FISHERY INVESTIGATIONS IN THE BALTIC

Conference for Coordination Between Estonia, Latvia, Lithuania and Sweden on Fishery Investigation in the Baltic.

Karlskrona, Sweden
10 – 12 February 1993
Arranged in cooperation with

Östersjöinstitutet
The Baltic Institute

FISKERIVERKET
National Board of Fisheries

Report/Rapport 1/12 '93

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REPORT

Conference for coordination between Estonia, Latvia, Lithuania and Sweden on fishery investigations in the Baltic. Karlskrona, 10-12 February 1993. Convened by the Swedish National Board of Fisheries in cooperation with The Baltic Institute.

1. The Conference was held from 10 - 12 February 1993 on the premises of The Baltic Institute, Karlskrona. It was attended by Mr. Lauri Vaarja, Director-General of the National Estonian Board of Fisheries, by Mr. Andris Ukis, Vice-Minister, Latvian Ministry of Maritime Affairs, Mr. Algirdas Rusakevicius, Deputy Minister, Lithuanian Ministry of Agriculture and their advisors, in all ten participants from the Baltic countries. It was further attended by the Permanent Representative of Estonia to the Food and Agriculture Organization, Ambassador Elena Askerstam, by Mr. Johán H. Williams, Nordic Council of Ministers, and by 12 participants from Sweden. Annex 1 contains the list of participants.

2. The Conference was opened by Dr. Per Wramner, Director-General, Swedish National Board of Fisheries, Göteborg. In his opening statement Dr. Wramner welcomed the participants from Estonia, Latvia and Lithuania and explained the purpose of this meeting which had been made possible through the allocation of funds from the Swedish Ministry of Agriculture and the Swedish Agency for International Technical and Economic Cooperation (BITS). The need for cooperation in fishery investigations between the Baltic States and Sweden is obvious as the same marine living resources are used by all four countries. Sweden also realizes the need for updating the hardware and software for fishery investigations in the Baltic States and for training on different levels and referred to letters received from responsible ministers in the Baltic countries. The full statement is in Annex 2.

3. Mr. Svante Ingemarsson, Deputy Governor of the County of Blekinge, briefed the participants about the history of Karlskrona and pointed out its central position in the Baltic. Mr. Åke Landqvist, Executive Officer of the hosting institute, outlined the activities and facilities of The Baltic Institute.

4. Since Dr. Wramner was unable to attend the whole meeting he asked for nominations of a Chairman and a Rapporteur. Dr. Armin Lindquist was elected Chairman and Dr. Jan Thulin Rapporteur.

5. The Chairman introduced Mr. Johan Williams, from the Nordic Council of Ministers, and suggested that a presentation of the Council´s activities in fisheries be included in the Agenda. He requested comments on the Preliminary Agenda and timetable. As there were no amendments proposed the Agenda was adopted.

6. In accordance with the Agenda the Chairman then asked for information on present fishery investigations in the Baltic States and how they are funded.

7. Mr. Vaarja from Estonia reviewed the organization of the National Estonian Board of Fisheries and its activities. Dr. Aps suggested a project idea on Fisheries information management system and Dr. Järvik outlined the research work at the Estonian Marine Institute. Details of the presentation are found in Annex 3. During the ensuing discussions the suggestion was made by Estonia that a common system for fishery statistics in the Baltic be established.

The need for coastal investigations was also stressed.

8. In his intervention Mr. Ukis from Latvia presented a brief review of Latvian fisheries and referred to the special difficulties arising from the high seas fleet which since independence is under Latvian flag, and those of finding necessary funds for research programmes. Dr. Vitinsh pointed out the heavy reduction of both personnel and facilities, which has limited research activities to the Baltic area under Latvian jurisdiction. Joint hydroacoustic investigations are considered to be of highest priority. There are great difficulties in finding funds for the running of the rather new Latvian research vessel. He pointed out that she had been used in international investigations but as present equipment no longer meets modern standards new acoustical instruments are urgently needed. Both he and Dr. Melnis stressed the importance of that the coastal fish monitoring supported by BITS should be further developed, Annex 4.

9. Mr. Rusakevichius from Lithuania advised that a fishery administration structure has not yet been established. Lithuania has a rather big fleet of high seas fishing vessels which is largely out of order. Lithuanian fishery investigations in the Baltic are limited to coastal waters, including the Couronian lagoon. There is no vessel for fishery research. Increased cooperation with Latvia in fishery investigations is warranted. Presently inland fisheries have gained high importance, Annex 5. Dr. Toliushis described his work with electric fishing equipment, which is considered to be an effective method of selecting fish according to size. It works with impulse current and can be used in both fresh and salt waters; Dr. Toliushis offered his institute's cooperation.

10. Mr. Williams outlined the activities of the Nordic Council of Ministers. He presented a proposal for organized cooperation between the fishery administrations of countries bordering the Baltic, The Baltic Fisheries Cooperation Committee, with the task of establishing a firm network (see page 31).

11. Dr. Neuman, from the Institute of Coastal Research, outlined the established cooperation in coastal areas in the three Baltic countries, Finland and Sweden, in polluted and in reference areas, and made proposals for a continuation and modification of the present system, supported by BITS and the Nordic Council of Ministers. Dr. Thulin reviewed the activities in the Baltic of the Institute of Marine Research and earlier cooperation with institutes in the Baltic countries. Dr. Sellerberg presented the new Baltic Sea Research Station in Karlskrona, belonging to the Swedish National Board of Fisheries. Prof. Ackefors informed about aquaculture activities in the Baltic area, particularly of salmon, and stressed the importance of following international quarantine standards at transfers and introductions of new strings and species. Messrs. Grip and Sjöberg referred to the extensive monitoring programme for environmental control, both in coastal areas and in the open sea.

12. In this context Mrs. Bergquist drew the attention of the participants to a paragraph concerned inter alia with coastal lagoons, wetlands, fishery biology and pollution in a document prepared for the forthcoming Diplomatic Conference on Resource Mobilization of the Baltic Sea Environmental Programme, to be held on 24-25 March 1993 in Gdansk, Poland.

13. The Chairman then summarized the information provided by listing five possible main areas of common interest. These were: (a) fishery statistics, (b) acoustic investigations, (c) integrated coastal fishery management, (d) oceanographic surveys, (e) aquaculture. He then asked the participants to elaborate their views on the most urgent needs in the Baltic. The meeting was adjourned for further work within the delegations and within smaller groups.

14. After resuming the session the following proposals were presented:

- Establishing a network for extended fisheries cooperation between the states bordering the Baltic Sea

- Acoustic assessments of fish stocks in the Eastern Baltic, Latvia, Estonia, Lithuania and Sweden
- Research on migratory fishes.
- Artificial spawning grounds for Baltic herring.
- Research on natural crayfish stocks.
- Assessment and monitoring of coastal fish resources.

15. After a discussion the Chairman summarized this by concluding that the proposals on fishery statistics, acoustics and coastal monitoring were the most urgent ones in all countries. The participants then continued elaborating details of these proposals, which are given in full in Annexes 6 – 8.

