

# Overview of Angler-based Tagging Programs and Management Issues

By Andrew J. Loftus, Jeff Waldon, Virginia Fay, Kay Davy, and Jon Lucy

## ABSTRACT

Within the fisheries management community, there is growing interest and concern about the practice of allowing volunteers to tag and release fish. While organized volunteer angler-based tagging programs have been in existence for at least 40 years, its practice has been most prevalent in marine fisheries. Recent concern over the production and distribution of inexpensive tagging kits through sporting goods retailers has raised the concern that the practice may expand in inland waters where it may not be legal or condoned by state agencies. Proponents of angler-based tagging programs argue that large amounts of data can be collected while engaging the angling community in catch-tag-and-release fisheries. Opponents claim that the untrained taggers are more likely to injure fish, that the quality of the fishing experience may be diminished by increasing the number of marked or scarred fish, and that such programs interfere with management/research tagging efforts. A summary of angler-based tagging programs and the results of a brief survey of fisheries agencies about the legality of tagging are presented, as well as a presentation of a "tag registry" and recommendations for model tagging programs.

**T**agging and recapturing fish is a standard tool used by fisheries managers and researchers to assess various aspects of fish populations. In recent years, the involvement of volunteers (generally anglers) in fish tagging programs has begun to capture greater attention of managers. Some state and federal agencies use angler-based tagging programs to collect information on species that agencies do not otherwise have the ability to collect. Other agencies prohibit or otherwise discourage tagging by volunteer groups.

With an apparent increase in angler interest in participating in tagging programs, professional fisheries managers across the nation are faced with the task of discerning the legality of allowing anglers to tag fish in their jurisdictions, as well as the benefits or harm of such practices.

While some managers actively encourage properly conducted tagging programs and work with anglers to utilize the data collected, others vehemently discourage the practice. At the 1998 Annual Meeting of the American Fisheries Society (AFS) in Hartford, Connecticut, a wide range of scientists, management agencies, and angler-based tagging groups came together to address the range of issues associated with volunteer fish tagging. This paper and the accompanying papers in this issue of *Fisheries* (volume 25, number 4) address the topic areas of that symposium.

## To tag or not to tag?

Many anglers may be drawn to tagging fish by the belief that this will contribute to the management information base. Beyond these perceived benefits to management, tagging is

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The following pages are devoted to a topic that is a source of growing debate among fisheries managers and scientists: angler involvement in tagging and releasing fish. AFS has taken an active role in this debate by participating in a workgroup with representatives of angler-based tagging groups, and state and federal agencies in January 1998, followed by a special symposium on this issue during the 1998 Annual Meeting in Hartford. As you will see in the following articles, there is no clear consensus on the appropriate role of anglers in tagging and releasing fish. By publishing alternative viewpoints, including those outside of the typical realm of fisheries professionals, we hope to foster solutions that take into account the breadth of differing opinions and that are based on sound science and good fisheries management principles.

—A. J. Loftus, Special Issue editor



appealing to anglers for discerning movement patterns of the fish they catch and as a component of catch-and-release tournaments (Cunningham et al. 1991). Many charter captains actively participate in tagging programs with some promoting tag and release fishing services only. These captains see the necessity of protecting the species and pass on conservation messages to new and old angler clients alike. The opportunities to tag fish will likely increase as the conservation ethic among the angling community increasingly moves toward the promotion of catch-and-release fishing and as fishery management plans require anglers to release undersized fish and adhere to bag limits or seasonal closures. Operated correctly, tagging programs can provide valuable data while allowing anglers to become actively involved, more aware and ultimately better stewards of natural resources. The beneficial effects of involvement with an angler-based program can be far-reaching.

However, some fisheries managers have raised concerns about the advent of some volunteer-based tagging programs that may have unclear objectives, uncertain long-term commitment, or are poorly planned. Further, some states concerned about the potential biological implications of tagging on fish, such as increased stress and mortality (Wydoski and Emery 1983), and the impact on the fishing experience, expressly prohibit the tagging of fish and wildlife by the public. Nevertheless, equipment to do so is marketed in stores in those states (Costello 2000, this issue; Wingate 2000, this issue). Even some well-designed programs may conflict with agency-based tagging programs which may result in compromising the quality and quantity of returns reported and ultimately the integrity of the management/research tagging database.

