Danish seine for shallow lakes.

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Kristjansson, Jon
Independent scientist
Krosshamrar 7A, 112 Reykjavik Iceland.
Telephone: +354 8927864
E-mail: jonkr@mmedia.is
Web-site: http://www.fiski.com

Originally written in 2010 and presented at a conference in Budojevitch, Check Republic.
Changed and updated in May 2017, only minor corrections,
A diagram of 3.5 m high seine, 70 meshes at start of the wing, is presented on page 4.

Abstract

A bottom seine for fish sampling in shallow lakes is described. It is a smaller model of the Danish seine used for commercial fishing in the North Sea. It can be operated from a 4.5-5.5 m long boat. The seine is 5 m high and 40 m long. Herding ropes, 100 m long, are attached to each wing. The seine can be operated by hand, but it is more convenient to use hydraulic winces driven by small inboard motor. A boat equipped with two winches is described. This seine was used in a tag - recapture population estimate of Arctic char in a medium sized lake. 1031 fish were tagged, 3415 examined for tags and 231 recovered in 3 consecutive years. Catches up to 800 kg have been caught in one shot.
Key words: Seining, Danish seine, sampling, Arctic char.

Introduction

In order to find a fishing gear to catch live fish in lakes without pulling it to shore beach seine, alternative to a beach seine which has to be pulled to the shore experiments were performed to
Use of a beach seine is limited to suitable spots on the beach. These can be difficult to find and in some lakes, beach seining is not possible. Therefore, a seine that could be pulled into a boat in open water was needed. Following some experiments, a commercial sea-water Danish Seine was scaled down in size and thin light netting was used for construction.
The final result was a light weight seine that could be stored and carried around in an ordinary 80 l sack.

Construction

A diagram of the seine is shown in fig.1. It is 40 m long, 5 m high and 10 m deep (stretched) from the opening of the belly to the bottom of the cod-end.
Material is 0.8 mm, polyethylene, which a specific gravity of 0.96 and therefore floats in the water. The head-line is 5 mm nylon rope, the netting is hung 95% on the rope. The bottom line is a lead-line no. 3, netting is hung 100% on the line.
Thus the upper line is 5% shorter than the bottom line, making the seine to "sit" better on the bottom when pulled towards the boat. The weight put on the bottom line depends on bottom density. To heavy line on a soft bottom makes the foot-rope dig into the mud. Heavy weight makes the seine sit better and can be used on a hard bottom. This has to be experimented with. It is practical to twist a lead line around the bottom line as needed.

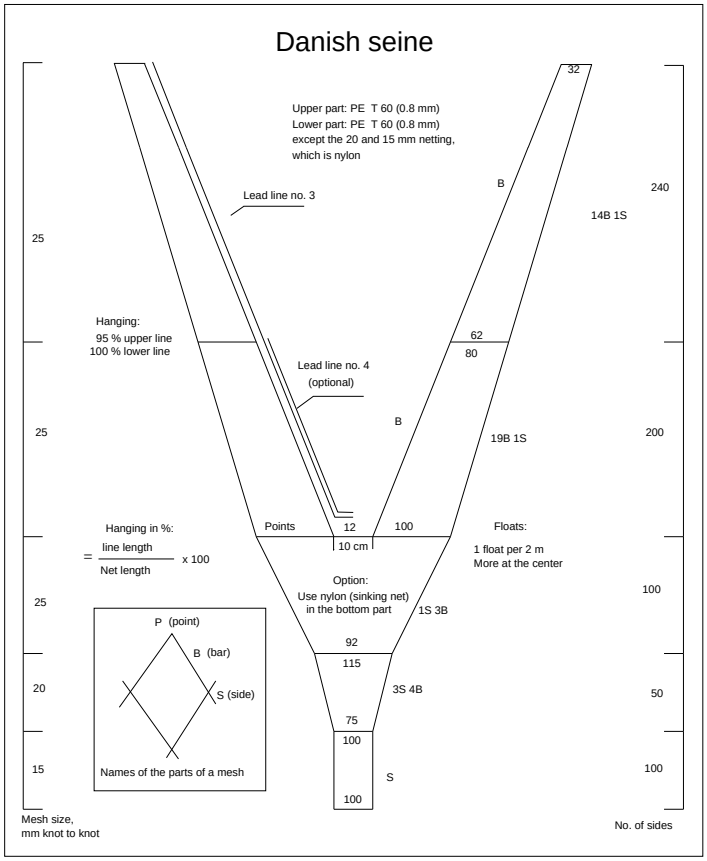


Fig. 1. Danish seine diagram

Use

The seine is lead out as shown in fig 2. First, a buoy, linked to herding rope, is put out. Then the rope is lead in a semi-circle. The first wing is laid out. While the cod-end still in the boat, the second wing is laid out, when the belly is fully stretched the cod-end is thrown over the wing.
Second rope goes out in a semi-circle towards the buoy, and then both ends are hooked by C-links (fig. 3) onto the winches (drums). Buoy, ropes and seine are also linked together with C-links which allow a quick operation.

