



Recreational Fisheries in the 21st Century: Towards a Global Code of Practice

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Contents



- Rationale for Dealing with Recreational Fishing
 - Global participation
 - Socio-economic and ecological importance
 - Brief sketch of issues of concern
- Towards a Code of Practice for Recreational Fisheries

Recreational Fishers are here ...



There ...



Everywhere



How Can We Define Recreational Fishing?

Fisheries conducted by individuals primarily for sport but with a possible secondary objective of capturing fish for domestic consumption but not for onward sale (FAO 1997)

Recreational fishing is fishing, which is not deemed to be commercial fishing (EAA 2004)

Recreational angling is the activity of catching or attempting to catch fish, principally by rod and line, pole or hand-held line for non-commercial purposes; recreational anglers do not sell the fish they catch (EAA 2004)

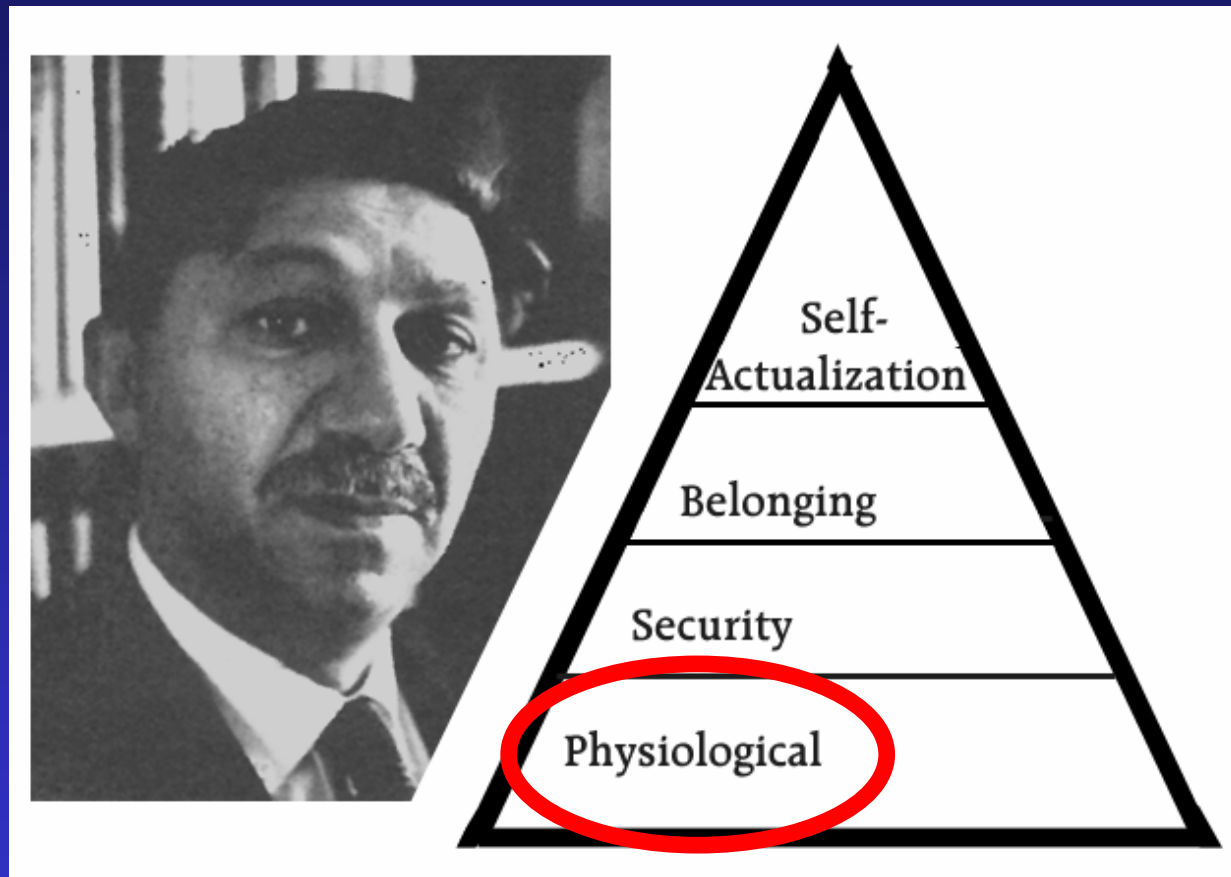
Definition for Developed Societies

Def.: Recreational fishing is fishing conducted during times subjectively defined by the individual as being leisure
(Arlinghaus et al. 2002, Fish Fish.)



Pictures Alexander Schwab

Maslow's Hierarchy of Human Needs to Define Recreational Fishing Globally



Def.: Recreational fishing is fishing of aquatic animals that do not constitute the individual's primary resource to meet essential physiological needs (Arlinghaus & Cooke, in press).

Recreational Fishing: Main Forms and Exclusion

Main fisheries form:

- Angling with line, hook and rod
- Often used synonymously with sport fishing, but sport originates from to disport (i.e. to take one's ease, to recreate), not to sport in the sense of competition

Excluded:

1. Commercial fishing (full time, part-time)
2. Subsistence fishing (e.g., developing nations)
3. People that live from their fishing, e.g. angling guides

Spearfishing

MAGAZINE

What's New?
 ★ Old Salts
 ★ Painter of Blue
 ★ Underwater Gallery

Sheri Deye

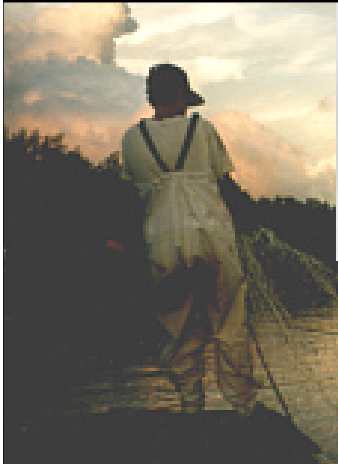
of the Year
Spearo 2005

www.spearboard.com www.spearfishingmagazine.com
 St. Pete open • Hunting for AJs • CA Halibuts • and Much More

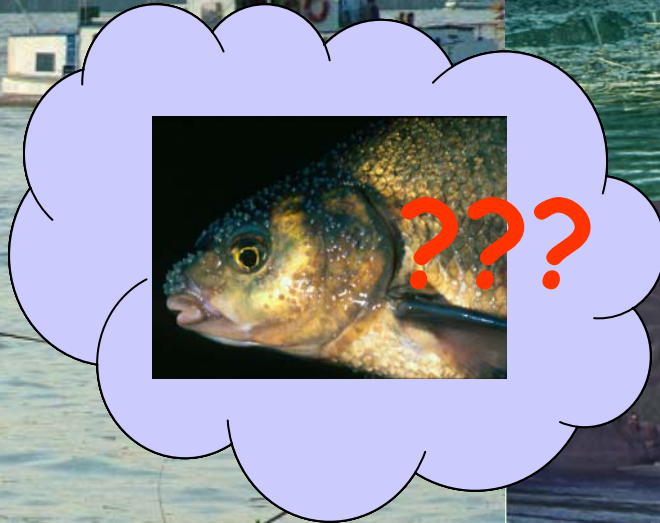


Archer's Bible Presents: **Practical Bowfishing**

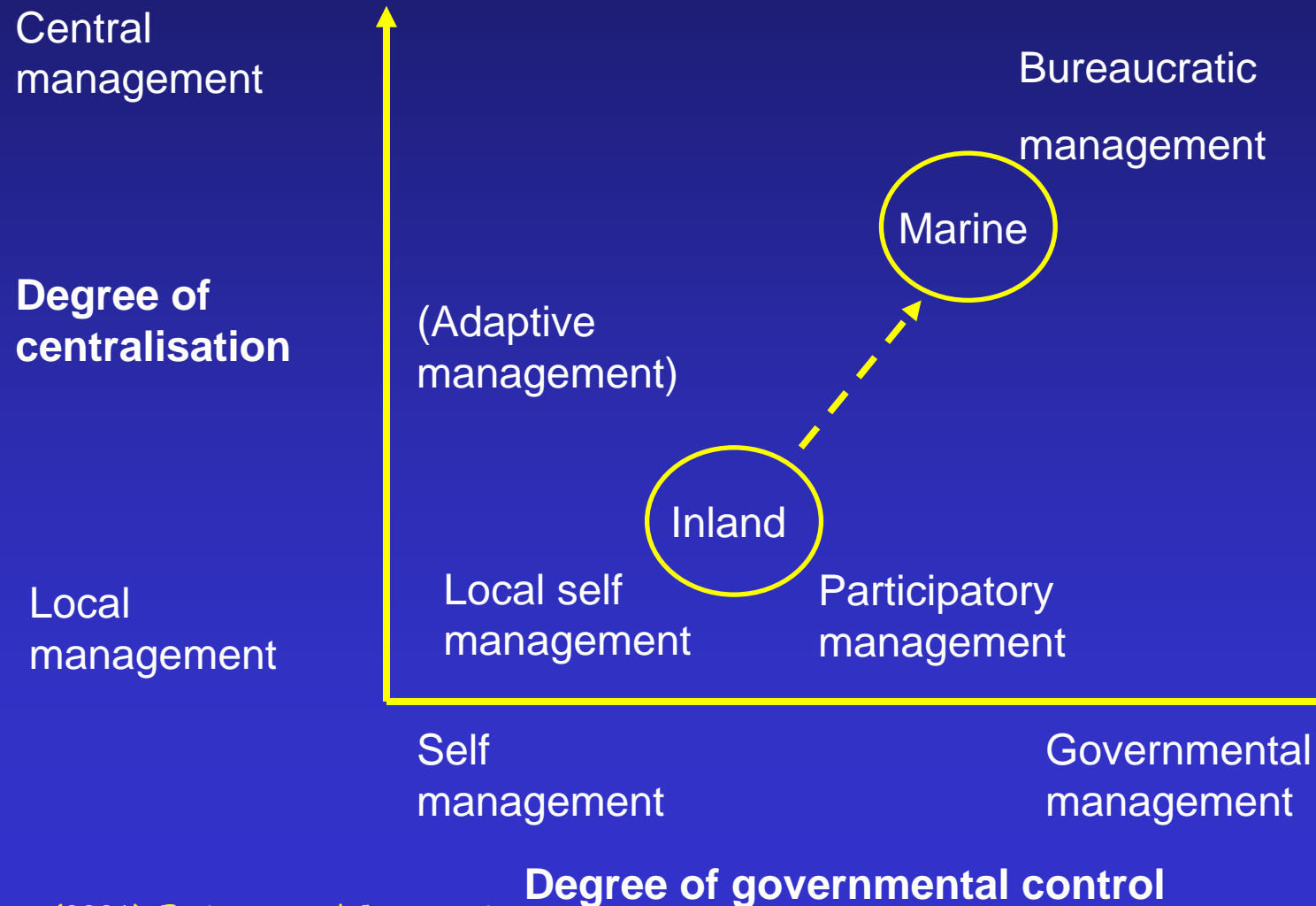
A man in camouflage gear is bowfishing. He is wearing a dark long-sleeved shirt with the text "cutt eat cutt work can't sleep ...gotta BOWFISH" and blue camouflage pants. He is holding a bow and arrow, aiming at the water.



