WFA-CPC
Welsh Fisherman's Association
Cymdeithas Pysgotwyr Cymru

FISHERIES & CONSERVATION SCIENCE GROUP
GRŴP PYSGODFEYDD A GWYDDORAU CADWRAETH

Welsh Waters Scallop Strategy

28th May 2013

Summary of research

Introduction

This document describes the scallop research being conducted by Bangor University's Fisheries & Conservation Science Group over the next two years. This research aims to support the Welsh Waters Scallop Strategy group and wider scallop industry to achieve a well-managed, prosperous and sustainable scallop fishery in Wales.

The research outputs will inform sustainable exploitation by improving knowledge and understanding of scallop stocks in Welsh waters, the impact of dredging on the marine environment and the effects of gear modification mitigation measures. The close cooperation and involvement of the Welsh scallop industry has been of huge value to the research activities to date, and continued industry involvement will be essential for achieving research objectives.

Fishing intensity experiment

This experiment aims to determine what level of fishing intensity is sustainable for the Cardigan Bay SAC area, with regards to the stock and the wider ecosystem. The specific objectives are:

1. To assess the environmental impact of scallop dredging at different intensity levels in the SAC by monitoring the seabed communities before and after fishing.
2. To determine recovery rates within the SAC after different levels of fishing intensity by monitoring the seabed community at specific sites over a two year period. These sites will be closed to fishing during this two year period.

This work will inform the Welsh Waters Scallop Strategy group and wider scallop industry of the impact of scallop dredging on the seabed in the Cardigan Bay SAC. The information will help the WWSS group and Welsh Government decide on acceptable levels of fishing in the Cardigan Bay SAC based on direct environmental impact and resilience of the area. The recommended sustainable fishing levels are planned to be incorporated into a new permitting scheme for the fishery.

Industry involvement

Pre-experiment

In order to conduct the fishing intensity experiment in the Cardigan Bay SAC, an appropriate assessment has to be conducted to meet the requirements of European Marine Sites (EMS) under the Habitats Directive. The appropriate assessment will assess the likelihood of the intensity experiment damaging the SAC conservation feature, cobble reef. To allow this assessment to take

place, the seabed habitat within the area to be opened to fishing needs to be sufficiently mapped to determine whether or not cobble reef is present. This will be achieved using various approaches, including seabed video survey, side scan survey and sediment sample collection across the area. Industry members have been actively involved in the seabed mapping work to inform the appropriate assessment, and have collected substantial amounts seabed video data using a mini drop-down sled.

During the experiment

The experiment will be conducted in collaboration with the Welsh scallop fleet, therefore close industry support and involvement is required. Many members of Industry have agreed to take part in the experiment and informal agreements have already been made with regards to the conditions of the experiment. A more formal agreement between Industry and Bangor University regarding the experimental design and conditions of the experiment will be made this summer. The conditions of the experiment will form the basis of an experimental permit being developed by Welsh Government. These experimental permits will act as a scientific dispensation, and intend to allow participating Industry members to prosecute the scallop fishery under restricted conditions in the proposed experimental area from the 1st October 2013.

So far, Industry has agreed to the following conditions:

- To install Succorfish Gear in, Gear out technology and temperature loggers on to participating vessels (this will be fully funded).
- To keep rigorous records of catches and by-catches during the experiment.
- To have onboard observers where required.
- To land all catches at one defined port using blue bags provided by Bangor University.
- To share all catches between all participating vessels based on specific criteria (criteria to be defined with industry in June/July).
- For part of the shared catch to be allocated to Len Walters in order to cover costs for the seabed video survey work he has completed on behalf of the WWSS.

More specific details of the design specification and conditions of the experiment, such as distribution of fishing effort across the area, will be discussed between Bangor University and Industry in June/July. The specification and conditions will be finalised, formally agreed and incorporated into the experimental permit following the outcomes of the appropriate assessment in September.

