International Technical Workshop on Gadoid Capture by Pots (GACAPOT)

WELCOME!

Michael Pol
Massachusetts Division of Marine Fisheries (USA)

Pingguo He
University of New Hampshire (USA)

Paul Winger
Fisheries and Marine Institute (Canada)

Thinking Inside **and** Outside of the Box

• Fish pots, baited structures for capturing fish, are an alternative gear with ideal or near-ideal qualities, including low impact on habitat, narrow species selection and low capture and discard mortalities. Research on pots targeting Atlantic cod *Gadus morhua* has recently been conducted in Canada, Faeroe Islands, Norway, and the US.

•Research on pots targeting haddock *Melanogrammus aeglefinus* and saithe/pollock *Pollachius virens* has also been conducted in Norway and the US.

•ICES Study Group on the Development of Fish Pots for Commercial Fisheries and Survey Purposes [SGPOT] has been proposed.

•A commercial fishery for Pacific cod *Gadus macrocephalus* has been established. However, for other gadoids improved catch rates are needed to reach commercial viability.

Thinking Inside **and** Outside of the Box

• This workshop will focus on **determining basic principles for potting gadoid species by examining the current state of research on gadoid capture in pots and assessing the direction of future research for improving catch rates.**

•The morning session will consist of invited talks from speakers, focusing on their understanding of the principles of gadoid capture.

•The afternoon session will consist of a focused discussion for defining essential pot characteristics and directing future research.

•The workshop is primarily intended for researchers actively studying pot capture of gadoids, including technical staff and fishermen, and secondarily for those interested in pots in general.

Thinking Inside **and** Outside of the Box

- Name Tags and Contact Information
- Bathrooms and Kitchen
- No Smoking in the Building
- Remember to speak clearly
- Relax; be informal; participate
- Anything else, just ask.

Agenda

9:00 AM	Mike Pol	Welcome and introduction to the workshop, agenda, and logistics
9:10 AM	Pingguo He	Introduction to fish capture by pots
9:50 AM	Bjarti Thomsen	Pot research and pot fishery in Faeroe Islands and other European countries
10:10 AM	Svein Løkkeberg and Odd-Børre Humborstad	Pot research and pot fishery in Norway
10:30 AM	Break	
11:00 AM	Phil Walsh	Pot research in eastern Canada
11:20 AM	Craig Rose	Pot research and pot fishery in the American west coast
11:40 AM	Mike Pol	Pot research in the American east coast
12:00 AM	Ken La Valley	Haddock pot experiment in Gulf of Maine
12:15 AM	Takafumi Arimoto	Pot research in Asian countries
12:30 PM	Lunch (provided to all participants)	
1:00 PM	Paul Winger	Introduction to afternoon discussions
4:00 PM	Mike Pol	Summary and wrap up

Fishing with Baited Pots: An Introduction

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Fishing with Baited Pots

- Fish pot: definition and terms
- Factors affect pot fishing
- Some recent literature on pot research

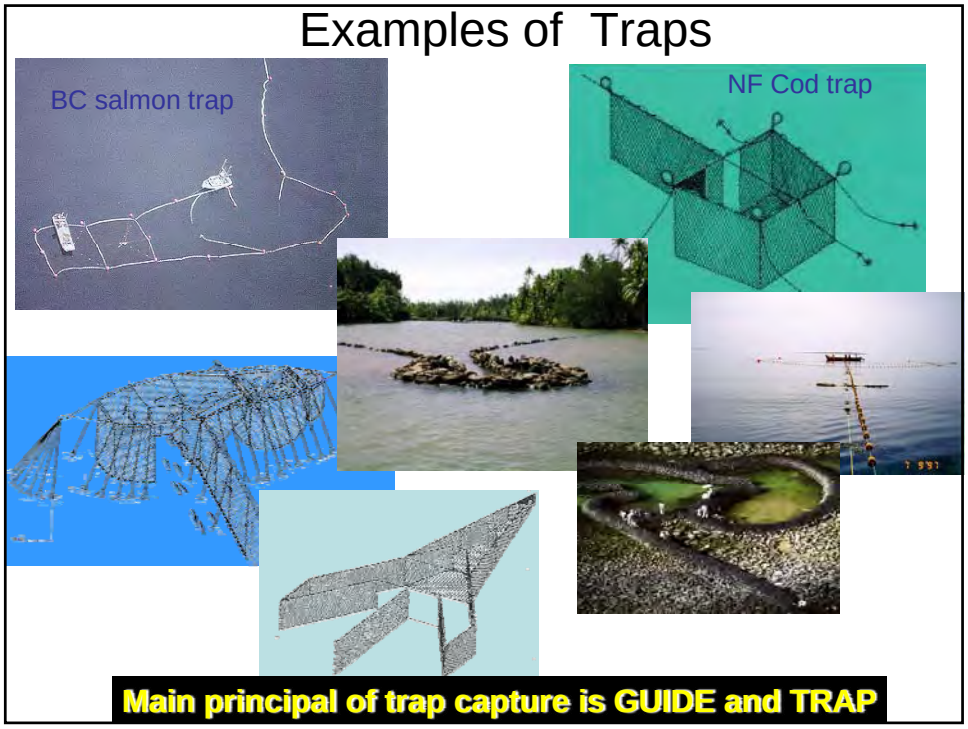
What is a Pot

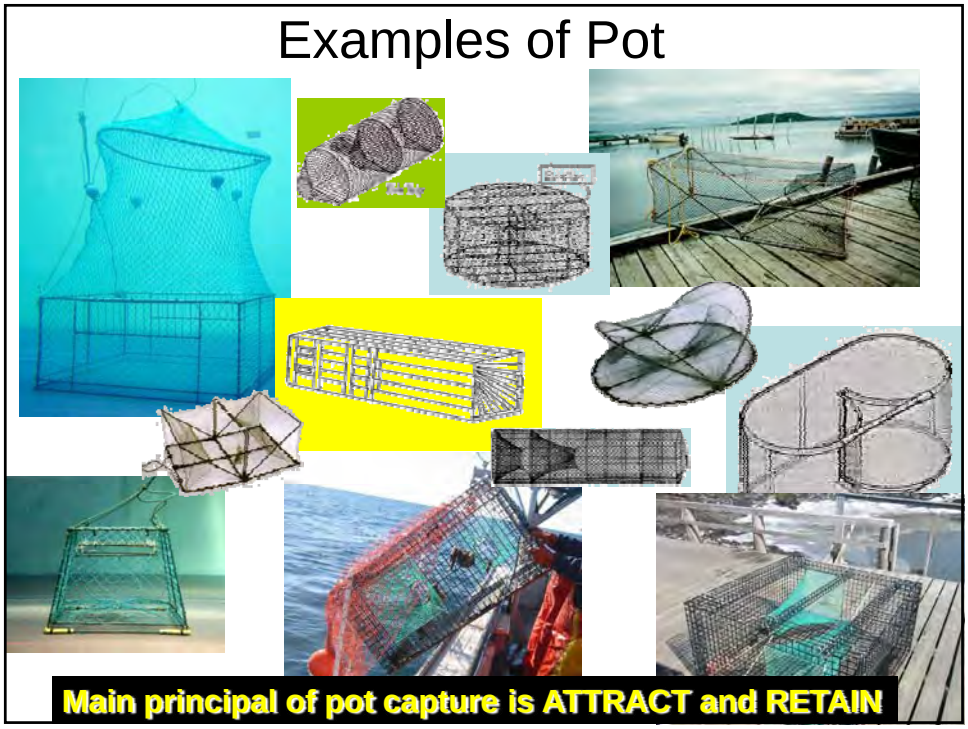
- Pot is a stationary gear
- Pot has a relatively small enclosure
- Pot is usually baited

Pot is a baited small enclosure with entrances which lead animals to get in and prevent them to get out

Pot vs. Trap

	Pot	Trap
• Size:	Small	Large
• Bait:	Used	Not used
• Leader	No	Yes
• Mobility	Can be moved	Stationary for a season
• Capture mechanism	Attract/retain	Guide/trap


Examples of Traps
BC salmon trap
NF Cod trap
Main principal of trap capture is GUIDE and TRAP


Examples of Pot
Main principal of pot capture is ATTRACT and RETAIN

International Standard Statistical Classification of Fishing Gear (ISSCFG)

GEAR CATEGORIES	STANDARD ISSCFG ABBREV.	CODE
SURROUNDING NETS		01.0.0
SEINE NETS		02.0.0
TRAWLS		03.0.0
DREDGES		04.0.0
LIFT NETS		05.0.0
FALLING GEAR		06.0.0
GILLNETS AND ENTANGLING NETS		07.0.0
TRAPS		**08.0.0**
Stationary uncovered pound nets	**FPN**	**08.1.0**
Pots	**FPO**	**08.2.0**
Fyke nets	**FYK**	**08.3.0**
Stow nets	**FSN**	**08.4.0**
Barriers, fences, weirs, etc.	**FWR**	**08.5.0**
Aerial traps	**FAR**	**08.6.0**
Traps (not specified)	**FIX**	**08.9.0**
HOOKS AND LINES		09.0.0
GRAPPLING AND WOUNDING		10.0.0
HARVESTING MACHINES		11.0.0
MISCELLANEOUS GEAR	MIS	20.0.0
RECREATIONAL GEAR	RG	25.0.0
GEAR NOT KNOWN	NK	99.0.0

Therefore, in strict sense and according to FAO, pot is a gear within the trap category.

