# What is a credit system and what could it add to fisheries management?

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# About the project

Koninklijke Nederlandse Akademie van Wetenschappen


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For quality of life

- Project funded by the Royal Dutch Academy of Science to Wageningen University and Research centre
- Type of research: projects for innovative, out of the box thinking
- Context BESTTUNA project http://www.besttuna.wur.nl/UK/
- Credit systems come in many forms, can they add to fisheries management?

# Outline

- Credit-like systems in fishery management
- 2 Case studies
- Management goal of credit systems
- Identifying credit system essentials
- What can a credit system approach add?

# Credit systems in fisheries

## Many ideas for credit systems in fisheries pop up:

Marine Conservation Society (2009) The fishing credit system

'**Credits allocations** for **all** fish, shellfish, marine mammals & seabirds caught, based on ecosystem criteria. would be used, but also habitats, and non-commercial benthic species not removed through fishing, (such as echinoderms), which would be managed through a system of closed and protected areas.'

Costello et al. (2012) A market approach to saving the whales.

'Properly designed, a whale market could accommodate important concerns such as the bycatch of whales in fisheries or whale ship strikes. It could even be integrated with other market approaches, such as a recent proposal to **apply carbon credits to live whales**. By placing an appropriate price tag on the life of a whale, **a whale conservation market** provides an immediate and tangible way to save them.'

Igual et al. (2009) compensation for sea bird bycatch

Tuna Think Tank (2009): Is there a way to address juvenile tuna bycatch through a credit system? Also see (Short 2012)

Kraak et al. (2012) a spatio-temporally explicit tariff-based approach based on real time incentives

# Credit systems from a governance perspective

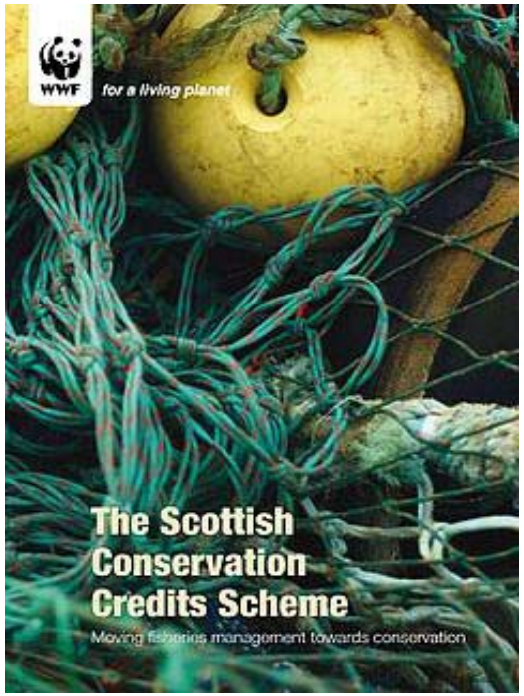
**To economists:**

This study focusses on fishing behavioural change, not fishing rights

**To fisheries scientists:**

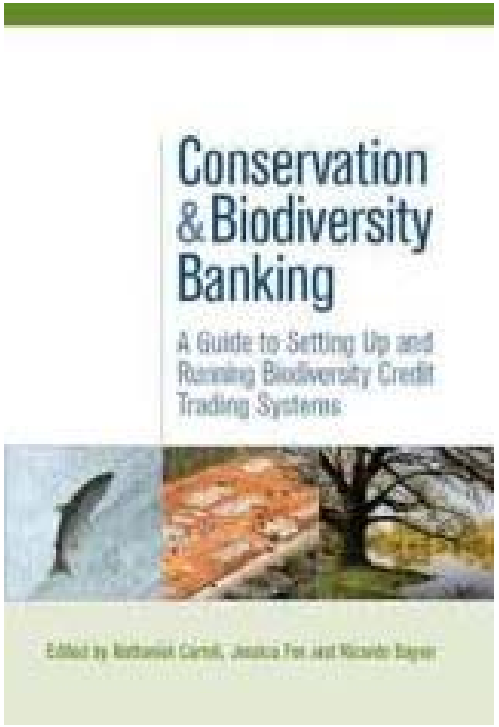
This study focusses on effort efficiency (q)

# Operational credit systems in fisheries




## Behavioural change credits

The Scottish conservation credit scheme (2007)

