The Impact of Pot Fishing on the Marine Environment

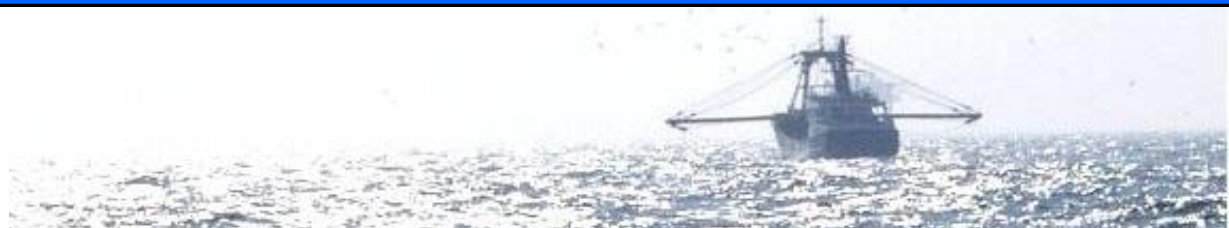
Hilmar Hinz, Natalie Hold and Jodie Haig

European Fisheries Fund project:

Sustainable use of fisheries resources in Welsh waters

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries



Welsh fisheries are mainly targeting shellfish with 90% of the fleet working in the inshore sector (up to 6 nautical miles)

Species	Fishery landings (£)	Fishery landings (t)	UK retail mkt (t)	Total fishermen in Wales (estimate)
Mussels	7,500,000	10,168	2,869	20
Scallops	3,462,905	1983.8	670	75
Whelks	2,536,863	4131.7	0	100
Lobster	1,482,797	149.1	195	500
Brown crab	341,779	316.9	668	500
Prawns	293,662	17.3	37,852	100
Spider crab	272,589	240.7	0	200
Sea bass	267,177	42.75	1,434	300

Other fish, ray, mackerel, gurnards, sprat etc.

PRIFYSGOL BANGOR UNIVERSITY

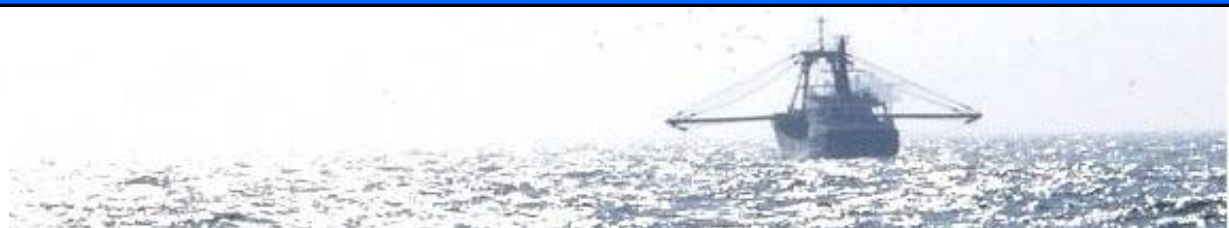
European Fisheries Fund
Investing in Sustainable Fisheries

Potential environmental concerns with respect to pot fishing

1. By-catch and Discards
2. Bait sourcing
3. Habitat impacts
4. Ghost fishing

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries



By-catch

Pots and traps, are highly selective for the species they target with low incidental catch.

Crab and lobster pot incidental catch is primarily composed of undersized target species & those that are soft or in poor condition.

These are generally returned to the sea alive i.e. thus no discards.

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries

Bait sourcing

Depending on which bait is used the pot fishing can be of environmental concern.

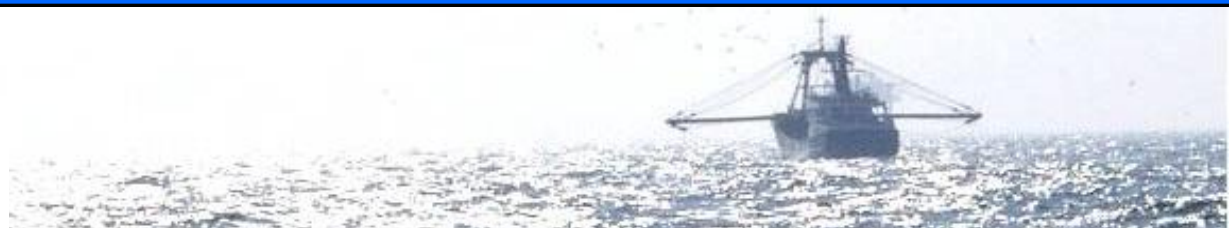
Negative example: Landing crab claws and the use of brown crab for bait in the whelk fishery.