Essentials for Fish Capture by Pots

Common to all Stationary Gears

- Fish is available
- Fish moves

For baited gear (pots and baited hooks)

- Fish feeds

Non-return devices

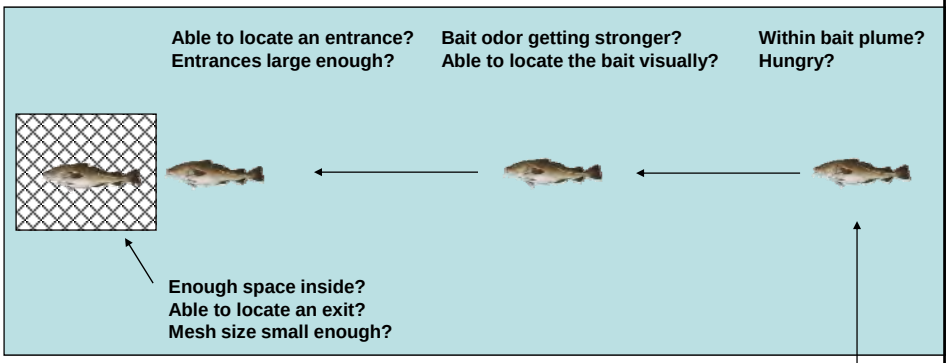
- Entrance large enough for entry but small enough to prevent escape

Pot Design and Fishing Operations?

Ed Wyman, Neptune Marine, Inc. Seattle:

- Large internal volume
- Multiple entrances
- Use bait bags
- Hull often
- Proper web netting to release undersize fish
- Use “triggers”

Fish Catch Process



How long the bait will last?
Soaking duration suitable?

As far as 800 m

(Kallyil et al. 2003)

Factors Affecting Pot Fishing

- Light level
- Temperature
- Presence of bait/prey species
- Scavengers and parasites

Effects of environmental variables on fish feeding ecology: implications for the performance of baited fishing gear and stock assessment

A. W. Stoner. J. Fish Bio. Volume 65 Page 1445 - December 2004.

Effects of environmental variables on fish feeding ecology: implications for the performance of baited fishing gear and stock assessment

- The effectiveness of baited fishing gear ultimately depends upon behaviour of the target species – activity rhythms, feeding motivation, and sensory and locomotory abilities.
- Environment related variation in feeding behaviour can act through four different mechanisms: metabolic processes, sensory limitations, social interactions and direct impacts.
- Water temperature, light level, current velocity and ambient prey density are likely to have largest effects on fish catchability, potentially affecting variation in CPUE by a factor of ten.
- Feeding behaviour is also density dependent, with both positive and negative effects.
- There is a critical need for greater understanding of how environmental variables affect feeding related performance of baited fishing gear.

Journal of Fish Biology (2003) 62, 1176–1193
doi:10.1046/j.1095-8649.2003.00117.x, available online at http://www.blackwell-synergy.com

Hunger and light level alter response to bait by Pacific halibut: laboratory analysis of detection, location and attack

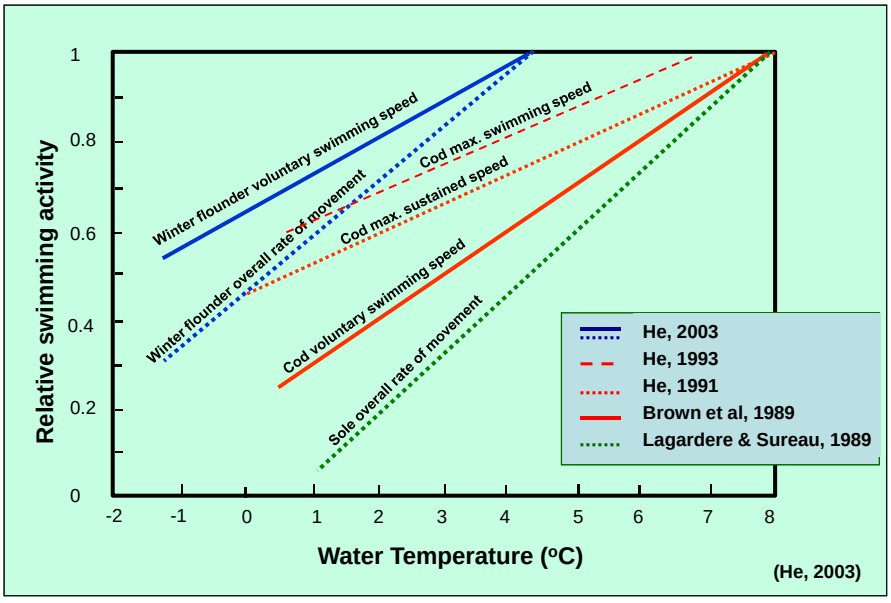
A. W. Stoner

Fisheries Behavioural Ecology Program, Alaska Fisheries Science Center, National Marine Fisheries Service, NOAA, 2030 S. Marine Science Dr., Newport, OR 97365, U.S.A.

(Received 4 November 2002, Accepted 9 April 2003)

Laboratory experiments with Pacific halibut *Hippoglossus stenolepis* revealed that hunger level had a significant effect on the first detection of bait, the number of baits located and attacked, the time required to locate and attack baits and handling times. In all cases, feeding motivation and efficiency increased with hunger. Light level influenced general locomotory activity and location and attacks on baits, but not detection or handling times. The effect of light was interactive with fish hunger level. Hungry fish could locate and consume baits in all light levels, ranging from daylight conditions to near darkness (10^{-8} quanta photons $m^{-2} s^{-1}$), but location, attack and handling times were all significantly elevated in low light conditions, and attack rates were significantly reduced. In the dark, only 50% of the baits were located and only 17% were attacked. Performance metrics were relatively similar among three higher light treatments (10^{-3}, 10^{-2} and 10^{-1} quanta photons $m^{-2} s^{-1}$) where bait location and attack were most efficient. Active space and effective area associated with baited fishing gear will vary because hunger and light levels affect variation in bait detection, locomotion and feeding behaviour. Consequently, fishing activity and stock assessments that depend upon bait may be compromised by spatial and temporal variation in prey abundance, time of day, season, depth and other environmental variables that influence feeding motivation and efficiency.

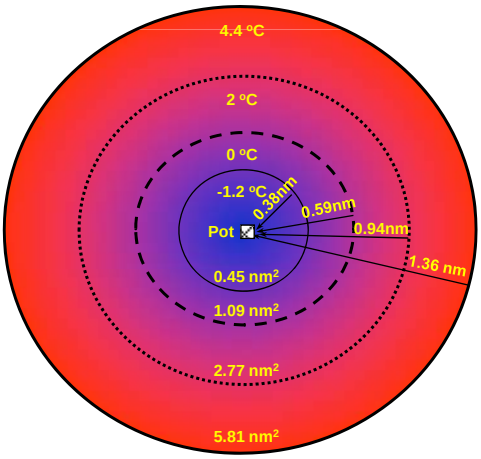
Swimming Activity Reductions at lower temperatures



(He, 2003)

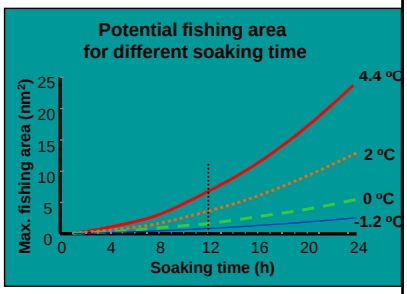
Swimming Speed, Fishing Area of a Baited Pot and Water Temperature

Potential fishing range **Soaking time: 12 h**



L=0.4 m

Winter flounder
Pleuronectes americanus



Searching, Attraction and Reaction

Rune Vabø, Geir Huse, Anders Fernö, Terje Jørgensen, Svein Løkkeborg and Georg Skaret. 2004. *ICES Journal of Marine Science, 61: 1224-1232.* Simulating search behavior of fish towards bait

Jawhar Kallayil et al. 2003. Fish Res. 61: 125-133. Baiting Gillnets-how is fish behavior affected?

