

Microwave Telemetry, Inc.



Around the world in 100 minutes

Dear Customers and Friends,

On December 27, 1831, Charles Darwin set sail aboard the HMS Beagle on a nearly five-year circumnavigation of the globe, collecting data on many species along the way. Forty years later, Jules Verne wrote his famous novel portraying the adventures of Phileas Fogg on his 80-day trip around the world. On Christmas Day 2003, the Beagle II spacecraft is due to land on Mars in search of life after its six-month journey from earth.

Today, each of the six operational Argos receivers is carried around the world in about 100 minutes aboard the NOAA satellites. During every orbit, each receiver collects data from animals in many countries and the oceans below. We are privileged to play a small part during this exciting time in the history of biological research. Over the last twelve years, our transmitters have been shipped to over forty countries and have sent data back from all seven continents and more than one hundred countries.

We present here, as we sweep west from the international dateline, a collection of short articles on the research of some of our customers from around the world (actually about halfway around the world—watch for Part 2 in the spring newsletter). We would like to thank each and every one of them for their contribution.

We wish you joy, peace and happiness this holiday season and all the best in 2004.

Sincerely,

Paul and the staff at MTI



Australia

Tracking flying foxes in eastern Australia

The grey-headed flying-fox, *Pteropus poliocephalus*, is endemic to coastal eastern Australia (from 25°32'S to 37°50'S) and is classified as a nationally Vulnerable species. It roosts during the day in camps that can contain up to 100,000 individuals and flies during the night into the surrounding areas to feed, mainly on eucalyptus blossom, but also on the flowers and fruit of native and introduced plants. While it was known from radio-tracking that individuals can move hundreds of kilometers within the range, the timing and extent of the movements were unknown until some were satellite-tracked.

Two flying-foxes flew about 1000 km and >4° of latitude north from 37°50'S, where they were trapped, and another flew the same distance south from its trap site, 28°48'S. Two returned to the camp where they were trapped after five to six months and the third, three months after leaving Melbourne, has not yet returned. All left camps that remained occupied by large numbers of flying-foxes. Some daytime locations were not in known camps and it is possible that the satellite flying-foxes roosted alone, within a small group or were in an unknown camp.

Although only a few flying-foxes have been tracked, the results show that flying-foxes can cover 400 kms in a couple of nights and that they probably move these distances using favorable winds. They move back and forth across state borders, so a national management strategy is needed to manage this Vulnerable species that appears to have its population wandering over its range—probably in response to fluctuations in blossom abundance.



John Nelson attaches a collar-mounted 18g solar PTT to a flying-fox



Flying-fox collared with an 18g solar PTT

Photos courtesy of John Nelson and Michael Kidman, respectively

Although only a few flying-foxes have been tracked, the results show that flying-foxes can cover 400 kms in a couple of nights and that they probably move these distances using favorable winds.

John Nelson, School of Biological Sciences, Monash University



Japan

Tracking pelicans in Kazakhstan

We are tracking the Dardanian pelican, *Pelecanus crispus*, in Kazakhstan where the greatest number of the pelicans breeding in the Eurasian Continent are found. However, some important breeding sites, such as the Aral Sea, are suffering losses or have disappeared. This study is a part of our project on the Aral Sea ecosystem restoration plan.

Pelicans were captured at Chardala Lake, 40 km north from Almaty, Kazakhstan on July 24, 2002. The lake is an artificial reservoir of 80 km² with a small island. Approximately 200 pairs of *P. crispus* made nests here in the year. We attached 95g PTT-100 satellite telemetry transmitters on the dorsal surface of the pelicans between the wings.



Dardanian Pelican

Photos courtesy of Yukihiro Morimoto and Osman Hamid, respectively



Yoshiro Natuhara

Three pelicans successfully flew from the breeding site and migrated. The departure dates from the breeding site were between September 8 and October 6. The migration route was similar among the three. At first, they moved to the northwest and arrived at the Chew River (one pelican stopped over at the delta of the Ili River), next, they moved to the southwest and arrived at the Syldaria River, they then moved toward the south. They overwintered at an artificial lake in Turkmenistan from mid-October to March.

So far, 1,133 individuals of *P. crispus* have been tagged using various methods in Kazakhstan, but only six were rediscovered. All of them were rediscovered only once. Interestingly, the pelicans stayed at artificial lakes most in their migration.

Our research reports the first recorded migration route of pelicans breeding in Central Asia. We will deploy new 70g Argos/GPS solar transmitters this year.