16. After thorough discussions the Conference stressed the need for the Baltic countries to seek the highest national priority for the proposals endorsed.

17. The Chairman thanked the participants for the cooperative spirit during the discussions and closed the Conference on 11 February 1993, 16.00 hrs.

18. The Report was adopted on 12 February 1993, at 09.30 hrs.

Annex 1

LIST OF PARTICIPANTS

ESTONIA

Mr. Lauri Vaarja, Director-General, National Estonian Board of Fisheries

Dr. Ahto Järvik, Director, Estonian Marine Institute

Dr. Robert Aps, Chief Specialist, Estonian National Board of Fisheries

Ambassador Elena Askerstam, Permanent Representative of Estonia to the Food and Agriculture Organization (FAO) of the United Nations, Rome.

LATVIA

Mr. Andris Ukis, Vice-Minister, Ministry of Maritime Affairs

Dr. Anatolijs Melnis, Chief Specialist, Department of Science and Research, Ministry of Education

Dr. Maris Vitinsh, Director, Latvian Fisheries Research Institute

Dr. Faust Shvetsov, Latvian Fisheries Research Institute

LITHUANIA

Mr. Algirdas Rusakevichius, Deputy Minister, Director of Fisheries Department, Ministry of Agriculture

Dr. Rimas Repecka, Senior Research Scientist, Laboratory of Marine Ecology, Institute of Ecology

Dr. Sharunas Toliushis, Director, Scientific Laboratory, Electrofishery Equipment "Elmar"

NORDIC COUNCIL OF MINISTERS

Mr. Johán H. Williams, Nordic Council of Ministers, Copenhagen

SWEDEN

Dr. Per Wramner, Director-General, Swedish National Board of Fisheries, Göteborg

Mr. Svante Ingemarsson, Deputy Governor of the County of Blekinge, Chairman, The Baltic Institute, Karlskrona

Dr. Armin Lindquist, Assistant Director-General, Swedish National Board of Fisheries, Institute of Marine Research, Lysekil, Chairman

Dr. Jan Thulin, Director of Research, Swedish National Board of Fisheries, Institute of Marine Research, Lysekil, Rapporteur

Professor Hans Ackefors, Zoological Institute, University of Stockholm

Mrs. Astrid Bergquist, Head of Section, Ministry of Agriculture, Forestry and Fisheries, Stockholm

Mr. Kjell Grip, Swedish Environmental Protection Agency, Solna

Mr. Åke Landqvist, Executive Officer, The Baltic Institute, Karlskrona

Dr. Erik Neuman, Director, Swedish National Board of Fisheries, Institute of Coastal Research, Öregrund

Dr. Gunnar Sellerberg, Director of Research, Swedish National Board of Fisheries, Baltic Laboratory, Karlskrona

Mr. Björn Sjöberg, Head of Section, Swedish Meteorological and Hydrological Institute, Oceanographical Laboratory, Göteborg

Mr. Hans Svensson, Director of Fisheries, County of Blekinge, Karlskrona

Annex 2

Opening statement by Dr. Per Wramner, Director-General, Swedish National Board of Fisheries

Ladies and Gentlemen, It is indeed a great pleasure for me to make an opening statement to this Conference for coordination between Estonia, Latvia, Lithuania and Sweden on fishery investigations in the Baltic. I am pleased to note that there are present so many distinguished guests from neighbouring countries, with which we have strong historical connections. On behalf of the Swedish National Board of Fisheries - the Government agency for fisheries and fishery management in Sweden - I would like to welcome you all to Sweden, Karlskrona, and The Baltic Institute to a conference which deals with an issue of greatest importance.

I wish to welcome particularly Mr. Vaarja, my colleague from Estonia, Mr. Ukis, the Vice-minister responsible for fisheries in Latvia, and Mr Rusakevichius, Deputy-Minister and responsible for fisheries in Lithuania. I wish to welcome the advisors from the three Baltic countries. I also wish to welcome Ambassador Askerstam, the Estonian Representative to FAO, Mr Williams from the Nordic Council of Ministers, and Mrs Bergquist from the Swedish Ministry of Agriculture, Forestry and Fisheries and all Swedish colleagues. You all are warmly welcome!

This meeting has been convened in cooperation with The Baltic Institute which operates to the benefit of all countries in the Baltic region. We appreciate the presence of Mr Ingemarsson, Chairman of the Institute and Deputy Governor of the County of Blekinge.

As you have seen from the prospectus which was attached to the invitation, this conference is not a scientific meeting but a gathering of high level administrators and their advisors to identify urgent needs in fishery investigations in the Baltic Sea and how those needs could be met with funding and regional coordination. A very important step after this meeting would be to achieve within the countries priority for fishery investigations on the national level. Applications for funds have then to be forwarded through official channels.

As fish move around, disregarding man-made boundaries, I think we will find that we need each other to manage resources. This should be done on the basis of adequate information. The same fish resources are used by all countries. Fish are heavily affected by environmental degradation and pollutants are moving around, in fish or in the water. This is another reason why cooperation is needed, also in environmental matters. The oceanographical situation of the Baltic sets the conditions for life and without knowledge based on concerted investigations nobody can identify long-term trends.

There have been enormous changes in the political situation of the three Baltic countries. With great admiration we have noted the scientific work done previously under difficult working conditions. Access to information was limited and so was participation in cooperative international investigations. We understand that there is now an urgent need to update hardware and software, and a need for training at all levels in order to

participate successfully in international fishery investigations.

It was therefore not a surprise when Ministers from two of the countries, responsible for fishing, requested Sweden to finance training and purchases of equipment. Consequently, the Swedish National Board of Fisheries approached the Swedish Ministry of Agriculture and the Swedish Agency for Technical and Economic Cooperation (BITS) for funds. Some funds were allocated to be used for arranging a meeting with the top-level administrators of fisheries in the four countries, assisted by their senior colleagues. It is for this reason we have met here in Karlskrona.

We have a rather heavy agenda before us and will discuss fishery investigations in the Baltic in some detail. We will find that funding is quite insufficient and that we will have to convince funding agencies that by doing nothing, fish stocks will be overfished, the environment will continue to be degraded and that we remain without knowledge on long term trends in order to judge the status of the Baltic.

There is, as you know, already cooperation in fishery investigations through the efforts of the International Council for the Exploration of the Sea (ICES). Some of your scientists are already participating in ICES´ work. Negotiations in the International Baltic Sea Fishery Commission are entirely based on the work of ICES. When ICES´ conclusions are based on poor data, results for Baltic fisheries become equally poor.

There is already some bilateral work going on between Baltic countries and Sweden, in part based on Letters of Understanding. I myself, and my colleagues, have repeatedly visited your countries. Thus, environmental monitoring is financed by the Nordic Council and BITS. Some work in fishery statistics, biological investigations, stock assessment, acoustical investigations, fish pathology etc. is financed with very limited funds by the Swedish National Board of Fisheries.

This conference is a very important one, for all of us. I wish you, I wish us, every success. We need a sustainable fishery in the Baltic - which requires a joint, sound fishery management, which requires knowledge of the environment and the fish stocks of the Baltic, which requires joint investigations, which in their turn require funds. I am sure that a precondition for funding will be a joint, comprehensive plan for fishery investigations in the Baltic and a main objective of this Conference is to prepare such a plan or at least to build up the foundation of it.