[Cod responses to bait up to 800 m away]

Soaking Duration

- Measuring efficiency and predicting optimal set durations of pots for blue cod *Parapercis colias* . *Fish. Res. 67: 163-170*
  Russell G. Cole , Niki K. Alcock , Anna Tovey and Sean J. Handley
- Ed Wyman: "Alaska fishermen often haul 2-3 times a day"

Baited Pot Fishing Trials

Bjordal, A. & Furevik, D. 1988. ICES CM, 1988/B:33. Full scale fishing trials for tusk (Brosme Brosme) and cod (Gadus Morhua) with a collapsible fish trap.

Bjordal, A. & Furevik, D. M. 1993. Scot.Fish.Res.Trans., 108, 1-6. Sea traps.

Dag Furevik and Svein Løkkeborg. 1994. *Fish. Res. 19: 219-229.* Fishing trials in Norway for torsk (*Brosme brosme*) and cod (*Gadus morhua*) using baited commercial pots

Dag Furevik, et al. 2006. ICES Boston. Floating Cod Pot.

Mark R. Collins. 2003. Fish. Bill (US), 9: 325-332. A comparison of three fish trap designs

Studies on Pot Selectivity

- Gary R. Shepherd, Christopher W. Moore and Richard J. Seagraves. 2002. *Fish. Res. 54: 195-207.* The effect of escape vents on the capture of black sea bass, *Centropristis striata*, in fish traps.
- David Robichaud, Wayne Hunte and Hazel A. Oxenford. 1999. *Fish. Res. 39: 275-294.* Effects of increased mesh size on catch and fishing power of coral reef fish traps
- Bertrand Gobert. 1998. *Fish. Res. 38: 159-167.* Density-dependent size selectivity in Antillean fish traps
- Stephen J. Newman and David McB. Williams. 1995. *Fish. Res. 23: 237-253.* Mesh size selection and diel variability in catch of fish traps on the central Great Barrier Reef, Australia: a preliminary investigation.
- John Stewart and Douglas J. Ferrell. 2003. *Fish. Res. 59: 379-392.* Mesh selectivity in the New South Wales demersal trap fishery.

Conservation Issues

Ghostfishing and Mammal entanglement

Scarsbrook, J. R., McFarlane, G. A., & Shaw, W. (1988). Effectiveness of Experimental Escape Mechanicms in Sablefish Traps. North american Journal of Fisheries Management, 8, 158-161.

R. G. Cole, et al. 2003. *Fish. Res. 60: 381-392.* Selective capture of blue cod *Parapercis colias* by potting: behavioural observations and effects of capture method on peri-mortem fatigue

H. Al-Masroori, H. Al-Oufi, J.L. McIlwain and E. McLean. 2004. *Fish. Res. 69: 407-414 . C*atches of lost fish traps (ghost fishing) from fishing grounds near Muscat, Sultanate of Oman.

M. G. Pawson. 2003. Fish. Res. 64: 101-105. The catching capacity of lost static fishing gears: introduction

Use Baited Pot for Research

- Catching cod for experiment

  F. Nøstvik and T. Pedersen. 1999. Catching cod for tagging experiments • *Fish. Res. 42: 57-66*

- As a survey tool

  Harris, P. (1995). The role of trap cameras in catch per unit effort calculations for species of the South Atlantic Bight snapper-groupper complex. Fish. Res. 22: 1-9.

  Conners, M., Munro, P., and Neidetcher (2004)

  Pacific Cod Pot Studies 2003-2003. AFSC Processed Report 2004-4.

Methods to Study Baited Fish Pot

Underwater video camera
Sonar camera
Comparative fishing in the field
Laboratory studies

- Use of high-frequency imaging sonar to observe fish behavior near baited fishing gears. *Fisheries Research, Volume 76, Issue 2, November 2005, Pages 291-304*
  Craig S. Rose, Allan W. Stoner and Keith Matteson

- The role of trap cameras in catch per unit effort calculations for species of the South Atlantic Bight snapper-grouper complex *Fisheries Research, Volume 22, Issues 1-2, February 1995, Pages 1-9*
  Patrick J. Harris

Reviews on Baited Pots

- Dag Furevik (1994):Behavior of fish in relation to pots. Ferno & Olse (eds): Marine Fish Behavior in Capture and Abundance Estimation
- Ed Wyman (1995): Selective groundfish pots offer solutions to bycatch problems. “Solving Bycatch: Considerations for Today and Tomorrow”

Bugging Your Mind …

Keep these in mind when you interact with the following presentations and afternoon discussions:

- Fishing season and how it relates to feeding and spawning conditions
- Availability or lack of prey species
- Type of bait, how bait is presented, bait bags
- Pot size and entrance/non-return devices
- Balancing entry and exit

Thank you

Some Fish Pot Experiments in Newfoundland and in Gulf of Maine

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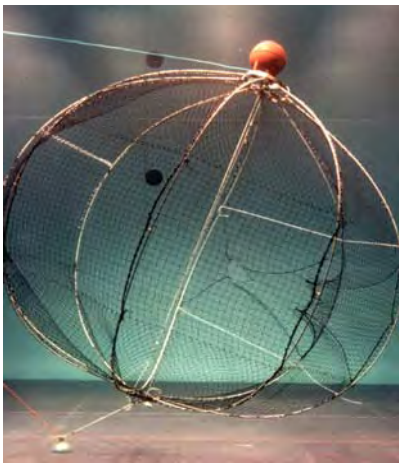
Early Newfoundland Experiments

Flounder Pot

Early Newfoundland Experiments

Spherical Cod Pot

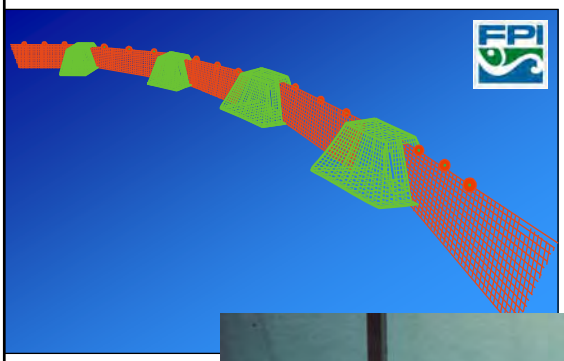


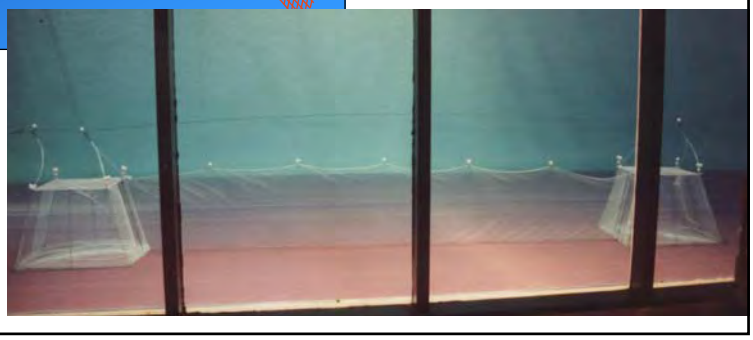
(Z. Kwidzinski, MUN)

Early Newfoundland Experiments

Cod Pot

Trapot – A Hybrid of Trap and Pot





Trapot – A Hybrid of Trap and Pot

Gulf of Maine Cod Pot Experiment

With roof

Without roof

Gulf of Maine Cod Pot Experiment

Thank you

Pot research and pot fishery in the Faroe Islands and other European countries

Bjarti Thomsen
Research Manager - Fisheries Technology
Faroese Fisheries Laboratory