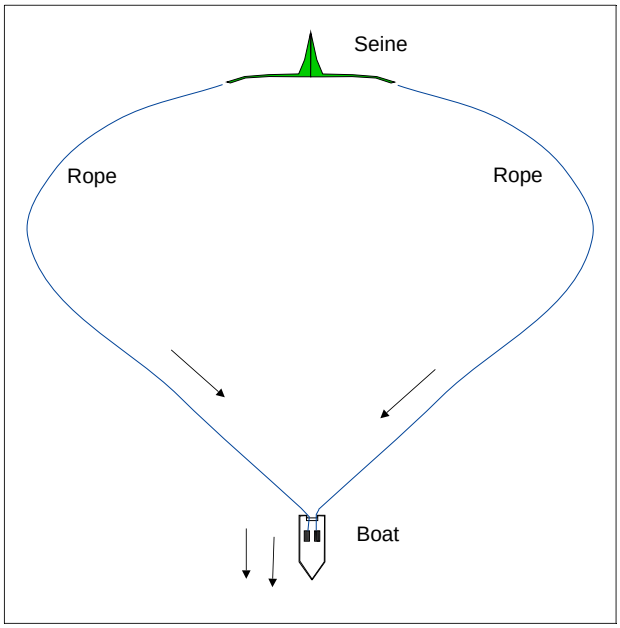


Fig. 2. Seine laid out

The ropes are pulled in slowly, the boat and seine approaching each other during the operation. This is very important: Do not try to pull the seine over the ground until in the end.
The ropes are to heard the fish, and the seine is only to catch them in the end.

Towards the end of the haul, the motor is set to full power to close the seine and drive the fish back to the cod-end. The noise from propeller of the boat drives the fish into the seine.
seine.


Fig. 3. C-link

Boat

A 5.5 m long boat was specially equipped for the operation of the seine. Two hydraulic hauling drums (winches) were installed, driven by a hydraulic pump mounted on the 16 Hp inboard motor, the propeller of the boat is also driven by the same hydraulic pump. This however has the disadvantage that the propeller looses power when the winches are operating. It is probably better to have a direct axle driven propeller and a separate motor for the winches. The boat has a stern ramp where the seine is taken aboard.

Results

Catches up to 800 kg have been taken in one shot. However catches can't be taken as granted and this goes for every fishery. Often, after a couple of negative results, people tend to give up and declare the gear as unusable.
But patience is needed. It often takes a long time to develop and train a new fishing gear, sometimes months or years. It is important not to give up to soon.

This seine was used in a tag - recapture population estimate of Arctic char in a medium sized lake in Iceland. 1031 fish were tagged, 3415 examined for tags and 231 recovered in 3 consecutive years. The fish were tagged / recaptured in few days each time so growth during precise time intervals could be determined. Fig. 4 is a Walford plot, showing the growth of various lengths of char in lake Ellidavatn Iceland in one year obtained from the tag-recovery experiment (Kristjansson, J. 2004).

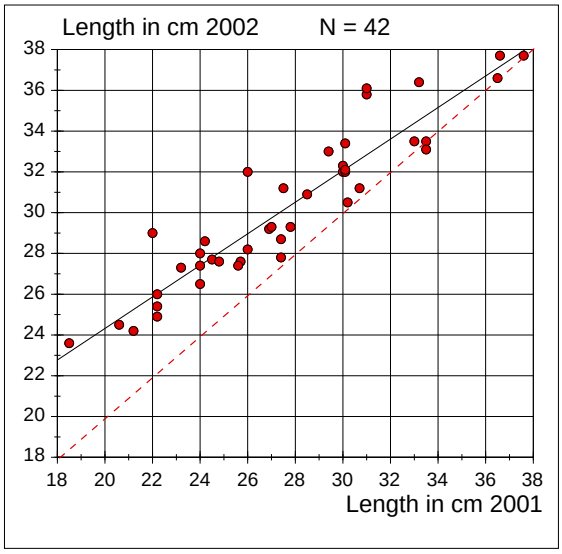


Fig. 4. Walford plot, annual growth of Arctic char in Ellidavatn, Iceland

Materials

All materials, netting, ropes, locks, lead lines etc. are available from:
http://www.engel-netze.de

Reference:

Kristjansson, J 2004. Veiðar og endurheimtur á merktum silungi í Elliðavatni 2003. Report in Icelandic, 13 pg.