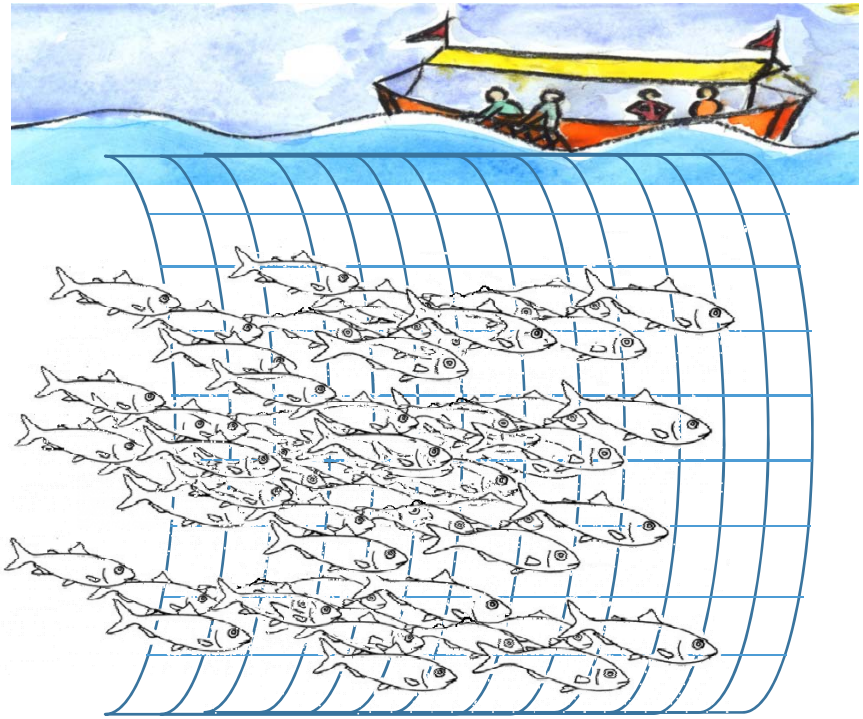



## Mitigation credits

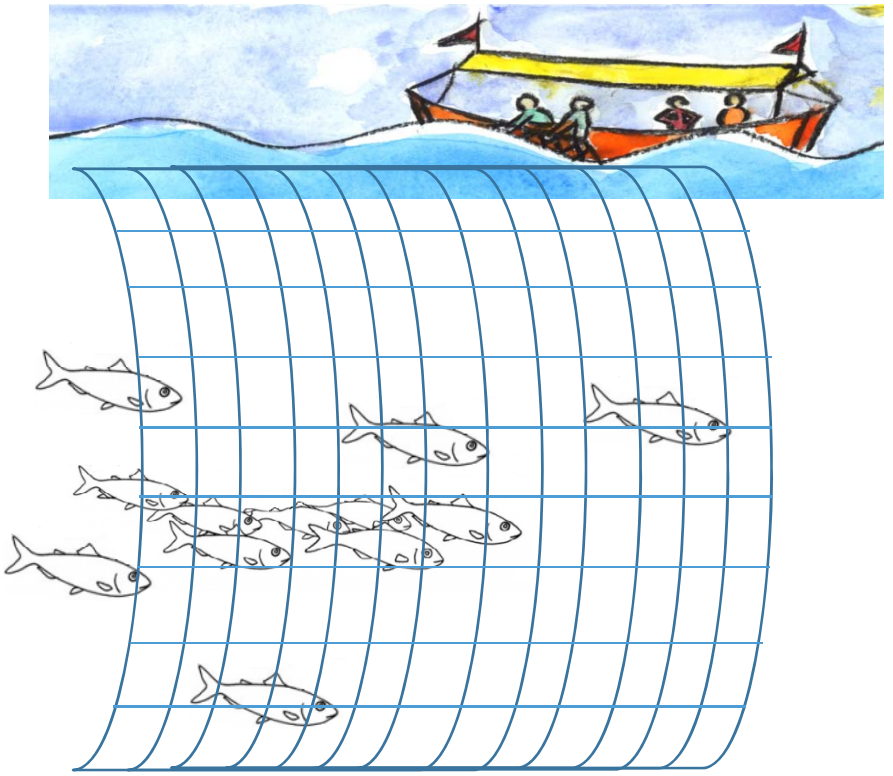
‘Fish banking’ (2009)

The Californian Drift Gillnet Swordfishers’ ‘turtle tax’

# Example 1: the Scottish conservation credit scheme



1) Real time closure of high cod density areas



2) Fish in low density areas

3) Adapt fishing gear

This is fishing less efficient, fishers are compensated by the reward of extra fishing effort.