The use of volunteers outside of the professional management/scientific realm to collect data in natural resources management is not new. Over 500 programs are listed in the "National Directory of Volunteer Environmental Monitoring Programs" (EPA 1994), with over three quarters of these conducting some type of stream assessment (EPA 1997). Many of these programs have adopted quality assurance programs in conjunction with scientific agencies to increase the utility of their data for management purposes (EPA 1996). In wildlife management, since 1966, wildlife managers and researchers have used volunteer census counts of breeding birds to assess trends in populations throughout North America (Robbins et al. 1986). This "Breeding Bird Survey" has become an established valuable tool for assessing avian populations that is used extensively by researchers (for an example, see Flather and Saur 1996). However, neither water quality monitoring or the breeding bird census involve an invasive procedure on organisms such as tagging, which is one of the concerns expressed by managers. Nonetheless, volunteer tagging programs have provided critical information for fishery management. In the management of highly migratory species in the Atlantic Ocean, data from tagging conducted by fishery constituents (commercial and recreational fishers as well as scientists) have been key sources of data available on movement and migration of species such as bluefin tuna and billfishes (Scott et al. 1990).

## History of angler-based tagging programs

Although fish have been marked or tagged for centuries (Wydoski and Emery 1983), it is not clear when the first angler-based tagging program was begun or even what first distinguished angler-based tagging from efforts of early biologists and fisheries managers. Current day angler-based tagging programs are perhaps most prevalent in saltwater arenas, and many of these programs have their origins with fisheries management agencies or research facilities. In 1954, Frank Mather at the Woods Hole Oceanographic Institute enlisted the aid of anglers to tag bluefin tuna. This program expanded, moved to Florida in 1980, and became the National Marine Fisheries Service (NMFS) Cooperative Tagging Program (Scott et al. 1990). It allows direct participation of anglers in tagging and monitoring movements of large pelagic fish (Anderson 1995). This program currently collects data from, and shares data with, a number of private-based organizations, including the Boat Owners Association of the United States (BOAT/U.S.) Clean Water Trust (which began a program to tag near-shore species in 1996), the Billfish Foundation (which began tagging programs in 1990), and the American Fishing Tackle Company (AFTCO) Tag A Tuna For Tomorrow and Tag/Flag Tournament (which began in 1988).

In 1961 the American Littoral Society (ALS) was founded under the umbrella of the Bureau of Sport Fisheries (now NMFS). The tagging portion of ALS was implemented in 1965, flourishing to involve nearly 1,300 volunteer taggers and resulting in nearly a quarter of a million fish being tagged and released (Bennett et al. 1996). In 1963, the NMFS Cooperative Shark Tagging Program was implemented based on angling tournament catches, and continues to operate out of Narragansett, Rhode Island.

In addition to federal agencies, several states have initiated programs to enlist anglers in tagging and releasing their catch. Since 1974, the South Carolina Marine Resources Division has encouraged anglers to tag 33 species of near-shore fish. The Virginia Gamefish Tagging Program, initiated in 1995, also supports an angler-based tagging program but restricts both the number of taggers (maximum of 200) and the species of fish to be tagged (currently eight). Both of these programs are coordinated through the respective state marine fisheries agency, with the data used for both management and research purposes.

On the Pacific coast, the NMFS Billfish Tagging Program (part of the NMFS Cooperative Angler Tagging Program) was begun in 1963 and is currently coordinated through the NMFS Southwest Fisheries Science Center in California. In the Gulf of Mexico, Fish Trackers Inc., a private nonprofit program based in Corpus Christi, Texas, enlists anglers to tag and release fish and provide information to a central repository. It has kept records on over 70,000 tagged fish from 185 species since inception in the early 1980s (S. Qualia, Fishtrackers, Inc., pers. comm.). No direct affiliation with a management agency has yet been established.

