eagles Using Satellite Telemetry

Libby Mojica recently received her Master's degree from the Warnell School of Forestry and Natural Resources at the University of Georgia. She is currently working as a raptor biologist at the Center for Conservation Biology at the College of William and Mary in Virginia. Her research interests include using satellite telemetry to investigate bird migration, communal roosting, and contaminant exposure.

I was lucky enough to land a job working with satellite telemetry after graduating from Trinity University with an undergraduate degree in biology. As an avian biologist for the Florida Fish and Wildlife Conservation Commission (FWC), I worked with several raptor species using radio and satellite telemetry. One of our research projects involved attaching 95g PTT-100s to nestling Bald Eagles in Florida with a backpack harness. From 1997-2001, our team tagged 70 eagles with PTTs we hoped would last until the eagles sexually matured at age 5. The study focused initially on survival rates of these tagged nestlings but we quickly realized the location data could answer other critical research questions.

Migration routes and important use areas used by Florida sub-adult Bald Eagles (n = 54) in eastern North America, 1997-2004.

After the Argos data collection was complete, I started my master's degree at the Warnell School of Forestry and Natural Resources at the University of Georgia with a graduate assistantship funded by FWC. With the large sample size of birds, I decided to group the data from all the eagles to look at broad movement trends. After the eagles dispersed from their natal area, they migrated north traveling along the Appalachian Mountains or the Atlantic Coast for distances ranging 300-4,000 km from Florida. I noticed that certain areas along the migration path seemed to be important hot spots where multiple birds congregated for weeks or months. Using a clustering program, I was able to identify and quantify the significance of 151 important use areas (IUA) for Bald Eagles.



Bald Eagle communal roosts in the Chesapeake Bay identified using GPS locations, 2007-2008.

Eagle management in the United States has historically focused on the breeders of the species mainly through nest protection and productivity monitoring. This management practice has proved highly successful; however, it doesn't address the management needs of the non-breeding (immature) segment of the Bald Eagle population. Ensuring the fitness and survival of immature eagles to breeding age is key to the continued success of the species. Identification of these IUAs initiated state and local groups to begin conservation of shoreline habitat for non-breeding eagles. Locating IUAs for this long-distance migrant would not have been possible without the use of satellite telemetry.

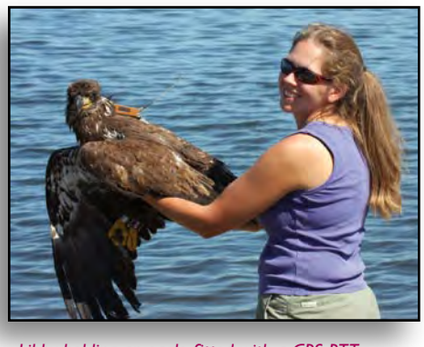


Photo by Bart Paxton

Libby holding an eagle fitted with a GPS PTT.

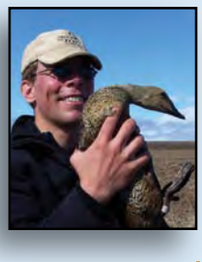
In my post-graduation job at the Center for Conservation Biology, I'm continuing to refine these IUAs with more accurate data from GPS PTTs fitted on a new group of Bald Eagles. We are exploring the dynamics of IUAs (locally known as eagle concentration areas) with 70g GPS PTTs on 64 eagles using the waters of the Chesapeake Bay, USA. The Chesapeake Bay is strategically located midway along the Atlantic Coast and as such is a convergence zone for eagles from the southeast US population and the northeast US and eastern Canadian populations attracted to the Bay's abundant prey. The seasonal fluctuation of prey availability (fish spawning, migrating ducks, carrion) is reflected in the movement patterns of migrant eagles into the Bay as well as movement within the Bay by the resident eagle population.

Bald Eagles are a highly gregarious species, especially among the immature eagles and adults during non-breeding months. Eagles commonly congregate in communal roosts, a behavior thought to facilitate information exchange on the locations of variable prey resources. Roosts can be occupied for only a few weeks a year if prey is periodically available, or occupied year-round if prey resources are stable. Using the 2D GPS PTT software, we are collecting 16 GPS locations each day and 1 additional location at midnight. The midnight location has facilitated the identification of 175 communal roosts in the Chesapeake Bay. We are currently investigating this matrix of communal roosts and how fluctuations in roost occupancy will affect future management of eagle roosts.

Photo by Libby Mojica

Fourth-year Bald Eagle fitted with 70g GPS PTT.