Yoshiro Natuhara, Osaka Prefecture University, Sakai, Japan

Some important Dardanian pelican breeding sites, such as the Aral Sea, are suffering losses or have disappeared.



Réunion Island

Satellite tracking of tropical seabirds in the southern Mozambique Channel

There is a widespread paradigm among seabird biologists that tropical seabirds live in a poor environment and rely on unpredictable food resources that are patchily distributed in the blue water of tropical oceans. This unpredictability and patchiness is supposed to have shaped the specific life histories and breeding strategies of tropical seabird species. However, very few studies have tested this idea and the foraging strategy and at sea behavior of typical tropical species like boobies, frigatebirds or tropicbirds remains virtually unknown.

We used satellite telemetry (PTT-100, lithium and solar powered) to study foraging trips of breeding red-footed boobies, *Sula sula*, and great frigatebirds, *Fregata minor*, at Europa Island, a major seabird breeding place of the southern Mozambique Channel. This study was completed by at sea surveys, collection of food samples, and various other telemetry studies including altimeters, accelerometers and depth recorders as well as GPS to precisely describe the foraging behavior of these widespread tropical species, and to link this behavior with the characteristics of their oceanic environment.



Matthieu Le Corre faces a red-footed booby returning to its nest



Red-footed booby on nest

Photos courtesy of Henri Weimerskirch

Frigatebirds are capable of very long trips during incubation whereas red-footed boobies remain closer to the island. These results and others will be of great interest to discover the way these fascinating and mysterious seabirds exploit the tropical marine environment.

Matthieu Le Corre, Henri Weimerskirch and Sébastien Jaquemet, Lab. ECOMAR, Université de La Réunion

The foraging strategy and at sea behavior of typical tropical species like boobies, frigatebirds or tropicbirds remains virtually unknown.



United Arab Emirates

The NARC houbara bustard program

The houbara bustard is a 1 to 2 kg sandy-buff-colored steppe and semidesert dwelling bird distributed from North Africa to Mongolia. All populations of African houbara are resident or nomadic, whereas northern populations of Asian houbara breeding in Central Asia, China and Mongolia are migratory, moving southwards in winter to Pakistan, Iran, Iraq, Syria, and the Arabian Gulf states.

The houbara bustard is the ultimate quarry of Arab falconers. Its populations are seriously threatened by detrimental factors including a loss of suitable habitat on the wintering grounds, heavy illegal trapping, and excessive hunting.

The National Avian Research Center (NARC) has been in operation since 1989 with the mission of promoting bustard and falcon conservation and reconciling the traditions of Arab falconry with a sustainable use of the resources. To achieve its strategic goals, NARC is organized around three main programs: a captive-breeding program, an ecology and conservation program, and a rehabilitation program. In the last ten years, NARC has organized numerous expeditions over the entire distribution range of the houbara bustard in Asia with a special emphasis on China, Kazakhstan and Pakistan. Expeditions are targeted at studying population dynamics, distribution, and migration. Satellite tracking is used to understand the migration strategy of the birds and to define the most important stopover sites and migration paths of the species. It is also used for estimating mortality rate of the birds. To date, NARC has harnessed more than 100 houbara with PTTs and followed some individuals over more than 7,000 km from Arabia to Mongolia.



Olivier Combreau with a houbara bustard

Olivier Combreau, director of the National Avian Research Center of Abu Dhabi



Houbara bustard displaying

Photos courtesy of Xavier Eichaker and Mark Lawrence, respectively

Populations of the houbara bustard are seriously threatened by detrimental factors including a loss of suitable habitat on the wintering grounds, heavy illegal trapping, and excessive hunting.



Norway

Tracking juvenile golden eagles' movements in Scandinavia

The Golden Eagle has been accused of inflicting damage on semi-domestic reindeer owned by the indigenous Sami people in Finnmark, Northern Norway. Claims are made that golden eagles gather there to prey on reindeer in winter. Little is known of the migratory patterns of the eagles from these areas.

Two eaglets from different nests were tagged with Argos/GPS solar-powered 70 g transmitters in July 2002, in the reindeer areas in Finnmark at approximately 70°N, 25°30'E. One bird stayed in its natal area until late September. The signal was then lost until it reappeared in the Gulf of Bothnia on October 18, the last recording of that bird.

The second bird moved from its natal area during September, and was recorded in northern Finland during mid-October. No signals were transmitted until February 20, 2003, presumably due to low solar battery charge, until it reappeared in Central Sweden, more than 900 km to the south.