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Angler-based tagging programs in freshwater appear to be more limited and geographically localized than in saltwater. Some freshwater regional tournament organizers utilize tagged fish for prizes. The AIS offered tags to their members for tagging freshwater species until 1987, but halted this program primarily because of concerns from fisheries managers about the utility of the data and the biological effects on the fish (P. Carlsen, American Littoral Society, Highlands, New Jersey, pers. comm.). In the mid-1990s, a fish tagging kit (including a tagging gun, tags, and instructional video) was introduced into retail markets nationwide, offering anglers an inexpensive and easy way to start tagging with little training or oversight. This system offers "nationwide computer tracking" to help anglers "track fish movements, growth, and habits." The ease with which individuals could obtain tagging equipment and start tagging fish raised concern among some natural resources agencies about the impact on freshwater fish stocks, fish health, the fishing experience, and fishery management programs, particularly in areas where such practices were illegal (M. Costello, Ohio Division of Wildlife; S. Stuewe, Illinois Department of Natural Resources, pers. comm.).

### Current management issues

In 1990, a workshop on "Increasing Angler Participation in Marine Catch/Tag-and-Release Fishing Programs" was sponsored by NMFS and four state Sea Grant programs (Lucy et al. 1991) to explore the status of marine tagging programs. This workshop and a preceding survey of angling organizations thoroughly documented the extent of saltwater angler tagging programs at that time and characteristics of those programs. Fifteen issues and

recommendations were identified, including:

- the need for increased education of taggers to improve the quantity, quality, and participation in tagging programs;
- the need for training of taggers and for evaluation of mortality induced by tagging and tag types;
- that tagging should not be encouraged just for the sake of tagging or "as the right thing to do;" and
- the need for better coordination between tagging data repositories and increased availability of data to fishery management agencies, as well as the larger fishing community.

In the mid-1990s, during the same time period that tagging kits began appearing in retail outlets, the BOAT/U.S. Clean Water Trust (Trust) began their program to offer members the opportunity to tag and release near shore marine species on the Atlantic coast. The Trust designed their program in conjunction with NMFS in response to angler interest in tagging near-shore coastal species. Despite the coordination with a government agency and established quality control measures, conflicts arose between the Trust and the striped bass (*Morone saxatilis*) tagging program coordinated by the U.S. Fish and Wildlife Service involving numerous state and federal agencies. These conflicts centered primarily on overlapping tag color and tag number sequence between the two programs and the unanticipated occurrence that a majority of the fish tagged by Trust participants were striped bass. Researchers and managers feared that the integrity of the coast-wide tagging program would be compromised as angler confusion between the programs spread. As a result the overlapping tags were recalled and replaced with others of different colors and numerical sequence.

Together, the BOAT/U.S. incident and the availability of tagging kits through major sporting goods retailers

spurred several activities to address the appropriate role of volunteer-based fish tagging programs in fisheries management. The Atlantic States Marine Fisheries Commission (ASMFC) adopted a *Resolution Concerning Citizens' Tagging Programs* in October 1997 that identified several potential shortcomings of some angler-based tagging programs, such as a lack of goals and objectives; problems related to improper handling of fish and poor tagging techniques; and increased need for education, training information, data management, and incentive programs. The resolution also identified several management benefits of angler-based tagging programs, including collection of detailed life history information, movement, and stock identification, and increased citizen involvement and awareness of fisheries issues. Through this resolution, the ASMFC urged all of their member states to establish their authority to coordinate and control fish tagging efforts conducted in their waters.