Post-experiment

Once the target levels of fishing intensity in the experimental area are reached, certain areas will be closed to fishing for a two year period, in order for Bangor University to monitor the recovery of the seabed communities. The recovery rates identifying though this work are important for determining

sustainable levels of fishing. The areas to be closed for monitoring recovery will be defined based on the spatial distribution of fishing intensity during the experiment and habitat type, in order to monitor and compare similar habitats impacted by a range of fishing intensities.

This work will require close engagement and cooperation with Industry and Welsh Government, to ensure that the closed areas are not accidentally fished. Accidental fishing will interfere with the outcomes of the experiment, and will negatively impact recovery rates and therefore estimates of sustainable levels of fishing. It is expected that the areas chosen for monitoring recovery will be 'geo-fenced' on the Succorfish iVMS system, so that all Industry members are aware of their location.

Progress to date

Video surveys and a side scan survey of the area to be opened to fishing have been completed and the data is being prepared for the appropriate assessment. As outlined above, Bangor University are currently developing the design specification and conditions of the experiment in collaboration with the Welsh scallop industry, and several conditions have already been agreed. The final experiment specification and conditions will be agreed and incorporated in an experimental permit by September, and the experimental fishery will be opened on the 1st October depending on the outcomes of the appropriate assessment.

Scallop stock assessment

The status of scallop stocks in Welsh Waters has not been quantified, therefore introducing management measures to ensure long-term sustainability is difficult. The aim of the scallop stock assessment work is to assess the status of the scallop stock and start a time series of indices which will allow a full stock assessment to be developed. This will include the calculation of Maximum Sustainable Yield (MSY), which is a proposed management target for fisheries under Common Fisheries Policy reform. This will be achieved by:

1. Industry interviews to identify past and present scallop distribution to inform scientific survey design.
2. Annual scientific surveys to develop an unbiased index of abundance (i.e. independent of landings data).
3. Red Bag Scheme to develop an age-length key of catches and measure growth rates. An age-length key is a table which shows the length and age of all the scallops caught. Age length keys and growth rates are widely used in stock assessments because age/length and growth relate directly to maturity and reproductive output. If the number of reproductive individuals can be quantified, future recruitment to the fishery can be predicted. Age-length keys are also useful because they give an indication of the general health of the stock, in

terms of the number of mature individuals that contribute to current recruitment, and the number of smaller scallops that may contribute to recruitment in the future.

4. Develop a stock assessment protocol that determines stock status, using the data collected by the above activities.

This work will ensure the development of an accurate stock assessment for scallops in Welsh Waters, which is necessary to inform sustainable stock management into the future.

Industry involvement

Whilst Bangor University are responsible for the annual scientific surveys and development of a robust stock assessment protocol, strong collaboration with Industry is required for the scientific survey design and the Red Bag Scheme to be effective.

Scientific stock assessment survey

The scientific survey design will be informed by information made available by industry about the location of scallop grounds in Wales, both inside and outside protected areas. This will be one of the objectives of the interviews that will be held shortly with the industry members.

Red Bag scheme

The Red Bag Scheme requires industry members to land part of their catch (from one or two dredges) in a red bag provided to them by Bangor University. In the bag there is an information sheet on which industry members are asked to record the number of undersize scallops caught in those dredges during a single tow, the position of that tow, the date, specifications about the gear, and the fishing speed. The scheme has been design by Cefas scientists to ensure that it does not impede too much on fishing time (10 minutes at the most), so that it does not incur a cost to industry. The scallops in the red bag (all over MLS) are bought by the processors with the rest of the catch as normal. The processor then returns the completed information sheet and empty scallop shells to Bangor University to be aged and measured to build the age-length key.

Progress to date

Scientific stock assessment survey

Bangor University has already run a preliminary scallop stock assessment survey in June 2012 and has published a report, which is available online (Report 18 on the fisheries-conservation.bangor.ac.uk website). Industry interviews to gather information about scallop grounds will be held shortly (June to August 2013) and will be used to inform the second stock assessment survey planned for July 2013.

