



news



COUNCIL OUTCOME POSITIVE FOR PELAGICS BUT LESS SO FOR WHITEFISH

The December EU Fisheries Council yet again proved contentious with the outcome a mixture of success and disappointment. And yet again, we come away with some of next years' quotas undecided until into 2014 when negotiations between the EU and Norway are concluded. This type of uncertainty is very difficult to factor in for an industry which already has more than its fair share of unpredictable conditions.

Pelagic Quotas 2014

The pelagic quotas would have been a very good news story if it had not been for the still-unresolved dispute regarding the management and sharing of the Northeast Atlantic Mackerel. Mackerel is the dominant species at stake and the increased quota of 13 per cent would be very welcome were it not for the proposed unwarranted share of almost 12 per cent being offered by the Commission to both Iceland and the Faroe Islands despite both

countries' repeated and reckless over-fishing of this stock.

Northeast Atlantic Mackerel is now classified as data-limited; it is essential that the necessary scientific work is completed as soon as possible to rectify this situation and enable a positive outcome for the benchmarking of this species in February next. The Irish quota of 65,275 tonnes is provisional until further negotiations in January 2014 and hopefully will be increased at that point.

Blue Whiting is another important resource for the Irish industry and has been increased by 36 per cent. This very welcome increase is also a provisional allocation for 2014 and it is very important that we receive 100 per cent of this allocation at the start of the year as our fishery for this species is over a very limited time period of six weeks from the start of February to mid-March. The transfer of blue whiting to Norway, which happens every year, will be part of EU/Norway bi-lateral negotiations that

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PELAGIC STOCKS

SPECIES	ICES Area	Quota 2013 (t)	Quota 2014 (t)	Diff. %
Mackerel ¹	VI, VII	57,753	65,275	13%
H. Mackerel ²	Ila, IVa, VI, VIIa-c, VIIe-k, VIIIa,b,e	40,803	29,578	-28%
H. Mackerel	IVb, IVc, and VIId	1,029	832	-19%
Blue Whiting ³	I, II, III, IV, V, VI, VII, VIII a,b,d,e XII, XIV	13,718	18,639	36%
Herring ⁴	I, II	3,574	2,419	-32%
Herring ⁵	VIaN	4,151	4,240	2%
Herring	VIaS, VIIbc	1,364	3,342	145%
Herring	VIIa	1,300	1,367	5%
Herring	VII ghjk	14,864	19,324	30%
Tuna ⁶	north.atl	2,371	2,699	14%
Argentines	III, IV	7	7	0%
Argentines	V, VI, VII	305	305	0%
Boar Fish	VI, VII, VIII	56,666	88,115	55%
Total		197,905	236,142	Not Applicable

Footnotes for 2014 pelagic quotas

1. Provisional quota subject to negotiations in January 2014.
2. Provisional quota subject to negotiations in January 2014. 5 per cent of this quota fished in Areas II & IVa before June 30 may be attributed to IVb, IVc & VIId. Advance notification necessary. Up to 5 per cent by-catches of boarfish, haddock, whiting and mackerel counted against the horse mackerel quota.
3. Provisional quota subject to negotiations in January 2014.
4. Provisional quota subject to negotiations in January 2014.
5. Prohibited to fish or retain any herring in the part of the ICES zones subject to this TAC that lies between 56° N and 57° 30N outside six-miles limit.
6. Maximum 50 licences in Ireland.

AREA VI WHITEFISH STOCKS

SPECIES	ICES Area	Quota 2013(t)	Quota 2014 (t)	Diff. %
Cod ¹	VIa	0	0	0%
Cod	VIb	16	16	0%
Megrim	VI	439	528	20%
Monkfish	VI	492	443	-10%
Haddock ²	Vb VIa	690	653	-5%
Haddock	VIb XII XIV	78	95	22%
Whiting ³	VI	87	83	-5%
Plaice	VI	261	261	0%
Pollock	VI	56	56	0%
Saithe	VI	421	380	-10%
Sole	VI	46	46	0%
Nephrops	VI	226	207	-8%
Total		2,812	2,768	-2%

Footnotes for 2014 whitefish quotas

1. Zero TAC with maximum 1.5 per cent cod retained on board.
2. By-catch provision removed in technical measures regulation (EU 227 of 2013).
3. By-catch provision removed in technical measures regulation (EU 227 of 2013).



were deferred until January, and will as usual be a very contentious issue from an Irish perspective.