Positive example: Use of fish carcases from fish farms or supermarkets.

For potting to be sustainable bait also need to be come from sustainable sources.

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries



Habitat impacts

The physical damage caused by pots to the seabed is insignificant compared to mobile fishing gears.

The contact area of individual pots with the seabed is very small (0.2-1m2).

Investigations of the environmental impacts of pots found few signs of damage to benthic habitats and species.

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries

Ghost fishing pots

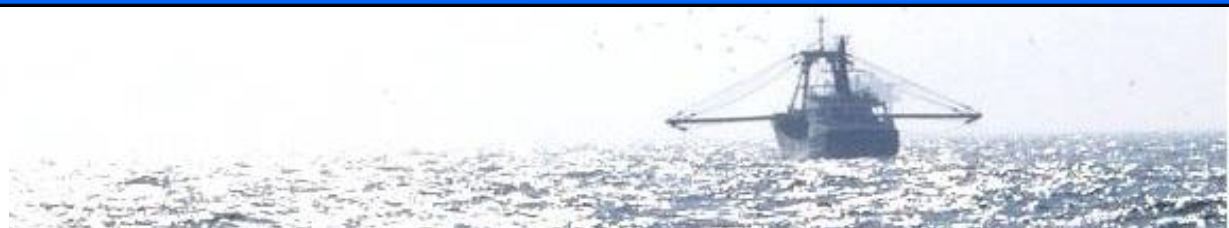
Lost or discarded pots can continue to fish outside human control, termed Ghost fishing

This can have a negative impact on species though loss rates are too low to warrant concern.

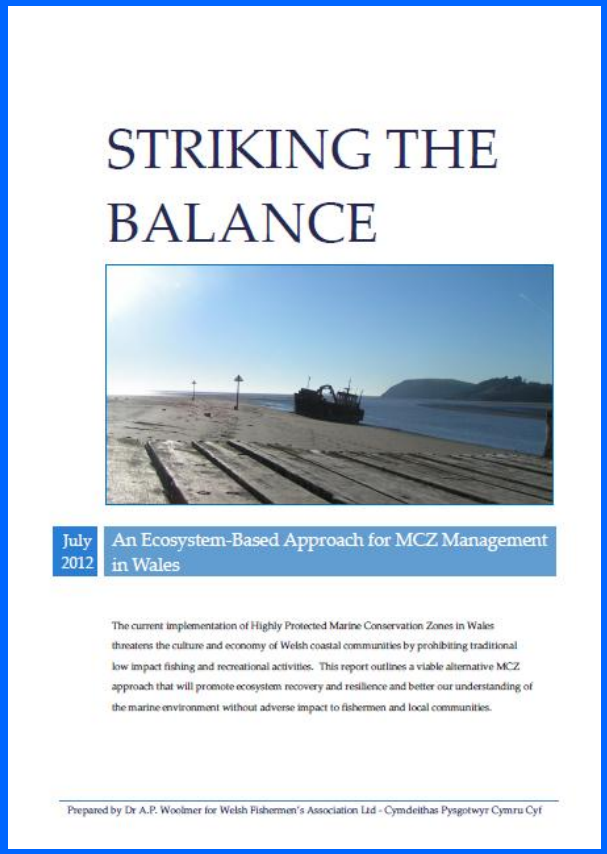
To mitigate effects modern pots use biodegradable materials that decay over time.

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries



Successful sustainable management approaches in fisheries have generally been stakeholder lead or had substantial stakeholder support.