Tracking Movements of King Eiders in the Bering Sea



Steffen Oppel is hoping to graduate this December with a PhD from the University of Alaska where he is working under Dr. Abby Powell. Steffen's interest in conservation led to this project on King Eider populations which had declined, and about which little was known about their ecology. Steffen will be working with Abby for another half year as a post-doc until he hopefully finds an interesting job in the field of ecology/conservation biology somewhere in the world.

The Bering Sea is a wild place, and not many bird watchers venture out into this stormy place. The distribution and movements of birds in the Bering Sea is therefore poorly understood, especially during winter when ice covers most of the northern Bering Sea. Despite the harsh conditions, it is used by many birds during winter as the very rich marine fauna offers sufficient food for large numbers of birds. But where exactly sea birds occur, and from which breeding areas they migrate into the Bering Sea, was largely unknown until the advent of satellite telemetry.

King Eiders (*Somateria spectabilis*) are sea ducks that breed in the Arctic and spend most of the year in cold northern oceans. They dive up to 60 m deep to gather food at the bottom of the sea. Because of their marine lifestyle it has been very challenging to track their annual migrations. Since 2002 my colleagues and I have equipped 150 King Eiders in northern Alaska with satellite transmitters and we have discovered interesting aspects of their migrations and movements at sea.

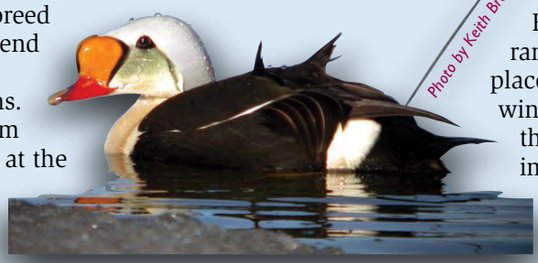
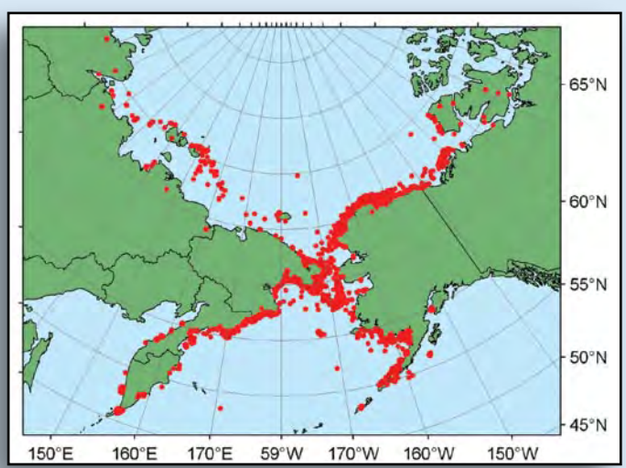


Photo by Keith Brady

Male King Eider with implanted satellite transmitter.

Most adult King Eiders migrate from breeding grounds in Alaska to the Chukotka Peninsula, the easternmost part of Siberia, to molt their flight feathers. In late summer and early fall King Eiders use the abundant food resources around the peninsula to forage while growing new feathers. Some birds stay around Chukotka throughout the winter, despite darkness, freezing temperatures, and sea ice covering most of the ocean. Some King Eiders migrate south along the Russian coast to winter along the Kamchatka Peninsula, and others migrate southeast to winter in Bristol Bay, Alaska. During the long winter in the Bering Sea some birds remain stationary at a single location, whereas other birds fly long distances back and forth between different sites. Individual ducks show individual behavior patterns but we still understand very little about the causes for this variation.



Locations of satellite tracked King Eiders caught between 2002-2007 on breeding grounds in northern Alaska.

King Eiders form pair bonds during the winter and migrate in pairs during spring to return to breeding grounds. While females return to the same breeding site year after year, males follow the female they acquired during the winter to the breeding site of her choice. Because birds from a vast geographic breeding region congregate at winter sites, males can travel halfway around the globe in a single year! Some of the males that we captured in Alaska in one spring migrated to central Siberia in the following spring – 5000 km west of where they had been the year before! Other males migrated to the central Canadian Arctic – 3000 km east of where they were the previous year. King Eiders from half their global breeding range, from 110°E to 110°W, meet at various places in the Bering Sea in winter. The wintering, molting, and staging areas in the Bering and Chukchi Seas are therefore important for a large proportion of the world population of King Eiders.