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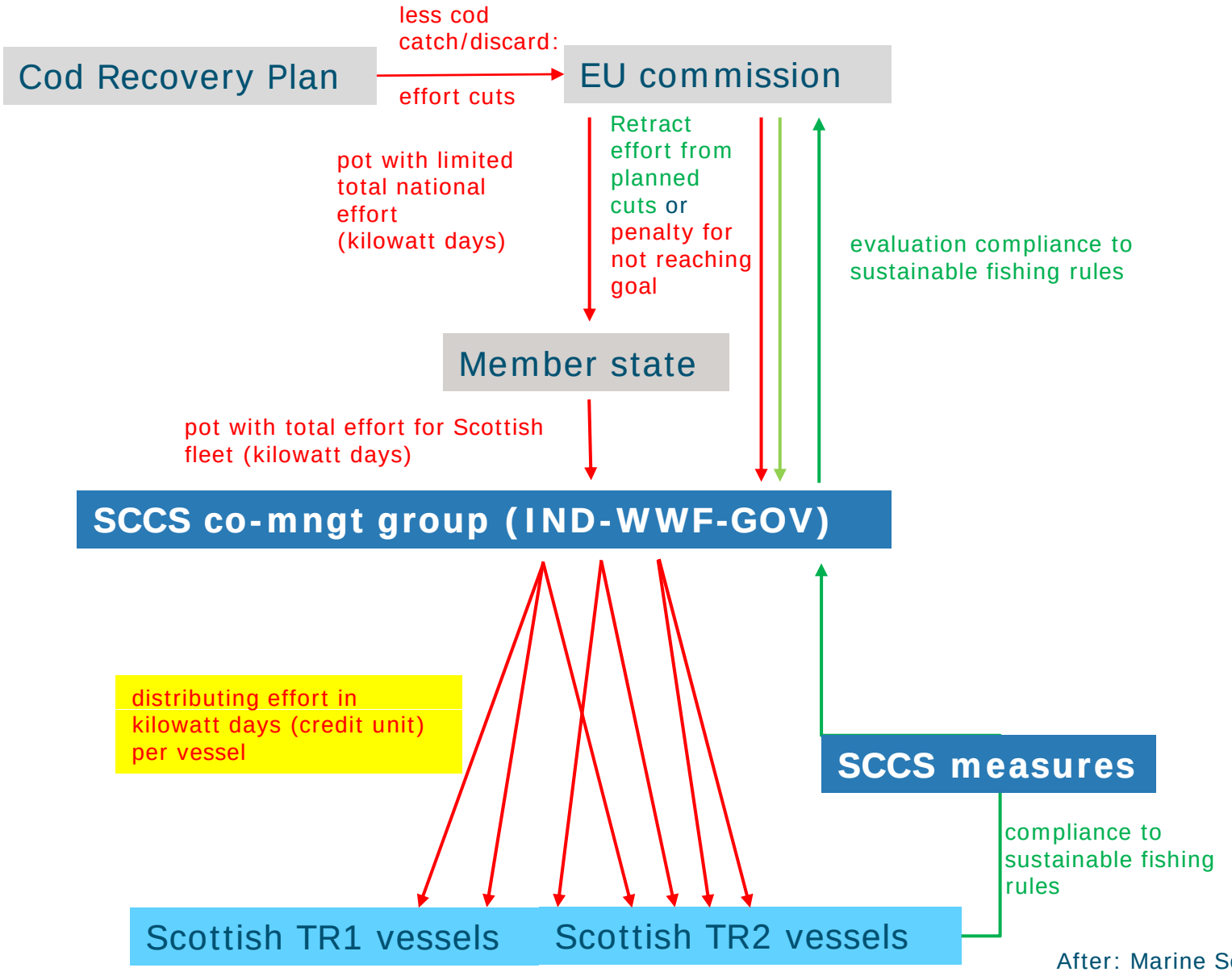
