Motus Wildlife Tracking System for the West

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The Motus Wildlife Tracking System

- Motus (motus-wts.org) is an international collaborative research network of automated radio-telemetry receiving stations.
- Initiated by Bird Studies Canada to facilitate landscape-scale research and education on the ecology and conservation of migratory animals.
- The current receiver station array comprises more than 500 sites from the Canadian Arctic to South America, operated by more than 600 collaborators.
- Since 2013, more than 20,000 individuals of more than 200 species have been monitored using the system.
- Data collected from Motus stations feed into BSC's master database where it is archived, visualized, and distributed to researchers and the general public.

Motus and Migratory Bird Research

- Partners in Flight Western Working Group established a Motus committee in 2018.
- Motus Committee Chair: Mary Whitfield, mjwhitfield.ssrs@gmail.com
- Expand the use of this technology to gather information to inform conservation actions within the next decade.
- Obtaining western specific post-breeding movement and migration information, especially identifying important stopover sites, is critical to the conservation of these species.

The Western Motus Network

Motus stations 2014-2017

Projected Motus stations by 2021

Motus Stations

- The western network will include western provinces and territories in Canada, eleven western states of the United States southward through the western states of Mexico, and the Pacific-slope regions of Central and South America.
- The network is made up of collaborators, so the placement of stations will largely be determined by independent research goals.
- PIF WWG proposes strategic placement of stations to address larger scale questions. Thus, collaborators can contribute to site-specific research needs, broad scale objectives, or both.

Motus Station Options

Motus Station Options

Motus Station Installation in Nevada

- Coordination among members of Nevada PIF. Establish Motus committee?
- Coordination with other partners including private landowners.
- Opportunities to leverage funding and resources.
- Other.

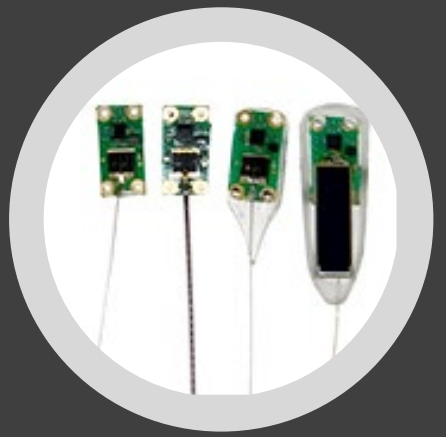
Motus Station Installations on National Wildlife Refuges

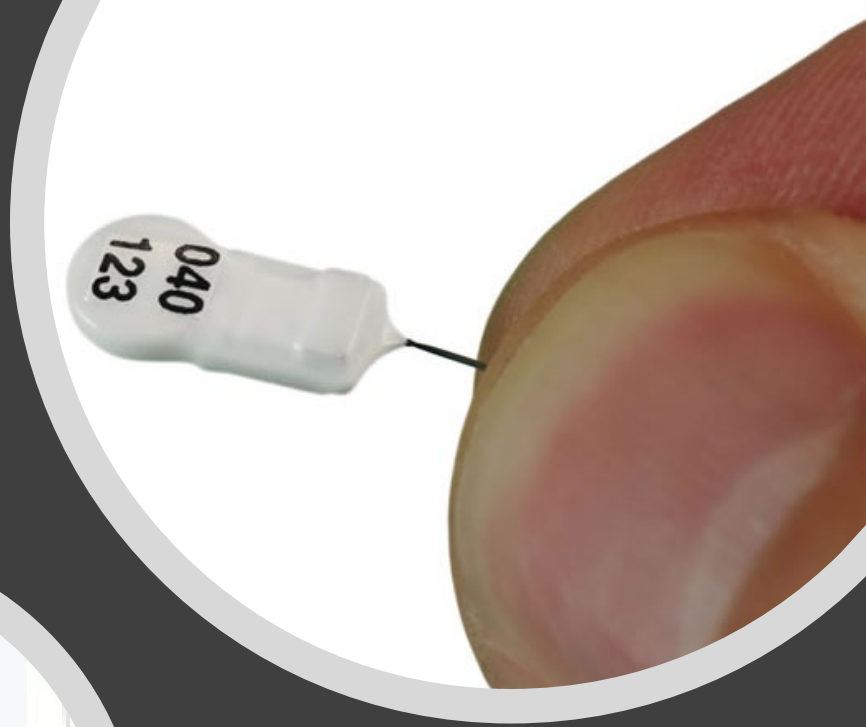
- Station installed on Desert NWR
- Stations being planned for Ash Meadows, Moapa Valley, and Pahranagat NWRs for this fall.
- Other potential locations: Ruby Lake NWR, Stillwater NWR, and Sheldon NWR.