### Development of a National Fish Tag Registry

<http://fwie.fw.vt.edu/tagging>

**Box 1.** It is not uncommon for fishery managers to recover tags from unknown sources. This problem is compounded in waters shared by multiple jurisdictions, where agencies often work independently on research and management projects. When citizen-based tagging programs initiate fish tagging programs, conflicts between programs may emerge. Many conflicts are simply due to an inadequate communication. In January 1998, the National Marine Fisheries Service Office of Intergovernmental and Recreational Fisheries convened representatives from federal and state agencies, interstate commissions and major angler-tagging groups to address solutions and collaborate on the development of a prototype Internet-based tag registry. The proposed registry will allow managers, as well as volunteer taggers, to share information regarding tagging programs, including tag colors used, tag number sequences, species tagged, geographic coverage and other facets of programs. This registry is not designed to promote the initiation of new tagging programs, but rather improve current programs and aid in guiding future programs by helping groups contact the appropriate management agencies, learn about state/federal laws and guidelines regarding citizen-based tagging, consider all of the important facets about tagging programs, and register their tags if they proceed. This system, although designed initially for angler-based tagging programs, may have applications for future use by management agencies throughout the country. The site is located at <http://fwie.fw.vt.edu/tagging>.

## Workshop on Developing Tagging Program Protocols

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**Box 2.** In August 1998, a facilitated workshop was held by the Atlantic States Marine Fisheries Commission (ASMFC) to develop recommended protocols for fish tagging programs. This workshop was initiated following the ASMFC's *Resolution Concerning Citizens' Tagging Programs* and by the need to maximize the utility of data collected by scientific and angler-based tagging programs. Data may be of a higher quality and could be used for purposes beyond what is often single purpose design by following standard protocols in the design and conduct of such programs. Using consistent formats also may provide greater compatibility of data among various tagging programs, more extensive use of data for stock assessment and management purposes, and enhance the contribution of collected data to address specific management efforts. In the process, approximately 65 ongoing tagging programs (scientific/management as well as angler-based) were surveyed to gauge the status of tagging programs on the Atlantic coast. The information obtained on 60 programs was also provided to the Fish and Wildlife Information Exchange of Virginia Tech University for use in a "tag registry" being developed cooperatively with the National Marine Fisheries Service.

The stated goal of the workshop was to "Improve the value of all tagging programs." Participants identified 8 broad "characteristics" of a good tagging program. These characteristics were refined to develop protocols and specific tactics:

1. Tagging programs should have established objectives directly related to scientific or management purposes.
2. Tagging programs should incorporate minimum design standards.
3. Tagging programs should consider the data management issues.
4. Agencies/organizations conducting tagging programs should provide dedicated commitment to meet the objectives of the program and to fulfill obligations to tag recapturers and taggers.
5. All tagging organizations should develop and implement a training program.
6. Tagging programs should incorporate provisions to adequately communicate with volunteer taggers, individuals who report recaptures, and management agencies.
7. A mechanism to ensure coordination among all agencies/organizations conducting tagging programs should be developed.
8. A Certification Program should be developed to help ensure that Atlantic coast tagging programs are collecting high quality and accurate data for use in fisheries management.

While it is recognized that these guidelines are voluntary, it has been suggested that approval or modification of these guidelines could be sought through entities such as the American Fisheries Society, International Association of Fish and Wildlife Agencies, or the Interstate Commissions acting collectively, thereby gaining broader usage and support. For a copy of the full protocols, contact the ASMFC, 202/289-6400.

In January 1998, the NMFS Office of Intergovernmental and Recreational Fisheries convened representatives of state and federal agencies, private angling organizations, the American Fisheries Society, Sea Grant, and interstate fisheries commissions to address issues surrounding angler-based tagging programs. Although some participants expressed substantial concern about any volunteer-based tagging programs that were not under management agency guidance and control and without specific objectives, the majority of participants concurred on the need to: train taggers; coordinate with management agencies; and improve communication about tagging programs, including objectives, contact personnel, geographic location, species, and details about tags used. In general, participants expressed support for an Internet-based tag registry as a means to facilitate this (Box 1).

At the 1998 AFS symposium mentioned earlier, a clear dichotomy emerged between tagging programs conducted in freshwater and those conducted in saltwater. In general, little support was expressed for freshwater tagging programs. As in the two previous workshops held in January 1998 and 1990, participants in the AFS symposium generally

echoed the need for some level of training of taggers, programs that worked in conjunction with fishery management agencies, and the need for information exchange about tagging programs for all programs. Immediately following the symposium, the ASMFC convened a group consisting primarily of Atlantic coast representatives to develop guidelines that all programs (scientific and angler-based) should follow (Box 2).