In 2013 North West Herring was dramatically cut as the Management Plan developed by the Irish fishing industry and supported by the PRAC had not been confirmed. This year the STECF has approved the Management Plan resulting in a substantially increased quota of 3,342 tonnes for 2014 in Areas VIa and VIIbc, albeit from a very low base. There is a new provision for VIa North herring for next year which prohibits fishing for herring between 560 and 570 30'. Boarfish is also good news with an extra 55 per cent on 2013 and proves the investment by industry in terms of scientific input has paid off. The increase resulted from an upgraded assessment to Category 1 status from ICES. This means it is no longer classified as "data poor".

The reduction of 28 per cent in the Horse Mackerel quota may seem disappointing but resulted from the assessment by ICES that the existing Management Plan for 2014 was not precautionary. The Pelagic RAC proposed the 28 per cent reduction as an interim measure on the understanding that the Management Plan would be reformed and re-evaluated as soon as possible.

The Northern Albacore Tuna quota has been increased by 14 per cent to just under 2,700 tonnes. This is a very welcome increase for a species that is fished to full capacity every year by Irish vessels.

Whitefish Quotas 2014

In the run-up to these negotiations the EU Commission flagged up some drastic cuts – 75 per cent in the haddock quota, 20 per cent in monkfish, 22 per cent in whiting, 20 per cent in sole, 20 per cent in megrim and, very worryingly, 24 per cent in the prawn fishery – which were severe in the extreme.

The 33 per cent reduction in the haddock quota in the Celtic Sea, while better than the proposed 75 per cent, is still inexplicable and a serious reflection on the inadequate management strategies which ignore evidence of abundant stock well above safe harvesting levels and will undoubtedly drive the discard problem rather than lessen it.

The justified increase of 49 per cent in the hake quota together with the 20 per cent increase in megrim in the North West and the welcome increase of 15 per cent in the monk quota for the South West coast will not compensate for the losses created by the decreases in Nephrops, haddock, cod and whiting. The downturn will not only affect fishermen but the wider industry depending on these fisheries and has been estimated at an economic loss of at least 8 per cent.

The Fisheries Council confirmed the freeze on effort (KiloWatt Days) would be maintained i.e. no change from 2013.

Deepwater Quotas 2014

Ireland does not have a direct interest in deepwater quotas but notes small increases in quotas in this area will have a positive impact on the "swapping" value regarding other species.

Finally, a word of thanks to Minister Coveney and his team, BIM, the Marine Institute and to all the officials for their efforts before and during the Council.

AREA VII WHITEFISH STOCKS

SPECIES	ICES Area	Quota 2013(t)	Quota 2014 (t)	Diff. %
Cod	VIIa	188	150	-20%
Cod	VII b-k	1,479	1,030	-30%
Megrim ⁴	VII	2,878	2,878	0%
Monkfish ⁵	VII	2,209	2,540	15%
Haddock ⁶	VII b-k	3,144	2,106	-33%
Haddock	VIIa	515	511	-1%
Whiting	VIIa	49	46	-6%
Whiting ⁷	VIIb-k	6,812	5,328	-22%
Plaice	VIIa	1,063	797	-25%
Plaice	VII bc	63	63	0%
Plaice	VII fg	197	202	3%
Plaice	VII hjk	61	59	-3%
Pollock	VII	1,030	1,030	0%
Saithe	VII	1,491	1,491	0%
Sole	VIIa	58	41	-29%
Sole	VII bc	36	36	0%
Sole	VII fg	34	29	-15%
Sole	VII hjk	181	171	-6%
Nephrops ⁸	VII	8,506	7,740	-9%
Total		29,994	26,248	-12%