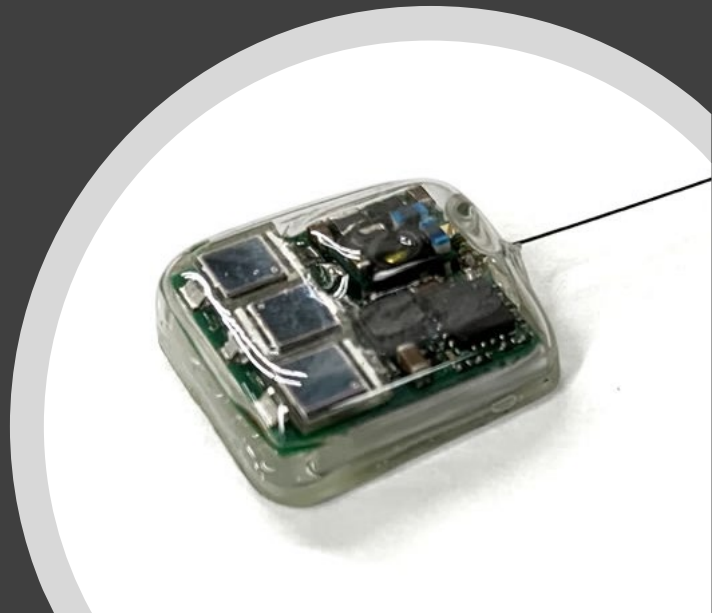
Current Technology

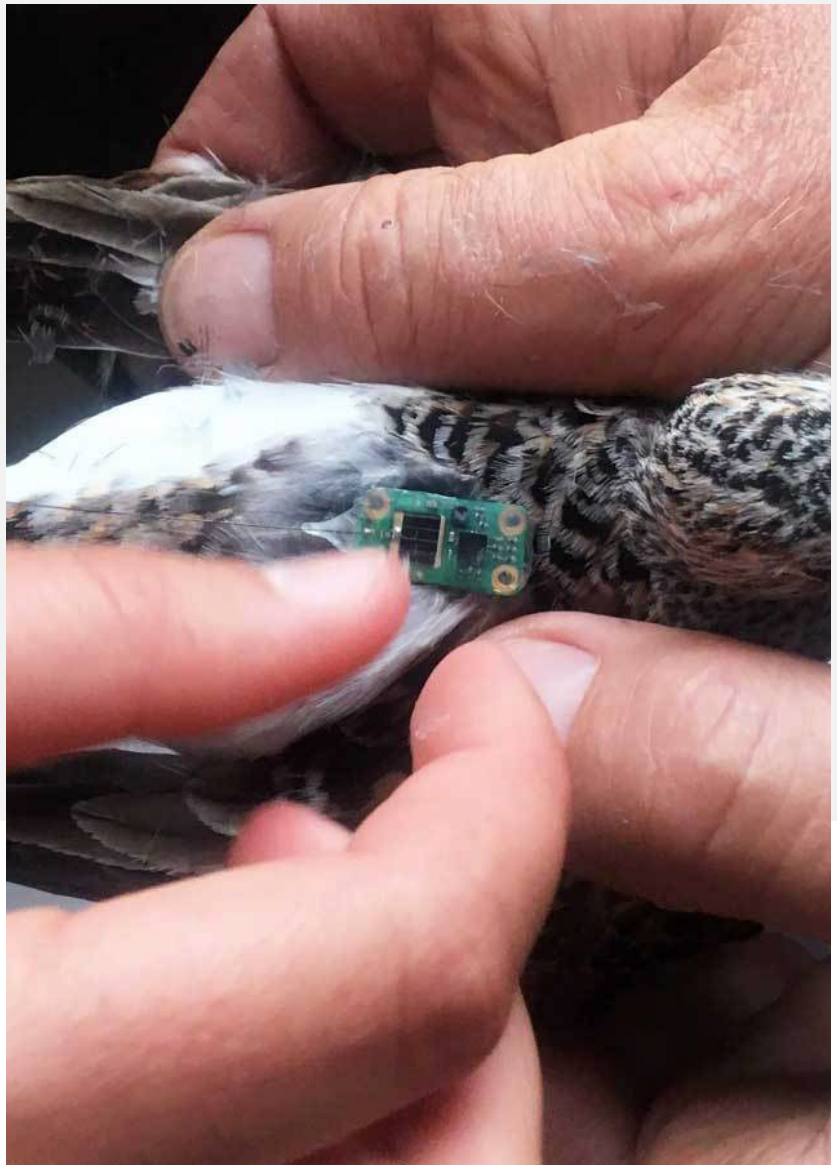
- The Motus Wildlife Tracking System is currently compatible with transmitters manufactured by Lotek Wireless and Cellular Tracking Technologies.
- Lotek Nanotags operate at 166.380 MHz and range in size from 0.15–3.0 grams. Solar Nanotags are now available.
- Cellular Tracking Technologies has two options for transmitters: PowerTags and LifeTags, each operating at 433 MHz with sizes 0.46 grams and up.
- With these options, there is much flexibility in choosing the most appropriate system to accomplish your project goals.
- PIF WWWG recommends building hybrid (i.e. Motus/CTT) stations to maximize tracking abilities.

Lotek Nanotags and CTT PowerTags and LifeTags









Lotek Nanotag and CTT PowerTag Attachment

Phase 1 (2019-2021):Initiate building the network and meet short-term landbird and shorebird objectives.

- Fill critical information gaps for priority bird species and groups.
- Integrate Motus Technology into ongoing research programs for the following priority landbird and shorebird species: Bank Swallow, Common Nighthawk, McCown's Longspur, Chestnut-collared Longspur, Oregon Vesper Sparrow, Sagebrush Sparrow, Bell's Sparrow, Brewer's Sparrow, Tri-colored