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The Icelandic lumpsucker fishery as a Responsive Fisheries Management System

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The lumpsucker (*Cyclopterus lumpus*) is a species of the genus *Cyclopterus*

Map of distribution in North-Atlantic

The female is larger than the male
- Female primarily sought after for her roes
- Annual production in barrels
- Iceland and Greenland main producers

![Graph showing production in barrels from 2004 to 2013 for Greenland, Danmark, Norway, Newfound land, and Iceland.]
Icelandic lumpsucker fishery

- Fisheries in Iceland generally managed by an ITQ system, but not the lumpsucker fishery
- Licensure; vessels that had the right to fish in the fishing season of 1997 and boats that have since entered the fleet replacing others
- Restrictions on number of fishing days and gear
- Seven regions around Iceland
- Each boat may only fish a predetermined number of continuous days per season – 32 in 2013 and 2014 – in one of the areas during a specific time span, e.g. March 20th – June 2nd
- Gillnets only; minimum mesh size of 276 mm and there is a limit on the number of gillnets per vessel (300 nets per vessel until 2012, now 100 nets per each legally registered crew member)
Icelandic lumpsucker fishery

- Fishing zones off Iceland
Icelandic lumpsucker fishery

- The number of fishing days is set in consultation with fishermen
- Takes into consideration world market conditions, both expected catches of others and stocks of unsold roe
- The aim is to prevent Icelandic products from flooding the market, which could drive down world prices
- Too few fishing days; risk that bad weather and unfavourable conditions may prevent fishermen from fully utilising their fishing day allocation, thus reducing their income and making the fishery less profitable
- Difficult to get other nations to take part in this scheme
Icelandic lumpsucker fishery

- Participation depends to a certain degree on market prices;

**Number of permit holders in the Icelandic lumpsucker fishery 2007-2013 and the price of roe in international markets (€/kg.)**
Responsive Fisheries Management System (RFMS)

- Founded on results-based management (RBM) principles
- Three defining features
  - authorities define measurable objectives
  - resource users are made responsible for achieving these objectives
  - users provide documentation that allows the assessor to analyse the extent to which the objectives are met
Management plan for the lumpsucker fishery

• The MP is a formal arrangement between a management authority and operators that specifies the partners in the fishery and their respective roles, the agreed objectives for the fishery, the management rules and regulations that apply, and provides other relevant details about the fishery.
• The management plan should be seen as a contract between the authority and the operator/s.
• Two outcome targets

<table>
<thead>
<tr>
<th>Management goal</th>
<th>Management objective</th>
<th>Outcome target</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable ecosystem</td>
<td>Sustainable fishery</td>
<td>landings/biomass index = $F_{\text{proxy}} \leq 0.75$</td>
<td>Landings and biomass index</td>
</tr>
<tr>
<td>Socio-economic sustainability &amp; sustainable ecosystem</td>
<td>Fishing pressure distributed to correlate distribution of stock &amp; secure fair share for all operators in fishery.</td>
<td>See table</td>
<td>Landing data, VMS data, Number of issued licenses pr. area</td>
</tr>
</tbody>
</table>

See table
Responsive Fisheries Management System (RFMS)

- Fluctuations in the relative number of fishing licenses in each fishing area in recent years

<table>
<thead>
<tr>
<th>Fishing ground</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>11% - 25%</td>
</tr>
<tr>
<td>B</td>
<td>13% - 23%</td>
</tr>
<tr>
<td>C</td>
<td>3% - 7%</td>
</tr>
<tr>
<td>D</td>
<td>8% - 11%</td>
</tr>
<tr>
<td>E</td>
<td>20% - 40%</td>
</tr>
<tr>
<td>F</td>
<td>11% - 17%</td>
</tr>
<tr>
<td>G</td>
<td>3% - 9%</td>
</tr>
</tbody>
</table>

- No economic output target; largely self-regulatory fishery, many vessel owners do not take part them when conditions are not favourable i.e. stock size and market conditions
- No other socio-economic output targets; the distribution of fishing areas ensures that lumpfish is landed in the small harbours close to the fishing grounds. Maintaining unchanged fishing zones has favourable social side affects
- No need for recruitment plan (entry/exit) as licenses can be transferred
Responsive Fisheries Management System (RFMS)