AREA VI, VII AND OTHER WHITEFISH STOCKS

SPECIES	ICES Area	Quota 2013 (t)	Quota 2014 (t)	Diff. %
Cod ⁹	I,II	299	0	N/A
Hake ¹⁰	VI, VII	1,704	2,532	49%
Redfish	Int waters V, XII, XIV (Shallow)	0	0	0%
Redfish	International waters V, XII, XIV	1	1	0%
Ling ¹¹	VI, VII, VIII, IX, X, XII, XIV	591	591	0%
Blue Ling	II,IV international waters	4	4	0%
Blue Ling ¹²	Vb,VI,VII	7	6	-14%
Tusk	V, VI, VII	53	30	-43%
Greenland Halibut	Ila, IV, VI	13	11	-15%
Snow Crab	Greenland Waters	31	25	-19%
Porbeagle	I, II, III, IV, V, IV, IVV, VIII, IX, X, XII, XIV	0	0	0%
Skate & Rays ¹³	"VI, VIIa-c, & e-k	1,165	1,049	-10%
Spur Dogs	I, II, III, IV, V, IV, IVV, VIII, XII, XIV	0	0	0%
Basking Shark	EU Waters	0	0	0%
Total		3,868	4,249	Not Applicable

Footnotes for 2014 whitefish quotas

- 1 per cent additional quota to Member States participating in fully documented fisheries.
- 5 per cent monkfish in VII may be fished in Areas VIIa,b,d,e. 1 per cent additional quota to Member States participating in fully documented fisheries.
- 5 per cent additional quota to Member States participating in fully documented fisheries.
- Provisional quota subject to EU/Norway bi-lateral negotiations
- Only 671 tonnes of nephrops quota may be fished in Porcupine Functional Unit 16. Closure period of one month, May 1-31, 2014.

- No quota issued as it is dependant on EU/Norway bi-lateral agreement.
- No more than 273 tonnes of hake in VI & VII may be fished in ICES Area VIII a,b,d,e. 1 per cent additional quota to Member States participating in fully documented fisheries.
- Provisional quota subject to EU/Norway bi-lateral negotiations.
- Provisional quota subject to EU/Norway bi-lateral negotiations.
- Separate reporting of seven species of ray and prohibits catches of three species of skate and one species of ray. 5 per cent may be fished in waters VIId.

DEEPWATER STOCKS

SPECIES	ICES Area	Quota 2013 (t)	Quota 2014 (t) ²	% Diff
Black Scabbard	V, VI, VII, XII	87	113	30%
Roundnose Grenadier	Vb, VI, VII	279	279	0%
Roundnose Grenadier	VIII, IX, X, XII, XIV	5	4	-20%
Orange Roughy	VI	0	0	0%
Orange Roughy	VII	0	0	0%
Orange Roughy	I, II, III, IV, V, VIII, IX, X, XI, XII, XIV	0	0	0%
Red Seabream	VI, VII, VIII	6	5	-17%
Alfonsinos	I, II, III, IV, V, VI, VII, VIII, IX, X, XII, XIV	10	9	-10%
Forkbeards	V, VI, VII	260	260	0%
Deep Sea Sharks	V, VI, VII, IX	0	0	0%
Deep Sea Sharks	XII	0	0	0%
TOTALS		647	670	4%



Since 2002 the Marine Institute has been using underwater television surveys to assess *Nephrops* stocks. The *Nephrops* fishery is extremely valuable to Ireland with first sale values in excess of €45 million in 2012. *Nephrops* stocks are difficult to assess using traditional fisheries assessment approaches. They spend a large proportion of their time hidden in burrows making catch rates vary, depending on emergence. Age and growth rates are also not readily determined. The UWTV technique involves estimating burrow density over the known distribution of the stock and then calculating future catch advice based on a maximum sustainable yield harvest rates and recent data on mean sizes and numbers in the landings and discards.

In 2013 the *RV Celtic Voyager* spent 30 days surveying most of the important *Nephrops* stocks at 328 stations in VII. Marine Institute scientist also collaborated with scientists in Northern Ireland and England to carry out UWTV surveys in the western and eastern Irish Sea. The results of these surveys were presented to ICES in October and are available to view from the Marine Institute Open Access Repository at <http://oar.marine.ie/handle/10793/59/>. Based on the 2013 surveys the overall advice from ICES for TAC area VII represents an 8 per cent decline on that given for 2013. The largest reductions accrue from the western Irish Sea (FU15) and the Smalls (FU22). A small increase in catch is advised for the Porcupine Bank (FU16). Continued good sampling of landings and discards, together with UWTV surveys are essential if we are to ensure that these stocks are sustainably fished.

