The Role of the Recreational Angler in Fisheries Monitoring, Research and Management

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Definitions — Monitoring

The Role of the Recreational Angler in Fisheries Monitoring, Research and Management

Participating in angler surveys and providing reliable Information

Volunteering with routine monitoring and assessment (can be problems with liability and training) – not just fish monitoring (water quality)

Reporting problems to authorities

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Definitions

Research

The Role of the Recreational Angler in Fisheries Monitoring, Research and Management

Identifying information gaps and research needs for different systems (research is different than monitoring)

Providing funds and in kind support for research

Reality check – most "lake specific" issues are not appropriate for graduate student thesis research

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Definitions

Management

The Role of the Recreational Angler in Fisheries Monitoring, Research and Management

Participating in consultation processes and fisheries management councils

Ensuring angler behaviour and gear is consistent with regulations

Informing other anglers of rules and best handling practices

Practicing selective harvest and maintaining the welfare status of angled fish

Adopting the code of practice for recreational fisheries

EIFAC Code of Conduct Document

EIFAC Occasional Paper No. 42 SEC/EIFAC/OP42 (En)

EUROPEAN INLAND FISHERIES ADVISORY COMMISSION

EIFAC CODE OF PRACTICE FOR RECREATIONAL FISHERIES

C & R Guidelines

Generalized Guidelines (Opportunities) for Improving Fish Welfare

- Minimize angling duration
- Minimize air exposure and improve handling
- Select terminal tackle to improve the outcome of the angling event (e.g., barbless, hook type, bait type, leaders where appropriate)
- Avoid angling in extreme environmental conditions (e.g., temperature) or habitats (e.g., high predator burden, great depths)
- Avoid angling during the reproductive period

All about gear choices/regulations and angler behaviour

Adapted from: Cooke & Suski. 2005. Biodiv & Conserv.

The Role of the Recreational Angler in Fisheries Monitoring, Research and Management

Angler surveys of sound design and implementation are essential for effective management of recreational fisheries

In general, angler surveys are used to…

- **Estimate angler effort and harvest (on a body of water)**
- **Estimate angler preferences and harvest patterns**
- **Evaluate angler attitudes towards different management strategies**
- **Quantify the socio-economic benefits/values of fishing to anglers and the local/regional economy**
- **Address biological questions such as contribution of fishing to total fish mortality**

Angler surveys very greatly in size, complexity, and cost

Definitions

Angler Surveys

Planning, organizing, and executing an angler survey is a demanding task

Any angler survey is an information device that must be aimed toward specified questions, problems, or issues if results are to be meaningful

Definitions

Angler Surveys

Components of an Angler Survey

Starting up - Objectives, cost, type, time-frame, team, legal and ethical considerations

Sample selection - Influence the accuracy and precision of survey estimates, how, when

Data collection - Letters, forms, protocols, training materials, quality control

Data manipulation and analysis - Analytical plan, software/database management, analytical input

Reporting - Synthesis is writing

Iterative process - revisit and revise

Definitions

Survey Types

Off-site – surveys conducted away from fishing sites, often based on sampling from a list of anglers (license file)

Examples…
- **mail**
- **telephone**
- **internet**
- **door-to-door**
- **diaries and logbooks**

On-site – based on sampling from a list of fishing places and times

Examples…
- **access point creel surveys**
- **roving creel surveys**
- **aerial surveys**

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Creel surveys

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} **Creel surveys**

Definitions — Angler Diaries and Logbooks

Do not require survey agents but can be conducted on-site or off-site

Used primarily to obtain information on catch, effort, and harvest

Information useful for monitoring trends through time (e.g., quality of a fishery) and supporting other monitoring activities

Typically voluntary

Regarded as simple and inexpensive ways to collect data

However – many biases

Definitions Angler Diaries and Logbooks

Two approaches –

Multi-trip records – more than one trip (usually logbooks and diaries), usually in the form of a diary or logbook

Single-trip records – pocket-sized catch cards, issued to anglers to record their catch and effort during a single day (typically collected at end of day at access point or mailed in)

Definitions Angler Diaries and Logbooks

Cooke, Dunlop, MacLennan, & Power. 1999. Application, design, and implementation of angler diary programs in Ontario. OMNR SSS Technical Report #111.

Reviewed 46 diary programs in Ontario from 1979 to 1997

Objectives of Angler Diary Studies

78%	Data on CPUE/harvest
74%	Biological data (size)
15%	Presence/absence
15%	Supplement creel survey data on lakes with low effort
13%	Involve anglers in fisheries monitoring
9%	Document fish movements
7%	Evaluate stocking program
7%	No clear objective

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Data Collected by Angler Diary Studies in Ontario

100% CPUE (catch and trip duration)
100% Harvest
87% Fish size (usually length to nearest inch)
50% Presence of fin clips or tags
46% Target species
29% Location of effort (reach, part of waterbody)
24% Scale sample
11% Water temperature

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Point of Contact for Angler Diary Studies in Ontario

33% Angling clubs
28% Creel survey clerks
20% Cottage associations
20% Ice hut/charter boat operators
20% Conservation officer
17% Government offices or tackle shops
11% Tourist operators/resorts
4% Displays at access points