STRIKING THE BALANCE

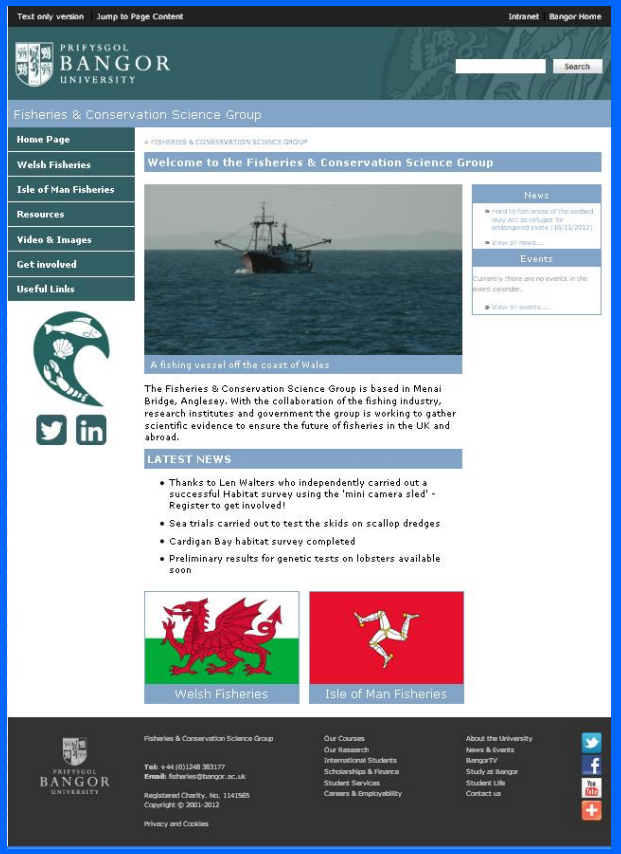
July 2012

An Ecosystem-Based Approach for MCZ Management in Wales

The current implementation of Highly Protected Marine Conservation Zones in Wales threatens the culture and economy of Welsh coastal communities by prohibiting traditional low impact fishing and recreational activities. This report outlines a viable alternative MCZ approach that will promote ecosystem recovery and resilience and better our understanding of the marine environment without adverse impact to fishermen and local communities.

Prepared by Dr A.P. Woolmer for Welsh Fishermen's Association Ltd - Cymdeithas Pysgotwyr Cymru Cyf

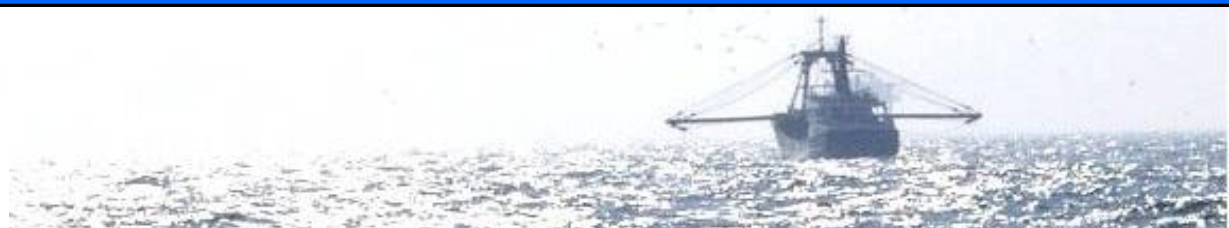
Welsh Fisherman's Association



http://fisheries-conservation.bangor.ac.uk

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries



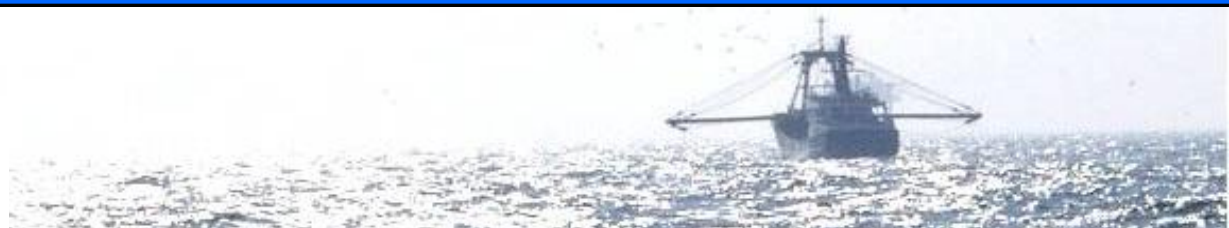
The Ecosystem based Approach for Welsh Fisheries

Delivering an ecosystem based approach for Welsh Waters will require sound scientific data:

- Documented knowledge about the spatial extend of the fisheries
- Documented knowledge about the fishing effort
- Documented knowledge about the state of habitats and target stocks

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries



Work-package 1— Fishers knowledge (questionnaire survey)

Work-package 2 — Habitat surveys

Work-package 3 — Stock status of target species

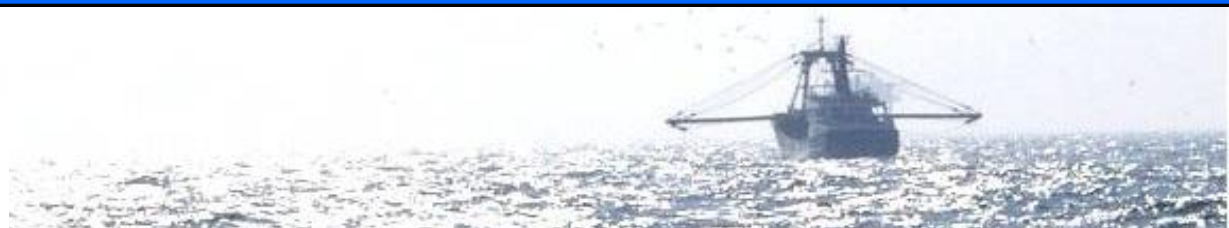
Work-package 4 — Connectivity of welsh stocks

Work-package 5 — Assessment and management advice

Additionally to these work packages the project is also able to response to specific burning issues to assist the fishing industry with the sustainable management of marine resources.