Thank you for your attention.

Annex 3

A period of transition in Estonian fisheries by Lauri Vaarja, Director-General, National Estonian Board of Fisheries

Thank you Mr Chairman. First of all let me express a great pleasure to meet people we have met several times before as well as those we'll be happy to make acquaintance with very soon. This gathering here in Karlskrona would not have taken place without special efforts from the Swedish side and therefore on behalf of the Estonian delegation I have the honour to express our thanks to the organizers for making the necessary arrangements in order to get us here to this meeting.

Today is also a good chance to express my greatest and deepest gratitude to the people I very much respect who, as I know, have always tried to do their best in the framework of possibilities to establish and to promote fruitful relations of joint activity between fisheries administrations of our countries. These people are Prof. Per Wramner and Dr. Armin Lindquist of the Swedish Board of Fisheries and a great number of others who have been actively promoting Swedish-Baltic relationships.

1. From where we started

I believe that participants of this meeting, because of their personal contacts, due to visits and ensuing exchange of information, are not lacking information about the situation in the Estonian fisheries. So, to my mind, there is no need to give you an extensive overview and therefore I limit myself by giving you only a brief description of the past situation as a background for my further thoughts and proposals.

It was not long ago we were still within the big empire ruled by the so called center in almost every area of human activity. And fisheries was no exception. Moreover, fisheries was totally centralized and there was not much to say on the part of the local government.

During the years of occupation, taking into consideration our geographical location and well developed infrastructure (harbours, railways, roads etc), Estonia as well as Latvia and Lithuania were used as starting base for ambitious expansion to the fishing grounds of world oceans. As a result of this expansion a large-scale Soviet style fishery was created where a lot of labour force from all over the former Soviet Union was used.

2. Where we are now

Now with the re-establishment of independence, Estonia inherited a big fishing fleet and coastal industries totally disproportionate to the country's needs. At the same time, Estonia has lost access to subsidized petrol, distant fishing grounds and (at least in the short-time) access to the immense eastern market.

That is why half of our fishing fleet remains idle. That is why our total catch and total output of fisheries production was only half the amount which was quite usual in previous years. In addition to that, militarization of the coastal area, forced collectivization, a policy of giving priorities to the deep sea fisheries, led to the situation where artisanal coastal fishery so natural to pre-war Estonia diminished drastically.

As you can see the state of things we are facing today is quite troublesome but not hopeless. Actually, it is the end of the postwar period of Soviet style fisheries and the beginning of a new development towards more integrated and harmonized national fisheries accompanied by privatization and decentralization activities.

3. What we have done

A number of legislative and organizational steps have been undertaken to reflect new conditions and create an environment encouraging private enterprise in fisheries.

A new body, the Estonian Board of Fisheries, was formed to develop and administer fisheries policy, maintain and protect fish stocks, coordinate research activities and issue regulations.

In spite of a relatively short period of existence, say 1.5 years, and the not at all numerous staff of the Board of Fisheries (10 full timers + 2 part timers), some work has been done and the start made is not bad. From the first of January 1992 a new fisheries law for the Republic of Estonia, one of the very first acts of new legislature, became valid and now after a year´s time we can say that it works, and works well! The law gives priority to local and professional fishing interests and establishes a licencing system and permits regional authorities to administrate fishing in coastal areas down to the 20m depth. Under this law an establishment of the Fisheries Loan Board has taken place and it is already of help for fish stocks reproduction. In the future it might be possible to finance some fishery research from this fund.

In addition to that the Estonian Board of Fisheries has been instrumental in working out:

- fishing regulations
- a law of the Estonian economic zone
- other legal acts and prescriptions on various issues;

- participation in the work of international organizations, such as IBSFC, NAFO, ICES, FAO; negotiations on international skeleton agreements on fisheries, on exchange of fishing possibilities;

- agreements with USA and the EEC; signed a memorandum with Canada;
- exchange of fishing possibilities with Finland, and the Faroe Islands.

An especially important event was the Swedish-Estonian negotiations, which took place in Tallinn in February 1993 with

a) an agreement on fisheries, and b) a protocol of reciprocal fishing rights in 1993.

I think we have had very good relations between fisheries administrations of different countries for some years. The Swedish National Board of Fisheries has given advice in building up the National Estonian Board of Fisheries and in training our fisheries administrators. We have gained and learned very much from the meeting with our Swedish colleagues.

And now, when working out a new fishery policy document, we are trying to follow your example taking into account recent developments in order to comply with EEC Fishery Policy.

After having studied some other approaches related to this issue seven broad policy items and development objectives should illustrate how to serve best the varied interests of the fishery:

1. The fishing industry must be internationally competitive, financially self supporting and a net contributor to the state economy.

2. Fishing should offer a prosperous way of life. At the same time, maximum participation in the industry must be encouraged both in jobs and diversity of ownership and must be consistent with resource availability and marketability.

3. All participants must have reasonable access to the resource and its economic benefits.

4. The industry must consist of a diversity of private interests of varying size, geographical location and ownership.

5. The fisheries must be viewed as an integrated whole. Harvesting, processing, distribution and marketing are closely interrelated and play equally essential roles in the industry.

6. It is of essential significance to encourage and support technical innovations or developments which display clear advantages in economic return, market access and resource conservation.

7. The fishing industry must be owned and operated by the private sector. Government involvement in the fishing should be limited and should reflect its responsibility to:

- protect resources;
- protect the interests of the state;
- create a suitable environment for investment;
- protect against monopoly conditions;
- assist in maintaining balance in the industry.

In order to carry out these objectives the structural build-up of the Board of Fisheries requires some changes. We have an idea what it should look like.

We don't believe that the staff of the Board should be more than 20-30 employees because of the country´s size and budgeting issues, but we do believe that these people should be highly qualified, knowing foreign languages, supplied with the best technical devices. Another problem is how to achieve all these levels.

The Estonian fisheries might need Swedish assistance (transfer of knowledge and experience, financial support etc) in the areas and issues defined for example in the final document of the East-West Symposium.

The East-West Symposium on cooperation in fisheries in the Baltic Sea Region (Tallinn-Espoo, 1991) clearly recognized that fishery administration, industry and research are three main areas of cooperation. The symposium recommended assistance (funds, know-how etc) to the Baltic States in order to strengthen their fishery administration which includes the building-up of standardized catch report systems, statistics, data bases, information systems etc, modernization of technical equipment and training of professionals.

These are all issues we have discussed with our Swedish colleagues not once but many times. So our needs are known and morally supported. As I understand we have also, in principle, agreed on solutions which could help us out of the present situation.

What we need, first of all, is of course assistance in matters within the state´s responsibility. There are international as well as national responsibilities concerning fish stocks management, such as:

1) thorough investigation of fish stocks assessment
2) regulation of fish stocks utilization.

Activities under 1) and 2) could become more operative and effective with an advanced information management system. This is the purpose of the project "Elaboration and implementation of information management system".