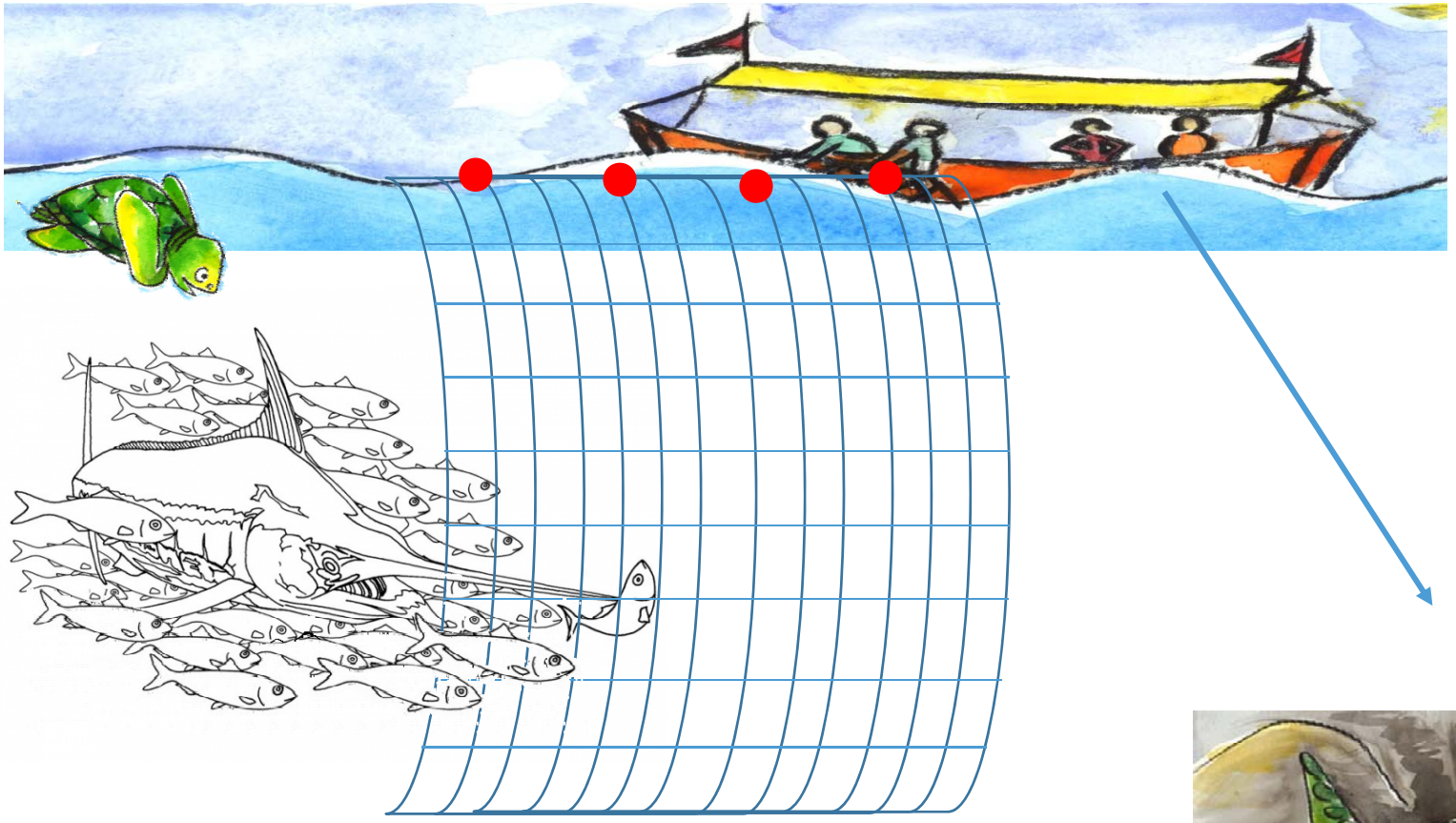
# Example 1: the Scottish conservation credit scheme