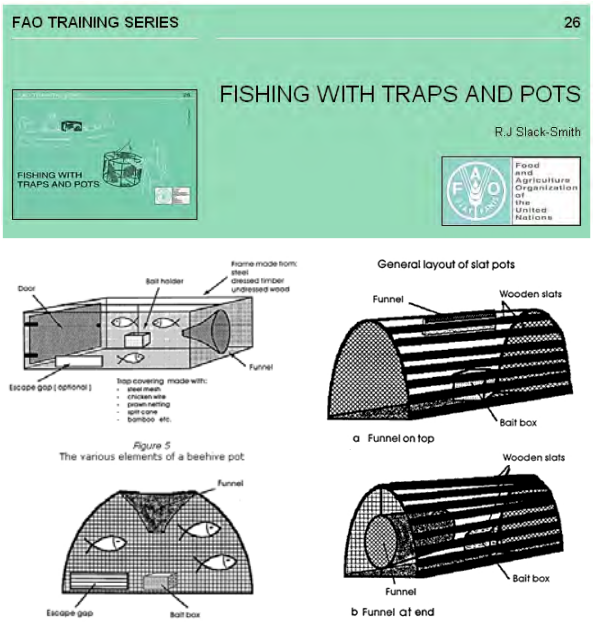
GACAPOT, Gloucester 4. Nov. 2006

Fiskirannsóknarstovan Faroese Fisheries Laboratory

Introduction
Potting in Europe
Faroese experiments (video)
Future work

FAO 2001

People in different parts of the world are not always referring to exactly the same things when they use the words "trap" and "pot". In general, traps are large structures fixed to the shore. Pots are smaller, movable traps, enclosed baskets or boxes that are set from a boat or by hand.



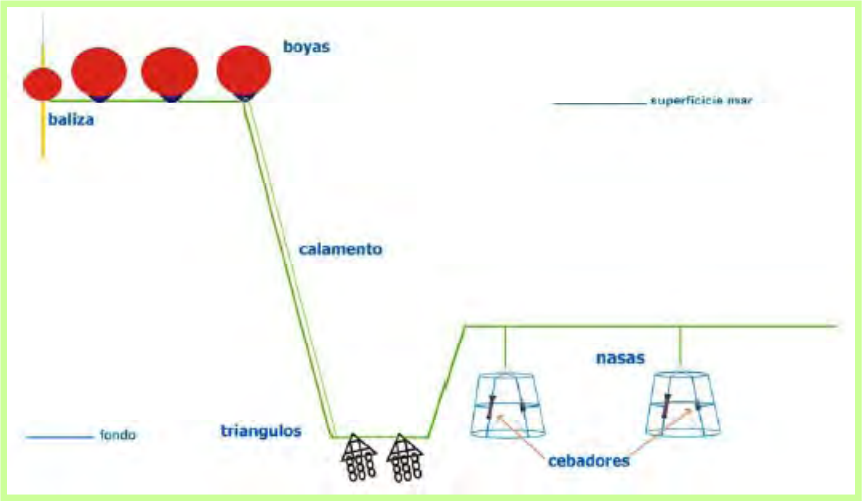
Literature on fish pots is not overwhelming

Collected old and new refs in pdf files

Efficiency of pots:
1.5% on Gadoids (Valdemarsen et al., 1977)
2 % on Puffer fish (Hirayama et al., 1999)
<1% on Sablefish (Rose et al., 2005)

Potting in Europe

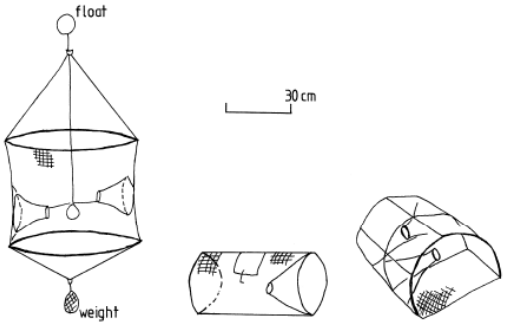
Spain

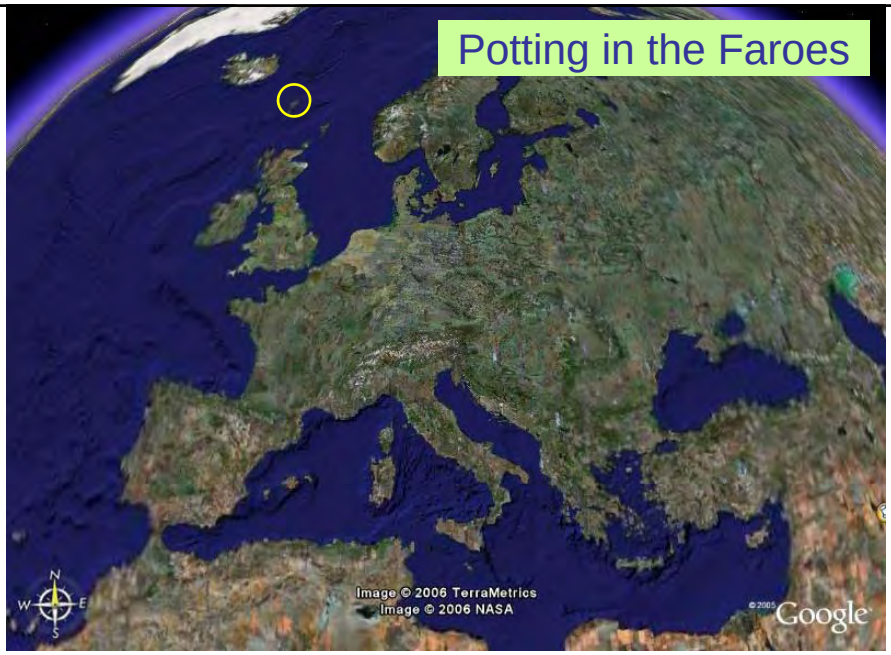


Potting in Europe

Turkey

Evaluation of the relative catching power of pots for north European wrasse
By J. W. Treasurer, J. Appl. Ichthyol., 1999





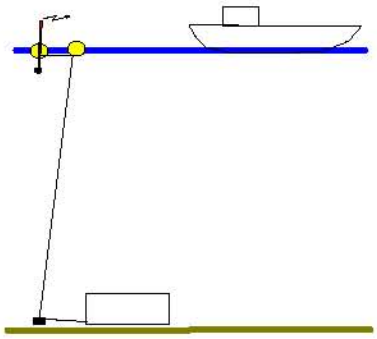
Fish pot experiments in the Faroe Islands

to develop a commercial pot for traditional species

- Long lasting bait
- Alternative stimulation
- Pot design (shape, size, entrance etc.)