Torgeir Nygård holding a juvenile golden eagle

On March 25 it took off for the north, moving through inland Sweden, covering 850 km in only 20 days. It moved between Finland and Norway in April, visiting its natal territory on May 7. On May 24 it came to rest in a reindeer calving area. The bird was never recovered. The allegations that juvenile birds stay in Northern Norway during winter to prey on reindeer were not supported by this study.

The new Argos/GPS technique proved very promising, despite the fact that only one of the two birds provided detailed information. The best transmitter provided 308 GPS and 547 Argos fixes in its year of operation.

Torgeir Nygård and Geir Helge Systad, Norwegian Institute for Nature Research



Juvenile golden eagle

Photos courtesy of Karl-Otto Jacobsen

Claims have been made that golden eagles from large areas may gather in large flocks in Finnmark in winter, causing damage to the reindeer.



Czech Republic

African and New Odyssey and black stork migration

In 1995, we launched a project called African Odyssey and since then monitored the migration of eighteen black storks, *Ciconia nigra*, from the Czech Republic to their wintering grounds spread between the southern edge of the Sahara and the Equator. They took either an eastern or western migration route. We followed one of the storks, a female called Kristyna, step by step to her wintering grounds in West Africa. Altogether, we tracked her for nearly four years. We also monitored some other storks for more than a year. We have undertaken many expeditions to the storks' final destinations as well as stopovers on their routes.

Besides providing a deeper insight into the migration pattern of the black stork, the African Odyssey project revealed the problem of insufficient protection of the species in Europe (three birds were intentionally shot to death). The project was organized by the public service Czech Radio which delivered regular updates on the migration of storks equipped with transmitters to hundreds of thousands of listeners.



Miroslav Bobek releases a black stork

In 2002, a project called New Odyssey was launched to succeed the African Odyssey. The New Odyssey project is being organized jointly by Czech Radio and the zoo in the town of Chomutov. It aims to broaden the knowledge of migration patterns and wintering grounds of the black stork in the Asian part of its breeding area. It also aims to improve the protection of the species and raise the public awareness concerning this matter. We tracked three storks last year and two this year, all of them from the Novosibirsk region in Russia.

Miroslav Bobek, on behalf of the African and New Odyssey team

More information is available at www.rozhlas.cz/odysea; a downloadable publication with an English summary at www.rozhlas.cz/odysea/publications.



Black stork

Photos courtesy of Khalil Baalbaki

The New Odyssey project aims to broaden the knowledge of migration patterns and wintering grounds of the black stork in the Asian part of its breeding area.



Denmark

Tracking king eiders and common eiders in West Greenland

Since 1999, scientists have collected information regarding migration routes, staging areas and population segregation of king eiders and common eiders in West Greenland and eastern Arctic Canada through the use of PTTs. The gathering of information began by implanting PTTs in ten king eiders during their wing molt in Upernavik, West Greenland. This first project revealed surprisingly that king eiders migrated in the autumn directly to bank areas far offshore Southwest Greenland where they stayed during autumn and winter.

Since then we have implanted PTTs in wintering, breeding, and molting common eiders and king eiders to link breeding and wintering areas and to learn about the migration routes, staging areas and population segregation of these two species.

Large numbers of both king and common eiders winter in the open water area off Southwest Greenland, where there is concern over hunting pressure and disturbance. Scientific information shows significantly that the common eider population has declined in the West Greenland breeding areas. However, most of the Greenland winter population breeds in the vast eastern Canadian Arctic. Satellite tracking has given us vital information about local movements and habitat use in winter areas, showing that despite large differences in hunting pressure, most eiders stick to the same place for long periods. We have also learned where birds from the most heavily hunted area go to breed.

Most of the projects have been conducted with collaboration between National Environmental Research Institute (Denmark), Greenland Institute of Natural Resources, Copenhagen Royal Veterinary University and Canadian Wildlife Service.

Anders Mosbech, National Environmental Research Institute,
Department of Arctic Environment, Denmark

For more information visit: http://www.dmu.dk/1_Om_DMU/2_Afdelinger/3_AM/4_Expertise/5_Research/6_Satellite_tracking/default_en.asp



Anders Mosbech



King Eider

Photos courtesy of Anders Mosbech and Christian Sonne-Hansen, respectively

Large numbers of both king and common eiders winter in the open water area off Southwest Greenland, where there is concern over hunting pressure and disturbance.