Recreational Fishers are Diverse



And so are the Property Rights Regimes and Governance/Management Systems Globally



However, Overall Many Recreational Fisheries Are Sharing Similar Issues

- Improving fisheries management to conserve and enhance fish stocks, sustainable management
- Providing the most satisfying fishing experiences in the face of environmental change, multi use patterns, competition among stakeholders and conflicts with human activities of higher social priority (e.g., flood control)
- Harmonizing conflicting stakeholder interests and world-views
- Addressing demographic changes and changing participation rates, lobby for public acceptance

BUT

1. Little interaction between different countries to address contentious issues
2. Also research has been parochial, with a strong national orientation and limited common frames of reference (Aas, 2002)

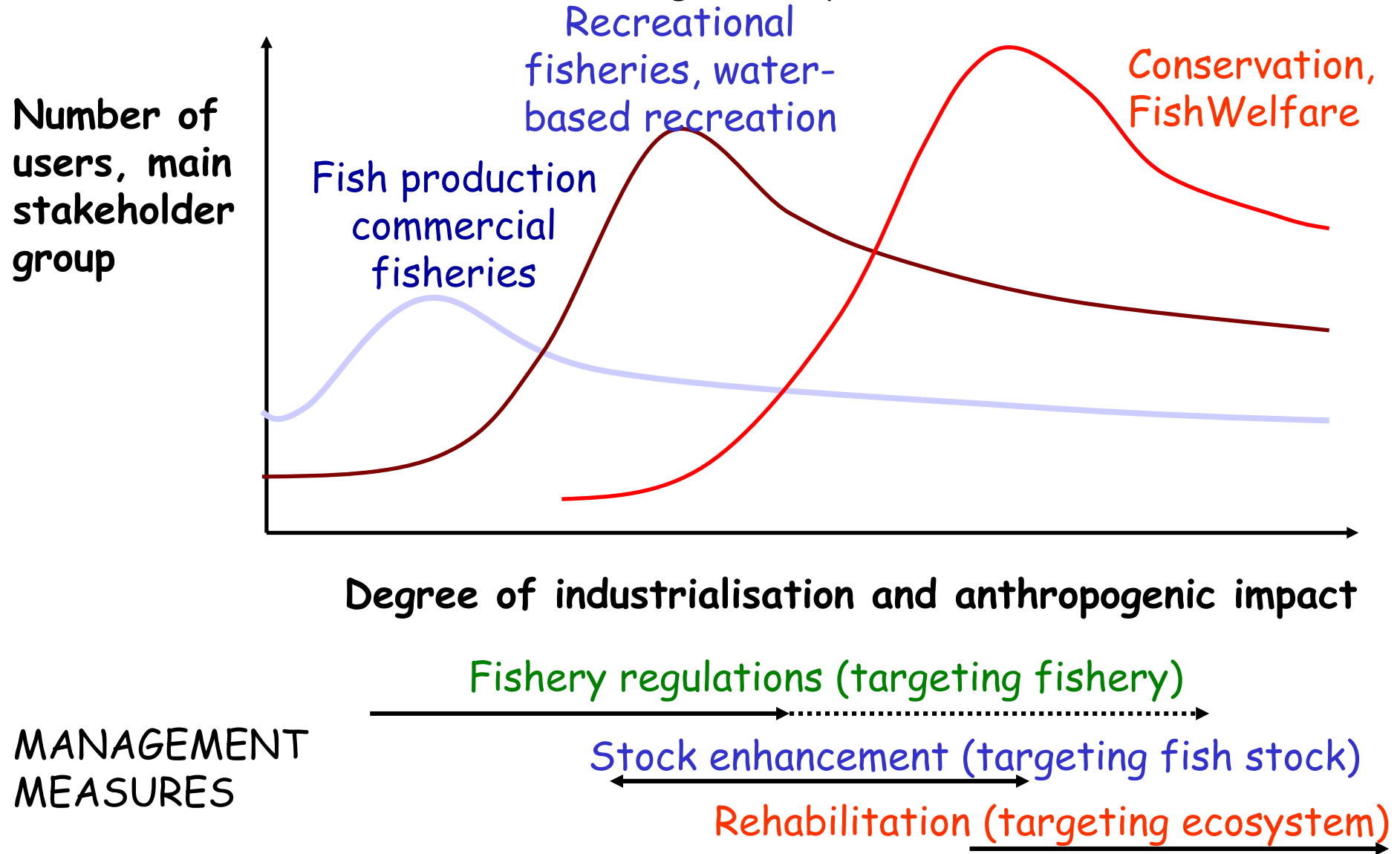
What are the Global Trends and Issues?



Picture Alexander Schwab

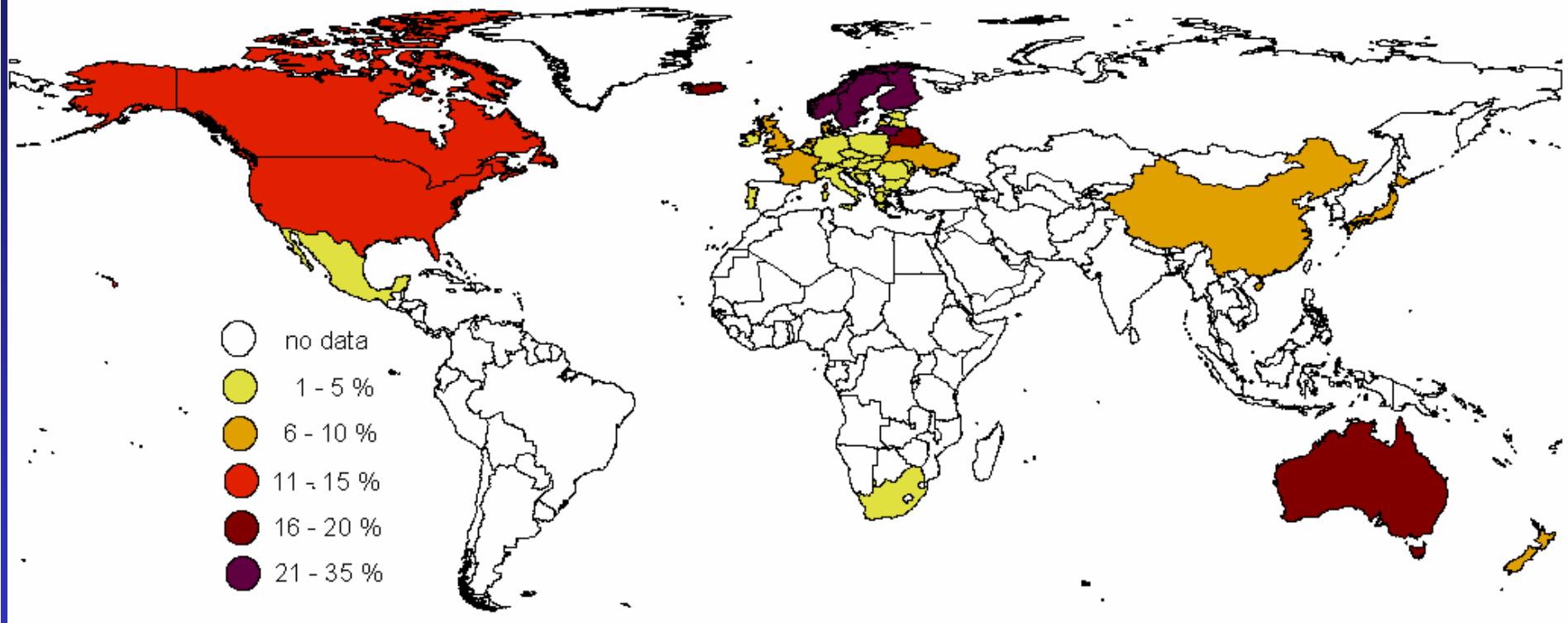
A Predictable "Life-Cycle" in Inland Fisheries?