What does the project contain and which are the needs? Dr Robert Aps will give you detailed information on this project in the following presentation. Information on what is going on in fishery research, information on the work of the Estonian Marine Institute, information on ongoing and desirable cooperation in joint fishery investigation in the Baltic - all these issues will be highlighted by Dr Ahto Järvik.

Thank you, Mr Chairman

FISHERY INVESTIGATIONS IN ESTONIA

by Ahto Järvik,
Director, Estonian Marine Institute

Mr. Chairman, Ladies and Gentlemen. I would like to give you a short overview of fishery investigations in Estonia. Fishery investigations and ecological background studies were carried out in Estonia during the former USSR period quite intensively. But they were made in several institutions and while we accept the idea of competition between scientists as such, nowadays, considering the economic situation in Estonia, this diversity is too big for us. In autumn 1992 the Estonian Marine Institute was therefore founded,

on the basis of some scientific staff, separated previously. After some changes in the composition of the scientific staff and in the direction of investigations, there is now the structure given in Fig. 1, with the number of persons indicated in each section. As you can see, all scientific disciplines necessary for fish biology and stock assessment are represented in the new Institute. The institute is also responsible for marine basic research and for monitoring of both the marine environment and its living resources in Estonia. We had to decrease the number of staff and I hope that by establishing this united Institute, economic effects will be gained this year and in the future, from closer cooperation when collecting scientific data and from the more efficient use of the potential of researchers. For example, we could leave one small research vessel and reduce the staff by16.

The system of financing of our institute is presented in Fig. 2. In spite of the large number of potential financing sources we are not in a lucky position. The Institute receives its main funds from the state budget, through the Estonian Science Foundation and the Ministry of Environment. The Institute may also receive some financial support from the Fisheries Fund of Estonia. But, today the financial situation of the Institute is nearly critical, the minimum needs are covered only up to 75 per cent.

The only possibility to have some new equipment, as well as to participate in conferences, working group meetings, etc. abroad, is by getting international support. The biggest problem for the Institute is covering the running costs of the R/V "Livonia". There is no financing schedule for "Livonia" on the part of the Government. The vessel must be self-financing and we hope to have in the future some joint projects or contracts for the use of "Livonia" outside Estonia.

The international scientific collaboration of the Institute has been developing rapidly after Estonia became independent again in 1991. Scientists of the Institute participate in three projects under the umbrella of the Nordic Council of Ministers, together with Swedish and Finnish colleagues: 1) work on herring trawl selectivity, 2) coastal fish monitoring, and 3) salmon immunology. We also participate, together with Latvian and Lithuanian fishery scientists in the Marine monitoring strategy training programme, supported financially by BITS. We are very grateful for this cooperation and for the financial support from our Scandinavian neighbours.

Fig. 1

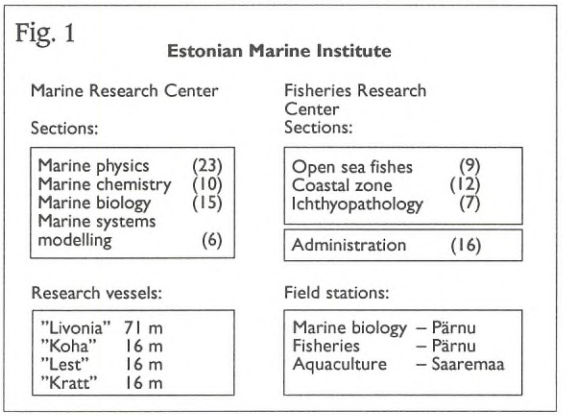
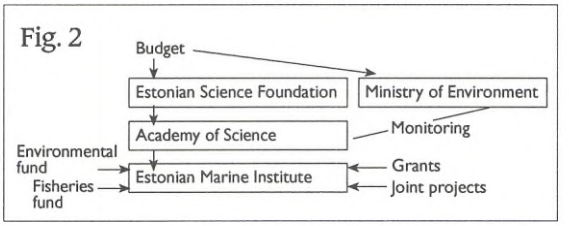


Fig. 2



An overview of investigations carried out by the Estonian Marine Institute is given in Tab.1. As you can see all main commercial species of fish in the coastal zone and in the open sea are studied. But only some of those (herring, sprat, pike-perch, flounder, and smelt) are studied on the level of internationally accepted stock assessment methods. The large coastal zone of Estonia with its great diversity of local fish stocks has been studied very little because it was closed during the Soviet period. Coastal fishing and fishery investigations were carried out in the Gulf of Riga and in the Moon Sound area. The coastal zone in the Gulf of Finland and in the Baltic proper was studied very little.

How fishery investigations should be developed according to the opinion of the Estonian Marine Institute, with financial support from BITS, is shown in Tab. 2.

Thank you for your attention and I hope that our Conference will be a great success.

Baltic Fisheries Information Management System as an instrument for cooperation

by Robert Aps, National Estonian Board of Fisheries

The importance of establishing the effective regional integrated system for collection and managing fisheries data throughout the Baltic cannot be overestimated. The Baltic Fisheries Information Management System (BFIMS) can be defined as an international computer network which could provide automatic data processing and satellite communication capability to system users. The core of this system is an integrated fisheries statistics program for collecting fishing, economic and sociological data (fish biology, stock assessment, fishing regulation, fishing technology, economical aspects, activities of the coastal population).

The aims of the system are:

1. to provide effective communication and teleconference capabilities for fisheries administrators and scientists around the Baltic Sea;
2. to provide fisheries information (statistics etc.) required by numerous national and international organizations (FAO, ICES, et.);
3. to provide scientific and technical information for decision making in conserving, developing and utilizing marine fishery resources;
4. to advance scientific understanding and research capabilities through the development of special data bases and new perceptions of biological, ecological, economical and sociological principles.

The implementation of the BFIMS is an essential prerequisite and instrument for effective cooperation between the fisheries administrations around the Baltic Sea. The BFIMS can be considered also as a frame and firm network for the future activities of the Baltic Fisheries Cooperation Committee (BAFICO), an initiative proposed by the Nordic Council of Ministers (see page 31).

Table 1:
Present research in the Estonian Marine Institute.

BIOLOGY, species:
herring, sprat, flounder, salmon, sea trout, whitefish, pike, pike-perch, perch, roach, smelt.

BIOLOGY, aspects:
reproduction (spawning grounds); feeding (prey objects); growth; distribution; stock structure (age, length); environmental impacts; parasites; diseases (flounder mainly).

ASSESSMENTS:
Herring (data for ICES + young fish survey)
Sprat (data for ICES)
Flounder (analyzing of cpue and catch composition)
Salmon and Sea trout (spawning rivers survey, catch composition)
Pike-perch (catch composition, recruitment, cpue)
Perch (catch composition, modelling: perch vis-avi pike-perch and perch)
Ide (catch composition, modelling: depends on hydrometry parameters)
Pike (catch composition, recruitment)
Smelt (catch composition, reproduction, VPA)

FISHING TECHNOLOGY

AQUACULTURE

HYDROBIOLOGY
Phytoplankton, zooplankton, benthos, macrophytes.