Addentum

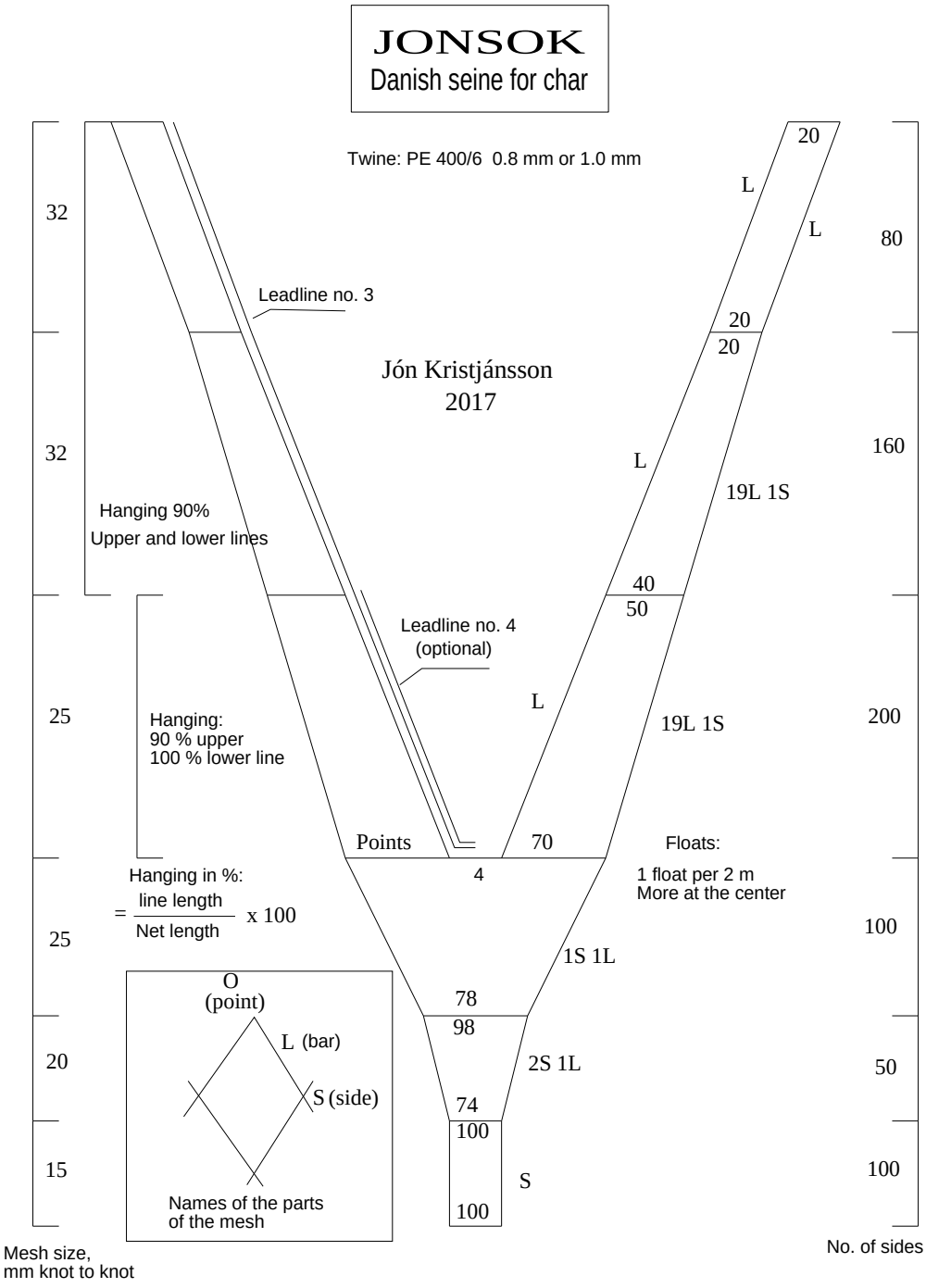
See next page page 4, for a 3.5 m high seine.

3.5 m high seine, 70 meshes half height of the wing.

The 5 m high seine, 100 meshes half wing high, presented on page 1, is relatively heavy to pull.
Therefore I designed a new one which is 3.5 m high, 70 meshes for the half wing height.
That one is much lighter and quicker to pull. I have not tested it yet as it is still winter over here!

It is difficult to obtain the right netting, netting for gear is usually intended for sea fishing and therefore made of thick thread. In difficulties, please contact http://www.engel-netze.de in Germany.

Upper and lower panel are both made of PE, Polyethylene, webbing, thin thread. 0.8-1.0 mm



Length of each wing is 15 m
Height of wing at belly opening is 3.5 m