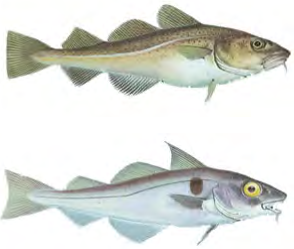
Examples of video recordings

Equipment

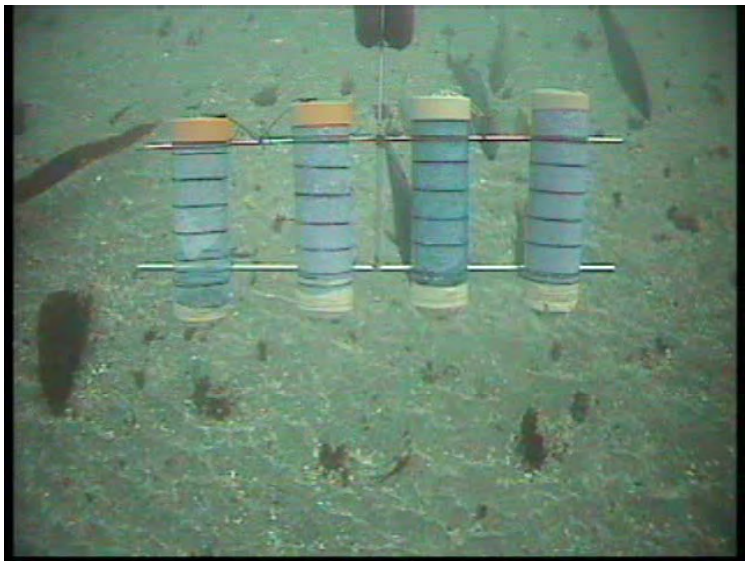


Equipment

Depths: 20-50 m

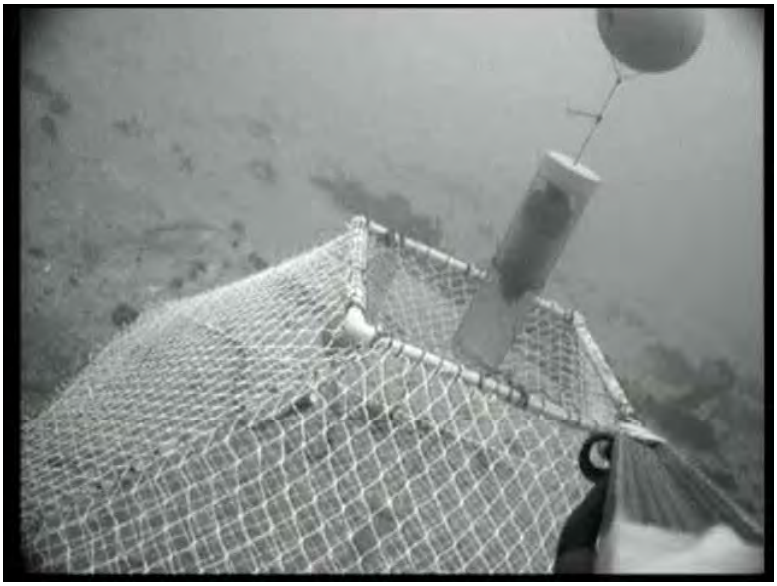


Long lasting bait



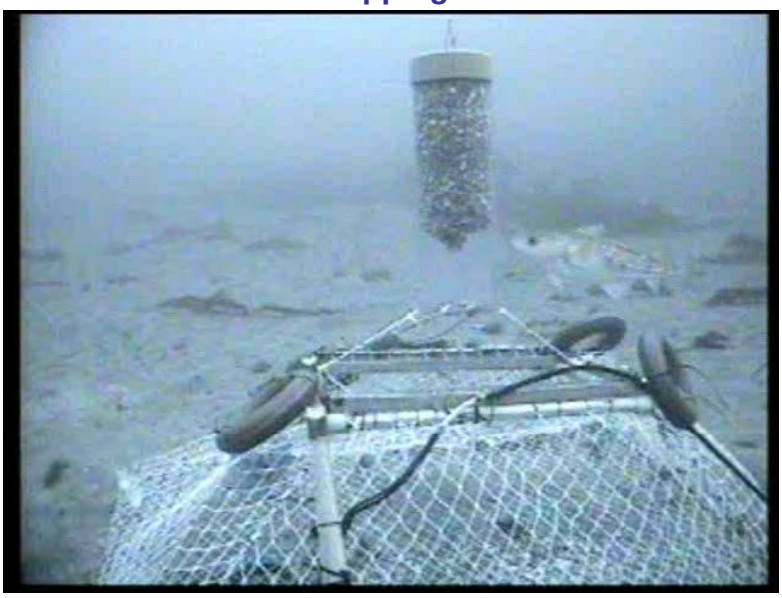
Cod keep distance downstream from the pot

A ’pyramid’ pot with entrance on top

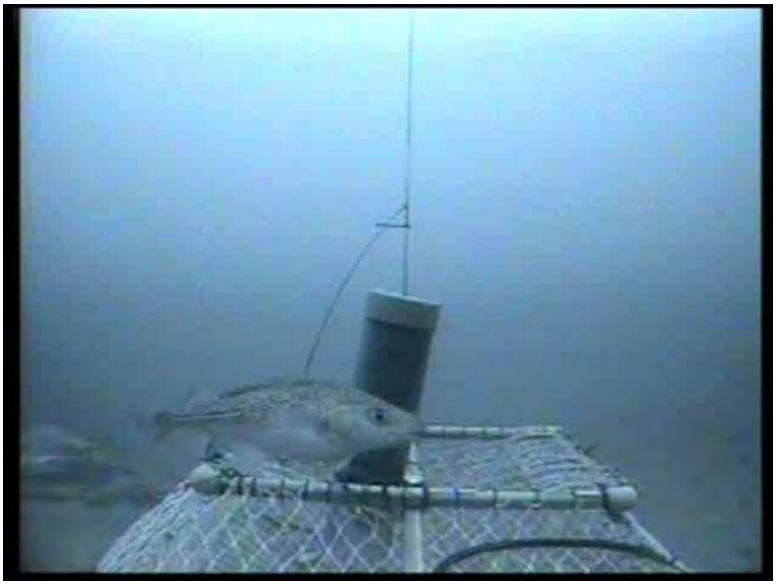


Feed release

Dropping bait



Territorial cod



Fish did not react to chasing light

Conclusions

Equipment and observation technique has been succesfull

Long lasting bait: a useful system has been developed

Pot entrance should face downstream or be accesibel from all sides

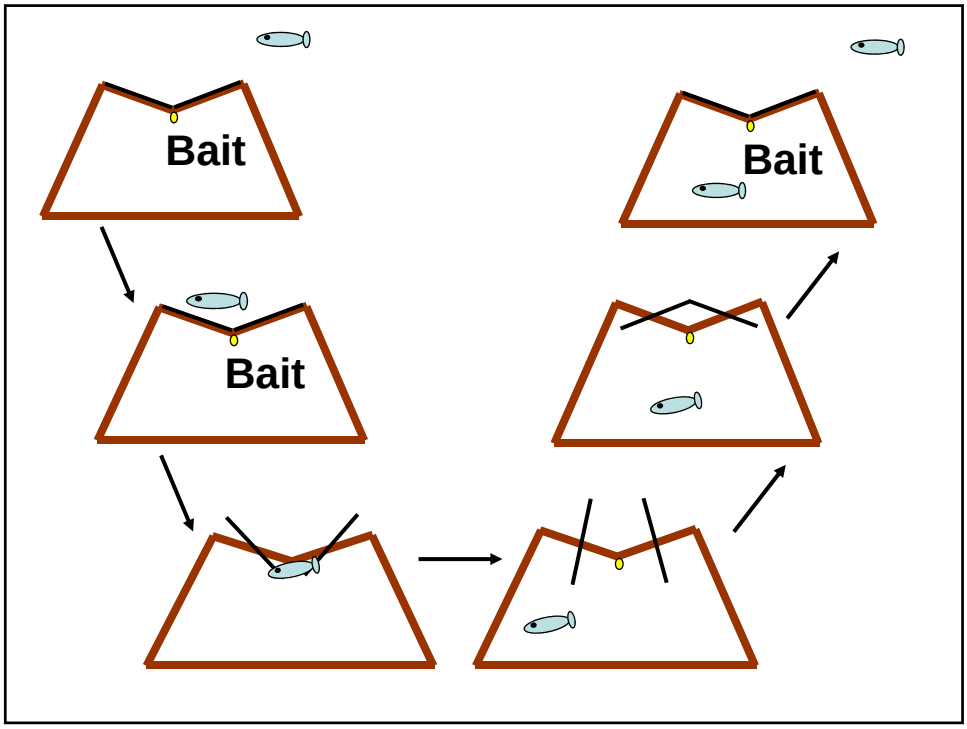
Need more work on effective entrance

Need more work on design (shape, size) of pot and how this affect fish behaviour. A pyramid shape may be an alternative

Alternative stimulation: only initial experiments – no success yet

Future work:

Pot shape
Bait (bait soup pump)
Transparent pot
Optomotor (LEDs, moving object)
Light
Sound
(Electricity)



Invitation

If you are enthusiastic about this subject and have ideas that you want to share with me, you are invited to visit me and work with me on the gear of the future!

ICES-FAO FTFB SGPOT

Study Group on the Development of Fish Pots for Commercial Fisheries and Survey Purposes [SGPOT]
(Chair: Bjarti Thomsen, Faroe Islands) will be established and will meet in Dublin, Ireland from **20–22 April 2007** to:

a) Review the current use of fish pots and provide a global overview of commercial fisheries and assessment surveys using these gears
b) In order to improve catching efficiency and assessment use of pots, the group will identify fundamental research needs on fish behaviour, in particular:
i) Development of methodology for describing fish behaviour relevant for the capture and escape process
ii) Reactions to different stimuli, including bait attraction, in the far and near field;
iii) Efficiency of pot and trap entrances; and
iv) Behavioural variation due to biological status and environmental conditions.
c) Make recommendations for improving the mechanical design and construction of pots, with considerations given to ghost fishing, with the specific aim of improving catch efficiency and their utility as survey gear.