CHEMISTRY
Biogenes, heavy metals, chlororganic and some other organic contaminants.

PHYSICS
Water parameters (T, S and others), water disturbances, micro- and macroprocesses, models.

Table 2:
Future research activities of particular interest

1. Development of the integrated coastal fisheries management system;

2. hydroacoustical surveys;

2.1. for herring and sprat (cod) in the Baltic proper;

2.2. for herring and sprat in the Gulf of Finland, in coastal fisheries, and in the Peipus lake;

3. training of young scientists in the field of stock assessment;

4. facilitation for participation of scientists in activities of ICES, and in other international bodies.

Annex 4

Latvian Fisheries Research by Maris Vitinsh, Director, Latvian Fisheries Research Institute

In the structure of national economy of the Republic of Latvia the fishing industry takes a significant place. This is due to the beneficial geographic position and favourable climatic conditions, access by navigation, abundance of freshwater bodies, substantial productive capacities available for processing and storage of raw fish, fish products and aquaculture development. There are 3 large and 6 smaller fishing ports in Latvia. Latvian fishery has age-old traditions, with high-powered fishing, refrigerator and cargo fleets. The total annual Latvian catch in the Baltic in recent years amounted to about 60 000 tons annually. The Latvian quota for 1993 is 83 000 tons.

Latvian fishery science has old traditions in international cooperation. Since 1924 Latvia has been a member of ICES. In 1992 our country applied for restoration of its membership in this international body. Returning to recent history, until 1991 the fishery investigations in the waters of Kaliningrad district, Lithuania, and Latvia, were performed by the Fisheries Research Institute in Riga, operating 4 research vessels, and covering research topics such as environment, fish stocks, fishery techniques, artificial reproduction of valuable fish species. In 1991, under pressure of the economic situation and considering the needs of Latvia, a reorganization of the structure, personnel, and topics took place. The Environment Research Laboratory, with the exception of the work on fishery oceanography, was transferred to the Hydrometeorological Agency. The number of personnel was reduced 3 times. Only one research vessel is now in use. Main research is concentrated to the waters of Latvian jurisdiction, with an objective to provide the scientific basis, for national and international management of living resources.

1. Financing

The Latvian Fisheries Research Institute (LATFRI) is a state institution under the Ministry of Maritime Affairs. It is the only institution in Latvia engaged in fisheries research in the sea. Another research unit under this Ministry is the Laboratory of Inland Waters, working out cadastres of lakes in Latvia, see Fig. 3.

Main research projects of LATFRI correspond to requests of the Ministry and are:

Project 1.
State of fish stocks, catch prognoses, proposals for fishing regulations in the Latvian jurisdictional waters in the Baltic.

Project 2.
Artificial reproduction and rational utilization of stocks of salmon and other valuable fishes.

Subproject.
Management of living resources of the coastal zone.

The Ministry of Maritime Affairs applies for funds from the Department of Science and Research for financing from the state budget projects for applied sciences.

It has to be understood that in a situation of the deep economic crisis in Latvia possibilities of science financing are rather restricted. For example, from draft funding of the 2 mentioned projects amounting to about 13.8 million LVR, about 97 per cent of the money is used to cover wages, expedition costs, taxes, maintenance and infrastructure, and partly, chartering of research vessels and cutters. No money remains for equipment modernization and for participation in international scientific meetings and working groups. Our Ministry is aware of this situation and is supporting the institute with some additional economic agreements with other organizations and private firms. Invaluable assistance is received from international cooperation and projects, including projects financed by BITS.

2. Structure of LATFRI

There are 2 laboratories in the Institute, see Fig. 4. The Laboratory of Marine Biology comprises the sector of pelagic fishes, the sector of demersal fishes, groups of mathematicians and oceanographers, with a total of 27 scientific personnel. The Aquaculture Laboratory has 9 scientists, including specialists on feeding physiology, genetics, fish diseases and ichthyology. The Institute has archives with a scientific data base, covering the period since the 1960s and Subdivisions of the Baltic 25, 26, 28, 29. The Institute´s scientific library consists of about 10 000 books and has 550 periodicals. The total personnel of the Institute is 63.

The research vessel "Baltijas Petnieks" (former name "Issledovatel Baltiki") – a 54.8m stern trawler, 635 BRT, was built in 1984; size of crew - 25, 6 places for scientists, two laboratories. The vessel belongs to the state organization Riga Trawler and Refrigerator Fleet Base. The Institute charters this ship on the basis of an agreement on joint exploitation.

To collect data from commercial catches in the open sea and to perform investigations in the Gulf of Riga, smaller fishing cutters are chartered.

In the coastal zone a few fishermen using commercial nets, trap-nets and seines are employed by the Institute.

The Institute has no field station of its own, but hires during expeditions laboratories in Pape, Lielirbe and Kolka.

3. Subjects, areas and methods of investigations

All investigations can be grouped as follows:

1. Research directly related to fishery management.

2. Strategic research.

The first group includes:
- current assessment of stocks
- solution of problems related to current fisheries
- monitoring of fish stocks and environment, routine research vessel surveys
- preparation of material, participation in international (ICES) working group activities
- advisory functions at the national and international levels on matters of fishery management, aquaculture and aquatic environment.

The strategic research includes:
- multispecies assessment, feeding and food relations
- studies on distribution in time and space of marine organisms
- studies of long-term effects of environmental changes in fish stocks
- ecosystem modelling.

Species investigated: long-term investigations on internationally managed stocks of herring, sprat, cod, salmon, flatfishes and stocks of national interest- sea-trout, vimba, river lamprey, eelpout. Research on pike-perch, perch and whitefish has started this year. Subject to the availability of funds, the Institute is investigating the ichthyofauna of Latvian sea waters with a view for elaborating proposals for inclusion in the Latvian Red Book.

Fig. 3

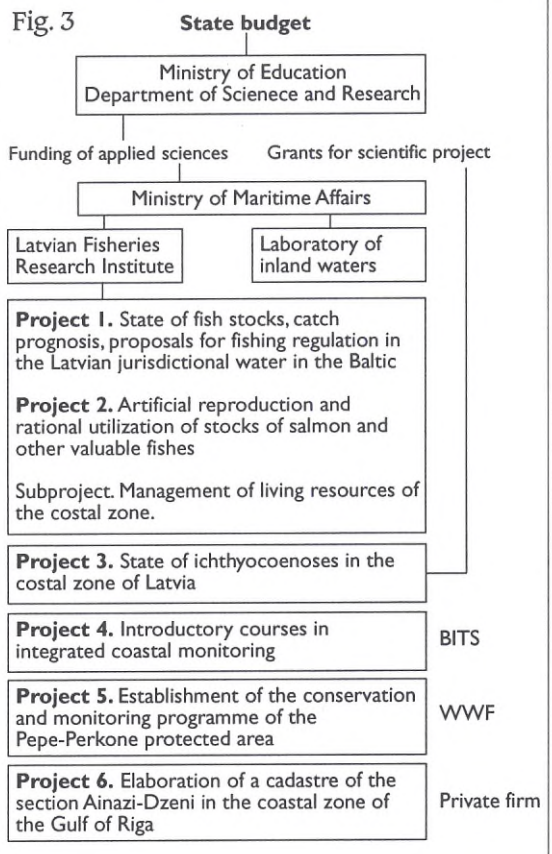
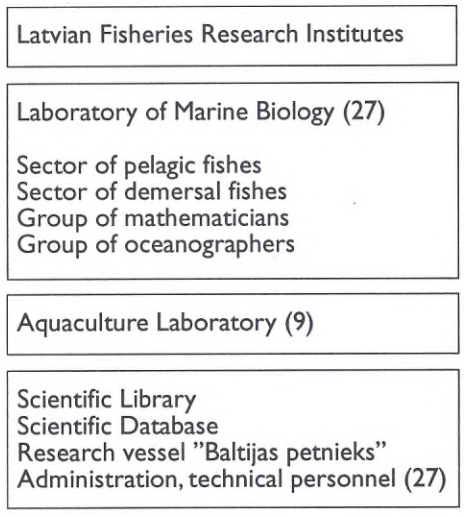