### Future direction

The relatively recent controversies surrounding angler-based tagging programs has caused some in the management community to begin evaluating the nature of this practice in their jurisdictions. During December 1999 and January 2000, Southwick Associates (an economics and natural resources consulting firm based in Alexandria, Virginia) and the authors conducted a telephone survey of inland fishery management agencies. Managers were asked whether tagging of fish by individuals outside of management or scientific fields (specifically anglers) was legal and, if so, whether a permit was required. Seven states indicated that it was illegal for citizens to tag wild

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**Table 1.** State regulations pertaining to angler-based tagging in freshwater systems.<sup>a</sup>

State	Illegal by law/regulation?	Permit required? <sup>b</sup>	Comments
AL	no	no	
AK	yes	yes	generally illegal except under special permit
AR	no	no	
AZ	no	no	
CA	no	maybe	must have a permit to offer prizes
CO	no	yes	not encouraged
CT	no	maybe	must get a permit to release in area different from capture
DE	no	no	not encouraged
FL	no	no	
GA	no	no	
HA	no	no	discouraged
ID	no	yes	need authorization from the state
IA	no	maybe	permit required if tagging is for tournaments
IL	no	maybe	permit required if tagging is for tournaments
IN	no	yes	no tagging in waters where tagging studies are ongoing
KS	no	no	
KY	no	no	
LA	no	no	strongly discouraged
ME	no	yes	must get a permit from commissioner of fisheries
MD	no	no	not encouraged
MA	no	no	not encouraged
MI	no	no	strongly discouraged
MN	yes	n/a	
MO	yes	n/a	
MS	no	no	
MT	no	maybe	permit required if tagging is for tournaments
NE	yes	n/a	
NV	no	no	
NH	illegal for wild fish	yes	
NM	no	no	
NJ	illegal for wild fish	yes	not encouraged
NY	no	no	
NC	no	no	
ND	yes	n/a	
OH	no	yes	strongly discouraged
OK	no	no	
OR	no	maybe	permit required if tagging is for tournaments
PA	no	no	not encouraged; illegal in some waters
RI	no	maybe	
SC	no	no	
SD	no	no	not encouraged
TN	no	no	not encouraged
TX	no	no	not encouraged
UT	no	yes	
VA	no	no	strongly discouraged
VT	no	no	not encouraged
WA	no	maybe	permit required if tagging is for tournaments
WV	no	no	illegal in some waters
WI	no	no	no sonic tags or radiotelemetry; discouraged
WY	no	yes	need permission from chief of fisheries
PR	no	no	not encouraged


<sup>a</sup> For comparison purposes only. Check with state agency before conducting any tagging for exact regulations.

<sup>b</sup> All states encouraged contact with state agency before any tagging, regardless of permit requirements.

fish in inland waters of their states (including New Hampshire and New Jersey, which allow tagging of hatchery fish only). In the other jurisdictions, although tagging is not technically illegal, many managers indicated that the practice was strongly discouraged or regulated in some way (Table 1). A more extensive evaluation of state tagging

regulations is ongoing at Texas Tech University and is projected to be released in the fall of 2000.

The combined activities highlighted above, along with the expressed willingness of major angler-based groups involved with tagging in saltwater to work with managers to improve programs, provide a solid starting point to

resolve some issues. The fish tag registry (which is designed to share only information about programs, not data collected) is quickly gaining support and acceptance. Calls have been made to expand this to make it universally available to all tagging programs (including management and scientific) to register their tags and reduce confusion in the future. It appears that the general consensus is to maintain the authority of states to regulate how and where tagging is done in their jurisdictions. It also appears that many professionals in the fisheries management community view tagging in freshwater as providing little or no utility for management purposes, believing that it should be carefully scrutinized. Where angler-based tagging is determined to be appropriate (particularly in marine applications), programs should coordinate closely with management agencies and incorporate basic guidelines into their programs to maximize their contribution to management and conservation. 

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