

Marine Recreational Fisheries - Data Collection

Harry V. Strehlow¹ & Kieran Hyder²

¹ Thünen Institute of Baltic Sea Fisheries

² Cefas Lowestoft



Athens,
06.10.2015

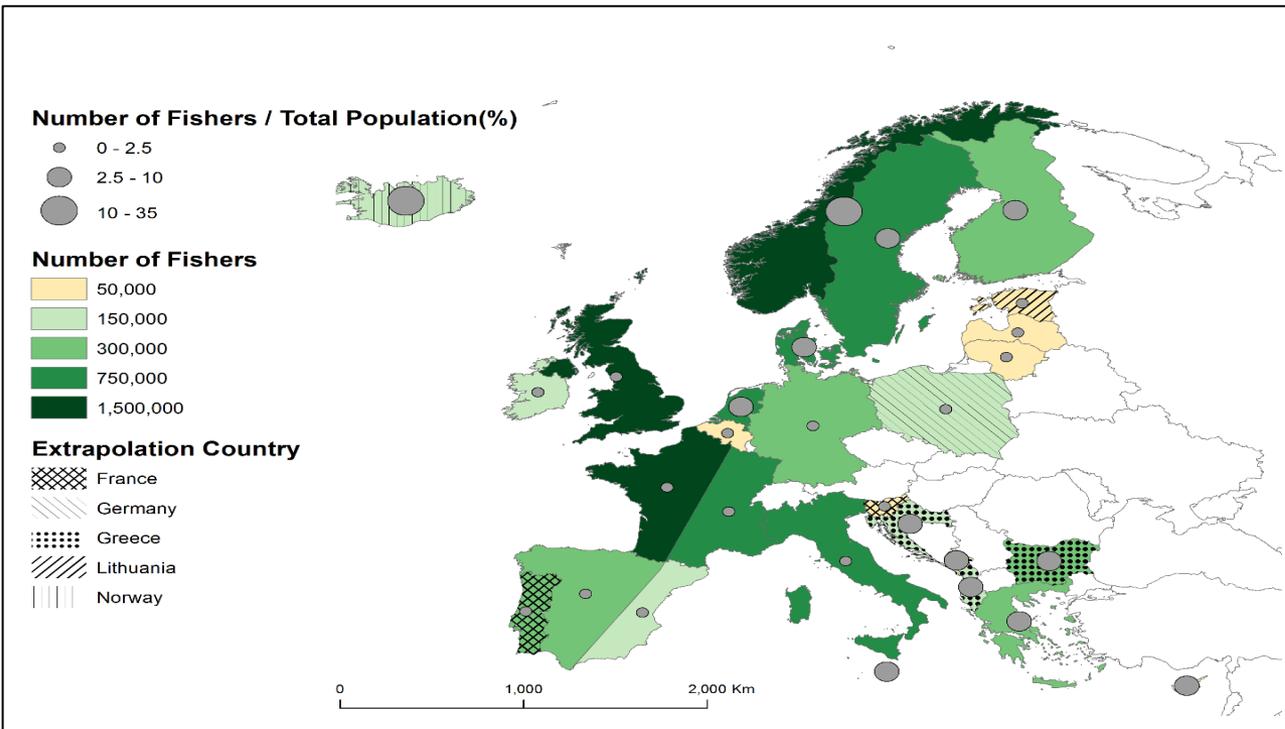
Why is recreational fisheries important?



- High value – spend billions €
- Large numbers – users of the marine environment
- Removals – impact on achieving management objectives (MSY)
- Management & allocation of resources between sectors