(Cowx & Arlinghaus, in press)



Participation Figures in Recreational Fisheries

Arlinghaus & Cooke, in press



- 7.4 % on average globally; 9.5% for 19 EU countries with reliable data = 44.8 million Europeans fish recreationally
- In industrialized societies leveling off or declining participation rates, but increases in developing nations

Myriad of Socio-Economic Benefits to Society



1. Economic

- Impact on regional and national levels
- Value to the individual (satisfaction)

2. Social

- Cultural asset
- Social (quality of life)
- Psychological
- Physiological

3. Ecological

- Watchdogs/drivers against environmental impacts
- Management, Education

Socio-Economic Importance of Recreational Fisheries vs Commercial Inland Fisheries

Recreational Fisheries

> 400 000 ha
2.6 - 4.1 million (5%)

Yield 45.000 t

6,4 billion €
52.000 jobs



Commercial River and Lake Fisheries

250.000 ha

Yield c. 4.000 t

11.7 million (caution)
1.875 jobs

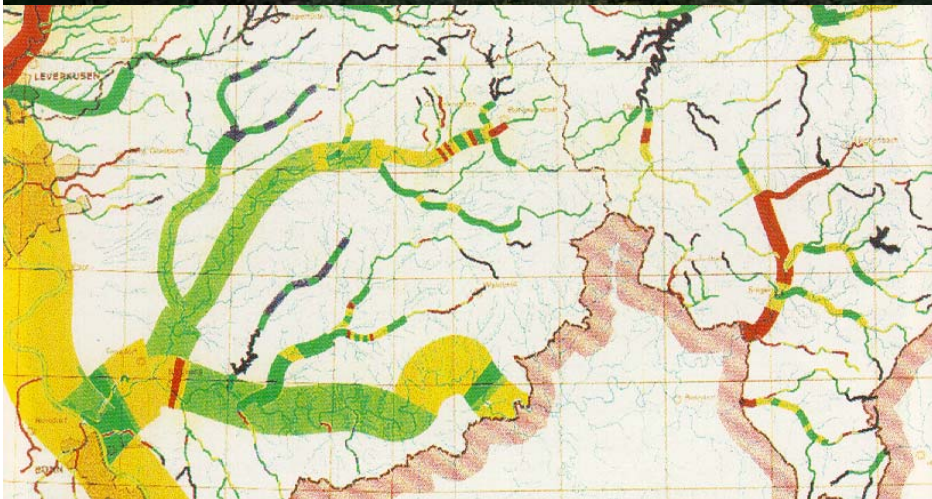


**Damming,
habitat loss**



© Picture-Alliance

Overfishing



Pollution

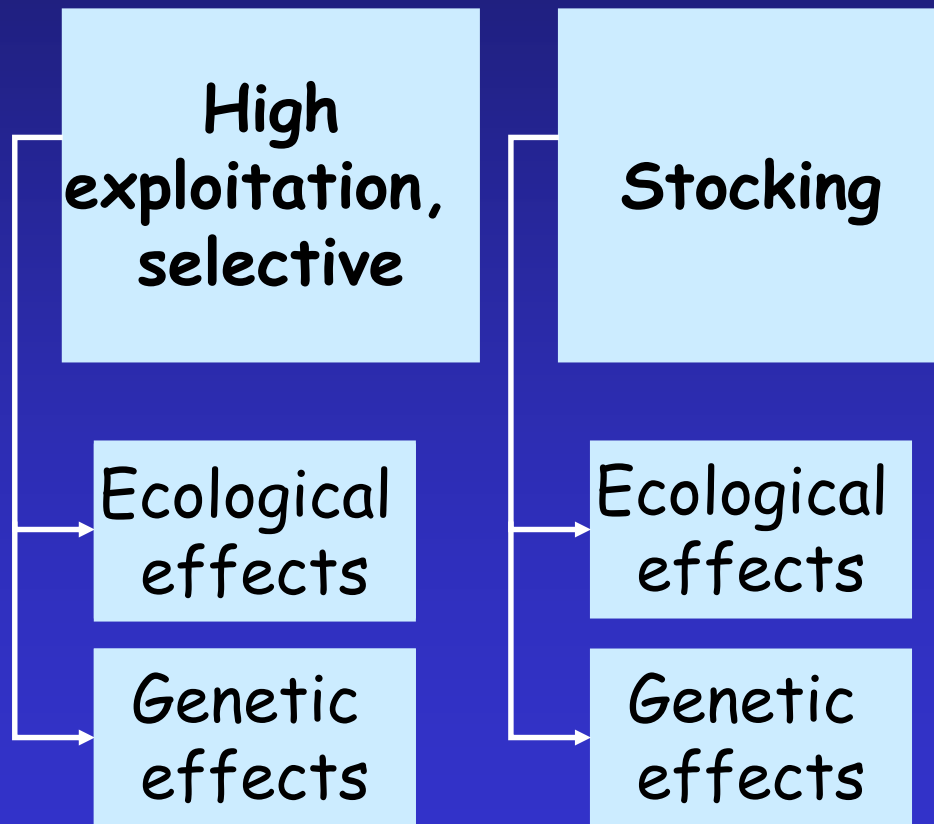


**Stocking,
Introduction**

Main Threats for Fish Stocks External to Recreational Fishing

Recreational Fishing-Related Threats to Fish Populations

From international scientific literature



Based on recent syntheses by Cooke & Cowx (2006), Biol. Cons. & Lewin, Arlinghaus & Mehner (2006), Rev. Fish. Sci.

Evidence for Angling-Induced Population Declines is Increasing

Rainbow trout:

1960-1980,

1980-1990

The Role of Recreational Fishing in Global Fish Crises

STEVEN J. COOKE AND IAN G. COWX

Bioscience

→ 0.02 fish/ha

Pike:

Science

LETTERS

Global Impact of Recreational Fisheries

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Canada's Recreational Fisheries: The Invisible Collapse? Fisheries

John R. Post, Michael Sullivan, Sean Cox, Nigel P. Lester, Carl J. Walters, Eric A. Parkinson, Andrew J. Paul, Leyland Jackson, and Brian J. Shuter

The Impact of United States Recreational Fisheries on Marine Fish Populations Science

Felicia C. Coleman,^{1*} Will F. Figueira,^{2,†} Jeffrey S. Ueland,^{3,‡} Larry B. Crowder²



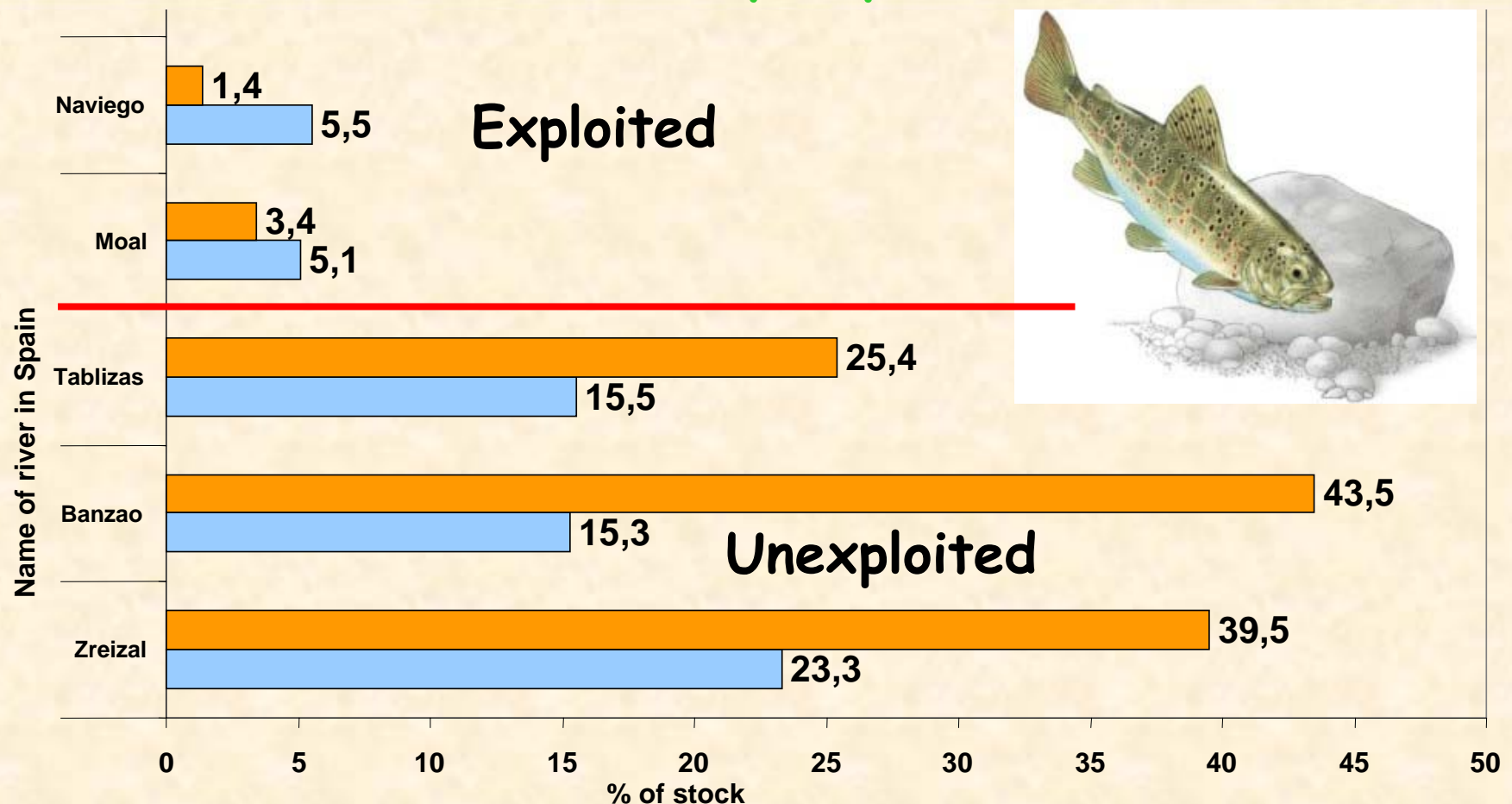


General rule: Size-selective exploitation of top predators, exploitation rates up to 80% documented