Fig. 4



Areas investigated: emphasis on waters under Latvian jurisdiction. As regards investigations on the distribution, stock size and reproduction of cod and sprat, on the distribution of ichthyoplankton, and on the hydrographic regime, such surveys overlap with those of other countries.

All biological investigations on stock assessment and on fishery regulations are performed with methods accepted after discussions in ICES. Those include reproduction biology, food supply, feeding, growth, recruitment, mortality.

Hydrographical data are collected parallel to biological surveys. This year we will start to use instruments with depth, temperature, salinity and oxygen sensors.

Latvia is the third largest producer of salmon smolts in the Baltic, both from reared and from wild spawning. Salmon fry in rivers is surveyed by electrofishing equipment and smolts migrating down-stream by research-traps. Each year 5 000 to 10 000 smolts are tagged and/or fin-clipped. The efficiency of salmon hatcheries is monitored by the Institute.

4. Cooperation within Latvia

As I said, primary production and environment quality investigations were separated from the Institute in 1991, when the Marine Monitoring Center was established, with which we are now cooperating in research and monitoring. In coastal investigations we have joint works with the Institute of Biology, Laboratory of Inland Waters, and the Latvian University.

5. International cooperation

Latvian fisheries research has traditionally been connected with ICES programmes, working groups and study groups. At the Statutory Meeting in Rostock in 1992 5 papers were presented by our scientists.

The success of the implementation of programmes under ICES depends on comparable methods and research tools, on the operation of research vessels, and on the possibility of scientists to participate in working group meetings. All those three factors are now hot spots in Latvian fishery research.

Great attention is paid to bilateral cooperation and programs and we cooperate with our closest neighbours - the Baltic States. With the Estonian Marine Institute work on stock assessment for herring and flounder is coordinated, as well as re-

search on pike-perch and other investigations in the Gulf of Riga. For the Lithuanian Institute of Ecology we are preparing an extract of biological data for the last 10 years on main fish species in Subdivision 26.

We have a cooperation agreement with the Kaliningrad institute ATLANTNIRO, on an exchange of data, on information about methods, exchange of scientists, and with planning of research cruises. Our specialists assisted this institute in interpreting the results of the first hydroacoustic survey in the Baltic.

Latvia has its longest sea border with Sweden. In the light of an intergovernmental agreement on fisheries between our countries, based on the mutual interest of conservation and rational exploitation of living resources of the Baltic, the Latvian institute has cooperation agreements with the Institute of Coastal Research in Öregrund and with the Institute of Marine Research in Lysekil.

Cooperation with the Institute of Coastal Research is within "Introductory courses in integrated coastal monitoring", financed by BITS. It has provided us with invaluable methodological and instrumental support in developing our own coastal research and monitoring. This is an example of excellent programme planning and organizing. We consider this programme as a starting point for further cooperation in coastal research.

Regarding coastal research, LATFRI has applied for funds from the World Wide Fund For Nature for the project "Establishment of the conservation and monitoring program of Pape-Perkone protected area". It was done with the kind assistance of Dr. Bertil Hägerhäll and Dr. Bernt Ingemar Dybern. The aim of this program is to get financial and technical assistance to continue underwater monitoring of the status of the last, longest and most valuable Furcellaria - Blue mussel biocenosis on the Eastern Baltic, in the area south of Liepaja. Our underwater research group has carried out long-term investigations. It has relatively good equipment and was very close to cease its activities due to lack of funding.

From what has been stated above on coastal research and monitoring, one can conclude that there exists a good cooperation and that there are good prospectives for the future.

6. Most urgent needs

The hottest spot in our fishery research is presently the operation of our research vessel. If we want to continue to cooperate in ICES international research programs or in bilateral cooperative programs and data exchanges, the equipment of our research ship "Baltijas Petnieks" has to be modernized.

In the cooperation agreement between our institute and the Swedish Institute of Marine Research, item 1 concerns hydroacoustic investigations.

Some historical notes. The hydroacoustic method on our ship was elaborated in 1977 and since 1983 regular spring and autumn surveys of herring and sprat are undertaken. The results of those surveys have been used in ICES working groups for tuning of the VPA for sprat. In 1989 and 1990 autumn hydroacoustic surveys were performed jointly with the Swedish research vessel "Argos". Sweden organized an equipment calibration near the island of Hogen and refunded harbour charges in Västervik. As a result, our survey results have become comparable.

It happened that in 1991, only the Latvian research vessel was available to carry out hydroacoustic surveys in the Baltic, in an area from Bornholm to the Gulf of Finland (see Figs. 5 and 6). The survey data were used in Working Group estimates of stock size for 1993. All survey results were made available to the Swedish institute.

The equipment onboard the "Baltijas Petnieks" is old and a lot of hand power is necessary to transfer integrator data to computers. There is no possibility for an operative analysis of intercalibration results. The working frequency used, 20 kHz, differs from that of Simrad systems, 38 kHz, which is generally used.

In order to have fruitful cooperation, hydroacoustic equipment of the type EK-500 is needed

onboard the R/V "Baltijas Petnieks". In this context a training course on the use of the equipment and on data processing would be necessary.

Second in order of importance is a small portable oceanographic winch for our research vessel. It should have a drum capacity of 700m, for a cable with a diameter of 2.8mm, equipped with a 2-pole slip ring, and have a speed control from 0 to 0.7 m/sec. The power supply should be 220 VAC and 24 DC (produced by ME Meerestechnik-Elektronik GmbH, Germany). Additionally, electronic balances are needed for fish weighing.

In our cooperation agreement training and exchange of experience in intercalibration of ageing, food analysing techniques, and studies on fish diseases are included. Funds for such training exercises and exchange of experience would be much appreciated, especially for young scientists.

Finally I would like to thank Sweden for the existing cooperation in fisheries research and express the hope that it will become closer and wider in the future.