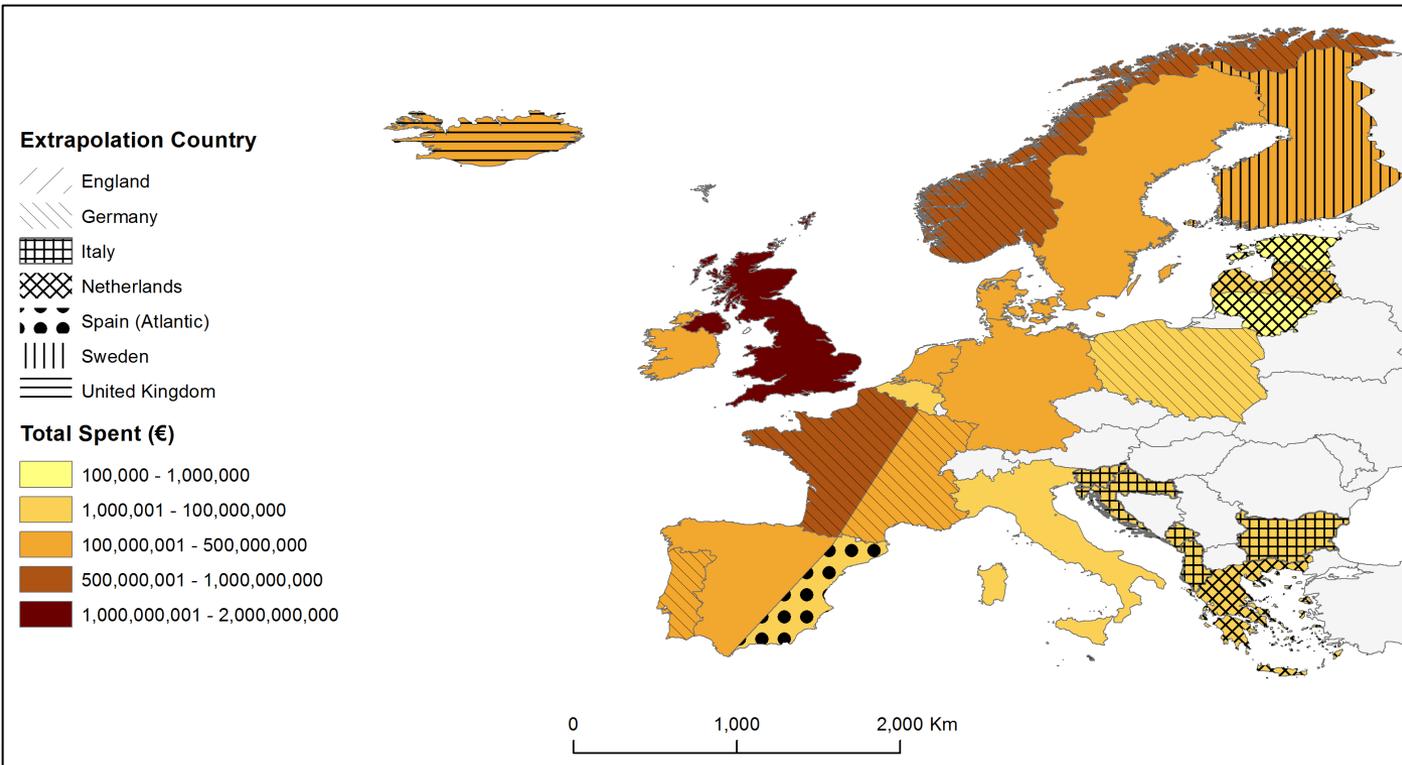
Hyder et al. (2014). ICES INSIGHT 51: 8-15

European RSF: numbers, participation & effort



Category	Total	Atlantic	Med
Numbers (millions)	8.00 (-)	6.02 (+/-)	1.98 (---)
Participation (%)	1.53	1.71	1.16
Activity (million days)	47.9 (-)	39.5 (+/-)	12.3 (---)

European RSF: direct expenditure



Category	Total	Atlantic	Med
Expenditure (billion €)	5.18 (--)	4.51 (+/-)	0.67 (---)
Spend per angler (€)	654	755	344

Legislation

European Member States obliged to collect recreational fisheries data:

- (EC) No 1639/2001
 - (EC) 2008/949
 - 2010/93/EU
 - C(2013) 5243
- cod, salmon, bluefin tuna, eel, sharks, sea bass
- Recommendations from ICES EGs
WGRFS and WGBAST
⇒ sea trout, European lobster, pollack
groupers, Sparidae, Cephalopods