Germany

Monitoring raptors in the Old World

It was a long-standing dream to be able to follow a migrating bird on its journey. With the introduction of satellite telemetry, the answers to a large number of questions came within reach (e.g., migration routes; timing and speed of migration; factors influencing migration such as weather, natural barriers, etc.; situation of wintering areas; home range sizes of wintering and non-breeding summering birds; and breeding and wintering site fidelity).

Between 1992 and 2003 we fitted PTTs on 105 Eurasian and African birds of prey belonging to fourteen different species (29 lesser spotted eagles, *Aquila pomarina*, 16 steppe eagles, *Aquila nipalensis*, 13 greater spotted eagles, *Aquila clanga*, 11 ospreys, *Pandion haliaetus*, 8 imperial eagles, *Aquila heliaca*, 6 black kites, *Milvus migrans*, 5 red kites, *Milvus milvus*, 4 short-toed eagles, *Circaetus gallicus*, 4 honey buzzards, *Pernis apivorus*, 4 Egyptian vultures, *Neophron percnopterus*, 2 Wahlberg's eagles, *Aquila wahlbergi*, 1 white-tailed sea eagle, *Haliaeetus albicilla*, 1 Steller's sea eagle, *Haliaeetus pelagicus*, 1 peregrine falcon, *Falco peregrinus*). These were mainly adult birds trapped by various techniques in many countries in Europe, Asia and Africa.



Bernd Meyburg with an Egyptian vulture

In the early years, battery-powered PTTs (weight 30-95 g) were used, but later on, once they became available, we switched to solar-powered PTTs (weight 18-95 g). Two solar-powered PTTs have functioned for almost five years and a third one for almost six years after being fitted to a lesser spotted eagle.

This is a brief sketch of the wide range of this research, only a small part of which has been published and the bulk of which still awaits analysis. More wide-ranging results can be expected from use of this technique, especially the way in which the processes of migration and reproductive success are interdependent.

Bernd-U. Meyburg and Christiane Meyburg, WWGBP



Lesser spotted eagle with chick on nest

Photos courtesy of Bernd Meyburg and Bojan Mitchev, respectively

More wide-ranging results can be expected from use of satellite telemetry, especially on the way in which the processes of migration and reproductive success are interdependent.



Switzerland

Satellite telemetry and the study of the eagle owl

Satellite telemetry is mostly used to follow migrating animal species. However, the method is also useful for bird species that cover only short distances. This can be shown in a test we have conducted with the eagle owl, *Bubo bubo*.

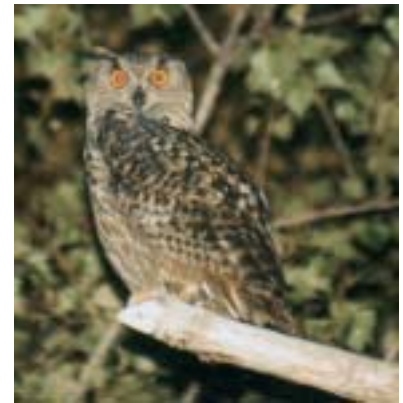
This species has disappeared in Switzerland almost completely. It is true that the population increased slightly in the 1980s, but breeding density has remained low and many abandoned nest sites have not been reoccupied. In order to better understand the population dynamics of the eagle owl, we want to study, among other things, the juvenile dispersal of the species—a project of several years. We would like to know what happens to the juveniles after they leave the nest, how many of them die, which are the most common causes of death, where they perish and where the surviving juvenile birds finally settle. For this purpose, 19 juvenile birds have been fitted with conventional tags. Four of them got an additional Argos PTT.

Our study area is in the Alps (Canton of Wallis, Switzerland). Since young owls roam about widely and frequently move from one valley to the next, we repeatedly lost birds carrying only conventional tags. Those had to be searched for by car, which meant driving thousands of kilometers. By using Argos PTTs we were able to save a lot of time and driving. Thus the Argos system proved useful even in this rocky habitat with its many valleys and ravines. With the help of Argos tags we have found several birds that had crossed mountain ranges 3000 m high and flown to another area. One of them crossed the Alps and went as far as Italy!

We were able to study juvenile dispersal in detail, where the animals went, and we also managed to find two birds that died in the course of the project. In addition, we learned that some individuals return to the parents after a few weeks, and we could prove for the first time that females can already breed successfully in their first year of life.

Adrian Aebischer with a juvenile eagle owl

Adrian Aebischer, University of Berne, Switzerland



Eagle owl

Photos courtesy of Adrian Aebischer and Daniel Maeder, respectively

In order to better understand the population dynamics of the eagle owl, we want to study, among other things, the juvenile dispersal of the species—a project of several years.