After: Marine Scotland 2007- 2011

# Example 2: California's drift gillnet fishers turtle-tax banking system



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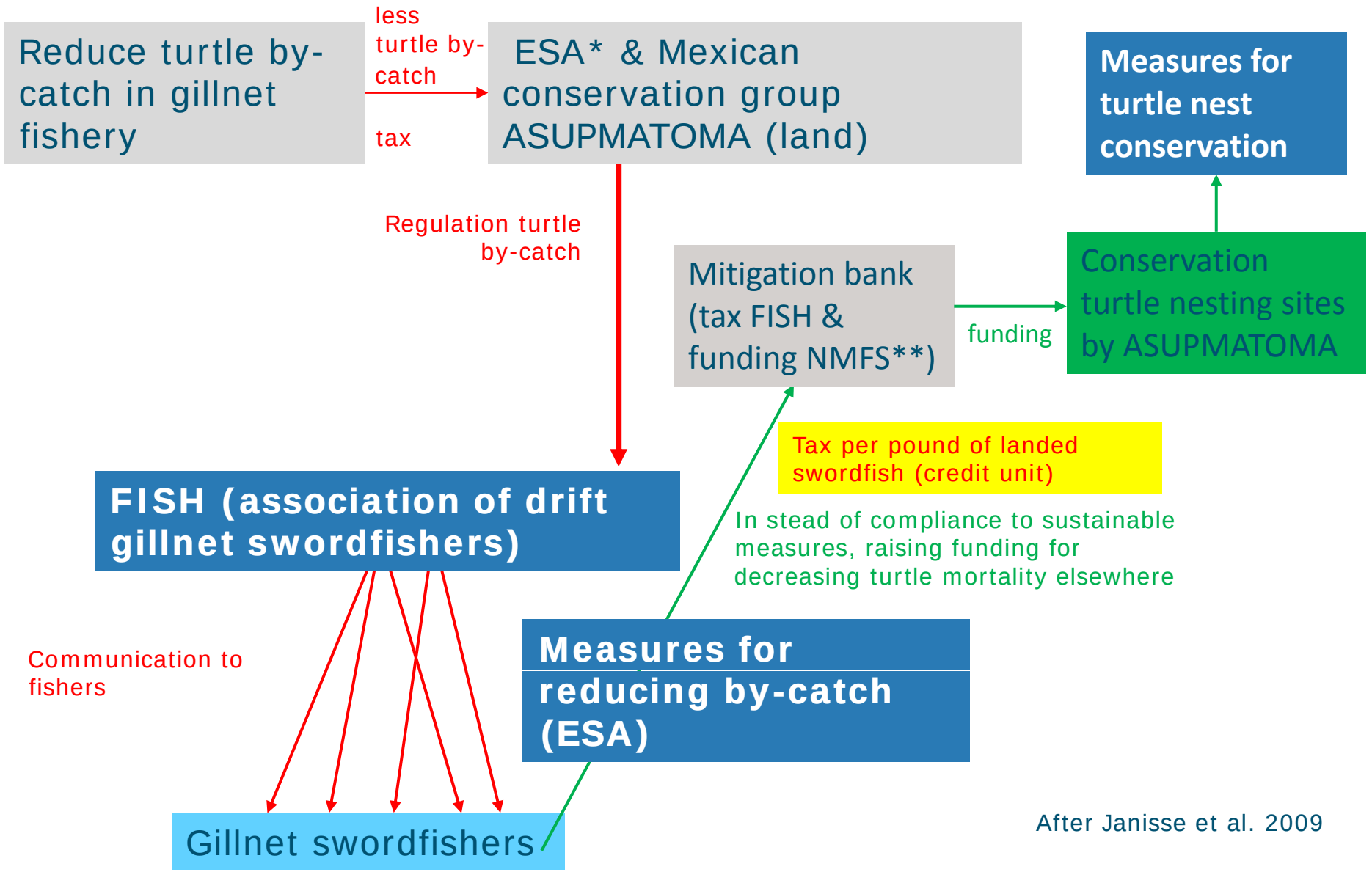



After Janisse et al. 2009

*U.S. Endangered species act
**U.S. national marine fisheries service

# Strategies

- The Scottish conservation credits scheme (SCCS)

Fishers can retract EU fishing effort cuts by *adjusting their fishing methods* towards more sustainable resource use.