Terminology

Definition: (ICES WGRFS)

*Recreational fishing is the capture or attempted capture of living aquatic resources mainly **for leisure and/or personal consumption**. This covers **active fishing methods** including line, spear, and hand-gathering, and **passive fishing methods** including nets, traps, pots, and set-lines.*

Recreational fishing activities are carried out from different platforms:

- land-based
- sea-based

Mediterranean: EC 1967/2006 Article 17

*The **use of nets ... shall be prohibited** for leisure fisheries.*

Challenges for data collection

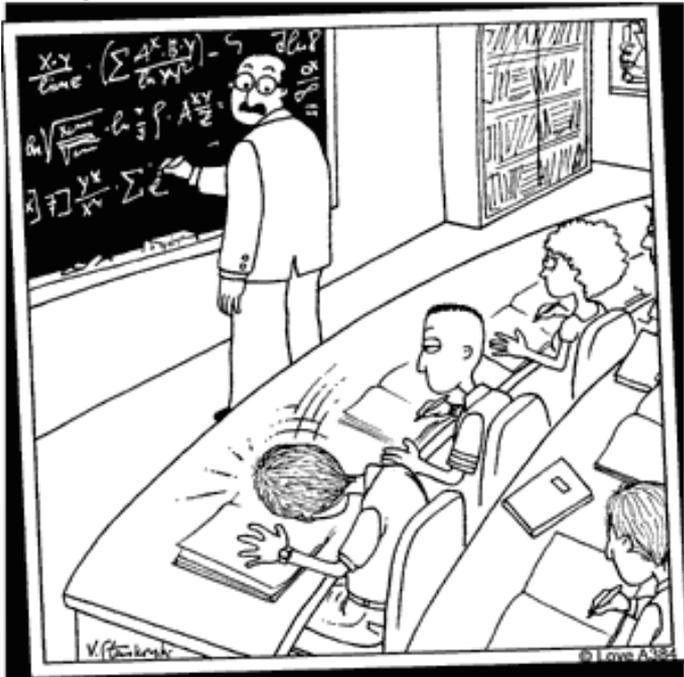
Data gaps → recreational fisheries data patchy and/or lacking completely!

1. no central registration of recreational fishers
2. recreational catches not documented
3. recreational fishers fish in remote and hard to access areas
4. Surveys difficult & expensive
5. Many countries exploit the same stock



Fishing survey methods

Snapshots at jasonlove.com



Professor Herman stopped when he heard that unmistakable thud – another brain had imploded.

- Challenging stats (design-based probability sampling) → need an expert
- Low participation rate → difficult to get a representative sample
- Different designs:
 - List (e.g. licence) – sample at random & recruit panel, then raise to population
 - No list – separate surveys of effort & catch per unit effort

Survey design and bias



- Coverage
- Self-selection
- Non-response
- Recall
- Avidity
- Species identification (high value species)
- Inclusion probability
- Rounding / digit
- Telescoping, Prestige
- Fluctuation (drop-outs/drop-ins)

Exkurs: survey design and bias

Bias may occur on many levels:

1. Survey design

- Does my sampling frame cover the target population?
→ coverage error, e.g. tourists, illegal fishers etc
- Is my sampling procedure probability based?
→ e.g. self-selection bias, over- and underestimation

Exkurs: survey design and bias

Bias may occur on many levels:

2. Implementation

- Are there protocols for the selection of subsamples?
→ Selection error, e.g. individuals, times, boats etc
- Are response rates recorded and evaluated?
→ nonresponse bias
- Is the recall period appropriate?
→ recall bias; e.g. does recall period match fishing season
- Species identification, high-value species

Exkurs: survey design and bias

Bias may occur on many levels:

3. Analysis

- Does the estimation procedure follow the survey design?
→ Inclusion probability, e.g. access points sampled with the same probability
- Has the data been weighted?
→ correction for nonresponse/avidity bias
- Have drop-ins or drop-outs been considered?
→ fluctuation bias

