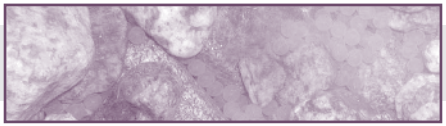
NINA
Aquatic Research Station, Ims



NINA

The Norwegian Institute for Nature Research (NINA) is Norway's leading institute for applied ecological research. NINA performs short- and long-term research projects in support of local, national and international utilization and management of natural resources. The institute's highly qualified staff collaborate closely with resource users as well as research and management institutions in Norway and abroad to reach the best environmental solutions. NINA offers broad-based ecological expertise covering the genetic, population, species, ecosystem and landscape levels in terrestrial, freshwater and coastal marine environments. In addition, NINA addresses interdisciplinary issues involving both natural and social scientists.

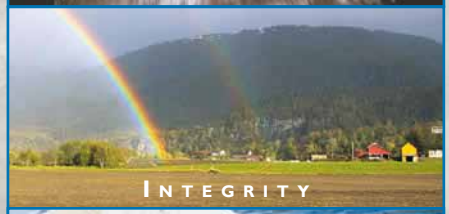
Resource Mapping, Resource Use & Resource Management

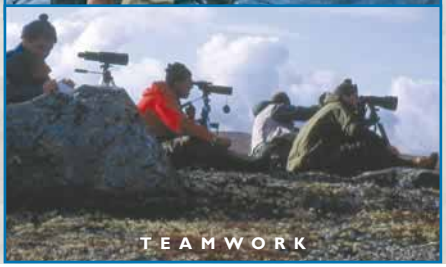
NINA has a wide network and plays an important role in national and international research. Its experienced staff of researchers within the fields of natural and social sciences collaborate with approximately 120 institutions in more than 30 countries in Europe, Africa, Asia and the Americas.

NINA's expertise is directed towards basic and applied research, consultancy work, and advice to management and industry.

Selected areas related to natural resources are:

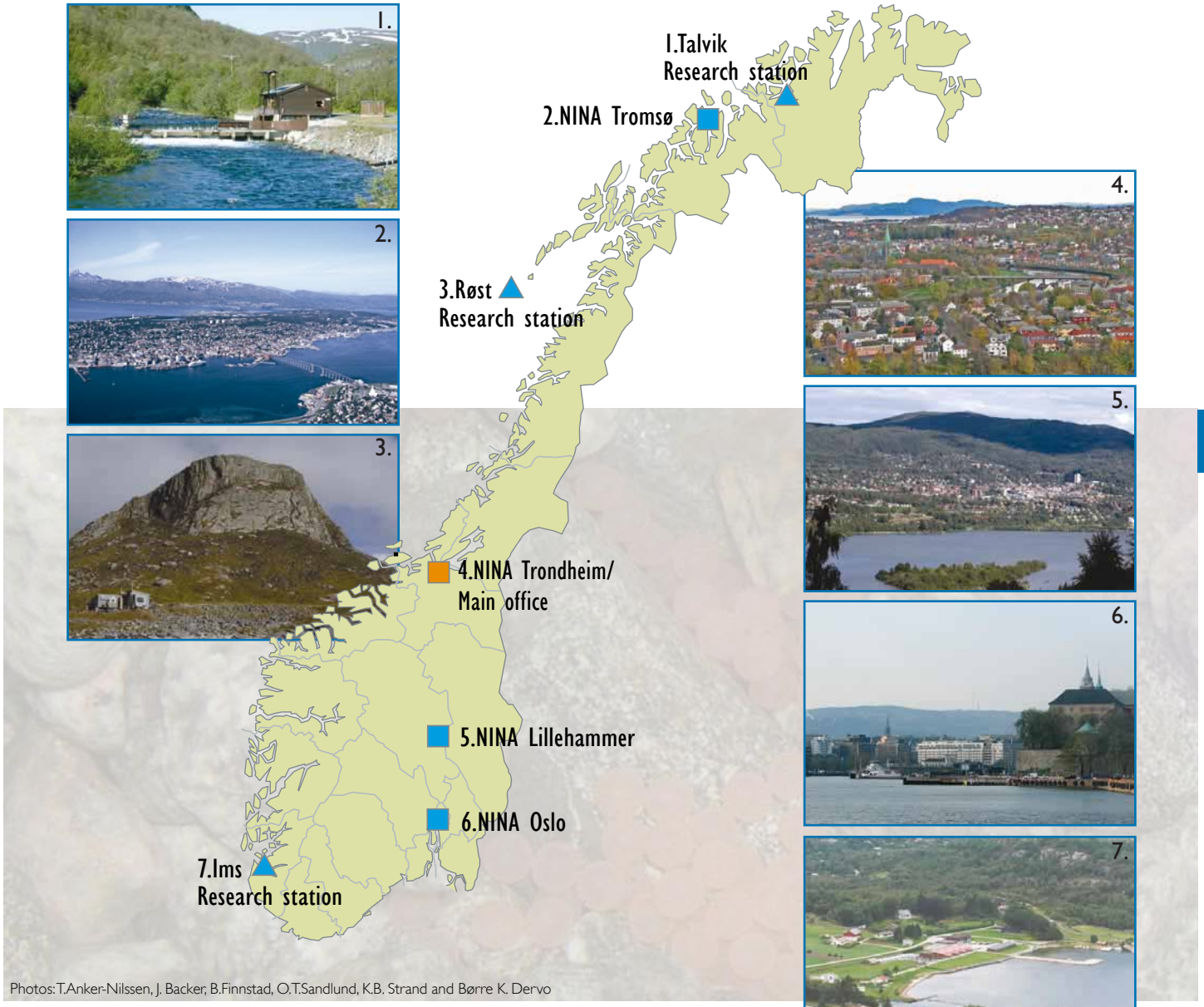
- Harvest and sustainable use of game and fish stocks
- Land use and nature management, including landscape analysis in the coastal zone and on land
- Community development and local participation in resource management
- Socio-economic issues related to subsistence, recreational and commercial use of natural resources
- Conflict resolution related to natural resource use and management
- Commercial development of biological resources
- Red-list evaluation and conservation planning
- Monitoring and time-series analysis
- Environmental databases– development, operation, use and public information
- Impact analysis and monitoring of pollution
- Environmental impact assessments





