Satellite Tagged Bar-tailed Godwit Circles the Pacific

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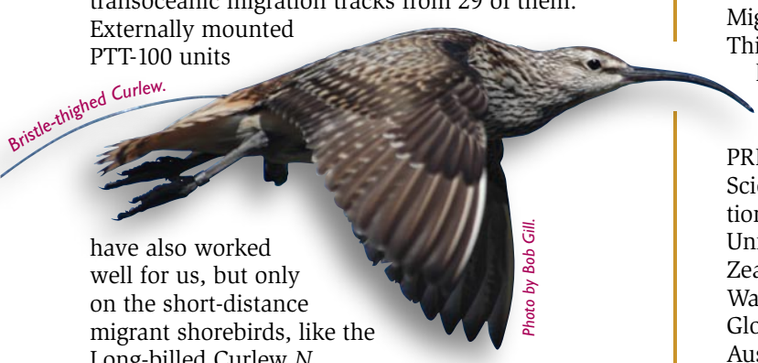
On 7 September 2007 an international group of scientists and shore-bird enthusiasts eagerly awaited transmission from a PTT deployed on an adult female Bar-tailed Godwit *Limosa lapponica baueri*, a large shorebird that nests in Alaska and migrates to New Zealand and eastern Australia. The bird (dubbed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

Photo by Ted Swem

Male Bar-tailed Godwit in Alaska in May.

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 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.



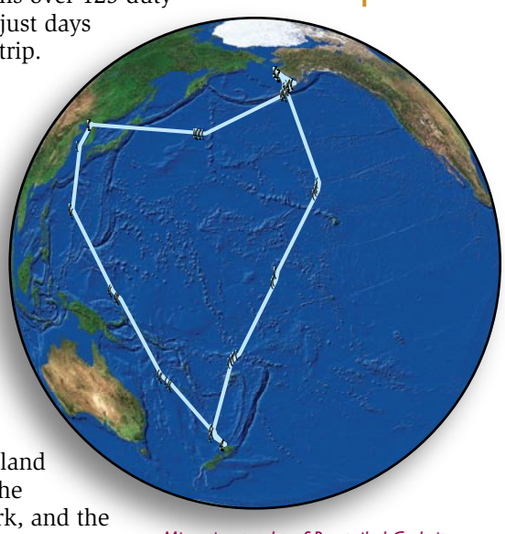
Bristle-thighed Curlew.

Photo by Bob Gill.

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.



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

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.