Brian Hogan of the Marine Survey Office has recently drawn attention to a number of international conventions that will shortly have a major impact on the fishing industry. The overall aim of these conventions is the improvement of safety and working conditions and while they have been adopted over quite a lengthy period it has proved very difficult to implement them until now. The conventions most likely to impact Irish fishing vessels are:

IMO Standards of Training, Certification and Watchkeeping on Fishing vessels-F, STCW-F Convention:

This Convention regulates the training and certification of crews on board fishing vessels and it entered into force internationally on September 29, 2012. This means that States which have ratified the convention may enforce the requirements on fishing vessels flying their flag and also on foreign flagged fishing vessels calling to ports in their states. The implications for Ireland are that Irish National Certificates of Competency may no longer be accepted by such States on board fishing vessels flying their flag. Additionally, Irish flagged fishing vessels may be subject to port state control in ports of states which have ratified the convention. The following states have ratified the convention: Canada, Denmark, Iceland, Kiribati, Latvia, Mauritania, Morocco, Namibia, Norway, Palau, Russian Federation, Sierra Leone, Spain, Syrian Arab Republic and Ukraine.

ILO Work in Fishing Convention No. 188:

This convention provides for acceptable living and working conditions on board fishing vessels. The convention applies to all fishers on all commercial fishing vessels, some of the requirements specifically apply to fishers on vessels over 24m. The main provisions of the convention deal with

minimum age, medical examination, manning requirements, hours of rest, crew list, work agreement, repatriation, recruitment and placement of fishers, payment of fishers, accommodation and food, medical care, occupational safety and health and accident prevention, social security, protection in case of work-related sickness, injury or death and compliance and enforcement.

This convention has important implications for the future of the fishing industry and it follows on from the ILO Maritime Labour Convention, ILO MLC, which contained similar provisions for the merchant fleet which was adopted in 2006 and which entered into force on the 20th of August 2013. It is likely that after the successful implementation of the ILO MLC 2006 that the ILO's attention will turn to the implementation of the Work in Fishing Convention. The recently updated MSO logbook for fishing vessels has included some of the requirements from the convention.

Cape Town Agreement:

This Agreement deals with the design, construction and equipment of fishing vessels over 24m. It was adopted in October 2012 and it is an agreement to implement the earlier Torremolinos Convention of 1977. The main implication will be that Irish Fishing vessels over 24m will be issued with international safety certificates under the Cape Town agreement, the survey cycle will be changed and it is anticipated that an international regime for port state control of fishing vessels may develop over time.

These international conventions herald a major change in the international regime for fishing vessels covering design, construction, equipment and operation. There are also other conventions dealing with environmental matters which will also impact on the fishing fleet.

Crustacean Sector Update

2013 was a reasonable year for the brown crab fisheries; prices remained stable throughout the year and demand was good despite poor economic conditions in all the major markets. The growth of brown crab exports, both live and processed, to Asia appears to have tipped the balance for the European markets and dampened the dangerous downward spiral of over-supply and falling prices.

The ACRUNET (Atlantic Crab Resource Users Network) has now reached the half-way mark; project partners at a recent meeting in Vigo, Spain, felt this was the right time to take stock of work achieved and tailor the remaining work to the issues highlighted so far. The main thrust of this meeting was the work of Activity 6 – the introduction of innovative technologies and practices. The presentations focused on transport options, packaging and targeted marketing, while the breakout sessions provided the feedback necessary to carry these actions forward with a view to finalisation in 2014.

Delegates also debated the issues surrounding management of brown crab fisheries in all partner jurisdictions and felt this topic warranted a specific industry/science meeting in early 2014. Also scheduled for the first quarter of 2014 are the vessel trials in France and UK for the proposed European Brown Crab Standard. Several Irish crab vessels are already accredited to the BIM Responsibly Sourced Seafood standard and they should meet this European Standard with very little difficulty. An important milestone for crustacean fisheries was the launch of the consultation

with stakeholders on management measures for lobster and shrimp by the Minister for Agriculture, Food and the Marine, Simon Coveney TD and the Marine Agencies & Programmes Division. The consultation process for these two vitally important species for the inshore sector took place over the summer/autumn months and, in the case of lobster, proposed options were to: (1) increase the Minimum Landing Size (MLS), or (2) introduce a new Maximum Landing Size, or (3) make no changes. Improved management of shrimp fisheries were proposed by way of increased closures but views and suggestions were invited on a range of measures such as grading, use of catch rate triggers to initiate closures, etc. While these consultations are very welcome and reinforce the role fishermen can play in managing their resources, they do not make sufficient allowance for the wide range of regional differences in both fisheries. The future for all Irish inshore crustacean species depends on implementation of regional management of these fisheries with entry and exit policies, harvest strategy rules and real, functional input from stakeholders. Within such a framework adjustments to measures such as MLS, pot limits, escape panels, a structured V-notching scheme and other effort restrictions may be applied in a focused fashion where they will address local problems as part of overall management. The Shellfish Management Framework developed by BIM in 2005 could be re-visited as a possible way forward for such measures.