The eastern Chukchi Sea is especially important during spring migration. The area between Point Barrow and Point Thompson along the Alaskan coast is used by every single King Eider migrating to breeding grounds in western North America. Even more surprising, some King Eiders migrating to Siberia fly a detour of several hundred kilometers to forage in the eastern Chukchi Sea during spring migration. From the results of our satellite tracked birds we estimate that more than half a million eiders congregate in the eastern Chukchi Sea in May each year. The eider staging area is very close to areas currently explored for offshore oil development, and an accidental oil spill in this region could have catastrophic consequences for eiders.

Photo by Steffen Oppel

King Eider pair on breeding grounds in Alaska.

Because it is expensive to track birds with satellite transmitters we have developed a new technique that allows us to determine where King Eiders that we observe on breeding grounds spent the previous winter. King Eiders grow head feathers in winter, and by plucking a head feather from birds captured on breeding grounds we can now assign these birds to a region in the Bering Sea where they grew that feather using a technique called stable isotope analysis. We initially collected feathers from birds equipped with satellite transmitters, and found that feathers from birds wintering in different regions in the Bering Sea had a different isotopic composition. This technique can now be applied to a large number of birds at a relatively low cost.

More information about this project, including maps and locations of birds currently flying around with an active transmitter, can be found at: http://mercury.bio.uaf.edu/kingeider

Migratory Pattern and Environmental Preference of the Blue Shark

Lucy Howey is pursuing her Master's degree at Nova Southeastern University's Oceanographic Center and Guy Harvey Research Institute (GHRI) (Fort Lauderdale, Florida) where she works under the direction of Dr. Mahmood Shivji and Dr. Brad Wetherbee (University of Rhode Island) researching patterns of habitat utilization and migration in blue sharks (Prionace glauca). The GHRI integrates genetics and field approaches to study the biology and conservation of marine fishes, with a focus on sharks, rays, billfishes and coral reef fishes. Lucy hopes to continue this blue shark research after she graduates later this year.

The blue shark *(Prionace glauca)* is a circumglobal, epipelagic and highly migratory species. It makes up a substantial portion of the shark bycatch in the international swordfish and tuna fisheries, and its fins comprise by far the highest proportion by species in the international shark fin trade. This high level of exploitation makes the blue shark an important species on which to focus our research. Due to the tags' numerous performance advantages, the GHRI has chosen to use Microwave Telemetry satellite tags to study the migratory movements of this wide ranging species.

Photo by Brad Wetherbee

Lucy and Mahmood attaching X-Tag to blue shark.

Atlantic blue sharks make expansive yearly migrations, the details of which are poorly understood despite substantial conventional tagging efforts (over 100,000 tagged over the last 40 years). The advantage of using satellite telemetry on blue sharks is the continuous, long-term record of movement and the fine scale information about habitat preferences, which is lost with conventional tagging. Every summer blue shark populations, mostly males, spend several months on the continental shelf of New England, which is where we have focused our

Photo by Capt. Vinny McCarthy

Mahmood (left), Lucy and Brad releasing a tagged blue shark.

tagging efforts. In the summer of 2007, we deployed 23 standard PTT-100's and X-Tags to 21 male and 2 female blue sharks. In addition to tagging blue sharks we also tagged several short-fin mako sharks for a project we have recently started. Our results were quite interesting. We found that the blue sharks stayed on the shallow (approximately 60 meters depth) continental shelf where they exhibited shallow diving behavior, with their mean depth being only 7 meters. The sharks spent 80% of their time in waters less than 20 meters, until October when the sharks traveled off the shelf in a general southeasterly direction toward warmer waters. Several sharks traveled to the Bermuda area and one male blue shark traveled to Puerto Rico in six months, a linear distance of almost 2500 km! In addition to our successful blue shark tracks the X-Tag carried by one of the mako sharks popped up and started transmitting from the Bahamas. The subadult female mako had traveled a distance of almost 2000 km in four months!

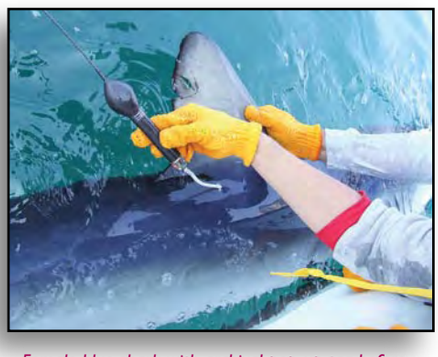


Photo by Brad Wetherbee

Female blue shark with archival pop-up tag before release. Note mating scars on the dorsal fin.