France

Tracking the little bustard, *Tetrax tetrax*

The little bustard, *Tetrax tetrax*, is a medium-sized Palearctic bird.

Until the early 1900s, it was common in open fields in many parts of Europe; since then, it has disappeared from a large portion of its former range. Remaining populations show continuous declines, especially in France, Italy, Ukraine, and some parts of Spain. Formerly considered as Globally Threatened, it is currently classified as Vulnerable in Europe. In France, the little bustard is red-listed because its population has declined from 7,200-8,500 breeding males in 1978-79 to 1,200 in 1996 (an 85 percent decline in 17 years), associated to the corresponding range reduction.

Given this critical situation, a conservation program financed by the European Union and French collectivities was started in 1997 and was led by the Ligue de Protection des Oiseaux. The main aim of the program was to determine the reasons for this decline.



Vincent Bretagnolle

Because the little bustard population in France is migratory, we had to investigate the possibility that the birds may winter in a particularly unsafe area. We used three PTTs (in 1997 and 1999) on our birds as well as 20 conventional radio-tags, and found that all were wintering in high plateaus of central Spain. Thus, we were able to definitively rule out the possibility that the decline was due to winter conditions. Instead, the main explanation for little bustard decline in France is a decrease in food (insect) abundance as a result of agricultural intensification.

We are now exploring the possibility of reinforcing our French populations using eggs from Spain. Using two solar PTTs, we are testing the migratory behavior of little bustards hatched from Spanish eggs (that are resident) but raised in France (where the population is migratory).

Vincent Bretagnolle, Centre d'Études Biologiques de Chizé



Female little bustard being equipped with a 20g PTT

Photos courtesy of Vincent Bretagnolle

Until the early 1900s, the little bustard was common in open fields in many parts of Europe; since then, it has disappeared from a large part of its former range.



Spain

Tracking Bonelli's eagle in Spain

The Bonelli's eagle, *Hieraetus fasciatus*, is a medium-sized agile raptor that lives in the Mediterranean area; the main European population of about 700 pairs is concentrated in Spain. It is often found in the neighborhood of man, where it competes to a certain degree with hunters for rabbits and red-legged partridge. This fact causes direct persecution which accounts for more than 30 percent of mortality of this eagle species, although the main number of bird deaths is caused by power lines—especially dangerous for young eagles during dispersal.

In the last 20 years, population size decreased significantly in the northern half of Spain resulting in a loss of 33 percent in the last decade. Therefore the regional Government of Aragón, in northern Spain, decided to carry out a series of studies and measures to explain and combat this trend.

One of the measures was the tracking of young Bonelli's eagles by satellite transmitters, a study that was conducted by BIOMA T.B.C.



From left to right: Ernesto Ferreiro and Andrea Gardiazábal from BIOMA T.B.C. and Manuel Alcántara from the regional Government of Aragón

The first results showed surprising wandering routes of up to 3,000 km through the Iberian Peninsula including non-Mediterranean climate-zones. Most of the birds spent their first year of life in southern Andalusia or in the central Spanish Tajo Valley. All of these dispersal areas hold a high density of prey—and of dangerous power lines.

Although the population decrease is more pronounced in the northern part, a solution of this problem must comprise all autonomous regions of Spain and requires legal measures by the national Government.

Andrea Gardiazábal, Ernesto Ferreiro, Manuel Alcántara



Adult Bonelli's eagle

Photos courtesy of Alberto Portero and Andrea Gardiazábal, respectively

In the last 20 years population size decreased significantly in the northern half of Spain resulting in a loss of 33 percent in the last decade.



Gibraltar

Tracking short-toed eagles

The short-toed eagle, *Circaetus gallicus*, is mainly a summer visitor to southern Europe. Up to about 700 have been recorded migrating over the Rock of Gibraltar in one season. Increasingly, they are seen in the area during winter. Therefore there is an indication of the beginning of a shift in migratory behavior. Several short-toed eagles are downed every year by yellow-legged gulls, *Larus cachinnans*, and peregrine falcons, *Falco peregrinus*, and are re-



John Cortes, bottom, rings a short-toed eagle with the assistance of Vincent Robba and Stanley Olivero

habilitated and released.

The satellite tracking investigations were started with various aims in mind. The first aim is to look at the migratory habits of the birds—in particular to identify their wintering areas and the routes followed to and from these. The birds targeted are those hatched in the previous year and released in late spring, giving an opportunity to locate them during two successive nesting seasons. A secondary aim is to ascertain survival after the rehabilitation process.