SGPOT will report by XXXXX for the attention of the Fisheries Technology Committee and

the findings of the SG will be reported in an *ICES Cooperative Research Report.*

GACAPOT workshop

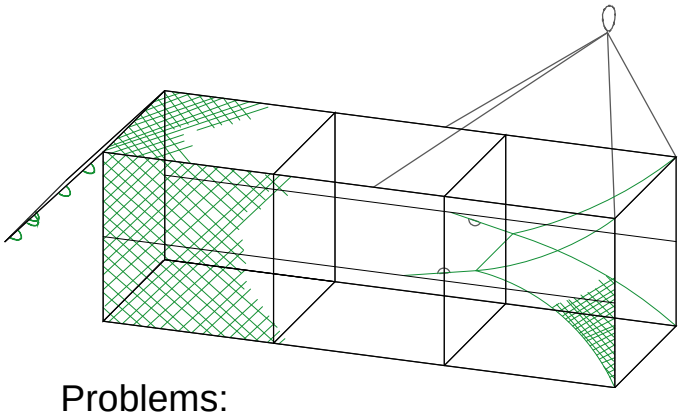
The Norwegian Pot Story

Svein Løkkeborg
and
Odd-Børre Humborstad

Fish Capture Division
Institute of Marine Research
P.O. Box 1870 Nordnes, N-5817 Bergen, Norway
Phone: +47 55236826, Fax: +47 55236830
Email: svein.lokkeborg@imr.no

The Start:

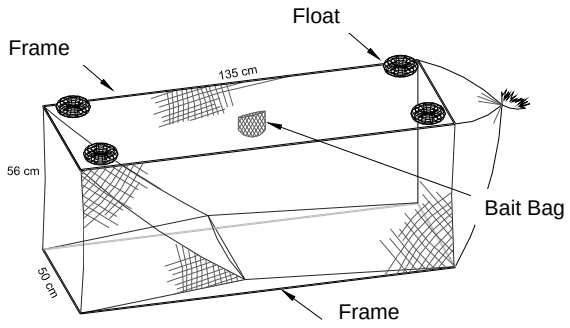
The Sablefish Pot used in Alaska



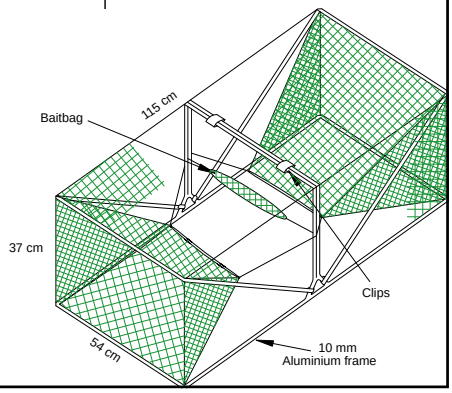
Problems:

- Low catches of cod
- Too big for our coastal vessels

Collapsible Pot



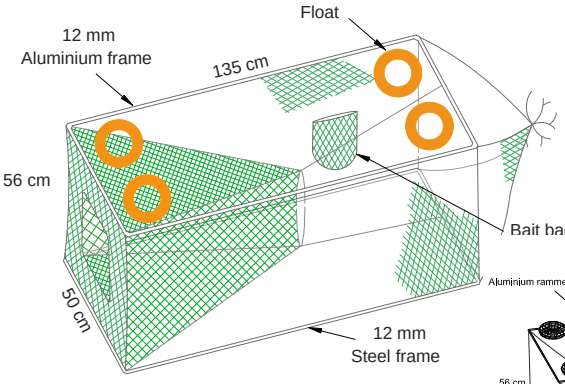
- Use by a few vessels targeting tusk
- Too low catches of cod



Cod Do Not Like Narrow Funnels

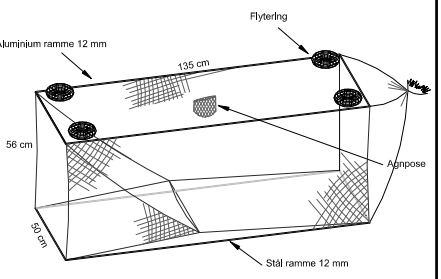
However, They are Good at Escaping

Double Funnel:
one wide and one narrow



Problem:

The position of the bait bag



Gave a three-fold increase in catches of cod,

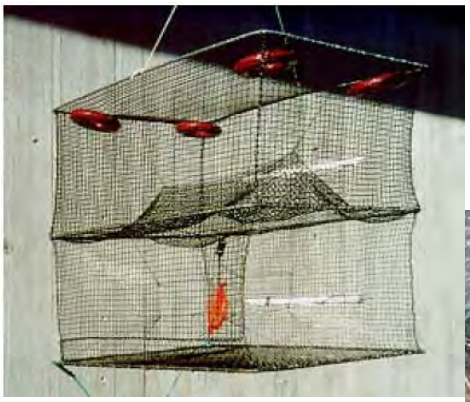
but still too low

The Position of the Bait Bag is Crucial

The Two-Chamber Pot

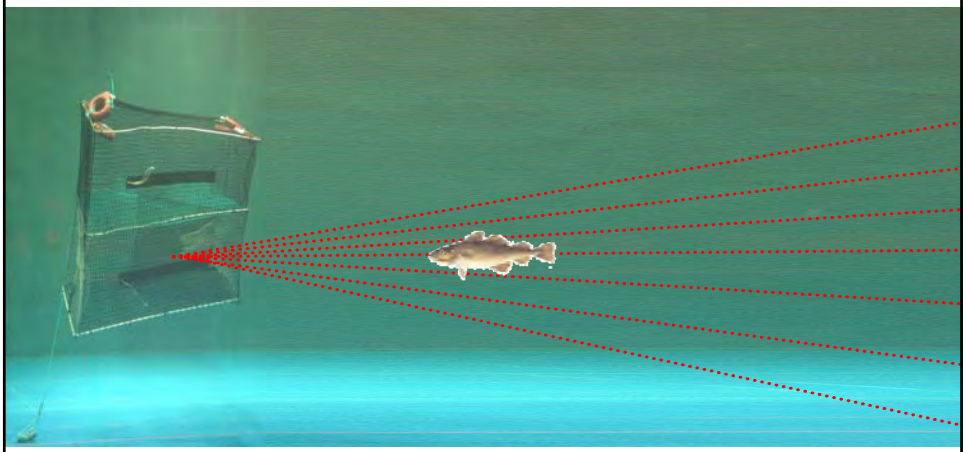
Vertical Search Pattern

The Two-Chamber Pot



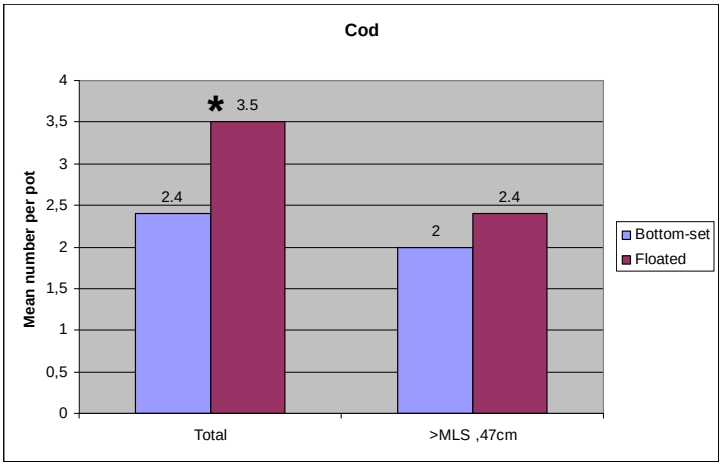
”Oh shit, these bloddy crabs”