Photos: T. Anker-Nilssen, K. Kringstad, E. B.Thorstad and P. Jordhøy

Offices and Research stations



Photos: T.Anker-Nilssen, J. Backer, B.Finnstad, O.T.Sandlund, K.B. Strand and Børre K. Dervo

History

The NINA Aquatic Research Station, Ims provides advanced facilities for aquatic research, primarily focused on fish ecology.

The main function of the research facility is to contribute to the scientific basis for conservation and sustainable utilization of wild anadromous Atlantic salmon and brown trout. The infrastructure available also caters for other aquatic research needs, including research on marine organisms.

Established in 1978 in the village of Ims near Stavanger, SW Norway, the Research Station has facilitated advanced research on several issues, in particular related to the ecology, genetics, physiology and behaviour of wild Atlantic salmon and other salmonid fishes. Over the period 1984-2004, more than 210 scientific papers and 240 reports, thesis and popular science papers have been published based on experiments conducted at Ims. International project collaboration is an important aspect of the research activities. Since 2000, research partners from Canada, the US and several European countries have utilized the facilities.

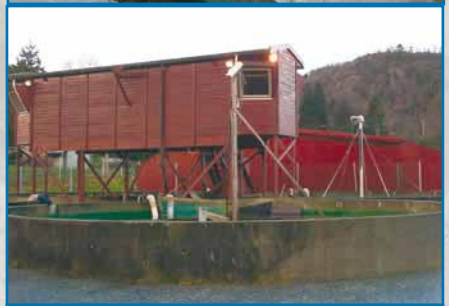
The Atlantic salmon stock in River Imsa is part of an international monitoring network which aims to assess the development of Atlantic salmon populations in rivers as well as in the sea. Results from research at Ims have from an early stage been utilized by international management organisations like ICES, NASCO, and EIFAC to develop fisheries regulations and conservation measures.

Photos: J. Backer, L. Sundt-Hansen and S. Einum

Facilities

The Research Station represents a unique infrastructure for experimental research on fish. The facilities include:

- Hatchery facilities designed to produce all life stages of salmonids (egg to mature fish).
- Broodstock groups maintained for a number of salmon and trout populations.
- Experimental tanks and outdoor semi-natural stream channels.
- Water temperature regulation.
- Facilities for video recording of fish behaviour.
- Standard laboratory facilities (e.g. microscopes, scales, water chemistry equipment, fish tagging equipment [PIT, Carlin], freezers).
- Supply of clean fresh water.
- Supply of clean sea water (35 ppt) including UV filtration.
- Facilities for mixing sea and fresh water to required salinity.
- Separate section for production of eggs or alevins for stock enhancement.
- Outdoor spawning arenas with observation tower.