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries



Prawns & Whelks
Brown Crab & Lobster

Working with fishers across Wales to obtains samples and assist in field experiments

PRIFYSGOL BANGOR UNIVERSITY

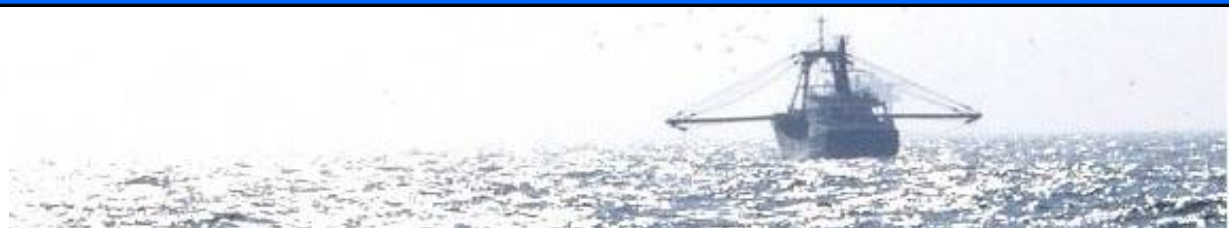
European Fisheries Fund
Investing in Sustainable Fisheries

Management goals for static gear fisheries

- Recruitment index
- Baseline population data for long term monitoring and stock assessments of all target species
- Place all target fisheries in a position to obtain MSC accreditation

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries



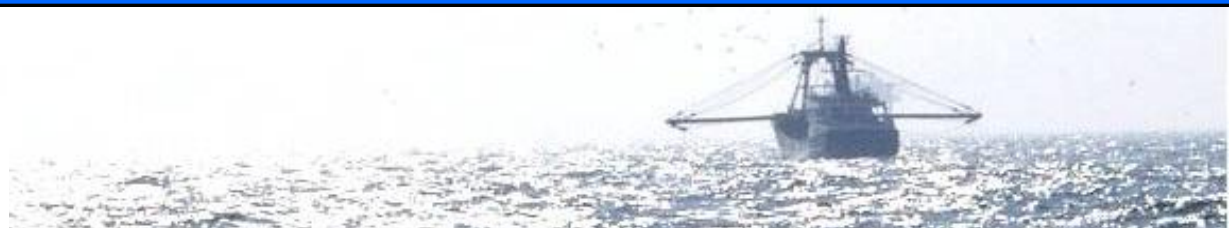
Adult population parameters

- Abundance
- Distribution
- Growth rate
- Population size and age structure
- Size at maturity
- Sex ratio