Impacts on Size and Age structure

Rel. Frequency of large/old fish (above minimum length limit) low in heavily exploited waters



data: Braña et al. (1992, Hydrobiologia)

Also Relevant in some Coastal Fisheries

- California marine park - contrasted rockfish assemblages

inside no fishing, only rec fishing, and all fishing areas

- rec fishing area had lowest density and small size structure

- for 16 of 17 nearshore stocks, rec fishing mortality exceeded that of commercial harvest



Ecological, non-genetic maternal effects;
reversible



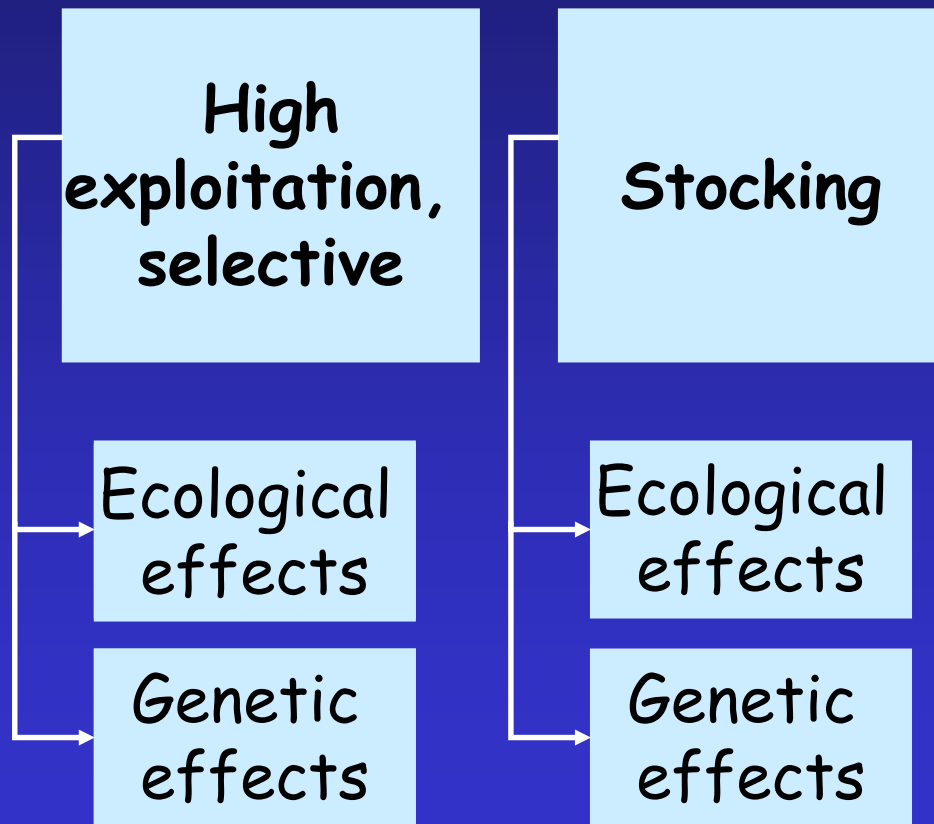
Size-Selective Exploitation



Evolutionary, genetic effects;
largely irreversible

Recreational Fishing-Related Threats to Fish Populations

From international scientific literature



Based on recent syntheses by Cooke & Cowx (2006), Biol. Cons. & Lewin, Arlinghaus & Mehner (2006), Rev. Fish. Sci.

Ecological Risks of Stocking (1/2)

Competition

(different species, hatchery-reared and wild fish).

(63 studies)



Predation

(salmonids/local fish species, eel/crayfish) *(20 studies)*



Translocation of pathogens

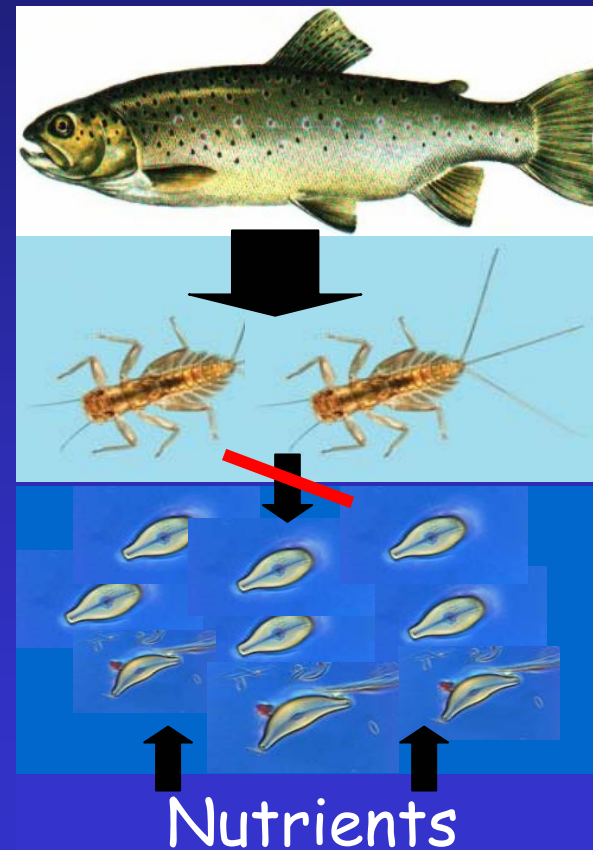
(Gyrodactylus salaris; Anguillicola crassus, viruses or bacterial diseases)

(25 studies)



Ecological Risks of Stocking (2/2)

- Impacts on invertebrates and trophic cascades
(49 studies)
- Impacts on nutrient cycling
(5 studies)
- Impacts on the aquatic environment (e.g. carp)
(12 studies)



Genetic Risks of Stocking

Genetic effects:

- Hybridization and introgression (*33 studies, 6 studies found no introgression despite stocking*)
- Loss of genetic variability within populations (*> 40 studies*)
- Loss of genetic variability between populations (*6 studies*)
- Outbreeding depression (*8 studies*)



Fish Welfare



PRIVATE PROPERTY

NO FISHING

BECAUSE fish have a brain, a central nervous system, and pain receptors, they can feel pain just like cats, dogs, and humans. Just because they can't scream doesn't mean they aren't in pain. Also, other animals, like birds, often strangle or choke to death on lost hooks and line.

FishingHurts.com

Stell dir vor
du liegst
auf dem
teller.



Animal Welfare, Animal Liberation, Animal Rights – Note the Differences!

Arlinghaus et al. 2007, Fish Fish.	Animal welfare	Animal liberation	Animal rights
Fish have intrinsic value	Yes/no	No	Yes
Fish have rights	No	No	Yes
Duties towards fish	Yes	Yes	Yes
Catch, kill and eat	Yes	No	No
Regulatory catch-and-release	Yes	No	No
Voluntary catch-and-release	Yes	No	No
Recreational fishing	Yes	No	No
Fishery management	Yes	No	No
Use of animals (food, work, manufacture, recreation and science)	Yes	No	No

- **No reference to pain/suffering!** “Good welfare means that an individual fish is in good health, with its biological system functioning properly and not being forced to respond beyond its capacity” (Arlinghaus et al. 2007, Fish Fish.)



Catch-and-release



Live baitfish

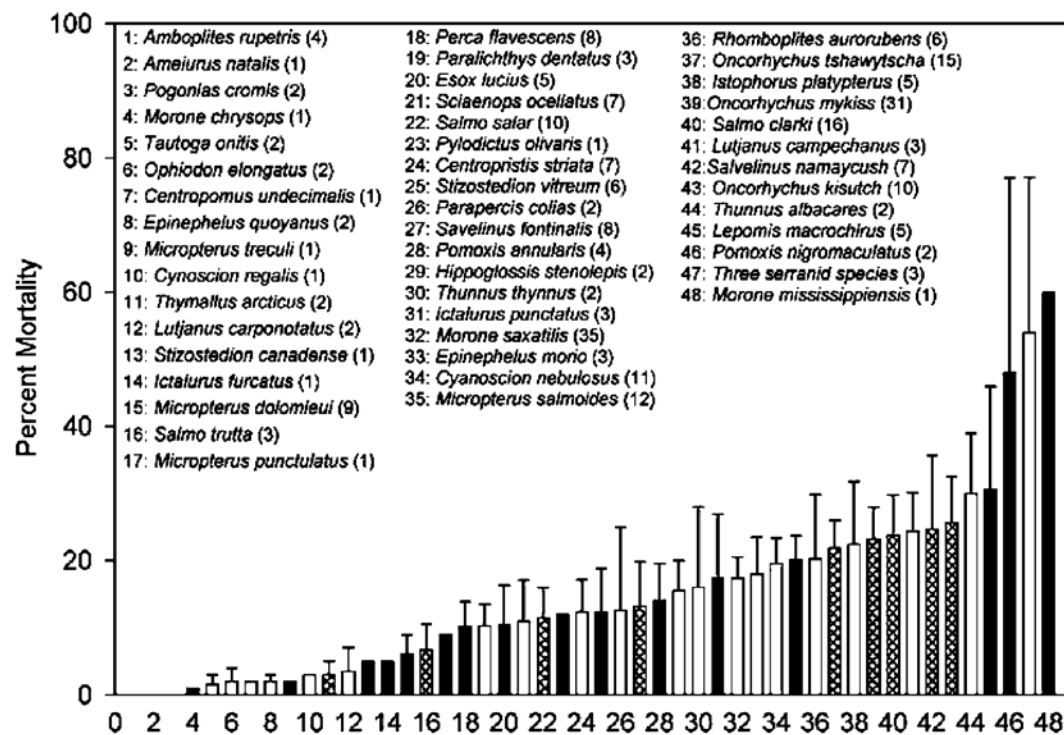
Holding fish alive



Biological Impacts of Catch-and-Release

Lethal and sublethal impacts found in many studies (recent review in Arlinghaus et al. 2007, Rev. Fish. Sci.)