- Ims River Park; two 150 m^2 artificial streams, with fish traps and adjustable water flow.
- Fish trap in the nearby river Imsa monitoring all ascending and descending fish (Atlantic salmon, brown trout, European whitefish, Arctic charr, European eel). Data series are continuous from 1975.
- Visiting researcher offices with internet access.
- Accommodation.
- Educated staff available for technical assistance during set-up and monitoring of experiments.

The Research Station holds a veterinary "green card" (i.e. fish produced at the station is certified for introduction to the anadromous section of other rivers). The research is always conducted in accordance with rules and regulations regarding hygiene and humane treatment of animals.

Photos: J. Backer, L. Sundt-Hansen and S. Einum

Types of research

Research at Ims has provided essential knowledge for the national and international management of Atlantic salmon, as well as basic data to help us understand the ecological and behavioural mechanisms influencing the development of fish stocks.

During the 1980s, tagging experiments with wild and reared smolts demonstrated high catch rates for salmon in the sea, and the results contributed to the controversial decision to ban drift net fishing for salmon along the Norwegian coast and to set international quotas in the salmon fisheries off the Faroes.

The data series from the fish trap in the River Imsa allows monitoring of the variation in survival and other population parameters for salmon in the sea, and the stock/recruitment ratio in the river. This has greatly improved our understanding of the importance of various environmental and internal factors in regulating salmon populations.

Research at Ims has contributed greatly to the methods used in separating wild salmon from escapees from aquaculture operations. These methods are presently used around the world. Behavioural ecological studies performed at Ims have provided essential information for our understanding of the interactions between wild salmon and aquaculture escapees in the rivers and on the spawning grounds.

In the early 80s, research was focused on sea ranching with salmonid fishes (Atlantic salmon, brown trout, rainbow trout). The aim was to optimize production in the sea based on reared smolts released in rivers or along the coast. Eventually, this approach was abandoned as a management tool, partly based on information gained through research at Ims regarding potential negative impacts on wild stocks. However, this research provided essential knowledge on the life history of salmon, as well as e.g., genetics, physiology, behaviour, and

Photos: L. Sundt-Hansen and S. Einum

migration. Experiments regarding suboptimal water quality and susceptibility to salmon lice infections have been carried out at Ims, and produced new information to benefit both nature management and the fish farming industry.

Data collected through experiments at Ims have also resulted in publications on diverse issues such as European eel biology, toxicity of aluminium to fish, MCH diversity, evolution of maternal traits (egg size and breeding time), physiological adaptation to ice cover and gene expression in farmed and wild salmon. Experiments with marine organisms have included cod, wolffish, sea urchins, and kelp.

Present research activities at Ims span a broad range of issues, including interactions between wild Atlantic salmon and salmon escapees from aquaculture, the impacts of pollution on fish, population regulation, migration studies, life history evolution, risk assessment of GMO's, interspecific competition, host adaptation in freshwater pearl mussels, effects of carotenoids on juvenile salmon performance, and experimental research on the natural fish populations in the Imsa watercourse.

NINA also operates Talvik Research Station, which includes a similar trap to catch all migrating fish in Halselva, close to Alta, Finnmark. Ims, at 59 °N and Talvik, at 70 °N, provide an unique opportunity to study the impact of climate gradients on aquatic organisms and systems.

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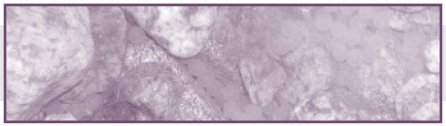

Information

on how to get access to the Research Station facilities is available at
www.nina.no/

NINA
Norwegian Institute for Nature Research

NINA Norwegian Institute for Nature Research • NO-7485 Trondheim, NORWAY
Phone: +47 73 80 14 00 • Fax: +47 73 80 14 01 • IMS Phone +47 51 67 24 70 • IMS fax: +47 51 67 24 71
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