DEPARTMENT of the INTERIOR

news release

FISH AND WILDLIFE SERVICE

Feature Release

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WILL MICROSCOPIC "FINGERPRINTS" ON FINS, FEATHERS, AND FUR REVEAL NEW INFORMATION ABOUT WILDLIFE?

They are so small they escape the notice of animals indelibly marked by them, but microscopic plastic particles as distinctive as fingerprints may soon have a big impact on wildlife research. The particles, now being tested by the U.S. Fish and Wildlife Service, could reveal valuable information long sought by scientists who study the ways of wildlife.

Microtaggants*--salt-sized, color-coded plastic chips originally manufactured by the 3 M Company to trace explosives used in criminal acts--may revolutionize the time-honored practice of marking animals for various purposes. "Recognition marking" was attempted before the nineteenth century by ornithologists and ichthyologists to establish ownership, send messages, and learn bird and fish movements. Izaak Walton's The Compleat Angler in 1653 alluded to experiments where young salmon had ribbons tied to their tails to demonstrate their return to spawn. The earliest known bird marking dates back to ancient Rome.

Today, marking is a basic tool of fishery and wildlife biologists who use tags, streamers, dyes, even radioactive isotopes, to learn behavioral information not otherwise available. Microtaggants could make marking easier for researchers, safer for animals, and cheaper for the Federal government, with unique codes, durability, and ease of detection and recovery.

The tiny tags are made of up to 10 layers of inert plastic sandwiched in a special color sequence to make an identifying code. Available with fluorescent and ferromagnetic layers, they can be quickly spotted under ultraviolet light and easily picked up for decoding with a small magnet. Although the particles are unobtrusive and do not interfere with animal behavior, they can be detected and decoded by any field researcher with a portable microscope.

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Application methods now being tested may further increase the usefulness of the particles; for example, aerial spraying may make mass marking of birds practical for the first time. Blackbirds and starlings can spread disease or cause considerable damage to crops. Researchers need more information about these birds, which sometimes congregate in roosts by the millions, so they can be effectively controlled. Specialists at the Denver Wildlife Research Center --the first Fish and Wildlife laboratory to test the particles--are conducting a field study to determine the practicality of aerial applications. Preliminary tests indicate most birds in a roost sprayed with a mixture of particles and liquid adhesive were sufficiently marked, and particles remained on penned birds for more than 90 days.

The tags' inconspicuous size, durability and other features have prompted Service fishery biologists to consider them for a broad range of studies, particularly to monitor populations. The striped bass, a popular food and sport fish, has drastically declined in recent years. The particles could be used to indicate survival rates of released bass and other fish, and could be an improved means of measuring the success of stocking programs. Particles implanted in a fin or under scales may prove more permanent than various paints and dyes now in use.

With the tags, researchers trying to restore endangered fish species may be able to effectively mark small ($1\frac{1}{2}$-, 2-, and 3-inch) species for the first time. Specialists who work with fish on the threshold of extinction look forward to retrieving tagged fish during studies without having to sacrifice them. They could also use the particles to learn if and when, after reintroduction, fish reproduce in the wild.

Fish and wildlife fed food laced with the flakes could give biologists important short-term information. Service scientists continue to study predator-prey relationships, and the markers may help solve nature's "whodunits"--identifying preying species and evaluating their effects. To learn how mink affect the duck population in a certain area, for example, a researcher could mark eggs or ducklings in nests, and mink droppings could be tested for the markers' presence. The markers do not interfere with digestion, and pass intact through the system.

Added to toxic baits and eaten, the particles could provide a quick means of identifying specific toxicants in pest control programs without expensive or time-consuming chemical analysis. Using the mini-markers to identify toxic substances also may help document secondary hazards poisons pose to predators.

Service researchers anticipate that the miniscule chips, slated for use in a variety of studies, will uncover much important information that has so far eluded them.

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*Reference to trade names does not imply Government endorsement of commercial products.