Blackbird, Sage Thrasher, Swainson's Thrush, Willow Flycatcher, Gray Flycatcher, western Warblers, Yellow-billed Cuckoo, Phalaropes, Western Sandpiper, Red Knot, Sanderling, Semipalmated Sandpiper, Semipalmated Plover, Dunlin, Short-billed Dowitcher, Snowy Plover, and Mountain Plover.
- Expand the partnership to include bats and other wildlife.

Areas of Study Needed for Most Landbirds and Shorebirds

- Arrival and departure times on breeding grounds
- Overwinter survival
- Stopover duration
- Regional and site level stopover and molt-migrant fidelity
- Post-fledgling survival and dispersal
- Breeding habitat use

Phase 2 (2022-2027):Fill spatial gaps, ensure longevity of the network, and meet long-term objectives.

- The following three areas of study have been identified as important for the conservation of migrant landbirds and shorebirds:
- 1. Migratory connectivity
- 2. Migratory timing and movements and how they relate to climate
- 3. Movements on wintering grounds

Motus Resources

- Websites
  - The PIF WWG Western Motus Prospectus: https://partnersinflight.org/resources/motus-initiative/wwg-motus-prospectus_20181010/
  - Motus Wildlife Tracking System: https://motus.org/
  - Cellular Tracking Technologies: https://celltracktech.com/
  - Lotek: https://www.lotek.com/