Floated Pot



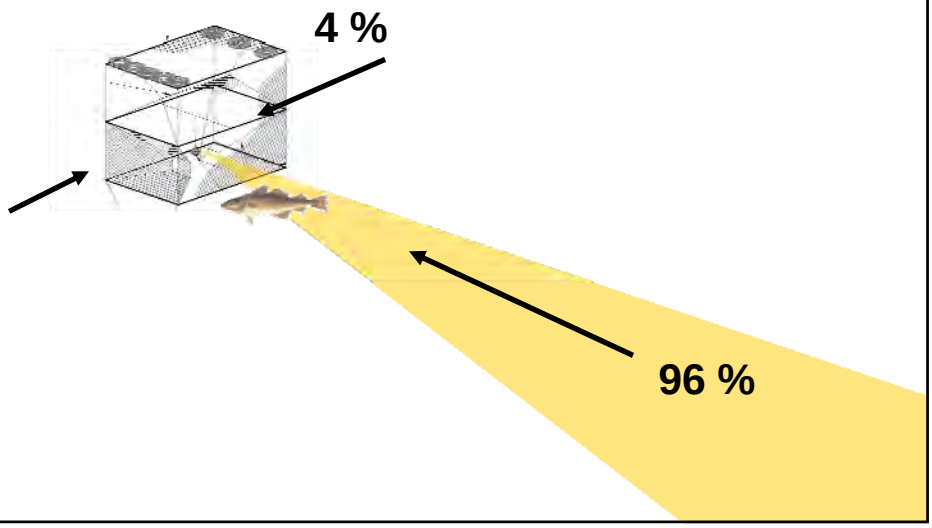
Catch Rates Cod

Floated pots caught 45% more cod

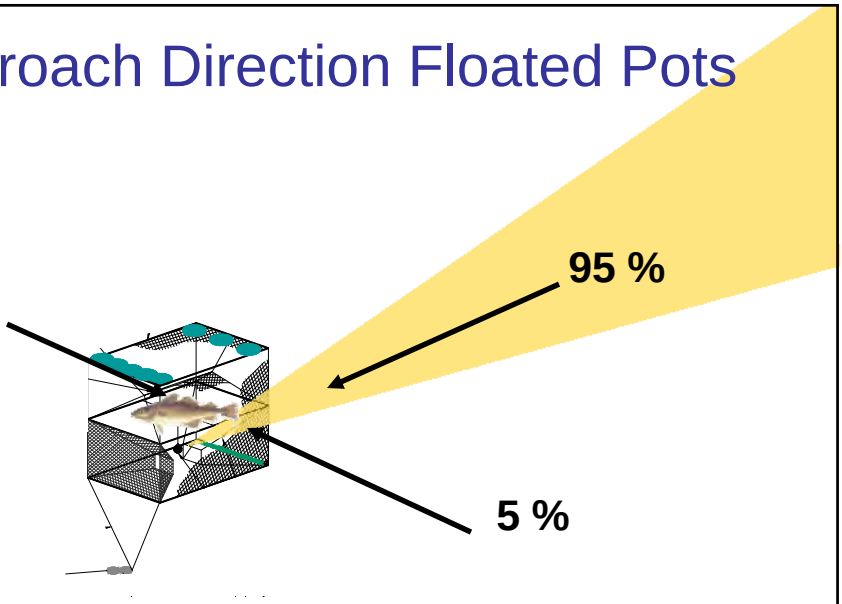


Approach Direction

Approach Direction Bottom-Set Pots



Approach Direction Floated Pots



The Ideal Pot for Cod

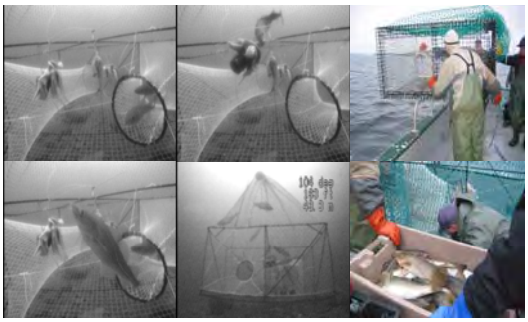
- Floated
- Odour plume out of the funnel
- A wide funnel
- Double funnel?
- Two chambers separated by a narrow funnel
- Long-lasting bait
- Visual stimulus
- Other stimuli

Conclusion

- Increase rate of attraction
  - Long-lasting bait
- Increase rate of entry
  - Improve entrance design
  - Additional stimuli
  - Long-lasting bait

The Marine Institute

Development of Baited pots for harvesting cod *(Gadus morhua)* in Newfoundland and Labrador, Canada



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MARINE INSTITUTE

Memorial University of Newfoundland

WHY POTTING TECHNOLOGY

- **Environmentally friendliness**
- **High discard survivability**
- **High quality of the catch**
- **Good species and size selectivity**
- **Good source of live fish**
- **Management perspective :The ability to tag more fish for less fish harvested (Fish are much better shape).**
- **No unaccounted mortality due to poor weather.**
- **Minimal ghost fishing due to netting escape vents, and opening in triggers**

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WHY POTTING TECHNOLOGY

Many governments, environmental awareness groups, Individuals, etc. are prepared to ban trawling. If this happens potting technology may be an unavoidable alternative.

Cod pots catch fish they do not kill fish

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Project Goals

- **Design an appropriate style of cod pot for Newfoundland inshore vessels**
- **Build prototypes and conduct tests**
- **Conduct sea trials to evaluate commercial feasibility and to recommend further improvements as required**
- **Conduct underwater observations to monitor fishing performance and fish behavior and recommend improvement in design and operation of the pots.**
- The main focus was to see if we could develop a cod pot that could catch commercial amounts of Atlantic cod

Experimental Testing

Experimental Testing Of Cod Pots
South West Coast, NL (Nov. 2000)

- Funnels vs. no funnels
- Floating Roof Sections

Cod Pot Sea Trials, May 9-20, 2001
Placentia Bay Newfoundland

- Circular Funnels
- Floating Roof Sections

Experimental Testing 2000/01

- Funnel System to guide fish to a entrance and pot interior volume was essential to improving catchability
- Weather was a major problem and resulted in many lost sea days. One positive from the lost sea days was the number of days fish were in the pots (up to 10 days) and when retrieved all fish were active with no mortalities.

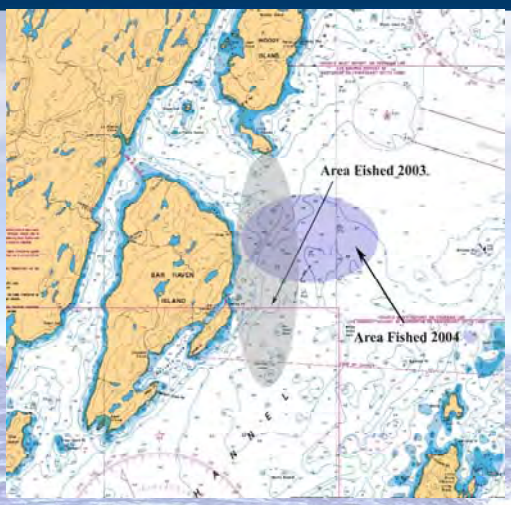
Experimental Testing
2003/04 *Study Area*

Bar Haven Bank area in Placentia Bay on the south coast of the island in NAFO division 3Ps

Depths ranged from 10 ftm to 65 ftm

Bottom water temperatures ranged from 2.2 to 7 ºC

Soak Times varied from Day to Day due to bad weather.



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Fishing Trials
2003

Commercial gillnets with monofilament twine and 5 ½-inch mesh size was used as the control gear to ensure there were Atlantic cod in the area being fished by the pots and for catch comparison purposes.

As well, handlines were used to verify fish availability to the gears types before and after setting.

Two types of bait were used during the experiment, squid *(Illex illecebrosus)* and mackerel *(Scomber scombrus)*.

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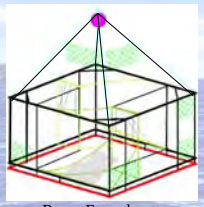
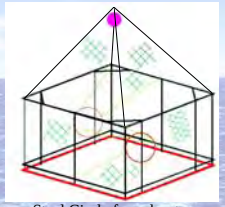
Pots
2003

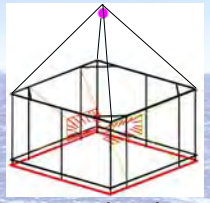
Pot #	Reference Name	Funnel Style	Size L x W x H	Steel FRD 36" x 9"	Plastic FRD 36" x 9"	Steel FRD 14" x 14"	Total Pots Fished	Funnel depth 2 inch mesh
1	Ramp 6	Ramp	6.5' x6.5' x 36"			*	2 pots	16
2	Circle 6a	Circle	6.5' x6.5' x 36"			*	2 pots	16
3	Trapezoid P	Trapezoid	5' x5' x 28"		*		3 pots	6
4	Ramp 5	Ramp	5' x5' x 28"			*	3 pots	12
5	Circle 5	Circle	5' x5' x 28"			*	3 pots	12
6	Trapezoid S	Trapezoid	5' x5' x 28"	*			3 pots	6
7	Circle 6b	Circle	6.5' x6.5' x 36"			*	2 pot	20
8	Circle 6c	Circle	6.5' x6.5' x 36"				1 pot	24