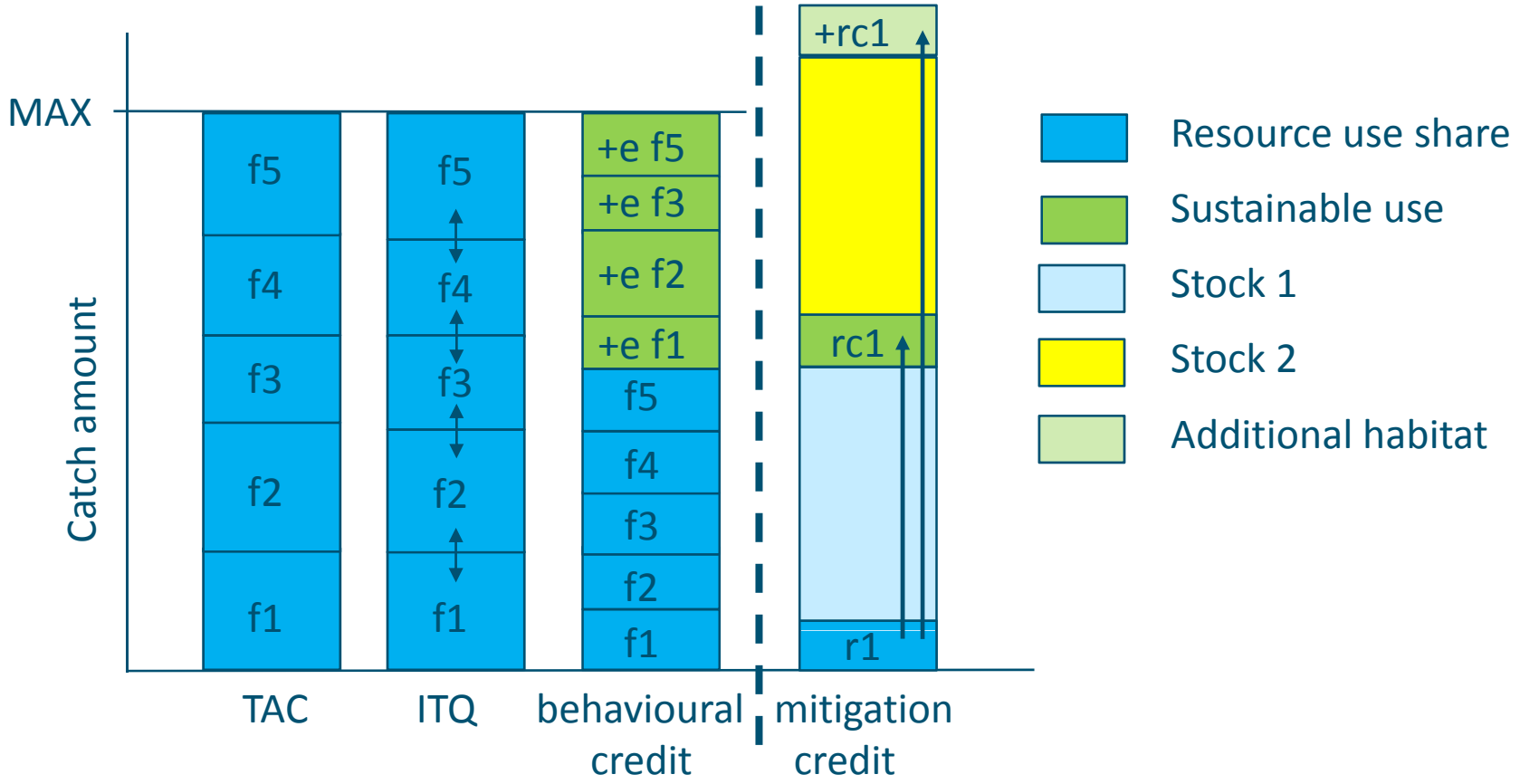
->Change fishing behaviour

- Turtle tax

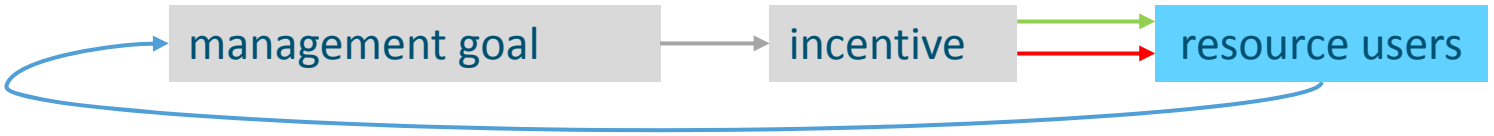
Damage to non-target species (turtle) is *mitigated* by raising conservation-credits through taxing target species (swordfish) catch, which finances *conservation* of the damaged species *elsewhere* (habitat, life-stage).