Recreational fishery data use

- Inclusion in stock assessments
 - Design and evaluation of management measures (e.g. bag limit)
 - Design and evaluation of management plans and strategies
 - Marine spatial planning
- ⇒ Co-Management
(recreational & commercial fishery)



Management paradox



VS



Maximum Total Satisfaction (MTS)

Maximum Sustainable Yield (MSY)

Competing objectives are not always compatible, so may require trade-offs between sectors

End users of recreational fishery data

- ICES expert groups (WGRFS, WGNAS, WGBAST, WGBFAS, WGCSE, WGEEL)
- EU Commission (DG MARE, DG Environment)
- National Governments
- National and international recreational fishing bodies
- National and international commercial fisheries bodies
- Advisory Councils (e.g. MEDAC, Baltic Sea AC, North Sea AC)
- ...

What recreational fishery data is needed ...

... to support the CFP?

Estimation of recreational fishery catches

- total number of recreational fishers, charter boats, fishing trips etc
- CPUE (or catch per person or per boat)
- Biological data on catches – size or age composition
- Demographic and avidity (frequency of fishing) data



Economic value of recreational fishing

- Direct expenditure data by spend categories
- Marginal values associated with a change in stock



Types of surveys

Screening survey

- sample from a broad coverage frame like residential households
- Recruit fishing participants → panel survey

Off-site	Pros	Cons
Random Digit Dialing (RDD)	<ul style="list-style-type: none">• Complete coverage possible• Accurate effort data	<ul style="list-style-type: none">• Mobile phones maybe excluded• Expensive• Potential nonresponse
Mail survey	<ul style="list-style-type: none">• Most complete coverage possible• Cheap	<ul style="list-style-type: none">• Inefficient• High nonresponse
Online	<ul style="list-style-type: none">• Easy• Cheap	<ul style="list-style-type: none">• Fishing behaviour may not match general population

Types of surveys

On-site	Pros	Cons
Access point (fixed point) intercept survey	<ul style="list-style-type: none"> • High participation rate • No recall bias • Completed fishing day • Accurate catch data 	<ul style="list-style-type: none"> • Possible undercoverage bias • Expensive
Roving (diffused point) creel survey	<ul style="list-style-type: none"> • High participation rates • No recall bias 	<ul style="list-style-type: none"> • Uncompleted fishing day • Expensive

Visual	Pros	Cons
Aerial/boat survey	<ul style="list-style-type: none"> • Covers large areas • Usefull for heat maps 	<ul style="list-style-type: none"> • Very expensive • Only for effort
Camera survey	<ul style="list-style-type: none"> • Inexpensive • Covers entire fishing day 	<ul style="list-style-type: none"> • Vandalism • Weather

Recommendations

- Regional cooperation between countries is needed
- Adopt definition for Mediterranean
- Combination of on-site and off-site approaches
- Multispecies data should be collected
- Include economic value and social benefits (every 5 years)
- Data collection defined on case-by-case basis
- Sampling with commercial small-scale fisheries surveys
- Seek expert advice from ICES



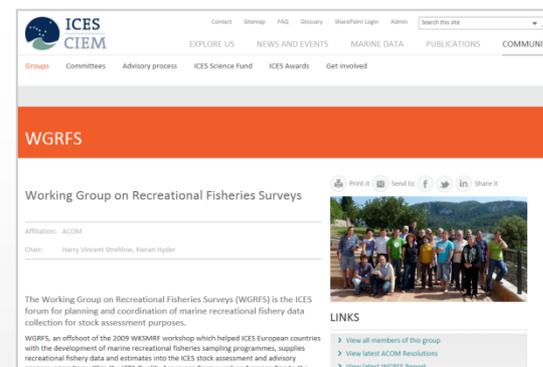
Thank you!



harry.strehlow@ti.bund.de

WGRFS is the ICES Working Group on Recreational Fisheries Surveys:

<http://www.ices.dk/community/groups/Pages/WGRFS.aspx>



We are seeking new members in the Mediterranean!