ICES and STECF Issue Advice on Management and Rebuilding Plans

Blue whiting management plan

A special request to ICES was answered in October 2013. It reiterated that target F_s in the management plan, in the range, 0.22, 0.25, to 0.30 meet the ICES precautionary requirements. Respectively, these relate to TACs in 2014 of 1,140 m, 1,279 m and 1,502 m tonnes. Bear in mind that the current target F is 0.18 (948,950 t in 2014). The TAC for blue whiting for 2014 has not been set yet (see table and article page one).

The request also asked for advice in the plan proposed by the Pelagic RAC, where there were two optional values (trigger points) in the plan. ICES found that the plan was precautionary. The results of the evaluations showed that both gave similar performance stock size or fishing mortality over time. However, the increase in F at high biomass leads to greater catch variability and 4 per cent higher yields over the 40-year period simulated (particularly during periods of high recruitment).

Two extreme cases of banking (keeping quota until the next year) and borrowing (taking of next year's TAC this year) were evaluated (either continually banking or borrowing the full allowable amount). Both showed negligible differences in terms of F , SSB, or probability of $SSB < B_{lim}$.

NW Herring (Advice from STECF)

The NW herring advice for 2013 from ICES was that there should be no catches without a rebuilding plan. A rebuilding plan was drafted in 2012, and updated in 2013, by the Pelagic RAC. This plan was evaluated by STECF in November 2013. STECF considers that the plan can rebuild the stock to B_{pa} by 2020, only if trans-boundary catch with VIaN is eliminated. Trans-boundary catch is catch reported across the boundary between VIaN and VIaS. Reporting catches of herring from the VIaS/VIIbc stock against the VIaN quota would serve to increase the fishing mortality on the southern stock. The plan is projected to deliver yearly increases in stock size from its current level, below B_{lim} . STECF notes that following the proposed rebuilding plan implies catches of 3,676t in 2014 (see table page one). STECF notes that the exclusion zone in the proposed plan in 2014 is unlikely to eliminate trans-boundary catch and in these circumstances a lower TAC should be set.



Editorial

by Sean O'Donoghue

CHIEF EXECUTIVE, KFO



There is an element of déjà vu to December Fisheries Councils in recent years, and 2013 lived up to all our expectations! There was good news for those in the pelagic sector with quota increases in mackerel, boarfish, herring and blue whiting but with a decrease in Horse mackerel. Unfortunately the whitefish stocks did not fare quite as well and several species were severely cut, which will have serious consequences for fishermen and other sectors down the road.

The increase of 13 per cent for mackerel is very welcome but viewed against the background of the Commissions' handling of the Iceland and Faroes behaviour it is rather galling. ICES has stated that the mackerel stock is much higher than the assessment model has previously indicated and intends reviewing its own methods of assessment. ICES has a benchmark arranged for February 2014 which we hope will be in a position to address the assessment model issues and recognise the very large stock of mackerel. But, ICES has already gone so far as to say that the 2014 TAC should have the level of the recent total of all catches made by any party. However, rather than sharing the greater proportion of this available stock with those countries which have complied with management measures, the Commission proposes to offer 11.9 per cent to each of the countries which have blatantly overfished for the past two years.

The intransigent attitude of Iceland and the Faroe Islands in recent years has resulted in Coastal States meetings ending in stalemate and little normal work being achieved. It now seems to be the norm that many species are allocated provisional quotas at the December Council and industry must wait until well into the following year for final clarification on availability of resources. This is an intolerable burden for any commercial operation particularly given the additional uncertainties attached to fishing and ancillary activities.