- Impacts vary with:
 - species
 - temperature
 - hooking location and depth
 - terminal gear
 - handling procedures
 - etc. etc.



Bartholomew & Bohnsack (2005, Rev. Fish Biol. Fish.)

Other Issues Related to Recreational Fishing Practices (1/2)

Litter

- entanglement
- ingestion
- aesthetics



Other Issues Related to Recreational Fishing Practices (2/2)

Habitat changes (e.g., removal of dead woody debris, bank erosion, bait digging)

Wildlife disturbance (e.g., water fowl, mammals)

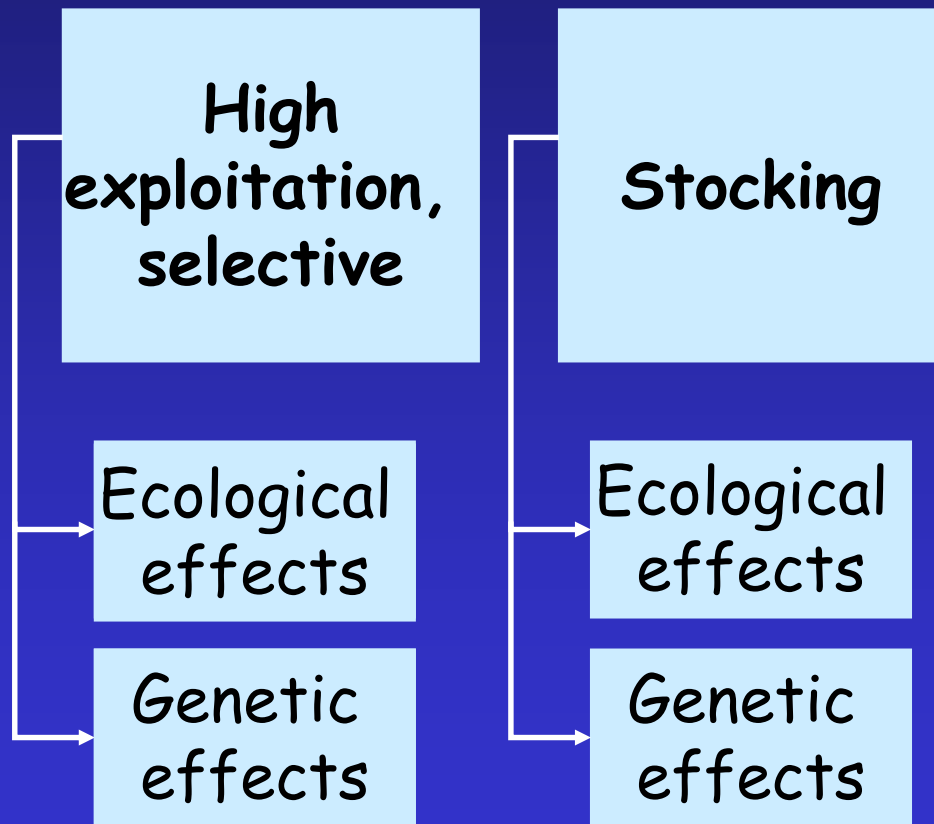
Groundbaiting (chumming), if used in excess

Boat waves, disturbance of sediment

Wading, noise (inside and outside water)

...

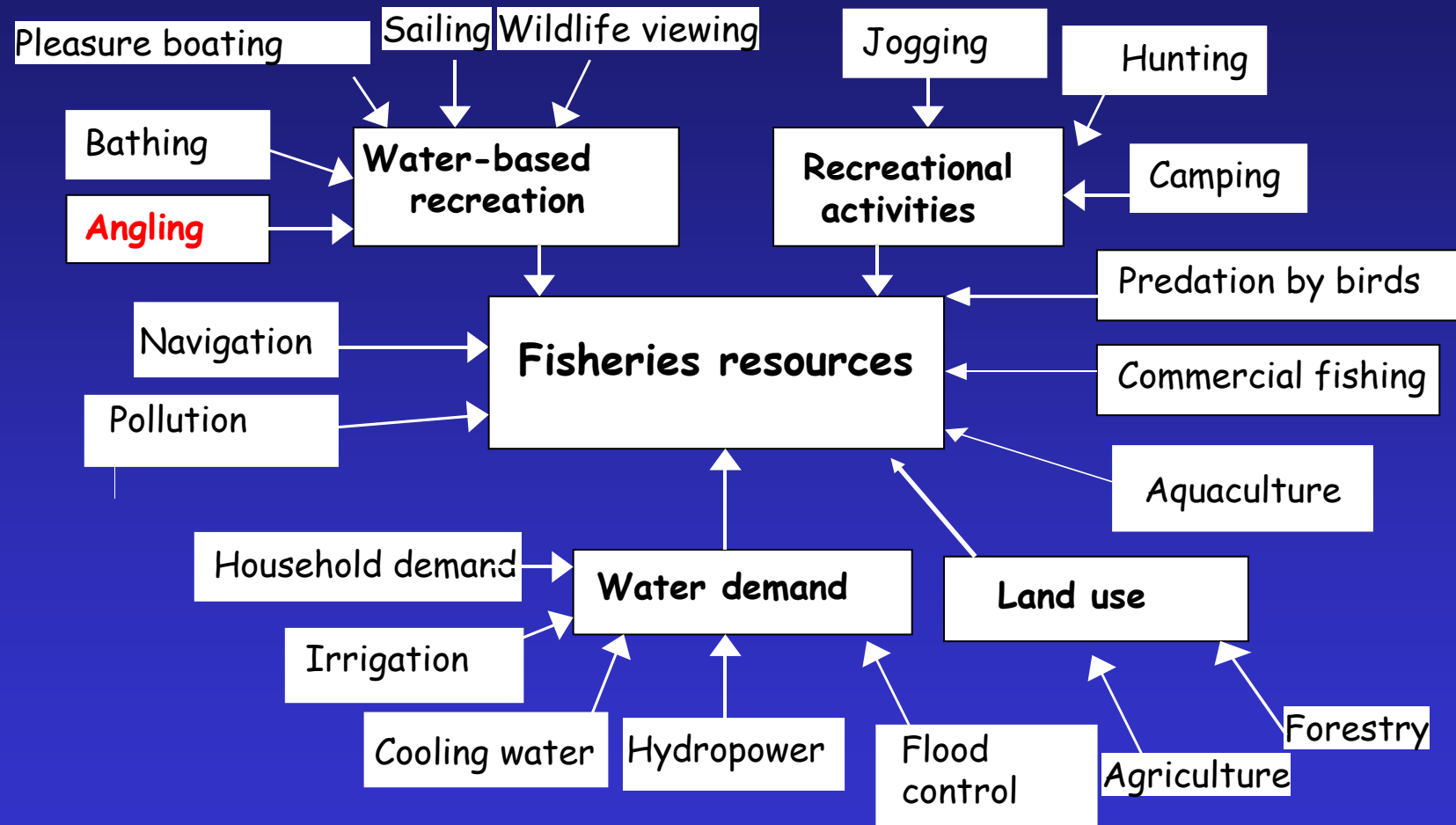
Recreational Fishing-Related Threats to Fish Populations and Ecosystems



In addition:

- Ground baiting (*7 studies*)
- Loss of gear (*22 studies*)
- Habitat modification (*11 studies*)
- Wildlife disturbance (*17 studies*)
- Noise (*6 studies*)
- Bait collection (*6 studies*)