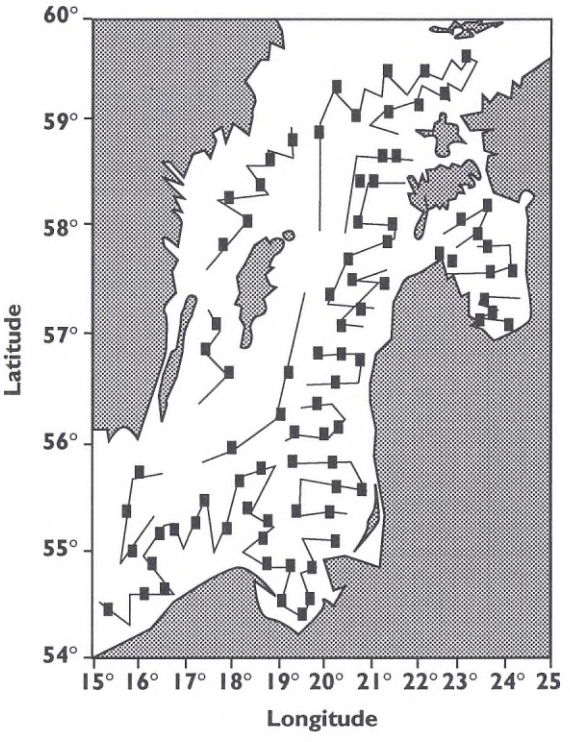


Fig. 5 *Cruise tracks of R/V "Isseldovatel Baltiki" and trawl stations in October – November.*

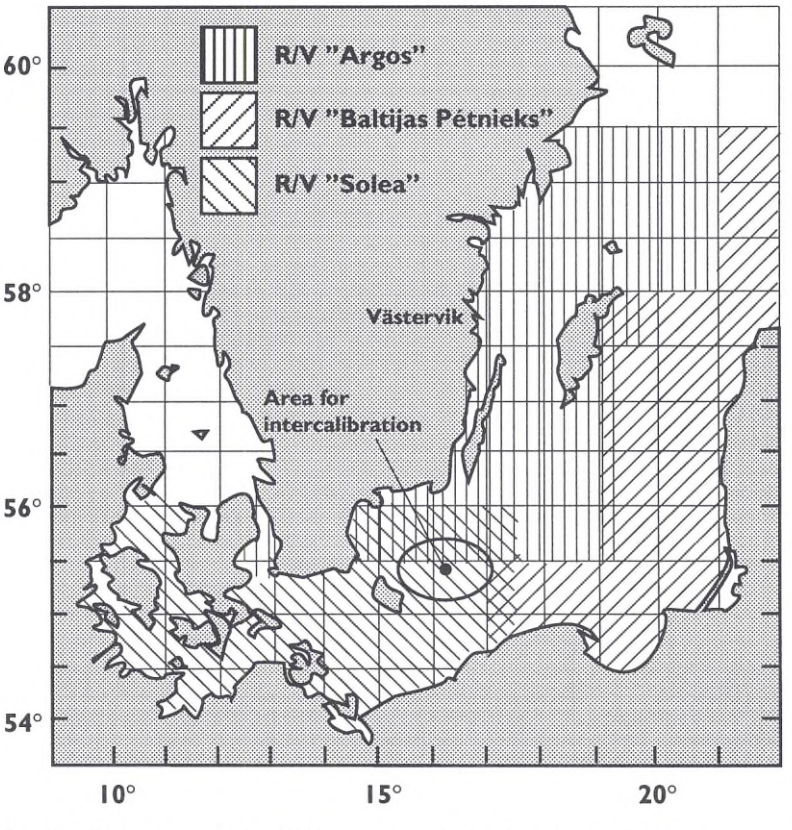


Fig. 6 *Allocated area for different vessels during the 1992 survey and the preliminary area for intercalibration.*

Annex 5

Fishery investigations in Lithuania by Algirdas Rusakevichius, Dep. Minister, Ministry of Agriculture

ORGANIZATION OF THE LITHUANIAN FISHING INDUSTRY

Fishery and aquaculture are important branches of the Lithuanian economy.

Because of the economic crisis and the loss of fishing rights in traditional areas the total catches of the Lithuanian fishing fleet in the open sea and in the Baltic have decreased in recent years from 326 000 to 185 500 tons. In the Baltic Sea total Lithuanian catches have been reduced from 18 000 to 10 000 tons in the same period. Total catches in the inland waters of Lithuania (Couronian Lagoon, lakes, water reservoirs, rivers and pond farms) amounted in 1992 to 5 600 tons - 62 per cent of the figure for 1990. 131 000 tons of fish food-stuffs, including 24 million cans and 12 000 tons of fish meal were produced in vessels and in coastal fish processing plants in Lithuania (62 per cent of the figure for 1990).

The overall responsibility for fishery policy lies with the Ministry of Agriculture. The most important role is played by the deep-sea fisheries, operating in international waters all over the Atlantic Ocean. The Baltic fishery delivers about 5.5 – 6.0 per cent, inland fisheries, including fish farming, give about 3 per cent of deliveries.

Deep-sea fishing, fish transportation, as well as processing plants, although in great majority still state-owned, are profit-oriented. Due to the liberal ecomomic policy of the state they are not subsidized. All those plants are now in a very bad financial situation.

The development of the private sector started in 1992 and is oriented only to inland and coastal fisheries.

The process of privatization is gradually gaining strength, but, due to the lack of sufficient financial resources, extremely high interest rates and the very small interest shown by foreign investors, this process is not very effective.

A great part of the Lithuanian fishery, fish processing plants, institutions, organizations, fish farms, hatcheries, are, as regards their regulation, within the competency of the Ministry of Agriculture, Fisheries Department. The Fisheries Department has two Divisions - the Division of Deep-sea Fisheries (in Klaipeda) and the Division of Inland Fisheries (in Vilnius, Fig. 7). The centre of the Department is in Vilnius. The Department is headed by the Deputy Minister of Agriculture - Director of Fisheries Department. The heads of both Divisions of the Department are also Deputies of the Director of the Department.

Representation of Lithuania in international fishery organizations and commissions, establishing and maintaining of international relations with foreign countries, management of the activities of the Lithuanian deep-sea fishing fleet in international waters and in exclusive fishing zones of foreign countries, are the prerogative of the Fisheries Department.

Specialists of the Department also work with many domestic problems and questions related to fishery regulations.

The management of fish resources and licensing in the Lithuanian fishing zone in the Baltic Sea and inland waters is conducted by two Departments - the Environment Protection Department (reporting directly to the Parliament of Lithuania) and the Fisheries Department.

Fishery and fishery investigations in the Baltic Sea and Couronian Lagoon.

The Lithuanian coastal zone is very short, only about 99 km long, so our economic zone is the smallest of all the Baltic countries. It includes the open Baltic Sea and a part of a lagoon - the Couronian Lagoon. The Lithuanian economic zone is not yet fixed but we believe it will be so after negotiations between Lithuania and its closest neighbours, Latvia, Russia and Sweden.

Although small the Lithuanian economic zone is one of the most fish-rich areas in the north-eastern part of the Baltic with big herring, sprat and cod stocks as well as with migratory and fresh water fish species.