Our tracks from 2007 have provided us with important information on short-term blue shark behavior, showing that they prefer shallow waters and only infrequently dive through the thermocline when on the continental shelf. We also gathered important long-term migratory data, as we found that male blue sharks leave the continental shelf moving in a southeasterly direction in the fall following a general southern heading to warmer Caribbean waters and apparently return north to the New England continental shelf early the next summer. We have continued our tagging efforts in the summer of 2008, with six more, long-term duration tags (6-12 month scheduled pop-offs) deployed on male blue sharks and one on a shortfin mako, and are hopeful for a successful 12-month reporting tag!

Tagging and pop off loctions of blue shark and short fin mako shark released in the fall of 2007.

International Cooperation through Satellite Telemetry

Urmas Sellis

The Estonian Eagle Club was formed almost 20 years ago. Our goal has always been a better and brighter future for the eagles and black storks of Estonia.

In 2005, we began to use Solar Argos/GPS transmitters in our greater spotted eagle and black stork research to determine their home range and preferences for foraging areas, migration routes and wintering grounds.

Photo by Abdullah Alsuhaibany

Dr. Shobrack examines Priidupoeg.

Over a period of four years we have equipped 24 adult greater spotted eagles, ospreys and black storks with PTTs. This year we put back-packs on six juvenile birds (in 2006, we outfitted one young osprey). The death rate of young birds is high. Of the seven young birds with backpacks, six perished before reaching their wintering grounds. Only one young bird is still in migration! After consideration, we concluded that there are no visible signs the weight of the backpacks inhibit the stork's everyday life.

We have managed to locate all of our fallen young birds' transmitters. Two years ago we had to travel from Estonia to the Sudan in order to find our spotted eagle transmitter. We acquired valuable information about the migration route and our presence served to generate interest in the local communities. We also learned more about what actually caused the bird's death. But retrieving transmitters is not always so simple.

For example, this year we equipped young black storks with PTTs to find out whether the migration routes of the adult birds and their offspring were the same, and how the young birds live before they start to nest. Adult birds from one nest (the male Priidu and female Piia) carried PTTs from the prior year. A PTT was given to one of their three nestlings (Priidupoeg—"Son of Priidu").

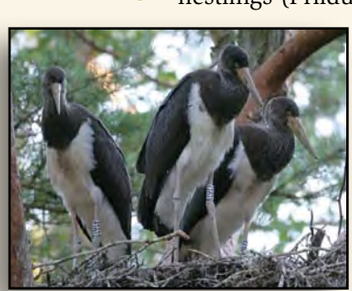


Photo by Urmas Sellis

Priidupoeg (far right) with his siblings.

In early August, Piia migrated, but the transmission points of the male bird, Priidu, originated from a single place—he was entangled in twine from a hay bale. Without the transmitter's data he would have remained there! Since no one had brought the chicks anything to eat, they began their migrations.

Priidupoeg flew to Lithuania where he stayed three weeks, and found an excellent feeding place. He traveled south to the Bosphorus Strait and then in a southeastern direction toward the northeast corner of the Mediterranean.

On September 28th, Priidupoeg's path drifted too far east, about 300 km east of his fellow species members, before he found a southern direction. He made it to Saudi Arabia on the banks of the Red Sea and turned southeast along the shoreline. This wrong turn carried him into the desert. He weakened after 500 km and landed on October 6th in the village of Yanbu-al-Nakhali. We did not receive additional data transmissions, so we assumed he had perished. Traveling to Saudi Arabia was complicated—acquiring a visa and other formalities would consume too much time.

On the 8th of October, it became clear that all was not well concerning Priidupoeg. By the next day, Cathy at MTI had given us a contact in Saudi Arabia, Abdullah Alsuhaibany, who volunteered to look for Priidupoeg even though he was located 350 km away!

This is Abdullah's account:

On the evening of the 9th of October I found emails from people I have never heard of before asking if I know of anybody who can help find a Black Stork with PTT on its back. Dr. Urmas Sellis, from the Estonian Ornithological Society, mentioned that the bird didn't move from the last location since the 6th of October. I am an ornithologist and conservationist, I understand the importance of such a project for an endangered species.