->Like for like approach, mitigation

# Credit system goal orientation



# Incentives




**Resource users**: incentives to participate and search for innovation

**NGOs**: Co-management, increased contact with other stakeholders, chances for negotiation, link multiparty goal to powerful incentive

**Private land owners**: of ecological valuable land: funding for maintenance, conservation and restoration

**Government**: efficient implementation, achieving management goal, compliance

# Credit system essentials

From analysing cases we identified credit system essentials:

- Incentives: How are stakeholders convinced to change behaviour?
- Mechanisms: How does a credit scheme work? How are incentives transferred?
- Elements: What is needed to make the mechanism operational?
- Measures: What needs to change to increase sustainability?

# credit system pros and cons: risks

Most of common risks seen in prevailing fisheries managements also apply to credit systems

**Behavioural credits**

- no possibilities for reward
- choosing easy over more necessary measures
- difficult to determine effects on stock
- inappropriate measures/incentives
- pressure on other species/areas
- direct communication required
- inequity

**Mitigation credits**

- payment for nothing
- buy off, no need to change
- loss of critical habitat/species
- creating mitigation sites for the sake of resource use
- evaluation difficulties
- inequity

# What can credit systems add?

*You can fish a certain quota provided that you also do a number of other things to improve your fishing methods towards more sustainable fishing as well.*

Assuming that the requirements for sound fisheries management are met, credit systems could..

- change *how* fish are being caught, > chances to sustain/rebuild stock
- direct to specific goals (by-catch, gears, fishing grounds, species, seasons) and adapt goals to real time situations
- incentivise industry for sustainable fishing, innovation (BCS), or conservation (MCS)
- BCS and MCS could be tailored into existing management and integrate to increase conservation and change behaviour

# Thank you for your attention

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# credit system pros and cons: Pros

| Behavioural credits | Mitigation credits |
|---|---|
| Positive incentive through rewarding change | Incentives resource users to pay for conservation, raises consciousness on ecological value and their harm to it |
| Something extra on top of flat base rate | Chance for industry to show stewardship |
| More access for sustainable compared to non-sustainable users | Redirecting users towards less valuable land through cost effectiveness |
| Ideally aiming at perpetual innovation of more sustainable fishing methods | Ideally aiming at perpetual conservation |
| Participants can choose which measures to comply to | Participants can choose their way of mitigation |
| At least part of the catch is caught in a more sustainable way, or not caught at all | At least part of vulnerable habitat and species are protected |
| Co-management, industry, government, and NGOs all have input | Possibility to conserve valuable habitat and species at privately owned land |
| Gradual adaptation towards more sustainable methods due to choice | Gradually increasing protection of important ecosystems |
| requires compliance to sustainability measures for (extra) access | Requires mitigation of the users' damage to the resource |
| Based on real time situation, generates large amount of real time data | |

# credit system pros and cons: risks

- High grading
- Misreporting
- Increase of fishing pressure on related stocks
- Fishers choosing preferred (e.g. easy to implement) over more difficult measures necessary for stock recovery
- Additional fishing pressure of non-participants
- New entrants
- Outcompeting the small
- Intensive monitoring required, evaluation difficulties
- Trade inequity, all credits in the hands of a few
- Inequity ability to invest in change or pay for mitigation
- In case of trading: Market determining management, market failures, ecological failures

# credit system pros and cons: risks

| Behavioural credits | Mitigation credits |
|---|---|
| Choosing inappropriate incentive (pressure >) | Payment for nothing |
| For depleted stock it might be too late to achieve rebuilding or conservation through rewarding credits (while still fishing) | Risk of losing habitat and species with specific value (irreplaceable, connectivity, population source, feeding or spawning places). Some harm cannot be compensated for |
| Focus on changing fishing method, but difficult to detect if this contributes to resource sustainability/stock rebuilding | Difficult to calculate like-for-like exactly, therefore difficult to detect if planned conservation makes up for the loss |
| Focus on 'how' (q) should translate into less fishing pressure and prevent damaging (not yet exploited) ecosystems. New methods should really be effective | Conserving another area cannot substitute the damaged ecosystem |
| Inappropriate measures/methods | Inadequate conservation measures/site selection |
| Credit unit should be scarce and distributable and not deplete the stock further to make it work. Rebuilding seriously degenerated stocks may require access limits that do not allow enough fishing effort to distribute | Only applicable as long as there exist enough mitigation sites. Risk of identifying sites for compensation because of market interest. |
| Inappropriate division of flat base rate shares (e.g. history, vessel size, heritage), incentive for change lost | Buy-off instead of environmental consciousness. You can do whatever where ever as long as you can pay |
| Requires high level of direct communication and traceability | |