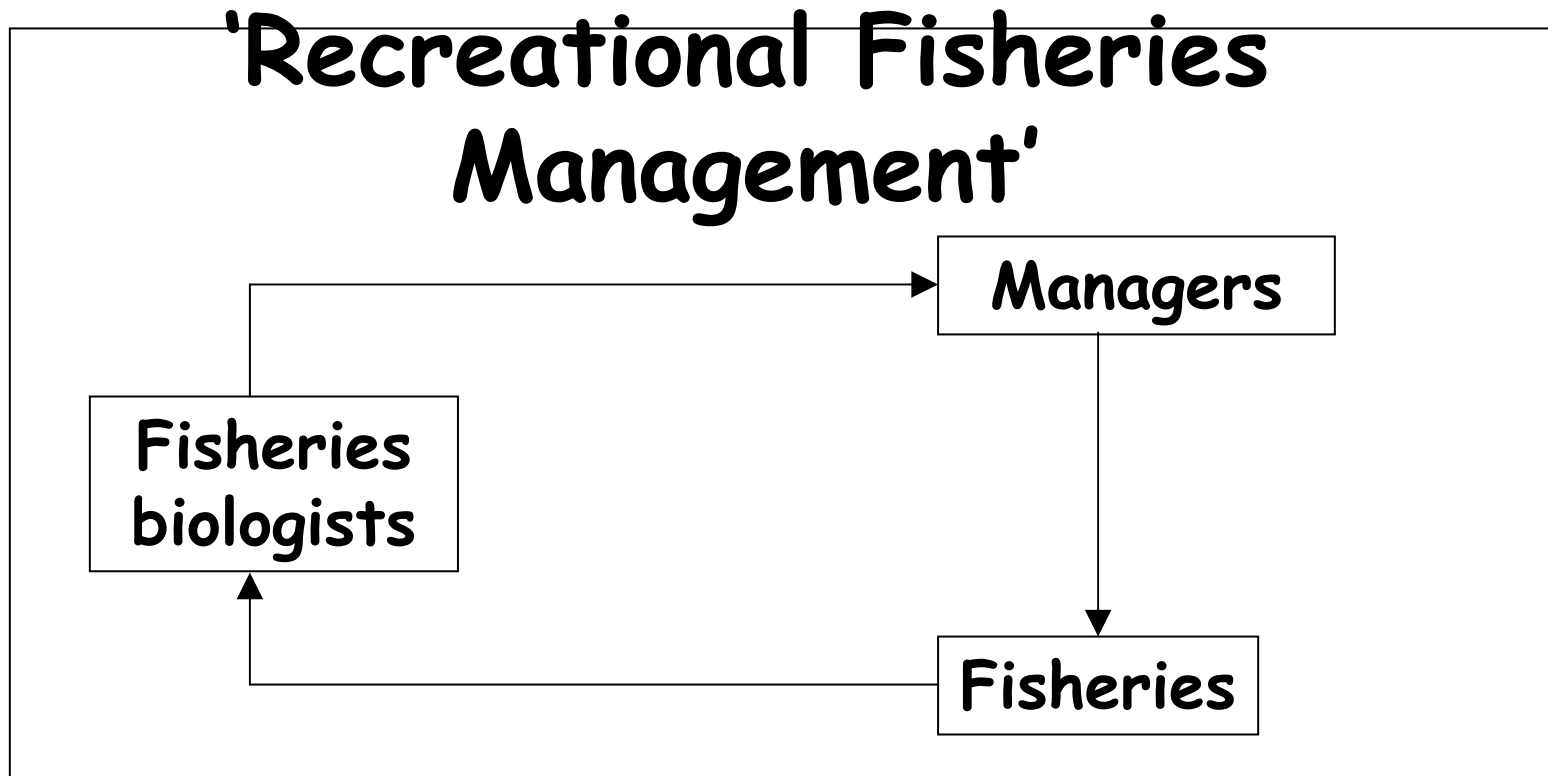
Note: Recreational Angling acts on Top of Anthropogenic Stress, often not the Most Important Factor of Fish Declines



Arlinghaus et al. (2002), Fish Fish.

And what about science and management?

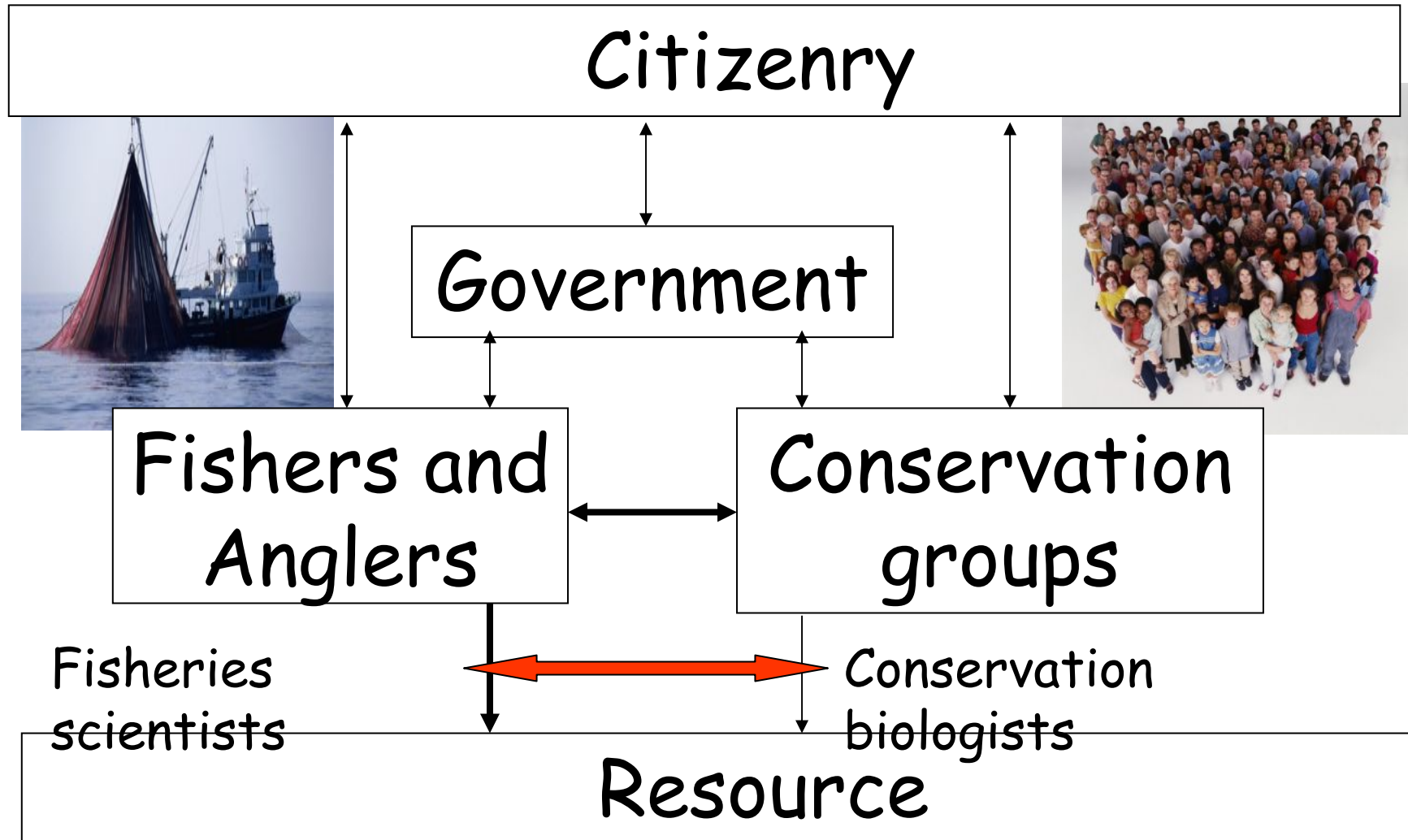
Here is how the role of fisheries scientists and management is often perceived!



Common Management Strategies

1. Management of the Fishery, e.g. by harvest regulations (input and output controls)
2. Management of the Fish Stocks, e.g. by stocking and introductions, culling of unwanted species
3. Management of the Environment, e.g. habitat enhancement

Things have become more complicated...