I decided to go there ASAP. It is only 350 km from Jeddah where I live. From the satellite photos that Urmas sent me, it looked like smooth driving and was close to a village named Yanbu Al-Nakhal. I went to see my friend Dr. Mohammed Shobrak (well known ornithologist in our region). He was attending a relative's wedding. I informed him about the poor stork and he insisted on joining me. We left at 2:00am and arrived at the bird's last location about 5:40 (no time to camp or sleep). It was still dark, but soon the sun rose and we were able to search for the bird. Fortunately, Mohammed had a GPS with him but less than 20 meters from the location, the GPS went off due to low battery! Not long after, the farmer Jammal showed up and we asked him about a black bird with a transmitter on its back. He showed us the body on the sand and brought us the transmitter.

Photo by Abdullah Alsuhaibany

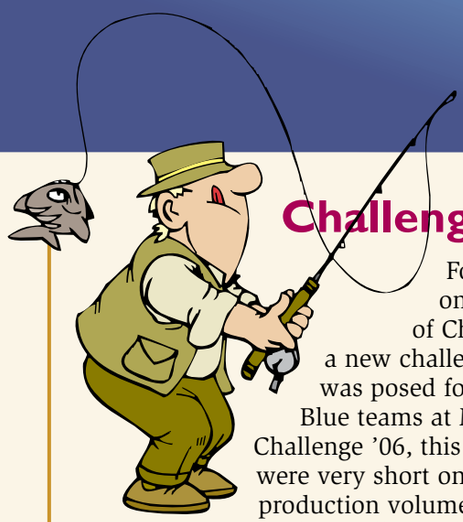
Jammal, the farmer, with recovered PTT.

"The bird was very weak, and I caught it without any resistance on the 7th of October about 13:00", the farmer said. He added also, "I gave it water and food but it didn't eat or drink, it died that same day". Then he removed the transmitter and kept it with him. The PTT is now on its way to Urmas. I wished that we had found the poor young stork alive, so that we could help him to continue his journey south, but there is nothing we can do when nature interferes.

I noticed how much time Urmas and his colleagues spent searching for someone who could help the bird. I wish that we could develop such contacts with scientists from all over the world to assist each other: "Science Without Borders".

This is an example of how it is possible to accomplish what may first appear impossible. The use of transmitters is clearly more productive if there are colleagues present along the migration route, who are ready to act when necessary.

Our sincere thanks to Jammal, Abdullah, and Mohammed!



Challenge ’08

Following up on the success of Challenge ’06, a new challenge for 2008 was posed for the Red and Blue teams at MTI. Unlike Challenge ’06, this year the teams were very short on time, due to production volumes. This led to a simpler challenge, based on the hardware from the previous challenge and no more than one 1-hour team meeting per week.

This year’s challenge required that the teams formulate a way to use a mobile robot to catch “fish” from a “pond” and transfer them to a “basket.” No actual fish were harmed for this project, despite a brief visit from someone representing himself as the “Gorton’s Fisherman” (the trademark of an American frozen food company specializing in fish sticks.)

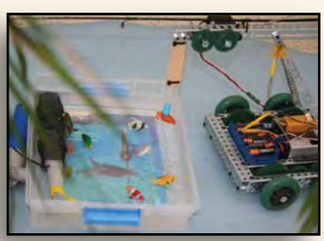
Winning team (clockwise): Diane, Bonnie, Lyn, Austin, Kevin and Ted (captain).

Extra points would be available for the robot acting autonomously, and for catching “swimming” fish. There were also size limitations on the fish, and the “pond” could be stocked with no more than 10 fish; fish were not to exceed 6 inches in length or 2 inches in width or height.

The fishing hole.

One point would be awarded for each stationary fish caught, two points for each “swimming” fish caught and an additional point for successfully placing the fish in the “basket.” The fishing expedition could not take more than 20 minutes to complete.

In both cases, the teams opted for radio-controlled robots, since the time to develop their robots was extremely limited. The magnitude and complexity of autonomous programming precluded that option due to time constraints. Both teams independently decided to use similar schemes for their “catch and release” fishing. Fish with metallic parts were selected to be caught with magnets. In one case, the “fish” were rubber fishing lures with steel hooks, in the other, magnetic aquarium fish. In order to release the caught fish, both teams used a line run through an outer tube, retracting the line into the tube to push the fish off the magnetic hook.



The Blue team robot in action.

The initial portion of the competition was a PowerPoint presentation to the judges and audience. This presentation was to be scored on creativity, ingenuity and the presentation itself, which was limited to no more than 15 minutes.

Christopher (Red Team), as the Gorton’s Fisherman, takes their robot fishing.

The Red team led off with their presentation, outlining their thinking in defining and then proposing solutions for the problem at hand. The Blue team followed: it became immediately apparent that the Blue team had figured a way of “moving” their fish by using a pump in their pond. All were anxious to see how well the actual robots would perform.

