

New promise in sea lice-eating lumpfish

August 27 2012, by Torkil Marsdal Hanssen



Lumpfish fry produced at Akvaplan-niva in 2011, ready for transfer to salmon cages later this year. Trials have shown that lumpfish actively feed on sea lice in low marine temperatures. NORDLUS researchers also believe lumpfish may have a pacifying effect on salmon. Photo: Lars Olav Sparboe

Ballan wrasse and goldsinny wrasse are currently the principal biological weapons to fight sea lice at fish farms in Trøndelag county and further south. As these two species are sensitive to cold temperatures, they would not be hardy enough to combat sea lice in Northern Norway.

Since spring 2011, the Norwegian company Akvaplan-niva has been

studying the suitability of lumpfish as a biological warrior for delousing farmed salmon and cod in cold marine waters. The company has teamed up with three partners on the NORDLUS research project: Nordlaks Oppdrett AS, Codfarmers AS, and the aquaculture research station Gildeskål Forskningsstasjon AS (GIFAS). Preliminary findings from the project are promising.

Hardy against the cold

Under the NORDLUS project, researchers are developing sound methods for catching lumpfish, stripping and hatching their eggs, and raising lumpfish fry . The researchers are testing various first-feeding methods and studying how different temperatures affect fry growth and development. Lumpfish fry with an initial weight of 20 grams are being tested in a variety of temperatures ranging from 4°C to 13°C.



A lumpfish and its sea lice prey. Photo: Gifas

"Midway through the trials now," says project manager Albert K. Imsland, "we see that the fry are growing well through a broad range of

temperatures. The optimal temperature range for growing fry of this size appears to be 10 to 13 degrees."

Appetite affected

In November 2011 the researchers placed lumpfish weighing an average of 150 grams in a pilot cage with 200 salmon infested with sea lice. Lice counts were taken four times, the final one at the end of January, to record the number of attached versus mobile sea lice and male versus female.

"The winter trial showed that lumpfish actively feed on the sea lice in the deep of winter, even at [water temperatures](#) of four to seven degrees," explains Dr Imsland. "There were marked differences in the extent of sea lice between the control cage and the cage stocked with lumpfish. Our behavioural observations indicate that the lumpfish actively swim to the salmon in order to feed on the sea lice."

The trials also revealed major individual differences in lumpfish appetite for sea lice. "While some of them prefer to eat the salmon feed, others showed a voracious appetite for sea lice. One individual had consumed so many sea lice that its stomach ruptured! We don't yet know what causes these differences in [appetite](#)."

Symbiotic relationship?

The NORDLUS researchers will be studying what triggers the feeding behaviour of lumpfish more closely. Trials will also determine the optimal numeric ratio of lumpfish to salmon in the cage. In trials carried out at GIFAS in 2000 , the lowest number of mature female [sea lice](#) was achieved using one lumpfish for every 20 salmon. This autumn, similar trials will be carried out with cod and the lice species that infests them.

"Trials done in tanks on land indicate that lumpfish have a pacifying effect on the salmon," continues Dr Imsland, "so we are wondering whether there may be a form of symbiosis between the two species. Surface trawling for salmon far offshore sometimes also nets lumpfish—which are actually quite poor swimmers—which could mean that the lumpfish travel alongside or hitch a ride with [salmon](#)."

Provided by The Research Council of Norway

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