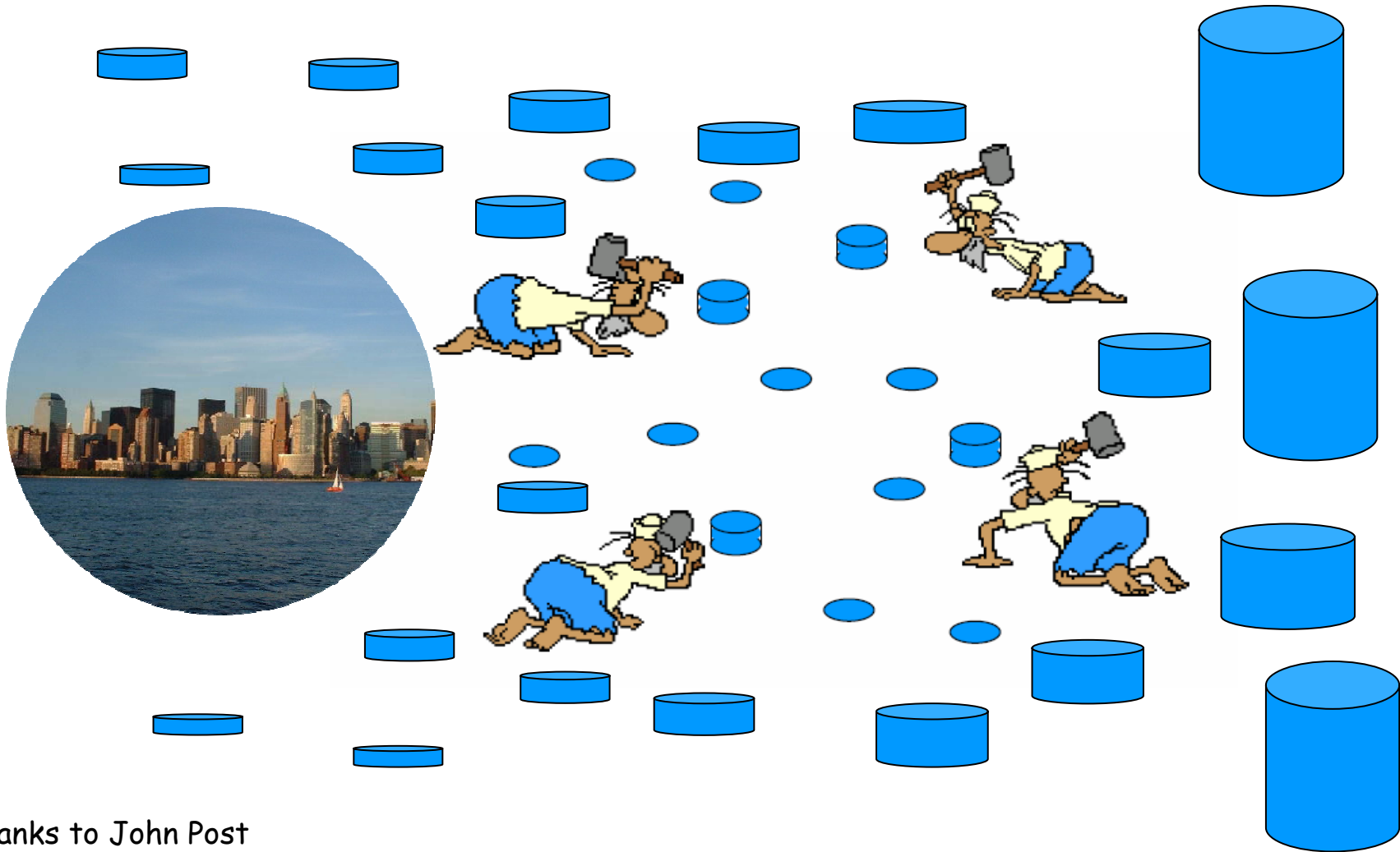


Stakeholder Interactions (Arlinghaus 2005)

Table 1. Typology of conflicts in recreational fisheries. Conflicting parties not only encompass users but also management institutions (e.g. laws) and management systems in general

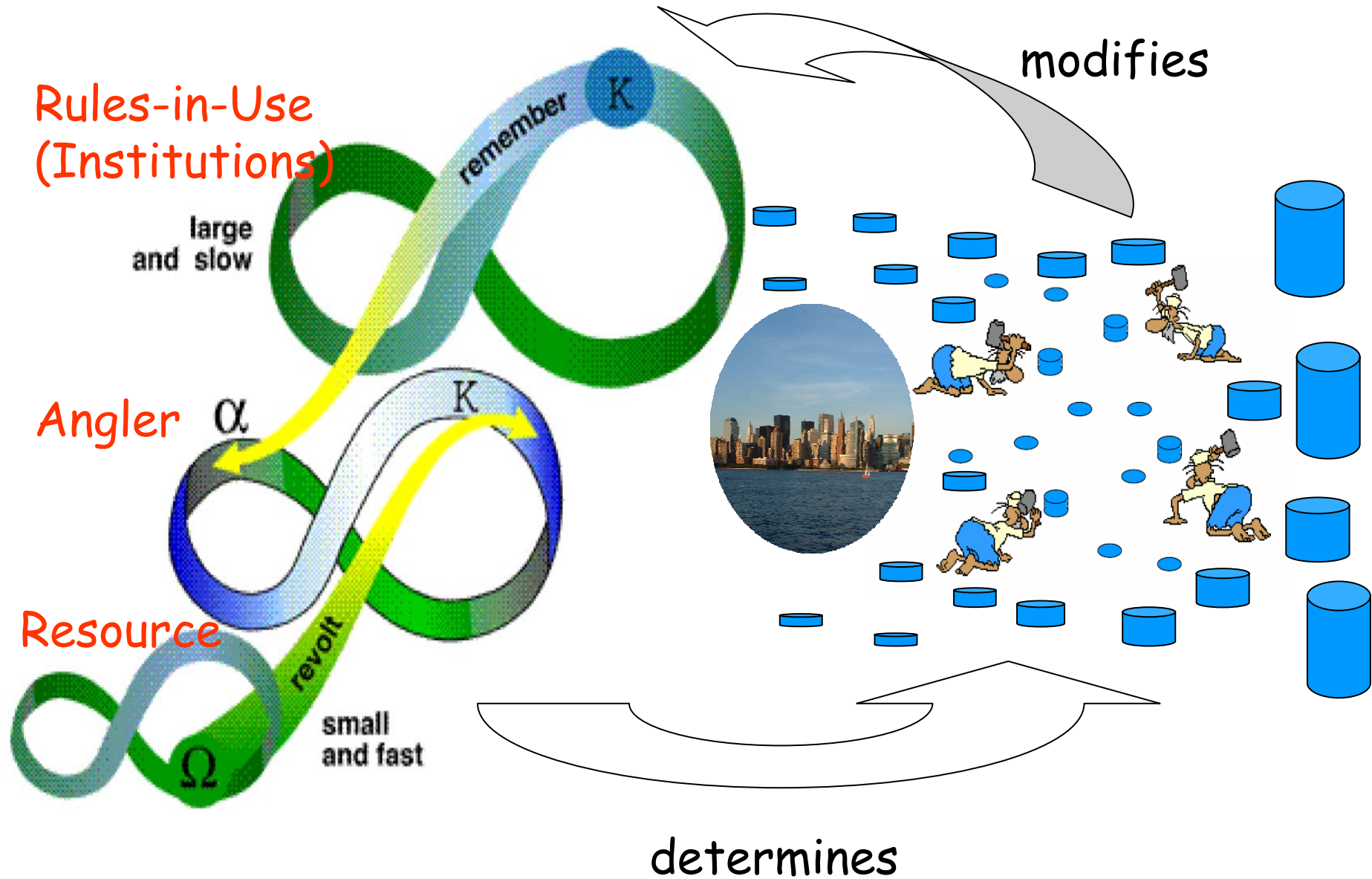
Type	Sector involved	Examples of conflicting parties
User conflicts	Intersectoral	Angler versus boater Angler versus swimmer
	Intrasectoral	Angler versus angler Angler versus commercial fisher
Management conflicts	Intersectoral	Angling/fisheries management versus animal rights law/interest Angling/fisheries management versus nature conservation law/interest
	Intrasectoral	Angler versus support or opposition to management measures Recreational fishing versus allocation of fishing rights to commercial fisher

A new Area of Recreational Fisheries Research: Beyond the Single Fishery



Thanks to John Post

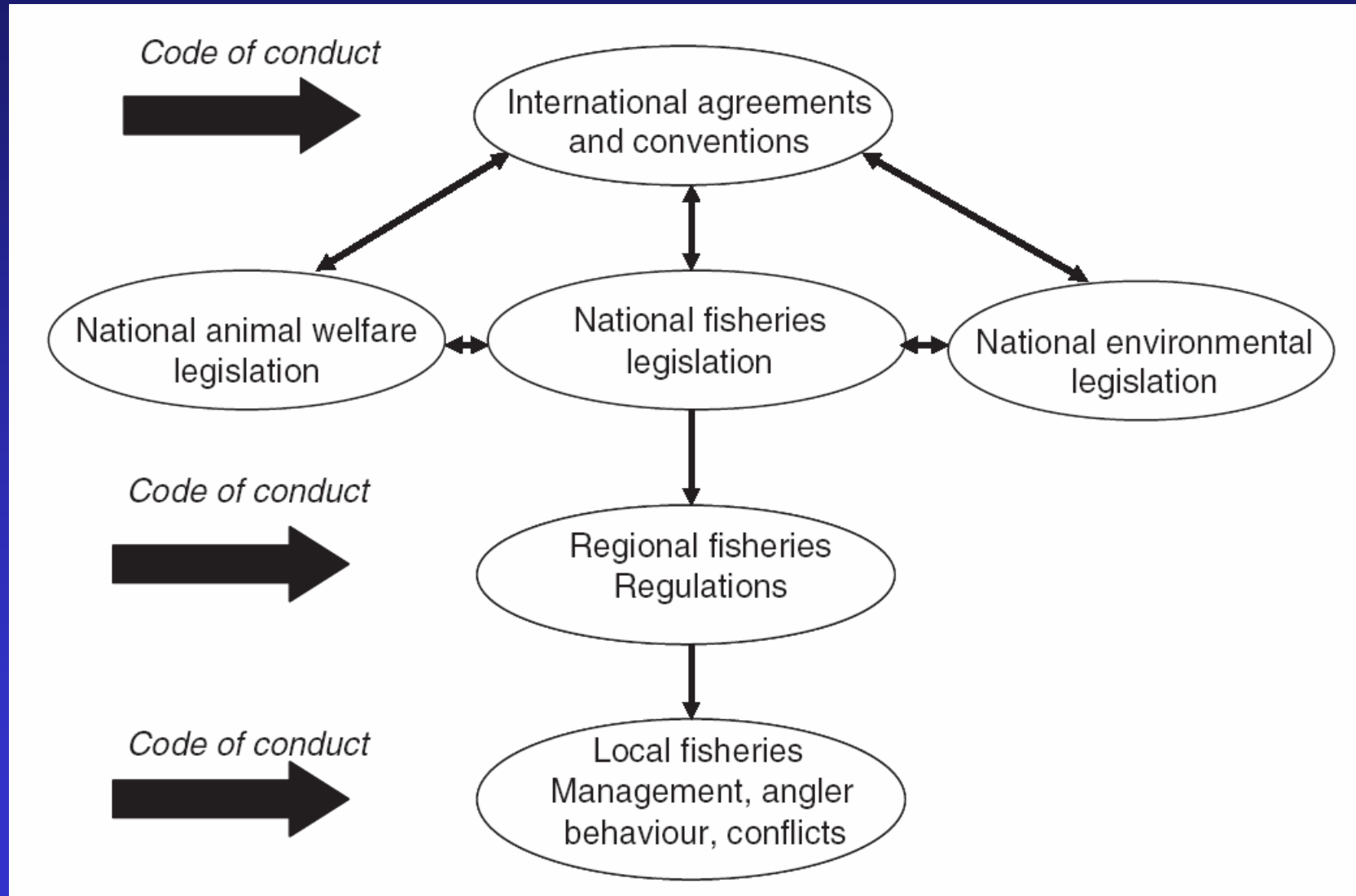
Understanding Social-Ecological Interactions