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Frequency of Participant Contact in Ontario

35% Distribution and collection only
33% Distribution only
15% Distribution and collection with phone follow-up
13% Distribution and collection with written reminders
2% Throughout via media

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Incentives to Participate in Angler Diary Studies in Ontario

57% Data summary
33% Benefits to angler
30% Patch, hat or lapel pin
17% Return of diary
7% Draw prize entry
7% None

Definitions Angler Diaries and Logbooks

What makes a program successful (i.e., ability to achieve objectives)? Note – most were NOT fully successful

Frequency of contact critical (need reminders)

Also requires clear objective

Even with frequent contact and incentive there was failure in an angler diary program on the French River due to poor fishing quality (low return rate)

NOTE – participation rates low, ranging from 0 to 56.5% with a median of 21.8%

Diarists that failed to submit diaries tended to mispace the diary, forget about it, move residence, or experience poor catches

Definitions Angler Diaries and Logbooks

Biases…

Should only be used when all other sampling methods are impractical, and even then with great circumspection

Self-reporting leads to biases

- **exageration – i.e., presitge bias**
- **failure to report failed fishing trips (biases CPUE)**
- **misidentification of fish species**

High non-reporting rates

Avidity bias (e.g., specialized anglers and "keeners") – data not representative

Digit preference (0, 2, 5), even numbers

Provide no information on absolute fishing effort

Definitions Angler Diaries and Logbooks

Big Rideau Lake Association 2000 Angler Diary Program

Anglers spent 1145 rod-hours and harvested (catch-and-keep) 269 lake trout. It took anglers approximately 1 hour to catch one fish. The catch-per-unit-effort in 2000 was 0.788. The mean total length of the fish sampled was 523 mm (20.6 inches).

Also evaluated incidences of fin clips to evaluate hatchery contribution

Definitions Angler Diaries and Logbooks

Benefits…

Particularly useful for obtaining information on species/systems that are difficult to sample using traditional methods (e.g., musky)

Can be used to corroborate creel surveys or as an independent measure of fishing quality during years when creel surveys are not conducted

Long-term trends in CPUE from diary programs in Muskoka are similar to those from roving creel surveys

Cheap and simple!

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Definitions

Creel Surveys

Two main types

- **access point creel surveys (intercept)**
- **roving creel surveys**

Useful for measuring fishing effort (total effort), catch, and harvest

Conducted by creel survey clerks so response rates are high

For access point surveys there are a limited number of access points

Harvest and effort examined by creel clerks so tends to be unbiased (not possible to exaggerate or lie – also includes people without licenses and breaking rules)

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Definitions

Creel Surveys

Design and analysis requires extensive statistical input from experts in fisheries surveys if data are to be useful - important to stratify sampling by time, day, location

Costly (requires vehicles, boats, and people)

Access point surveys tend to be safer than roving surveys and can be conducted at night but do not work well when access sites diffuse (e.g., cottagers and docks)

Roving surveys best when a fishery occurs at too many points to accommodate access point design (e.g., cottage associations)

Roving surveys even more complex than access surveys

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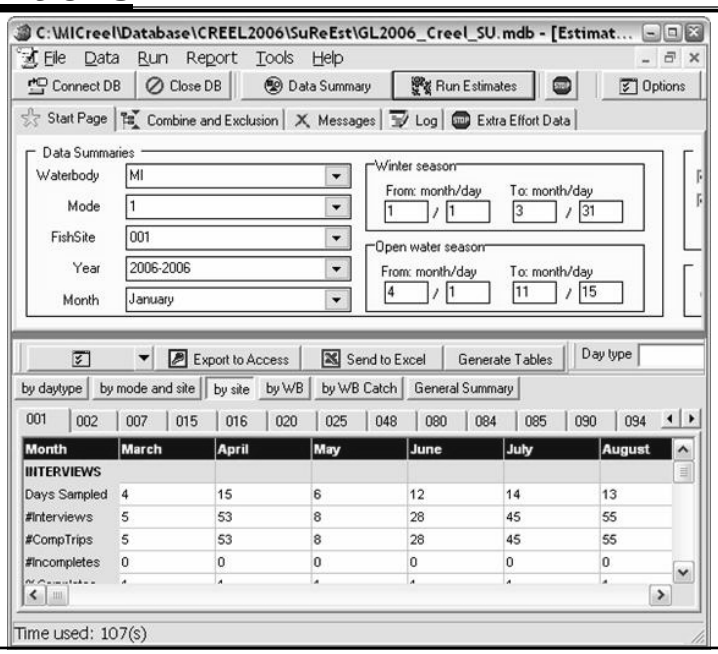
Definitions

Creel Surveys



General Comments on Fish Surveys

Need to have a compelling reason to “monitor” as it is costly (WHY?)

Fisheries are inherently difficult to evaluate and stock assessment is as much magic as it is science (just a reality) – it is called “quantitative stock assessment” for a reason

Methods need to be standardized and repeatable

Fisheries monitoring requires a time series to be truly effective (monitoring changes through time)

Fisheries populations/communities are dynamic (size structure, abundance, assemblage)

Angler dynamics are complex (shifting effort based on catch rates)

Need to understand biases

Thanks