The project is in its infancy, with only two eagles, a male and a female, having been equipped so far. They have, however, already shown that they both survived for months after release. Winter locations were found for one of the eagles in Morocco, further north than the main wintering grounds. This eagle, which continued to transmit for over a year, returned in the second spring to a location similar to the first.

John Cortes, Gibraltar Natural History Field Centre



Short-toed eagle flying away over a Gibraltar town

Photos courtesy of E.Yome/
GONS photo library

Satellite tracking investigations were started with various aims in mind. The first aim is to look at the migratory habits of short-toed eagles—in particular to identify their wintering areas and the routes followed to and from these.



Portugal

Movements of the little bustard in the Iberian Peninsula

The little bustard, *Tetrax tetrax*, is a medium-sized grassland bird that has suffered a major decline in most of its Palearctic range, mainly due to agricultural intensification. It is considered a globally Near Threatened species and is a priority species under the European Bird Directive. Portugal and Spain harbor more than half of the world's population of the species.

In contrast with the northern and eastern breeding populations of the little bustard, which are fully migratory, the Iberian populations are thought to be sedentary or, at most, partially migratory, but still little is known.



João Paulo Silva

Since 2000, a study of the little bustard's movements has been carried out by the Portuguese Nature Institute (ICN) with three main objectives: (i) to identify the areas that it depends upon through the year; (ii) to contribute to the understanding of its biological requirements and (iii) to test the fidelity to the selected areas.

Since the little bustard is mostly dependent upon open agricultural ecosystems, its survival is highly dependent on how these are managed within its range. Knowledge of the factors that determine how the species uses these ecosystems throughout its yearly cycle is essential to plan sound management practices.


João Paulo Silva, Instituto da Conservação da Natureza



Male little bustard

Photos courtesy of Carlos Carrapato and Paula Pereira respectively

The little bustard is considered a globally Near Threatened species and is a priority species under the European Bird Directive.

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School kids make an interesting discovery

Three eight-year-old boys were exploring the dunes at Island Beach State Park, New Jersey on Saturday, September 27, when something at the base of the dune at Marker 21 caught their eye. It was a dead sea turtle. But what was that mysterious object beside the carcass? It was black and cylindrical with an antenna—they'd never seen anything like it! The return label on the device led them to Dr. Molly Lutcavage (Department of Zoology, University of New Hampshire) who explained that they had found an Archival Pop-up Tag that she had deployed in her bluefin

tuna project. The recovery near the sea turtle carcass was just a curious coincidence.

The discovery of the tag became a source of fascination to the boys. With the enthusiastic help of their parents, they researched and printed out anything related to the bluefin tuna project and the tag. They read everything they could find about Dr. Lutcavage's project and boasted about their discovery to their friends and classmates.

Before returning the pop-up tag, the boys took turns bringing it to school for show and tell. Their teachers declared it the most interesting presentation they had seen in ages. After a week of sharing the tag with each other and their classmates, the boys finally allowed the tag to be shipped back to Dr. Lutcavage's lab.

We were happy to hear that one of our tags provoked so much interest and curiosity among schoolchildren—the biologists of tomorrow! To further their interest, we sent the boys a dummy tag.



Photos courtesy of Kenneth Connaughton

Michael, Brandon and Kevin holding our Archival Pop-up Tag on the beach where they made their discovery



Aerial photo showing the area of the New Jersey shore where the boys found the tag

You need to know...

Constant depth explained

Each Microwave Telemetry Archival Pop-up Tag is equipped with an automatic release feature whereby the tag pops off and begins to transmit to Argos if it senses that it has been at a constant depth for four days. Depth variations less than twenty meters are regarded as constant depth by the tag.

This pressure release mechanism is standard on Archival tags for good reason—it indicates when a fish is dead or a tag is detached. Tags that detach and float around for months before the programmed data transmission time have a poorer reporting rate; the opportunities for the tag to be eaten, covered in growth, washed up on a beach or otherwise damaged reduce the chances of getting the archived data.

This spring, look for the second special edition of our newsletter.

The continued focus will be on research around the globe—

featuring projects in Africa,

North and South America, and

more...

The automatic release feature may initiate pop off from a live fish if the fish being tracked remains in shallow water or within a narrow depth range for four days. Although it is possible to disable the automatic release feature, this is not something we recommend in most cases.

Contact us to discuss your project if it is possible that the fish you are tracking may remain at a constant depth for four days in the course of its normal behavior.