I must take this opportunity to applaud Minister Simon Coveney TD on the stance he has taken in all this; he appears to be the only Fisheries Minister who has consistently pointed out the perils of caving in to the Icelandic and Faroese tactics. He may not have the political support of the other Member States but he most assuredly has the support of the fishing industries of Europe and Norway.

We were well aware in advance of the stance being taken by the Commission regarding many of the whitefish stocks. The cuts proposed in advance of the Council meeting were drastic and in many cases

incomprehensible. While the haddock was not quite as bad as earlier indications, a 33 per cent reduction is completely inappropriate and will have serious implications for efforts to reduce discards.

We welcome the appointment of Dr Noel Cawley to chair the Discards Implementation Board. He showed a remarkable grasp of the complexities of the fishing industry in his previous roles both in the production of the report "Steering a New Course for the Irish Seafood Industry" and co-ordinating Ireland's response to the consultation on reforming the CFP. This new task will test all his abilities as Ireland's fishermen, particularly in the whitefish sector, will be faced with enormous challenges to implement the discards ban and remain economically viable. The recent cuts in quotas will not help.

You are all aware of some very important issues in the original European Maritime and Fisheries Fund (EMFF) Proposal which caused concern to the Irish industry but, by and large, most have been addressed with the inclusion of some key amendments. Subsidies for fleet modernization, improvements and innovations for processing fishery products, preparation of production and marketing plans, storage aid and funding for Advisory Councils, data collection and improved scientific advice to name a few. The final negotiations are still to be completed but the European Parliament voted to accept these key elements on October 23 last. Ireland's Operational Programme is currently being prepared by the Fisheries section in the Department of Agriculture, Food and the Marine which will outline how the EMFF will be implemented in practice.

On a more serious note, KFO cannot condone the activities of fishing vessel operators who deliberately exceed their fishing quota. We would urge Minister Coveney and his Department to ensure the majority of compliant fishermen are not penalised by the actions of a few who have complete disregard for both the law and fair play.

Finally on behalf of all the KFO staff I would like to wish all our members a very happy Christmas and prosperous fishing in 2014. I look forward to continue to work with you to address both the many challenges and opportunities in order to achieve a sustainable and profitable Irish fishing industry.



Information and Work on Seals is Gathering Pace

In the autumn of 2010, a seminar and workshop was held at the Marine Institute to look at the many issues surrounding seal interactions with fishing. Fishermen were rightly concerned with what were seen as high levels of depredation by seals – seals taking fish out of nets, particularly set nets. More widely fishermen had concerns about competition with seals for commercial fish stocks, many of which were at a low level. There was also concern about the scale of seal by-catch in fishing operations, especially as seals are protected species. And there were regular reports of dead seals on beaches raising public concern.

The common factor in all of these issues was the lack of concrete information plus the various interested parties had no communication forum. To address the situation the Irish Seal Group was set up involving participants from the Federation of Irish Fishermen, The Seal Sanctuary, Inland Fisheries Ireland, University College Cork, Bord Iascaigh Mhara and the Marine Institute. The group set out to promote collaboration and research on all the areas mentioned above.

A study of seal by-catch and depredation in a small number of fisheries in the west and south of the country was set-up involving UCC, MI, BIM and FIF. The results of this study have recently been released and indicate substantial depredation in both hake and pollack fisheries estimated at an economic cost of €1.7m. The study also looked at factors affecting depredation and actions that can be taken to discourage seal depredation.

Other initiatives included the setting up of a database of seal strandings, in co-operation with the Seal Sanctuary, to quantify these events and possible causes. UCC and IFI are currently studying seals in relation to salmon cages and finally, MI and Queens University Belfast carried out a study of the potential competition between seals and the fisheries in the Celtic Sea, the results of which will also be published shortly. The report detailing the most recent seal count is expected to be released soon by the National Parks and Wildlife Service.

Discards Implementation Group Formed

Dr Noel Cawley, a well-known and highly respected figure on the Irish fishing scene, has been appointed by the Minister for Agriculture, Food and the Marine, Simon Coveney TD, to chair a national Discards Implementation Group. Eliminating the practice of discarding fish at sea is a key factor in the reformed CFP which was negotiated under the Irish EU Presidency earlier this year. The discards ban itself is a relatively blunt instrument and the Implementation Group is facing an onerous task to make this ban work effectively to reduce the wasteful discarding of fish while mitigating adverse economic effects as much as possible.