We moved to the “pond” and each team took turns to transfer their fish from one pond to the other. Amidst cheers and jeers, while each team played fishing songs in the back-ground, all of the fish were caught!

Award presentation: Paul, Ted and Tom.

Adventure Day at the National Aquarium.

While the judges debated, more food from the picnic was consumed. The judges were unanimous: The Blue team was the winner! They really enjoyed their prize: a day at the National Aquarium in Baltimore and lunch at the Inner Harbor.

Everyone had fun and hope to come back in 2 years for Challenge ’10. Judging by the great feedback we got from our readers for Challenge ’06, we’ll make sure to share our next challenge with you.

Judges for Challenge ’08: Jonathan, Kathy and Joan.

Personal Note from Joan:

I’m always happy to have an excuse to spend some time at MTI. An event like this gives me a chance to put my engineering hat on for a little while and think like an engineer rather than a software geek. Chris and Paul are both very creative, and find ways to foster creativity in the people around them; this is one of the ways they achieve this, and share the experience with other people around them, like their web developer and graphic designer, bankers and insurance people. We all have a great time. I can’t wait for the holiday party in December!

MTI Bird and Fish Tracking Conference

Conference Objective

To promote an exchange of scientific information among scientists using satellite telemetry all over the world.

Date

Conference Sessions March 24, 2009 through March 27, 2009 to be held at the Turf Valley Resort and Spa in Ellicott City, Maryland.

There will be three tracks for the conference: Bird Tracking, Fish Tracking and Technical Conference. The Technical Conference sessions are intended to cover common aspects for both of the other sessions.

Tuesday and Wednesday will feature bird tracking papers, while Friday will feature fish tracking papers and a round table discussion. We will overlap both groups on Thursday morning for the technical presentations pertaining to both bird and fish tracking, to the Argos system and to the new products being released then.

Call for Papers

Abstracts are being accepted for presentations describing the use of our PTTs in bird and fish tracking. The deadline for abstracts is January 31, 2009.

Scholarship for Two Students

In keeping with our ideal of promoting satellite telemetry for the next generation of scientists, we would like to sponsor two students to attend the conference by providing for their food and lodging. Please see our website for details and application; selection will be made by a committee. Students are to provide their own transportation.

Registration Information

All conference attendees, including speakers, are required to register. Registration entitles attendees to all sessions, a copy of the conference proceedings and admission to the welcome dinner reception on Tuesday evening.

There will be hosted breakfast and lunch each day.

There is a $25 fee for registration payable in U.S. dollars (cash or personal check) at conference check in. Use our convenient on-line form to register.

Accommodations

The conference will be held at the Turf Valley Resort and Spa in Ellicott City, Maryland. A block of Traditional style rooms has been reserved for conference attendees at a rate of $131 per night. Additional room types and rates are shown for comparison.

Guest room rates have been confirmed as follows:

Room	Rate
Traditional 1 Queen Size Bed	$131.00
Traditional 2 Full Size Beds	$131.00
Deluxe	$147.00
Junior Suites	$168.00
1 Bedroom Suites	$215.00

Make your reservations by calling 888-833-8873 and use the **conference group code 27M4OK** to receive your special rate. Allocation is on a first come first served basis. **The deadline is February 21, 2009** to make your discounted reservations. Attendees must identify themselves with the Microwave Telemetry name to receive the group guest room rate.

Complimentary Shuttle Service to and from Baltimore Washington International Airport will be available from Turf Valley Resort with advance reservations. Call 888-833-8873 for more information or email them from their website www.turfvalleyresort.com

Turf Valley Resort
2700 Turf Valley Road, Ellicott City, MD 21042

For more information on the conference, contact us by phone at +1 410 715 5292 or email us at microwt@aol.com

Bits & Pieces

Can you believe that in 2007 we gave away 452 Ground Track™ options worth a total of $90,400, in celebration of our 2006 15th anniversary!

Thank you for your patience! Due to an unusually large number of large orders, our production schedule filled very quickly this year, resulting in long lead times. We have taken steps to make production more efficient and expect to be back to an 8 week lead time by the beginning of 2009.

Have you checked out our news widget on the homepage of our website, www.microwavetelemetry.com? Look there for latest updates on production news and events.

Our thanks to all of you who stopped by our booth at the Argos User's Conference in Annapolis, Maryland this past September. It was a pleasure meeting you all and hearing about your projects.