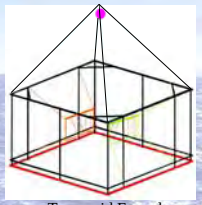
Ramp Funnel pot
5' x 5' x 28"
6.5' x 6.5' x 36"



Steel Circle funnel pot
5' x 5' x 28"
6.5' x 6.5' x 36"



Trapezoid Funnel
Plactic trigger pot
5' x 5' x 28"



Trapezoid Funnel
Steel Trigger pot
5' x 5' x 28"

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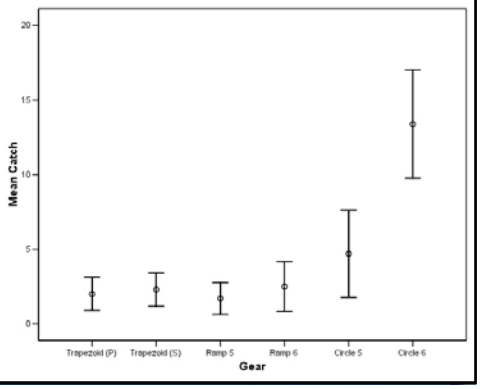
Results

Cod catch and Comparisons Pots (December 2003)

The circle 5 was compared to trapezoid P, Trapezoid S, Ramp 5 to see if entrance styles played a role in catchability. Also, there were two pots *(Ramp 6* and Circle 6) used to see if pot size (Volume) played a role in catchability.

Pot type	# of Sets	Total Catch # = n	CPUE
Trapezoid P	10	20	0.027
Trapezoid S	10	23	0.028
Ramp 5	10	17	0.027
Ramp 6	10	25	0.028
Circle 5	10	47	0.091
Circle 6a	10	134	0.24

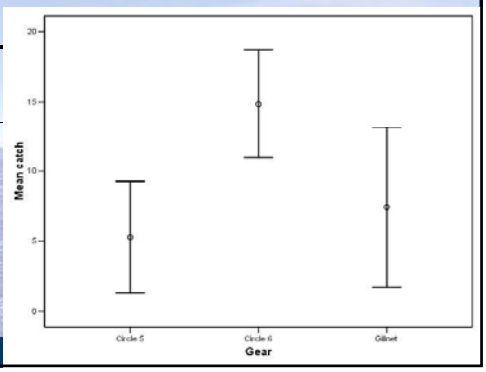


Results

Cod catch and Comparisons Pots (December 2003)

Two 50 ftm (5.5 inch mesh size) gillnets were fished alongside the two Circle 5 and Circle 6a pots for a total of 7 sets. Over the seven sets, the Circle 5 pots harvested 37 fish with a CPUE of 0.094, the gillnets harvested 52 fish with a CPUE of 0.082 and the Circle 6a pot captured 104 fish with a CPUE of 0.24.

Pot Type	# of sets	Catch # = n	CPUE
Circle 5	7	37	0.094
Circle 6a	7	104	0.24
Gillnet	7	52	0.082



Results 2003

Size Selectivity Pots and Gillnets 2003

Circle 6 (n=562),
Circle 5 (n=87)
gillnet catches (n=104).

Circle 6 pots
Range of 42 cm to 93 cm. 576g- 3493g, mean 54.3cm/1296g.

Circle 5 pots
Range of 47 cm to 83 cm 872g to 4640g mean 56.5cm/1640g.

Gillnets
Range of 47 cm to 81 cm 840g to 2969g, mean 64.3cm/2142g.

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Results 2003

During the experiment in 2003, funnel length in the Circle 6 (a, b & c) pots were compared to see if length of funnel made a difference in catch and size of fish captured. Five sets were completed on the pots There was no significant difference based on length of funnels. Funnel lengths were 16, 20 and 24 meshes deep of 2" white knotless nylon

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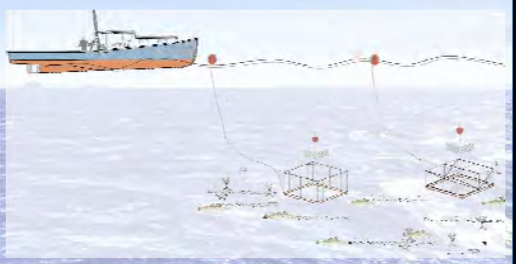
Results 2004

There was a significant difference in CPUE of Circle 6 pots vs. Circle 5 pots.

When further tests were completed on funnel depth and Funnel inside opening there was no significant difference. Funnel inside opening was 14 & 16 inches.

The majority of cod entering the pot entered within the first 12 hours.



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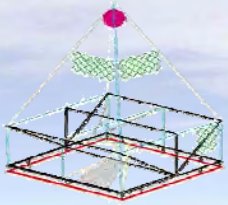
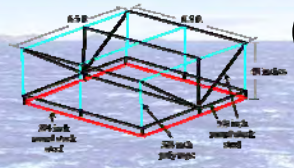
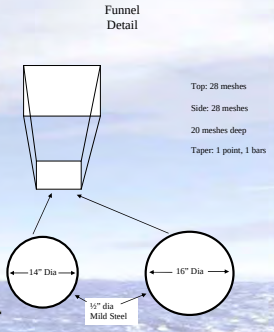
Prototype Pots 2004

Four prototype pots were constructed for testing in December 2004 these pots were similar to the successful (Circle funnel) pots fished in 2003







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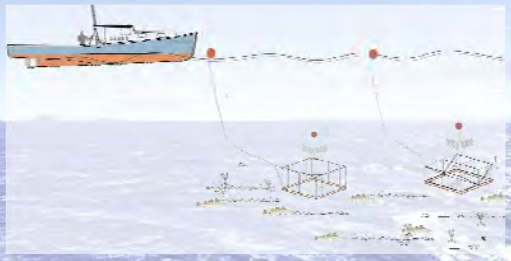
Fishing Trials 2005

Harvesters in the Sentinel Fishery fished two to four pots at different times during the 2005 season. The commercial harvester from Labrador fished up to 10 pots in late July and September during the commercial cod fishery. The pots in the Sentinel Fishery were set alongside traditional gears (gillnets and longlines) and in Labrador, pots were fished on traditional grounds where commercial harvesters were fishing.



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Results 2005

At-sea experimental testing program that was conducted during the Newfoundland and Labrador Sentinel Fishery and in the commercial cod fishery from coastal Labrador in 2005. Experiments were carried out between July and Dec by harvesters in NAFO Divisions 3Ps, 3L, 4R and 3K

These tests were completed to look At catchability based on time of the Year.

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Results 2005

Collapsible Pot

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Results 2005

Pots are a seasonal type fishery.

In NL they work best from September to December

They will most likely work well in early spring when fish are very hungry.

Catches in summer months are substantially less than gillnets but gillnets have a major problem with quality at this time.

In the fall Pots harvested as much as the gillnets Two pots had a mean CPUE of 51.5 fish while one 50 ftm gillnet 5.5 inch mesh had a CPUE of 30.8 fish for 24 hour set.

Gillnets with 24 hour set did have fish that was of lower quality. Pot no dead fish.

All fish from pots given to plant in the area was grade A quality.

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What do we know about Cod Pots in NL

Pots can catch commercial amounts of cod at certain times of the year (Fall). Catches have been as high as 59 fish in one set for a total of Approx 357lbs.

Mass. Division of Marine Fisheries has used the pots for tagging cod during potting experiments 2005.

If in areas where lobsters are present pots will have to be outfitted with lobster escape vents to deduce by-catch.

Other by-catch can be released alive.

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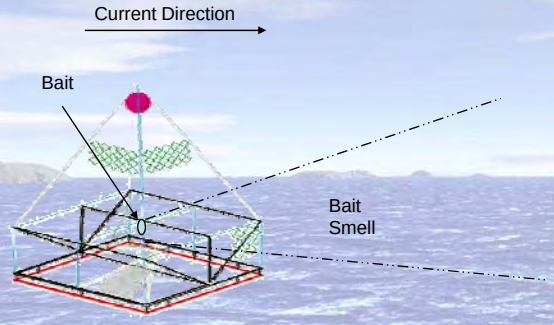
What do we know about Cod Pots in NL

Is it the pot or the fish that determine catchability/efficiency.

It is both.

Fish condition
- Spawning
- Are bait fish present
- Are fish Hungry



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Thank-you

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