Conclusions: Towards a Global Code of Practice

- Recreational fishing the dominant user group of fish stocks in most freshwater fisheries and many coastal ones
- Until now this importance has not been properly addressed in international policy documents (focus on commercial fisheries)
- There are a number of issues of joint importance for the global's recreational fisheries
- It is important to represent recreational fisheries on the same level as commercial fishing in international fora and policy documents
- A global Code of Practice would reduce the need for development of hundreds of more regional and local codes
- It would need to build on existing Code of Conducts (e.g., RecFish Australia, Coarse Fishing UK)

The Role of a Global Code of Practice (Cowx & Arlinghaus, in press)



Value of a Code of Practice

- Proceeding from the general moral assumption that recreational fishing is good and legitimate now and in the future
- Framework to describe minimum standards of environmentally friendly, ethically permissible and, depending on local situations, socially acceptable recreational fishing
- Discuss and clarify the most important issues critical for sustainable recreational fisheries management worded as broadly as needed to cover the globe, but specifically enough to be meaningful
- No legally binding character! Entirely voluntary (as the FAO CCRF)
- Primarily useful for policy makers, NGOs, recreational fishing industry, local angling clubs, fisheries managers and fisheries scientists as a communication tool for best practices
- It shall ultimately also raise awareness of the importance of recreational fishing as part of the world's fisheries

Process in Developing the Code of Practice

- Review of existing Code of Conducts
- Review of the scientific literature
- First draft developed by RA
- Revision by Ian Cowx, Raymon van Anrooy and Steven J. Cooke
- Revision of first draft by RA
- Circulated modified draft among Workshop Participants for preparation
- Incorporation of YOUR Feedback into Final Version (the deliverable product)
- Submission of draft for endorsement by EIFAC and by COFI of FAO

(1) Definitions, Nature and Scope,
Objectives, Implementation Procedures

(2) General Principles and Environmental Stewardship

(3) Institutional and Policy Framework, Enforcement

(4) Recreational Fishing Practices and Safety

(5) Fish Welfare

(6) Stakeholder Interactions

(7) Recreational Fisheries Management

(8) Recreational Fisheries Research

(9) Education and Training

The Process at This Workshop

- Discussion about the general value, concerns, perceived omissions until lunch
- Group work on specific articles (but not at a level of editorial issues, more generic) this afternoon
- Presentation of suggested changes or issues of concern to workshop audience, immediate discussion so that the entire group can raise issues and complement the work of each subgroup
- Overall, focus on the most contentious issues and let's not discuss details. Note details in the subgroups in the text using Track Changes and Comments function
- I assume all are familiar with the draft?

Discussion and Suggested Review Subgroups

<p>Nature and Scope; Objectives; Implementation, Monitoring, Promotion & Updating</p> <p>(Articles 1-3)</p>	<p>General Principles; Environmental Stewardship & Ethics</p> <p>(Articles 4-5)</p>	<p>Institutional and Policy Framework; Monitoring, Control, Surveillance & Enforcement</p> <p>(Articles 6 - 7)</p>	<p>Recreational Fisheries Practices; Safety</p> <p>(Articles 8 & 10)</p>
<p>1. Phil Hickley 2. Raymon van Anrooy 3. John Harrison</p>	<p>1. Rob Kramer 2. Alexander Schwab</p>	<p>1. Jan Kappel 2. Kristof Vlietinick 3. Sjaak Vonk 4. Ana Gordo</p>	<p>1. Zdenek Adamek 2. Anna-Liisa Toivonen 3. Ferenc Szalay 4. Joe Caffrey</p>
<p>Fish Welfare</p> <p>(Article 9)</p>	<p>Stakeholder Interactions; Awareness Raising, Education & Training</p> <p>(Articles 11 & 14)</p>	<p>Recreational Fisheries Management</p> <p>(Article 12)</p>	<p>Recreational Fisheries Research</p> <p>(Article 13)</p>
<p>1. Robert Arlinghaus 2. Toine Aarts 3. Thomas Meinelt 4. Bruno Broughton</p>	<p>1. Chris Horton 2. Fred Bloot 3. Esteban Graupera</p>	<p>1. Doug Beard 2. Nancy Leonard 3. Eva Roth 4. Graciela Nicola</p>	<p>1. Brett Johnson 2. Ian Cowx 3. Ana Almodovár 4. William Taylor</p>

- We need agreement on allocation of people, a speaker per subgroup, one laptop and a USB stick per subgroup



Management Strategies

Management of Fish and
Fisheries

Fishery

Environment:
Improvement of Habitat
Structure und Function

Techniques for
Habitat Enhancement

Legislation

Input and
Output Controls

Education

Management of Fish and
Fisheries

Connectivity

Flood regime

Pollution

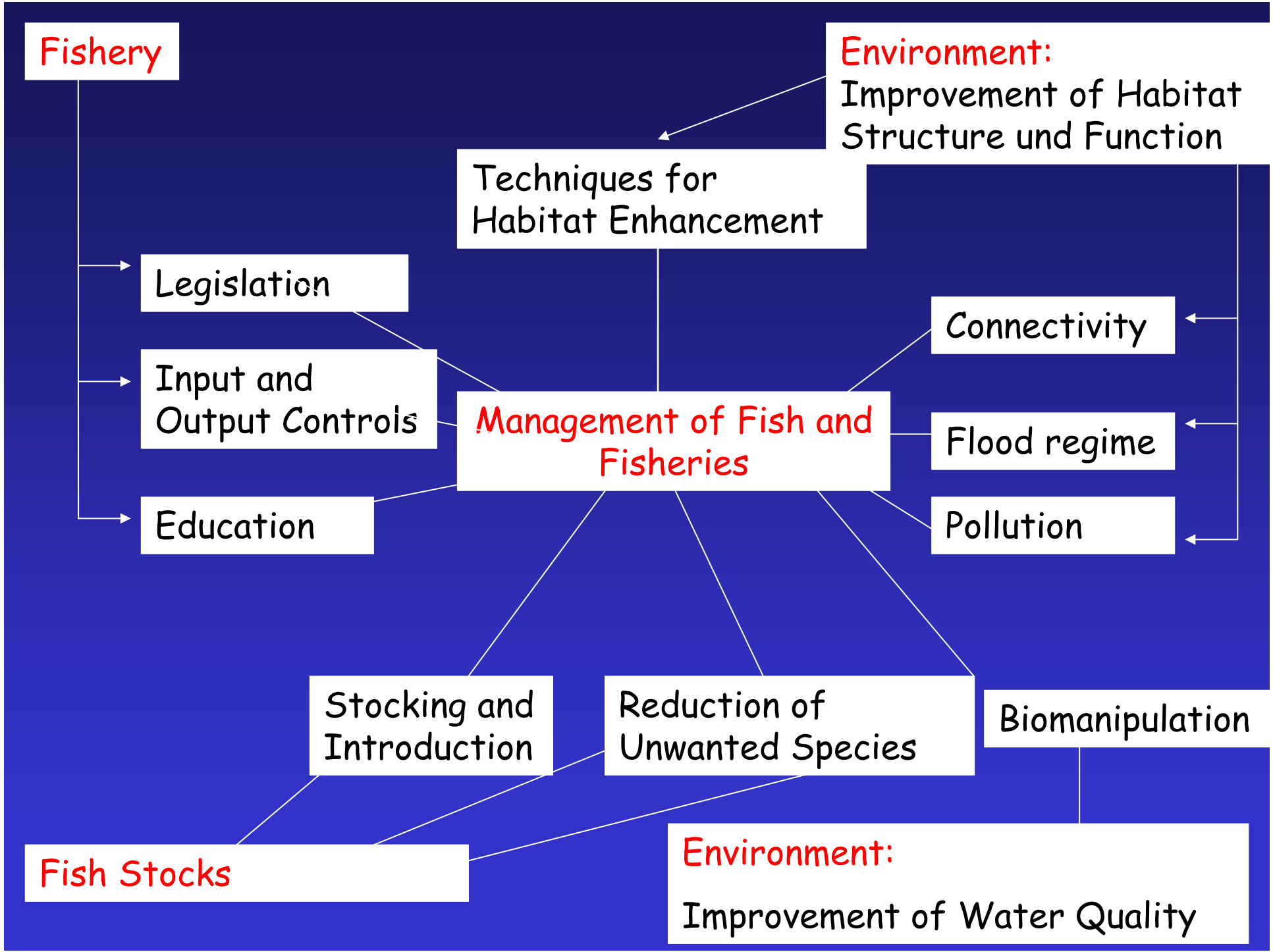
Stocking and
Introduction

Reduction of
Unwanted Species

Biomanipulation

Fish Stocks

Environment:
Improvement of Water Quality



Managing the Recreational Fishery

	Input controls	Output controls
Closed areas	X	
Closed season	X	
Type of gear	X	
Type of fishing right	X	
Effort controls	X	
Access restriction	X	
Bag limits		X
Size-based harvest limits		X
Catch-and-release		X
Sale of fish		X

Fishery

Environment:
Improvement of Habitat
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