- For stocks where commercial quotas are defined, bycatch is not allowed unless the vessels have a quota.
- The Management Plan shall contain measures to minimize bycatch of the following species:
  - Halibut (Hippoglossus hippoglossus)
  - Blue ling (Molvadypterygia)
  - All other species that are red-listed during the planning period
  - Vulnerable bycatch species shall not be utilized for commercial purposes
- A general discard ban is valid for the fishery. All live exemplars of species defined as vulnerable shall be released immediately.
- Planning period 2014-2024 - results simulated
The lumpsucker management measures:

- Fishing for lumpfish in Icelandic waters is only allowed if the vessel has a special permit issued by the National Associate of Small Boat Owners (NASBO).
- The fishery is divided into 7 areas (A-G) where fishing is allowed during a certain time-frame.
- Vessels over 15 GT are not eligible for lumpfish licenses.
- Lumpfish licenses can be bought and sold, given that the seller and buyer meet all legal requirements.
- Vessels that are fishing for lumpfish are not allowed to have other fishing gear on-board.
- All fishing gear must be properly labelled before going out at sea.
The lumpsucker management measures:

- Each vessel has a permit to have a specific number of nets in the sea for a predetermined number of days per season, counting from first day at sea in one of 7 areas.
- The NASBO lumpfish management council decides before issuing of licenses how many licenses are to be granted for each fishing area.
- Representative of NASBO is required to count the nets into the boat when it starts fishing and replacement of nets needs to be reported to the representative or NASBO.
- Mesh size of lumpfish nets must be between 10.5” (267 mm) and 11.5” (292 mm).
- Lumpfish vessels need to have quotas for their by-catch.
- Logbooks must be kept by all lumpfish vessel captains and each entry has to be sent to NASBOs representative within 24 hours of landing.
The lumpsucker management measures:

- Processors and auction markets that sell/buy fish from lumpfish vessels are required to send representative of NASBO information on volume and value of each species they sold/bought from lumpfish vessels. They are also required to enter number of lumpfish, total volume and proportion of roes.
- Each lumpfish vessel must be equipped with VMS (Vessel Monitoring System) that relays information on location to NASBOs representative every hour.
- Failing to apply to this regulation may result in fines or temporary suspension of licenses.
The lumpfish management measures:

**Documentation**
- Processors and auction markets that sell/buy fish from lumpfish vessels are required to send representative of NASBO information on volume and value of each species they sold/bought from lumpfish vessels, as well as the number of lumpfish, total volume and proportion of roes.
- Each lumpfish vessel must be equipped with VMS (Vessel Monitoring System) that relays information on location to NASBOs representative every hour.
- Failing to apply to this regulation may result in fines or temporary suspension of licenses.
The lumpsucker management measures:

Documentation
- Licences are issued by NASBO and will be available online
- Representatives of NASBO will make unscheduled visits on-board vessels
- NASBO will update daily on an open web-page how many days have been used by each vessel
- NASBO will update weekly on an open web-page data from logbooks
- NASBO will use data from processors to double check logbooks and to gather data that can possibly later provide information that can be used to assist in stock assessment
- NASBO will keep VMS data that includes a track of where nets were laid
- NASBO will hire the MRI to provide the current biomass index and recommend TAC
Difficulties encountered

- Will not eliminate swings in catches and prices
- RFMS means a lot of new work for the operators – can be cumbersome and time-consuming. Money and time.
- But operators can better data on the stock and fishing and have a bigger say on the utilisation of the resource
- Clear incentives for fishermen to keep a closer eye on how others behave. Fishermen have in the past often been caught operating with too many nets, discarding by-catch. Will this change when they start spying on one another?
- NASBO will become completely responsible for utilising the resource in a sustainable manner. Will the association be able to carry that burden and fulfil its duties?
- Based on simulations, that depend on assumptions. Results may differ in the real world
Thank you