Red Bag scheme

Bangor University has received 3 bags from scallop processors so far, one from the Cardigan Bay area and two from the Llyn Peninsula, and these have been analysed in the lab. It has been suggested that more than 3 red bags have been filled by different fishermen but unfortunately they have not all been returned by the processors. The pilot was therefore only partly successful. The operation of Red Bag Scheme will be changed slightly for the next season, in order to improve the scheme and achieve consistent sampling between November and May. For example, a different colour bag might be used so that processors do not get confused between the Cefas Red Bag scheme and the Bangor Red Bag scheme, and fishermen may be asked to let Bangor University know when a bag has been filled, so that the University can phone the processor directly and organise collection of the bag after processing. Fishermen participating in the up-coming industry interviews will be asked whether they want to participate in the Red Bag Scheme.

Understanding scallop spawning dynamics

The aim of this work is to acquire necessary data on the scallop spawning stock in order to better inform the sustainable management of the fishery. The specific objectives of the work are:

1. To identify the key areas in Welsh waters where scallops spawn.
2. To determine the timing of scallop spawning in Welsh waters.
3. To determine which size scallops are most fertile in terms of egg numbers and egg quality.

The outputs of this work will increase the understanding of when and where scallops spawn, and which size scallops are most valuable for increasing recruitment to the fishery. This information is essential for management measures such as; i) recommending the protection of priority spawning areas that contribute significantly to recruitment, ii) recommending minimum/maximum landing sizes, and iii) suggesting appropriate fishing and closed seasons to maximise yield. Knowing when and where scallops spawn will also increase understanding of the connectivity of scallop stocks in Welsh Waters, and will further help inform management decisions. For example, investigating connectivity will help identify whether or not areas are self-recruiting, and will help determine whether or not the stock should be managed as a whole or as separate entities.

Industry involvement

Industry members have already agreed to take part in the sampling of scallop spawning stocks. Potential sampling areas have been defined based on scallop stock distribution and the summer fishing grounds of those industry members that have volunteered to take part.

Sampling will be conducted in 3 different ways: i) diver surveys (1 nautical mile of the shore), ii) single dredge tows by pot fishermen who are able to tow a single dredge from their potting vessel

(1 -12 nautical miles), and iii) king scallop by-catch from queenie trawlers/dredgers (1 – 12 nautical miles). Industry has agreed to provide samples approximately 1 – 4 times a month to Bangor University for analysis.

Progress to date

A request for a scientific dispensation to allow Industry to conduct the sampling work has been submitted to Welsh Government. A response is expected by early June, and sampling is planned to start Mid-June.

Gear improvement (Skid) trials

The aim of the gear improvement trials is to test different configurations of scallop dredge gear, and assess their impact on the sustainability of the fishery, both in term of stock sustainability and the sustainability of the wider ecosystem. The work will test different gear configurations that have the potential to reduce by-catch, increase selectivity and mitigate negative impacts on seabed communities. The specific objectives are:

1. To determine the effect of skid attachment on catch composition, by-catch, debris and fuel consumption.
2. To determine the effect of skidded dredges on seabed communities.
3. To determine the effect of different tooth lengths on catch composition, by-catch, debris and fuel consumption.
4. Determine the effect of different belly ring sizes on catch composition, by-catch, debris and fuel consumption.

The outcomes of the proposed work will provide the Welsh Water Scallop Strategy group and wider scallop industry with options for improving the sustainability through gear modification.

Industry involvement and Progress to date

Industry has already been involved in a number of successful trials of skid attachments. However, tow numbers are insufficient to yield conclusive results regarding the effects. A more cost-effective sampling design for assessing the impact of skids is currently in development. This will be tested during the scallop stock assessment survey in July 2013, and further involvement of industry will be required in the future to help gather further evidence on the value of using skidded dredges.