- Environmental factors
- Environmental impacts of potting
- Bycatch

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries



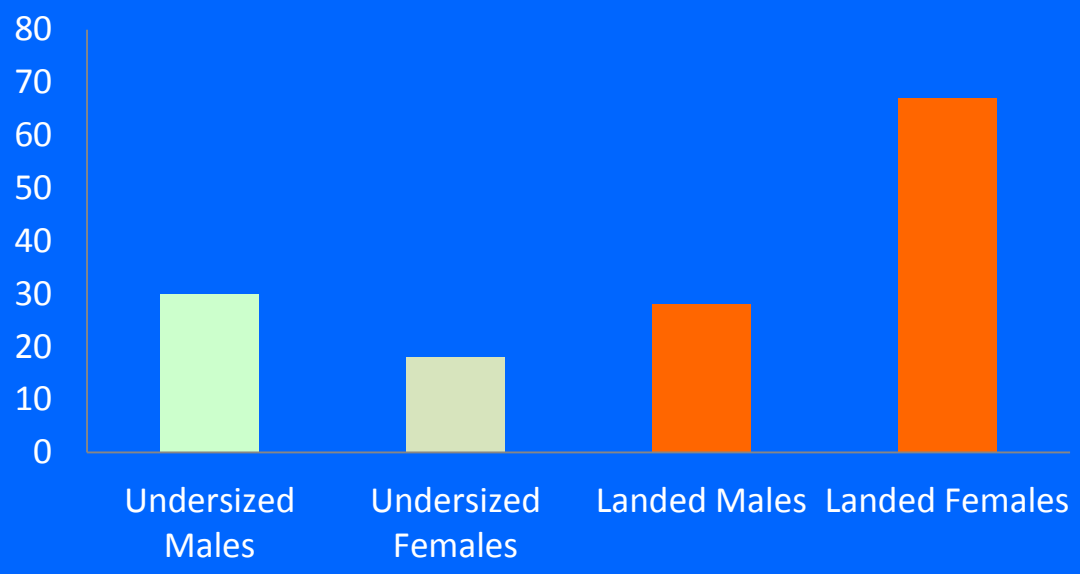
Environmental Parameters

- Temperature
- Salinity
- Depth
- Currents
- Proximity to coastal run off

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries

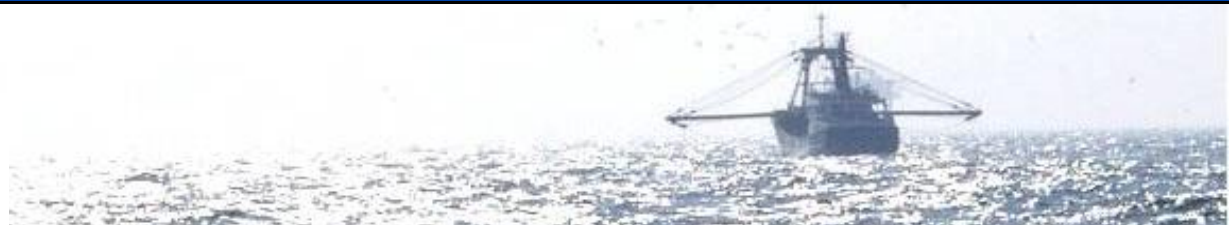
On Board Camera Trial



- Number of pots fished
- Landed and discarded
- Sex ratio
- Size

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries

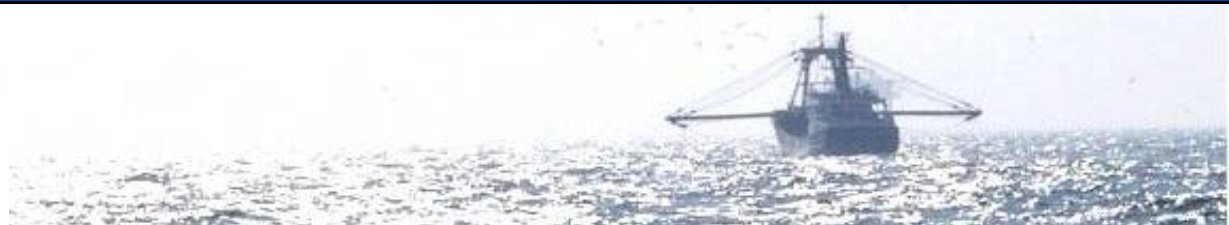


Nursery habitats

Identification of preferred habitat for juvenile crabs and lobsters;

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries



Lobster Paternity

- Multiple paternity increases genetics diversity
- Bias in the sex ratio may decrease genetic diversity

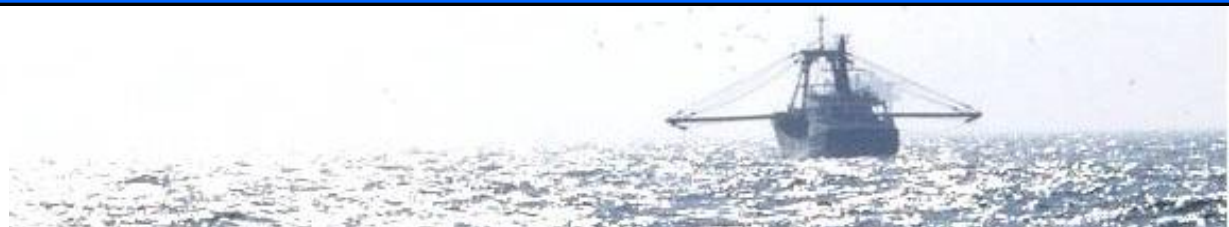
GENETIC DIVERSITY PROVIDES RESILIANCE TO CHANGE

Aims

- Does multiple paternity exist for this species?
- What is the sex ratio of reproductively successful individuals?
- Are larger males are more reproductively successful than smaller ones?
- Does population density affect the observed reproductive ratios?

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries



Natural Selection between different life stages

Natural selection due to changes in life stages can be identified with genetic techniques:

Can be a decrease in genetic diversity between one stage and another

Genetic structure identified between different life stages in markers associated with those adaptive traits e.g. salinity tolerance, competition for habitat.

PRIFYSGOL BANGOR UNIVERSITY

European Fisheries Fund
Investing in Sustainable Fisheries