Investigations on the fish resources in the open part of the eastern Baltic, including the Lithuanian economic zone, were for a long time performed by the Latvian Fisheries Research Institute. The Lithuanian ichthyologists worked only in the coastal areas. We had neither the experience nor equipment to work in the open sea, so up to now we have been supported with data from our Latvian colleagues. The Lithuanian economic zone takes up only 7.8 per cent of all areas of the former USSR in the Baltic Sea. The stocks of the main marine fish species, however, are much higher. Although Subdivision 26, which includes the Lithuanian economic zone, covers only about 23.6 per cent of the whole economic zones of the Baltic Republics, it has 47.7 per cent of the cod stocks.

According to the Latvian Fisheries Research Institute there are also large stocks of herring in the economic zone of Lithuania, They comprise about 10 - 25 per cent of all herring stocks in Subdivision 26, in the order of 20-50 000 to 40-80 000 tons. Sprat stocks in our economic zone reach 25 per cent of the sprat stocks in the whole Subdivision 26.

The research on populations and communities of hydrobionts and fish stocks in the Couronian Lagoon and coastal zone of the Baltic Sea as well as in the inland waters are carried out by the Institute of Ecology. However, we have only one Laboratory of Marine Ecology which carries out investigations in the Baltic Sea and the Couronian Lagoon. The Laboratory has two sections, the ichthyological and the hydrobiological sections (Fig. 8) and has a total of 18 scientific and technical staff, including specialists in fish biochemistry, physiology, fish diseases and ichthyology. The research programme in the Couronian Lagoon and in the Baltic Sea costal zone covers subjects as follows:

1 investigations of toxical and geotoxical effect on hydrobionts;

2. investigations of changes of population parameters (growth, abundance, age distribution, reproduction, sexual maturity);

3. investigations of pathological status of populations (infection, invasion, cancer diseases, genetical disturbances);

4. investigations of changes of communities structure (species composition, species elimination, changes of dominant fish species).

The Institute has field stations in the delta of the river Nemunas near the Couronian Lagoon (Rusne), on the coast of the Lagoon (Vente) and in Klaipeda. Research vessels are old and small, they were only used in the Couronian Lagoon.

Wide hydrobiological and ichthyological investigations in the Couronian Lagoon have been carried out since 1949. In the coastal zone of the Baltic Sea investigations have been performed only since 1990 when the problem of finding a place for the construction of an oil terminal appeared. Lithuanian ichthyologists have taken part occasionally in some investigations in the Baltic Sea and the Lithuanian coastal zone.

Since 1934 our ichthyologists have registered more than fifty fish species, but only a few of them with high abundance and high stocks.

In our investigations of the coastal zone of the Baltic in recent years we registered 32 fish species. Those investigations were made by trawling, by catching with multi-mesh size nets and with beach seines. Herring, flounder, turbot, bream, pike-perch and vimba were the dominating species with great abundance and biomass. The fish species composition was correlated with fishing area and depth. The abundance of marine species was increasing while freshwater and migratory species were decreasing from north to south of Klaipeda and from the coastal zone to greater depths. Cod was now only occasionally registered and in the coastal zone, compared to the situation during 1977-82 when cod accounted for 50 - 80 percent of all catches with multi-mesh size nets.

The Lithuanian economic zone includes very important spawning grounds for the Baltic herring, sprat, turbot and for other fish species. The greatest abundance of fish roe and larvae in Lithuanian coastal zone is to be found between Karkle and Sventoji. This area differs from other coastal areas: the sea is more shallow and there are many stones and algae (Fucus and Furcellaria) on the bottom. The area is the main spawning ground for herring, turbot and sprat. However, the area is very much affected by pollutants from Nemunas river and Couronian Lagoon waters.

Fishery in the Baltic Sea is carried out by the Fishery Joint-Stock Company "Baltija", and by the State Fish Farms "Neringa" and "Pajurys". They fish for herring, sprat, cod, salmon, flounder, and other fish in the Lithuanian fishery zone. The Fishery Joint-Stock Company "Baltija" has 40 trawlers. The company is the biggest user of the Lithuanian fishing quota - up to 80 per cent. The company has the following activities: fishing, fish processing, repairing of vessels, production of fishing tackle, selling of fish products. Two refrigerator trawlers and two other trawlers are specialized in canning. The factory of the company processes more than 20 tons of fresh fish every day. The total catch of the State Fishery Farms "Neringa" and "Pajurys" has fluctuated from 3 690 to 1 800 tons in the period 1961-92. Those farms own only 11 trawlers. A small part of them is specialized not only for fishing, but also for making non-sterilized canned fish. Those farms have small coastal fish processing plants for the production of frozen and smoked fish.

The Lithuanian commercial catches in the Baltic Sea consist mostly of herring, sprat and cod (Tab. 3). The catches of herring and sprat were stable for a long time but were increasing in recent years. The highest catches of cod were made in 1980 (26 621 t) and have been decreasing since then. In 1991 the Lithuanian fishermen caught only 1 849 t of cod and in 1992 only 497 t (catch figures for 1992 are not completed, we have not got information from some farms, but they caught much less than the farm "Baltija"). Catches of flounders, mostly river flounder, and turbot were not high and reached little more than one hundred tons: 166 t - in 1990, 101 t - in 1991, for example. Salmon has not been fished by our fishermen for a long time. Only some tons of salmon were registered in 1979 in the Lithuanian catches. The catches have increased in recent years and reached 67 t in 1990 and 63 t in 1991. Sometimes other fish species are registered in the catches: bream, smelt, perch, vimba, pike-perch and others. The landings of these fishes are not high and reach only some tons.

The Couronian Lagoon was one of the most fish-rich areas in Europe for a long time, where stationary and migratory freshwater fish species could be observed. At the beginning of the century commercial catches were up to 80 kg/ha, but now it has decreased by almost half and accounts for about 40-45 kg/ha. The fish resources decreased due to a high pollution level, especially in the River Nemunas estuary, where the main spawning areas of stationary and migratory freshwater fish species are located. At present the ecological situation of the Couronian Lagoon is very difficult - the delta of river Nemunas is overgrowing with grass, it is getting muddy and all this is partly preventing fish migration, feeding and spawning. Particularly, the

Couronian Lagoon is suffering from badly cleaned waste waters. As a result of this development, the structure of species caught in what has been earlier one of the most productive lagoons in Europe, has deteriorated.

On the coasts of the Couronian Lagoon there are four fish farms: "Rusne", "Kintai", "Dreverna", and "Neringa". The fishermen of those farms catch fish in that part of this unique lagoon which belongs to Lithuania.

The species composition in the commercial catches in the Couronian Lagoon differs from that in the sea (Tab. 4). The Lagoon is mostly a freshwater basin. The water in the north of the Lagoon may sometimes reach about 3 per thousand but only when the north and northwest winds dominate. All catches in the Couronian Lagoon differed in recent years in ranging from 4 to 7 000 tons per year. The catches of Lithuanian fishermen accounted for about 40 per cent of all catches and reached about 2 000 tons. Roach, bream, ruffe, smelt, perch, pike-perch dominated the catches.

Based on many years of ichthyological investigations (from 1949 onwards) and on fishery statistics, prognoses are made for optimum fish catches. The results have shown that the fish resources in the Couronian Lagoon in recent years have been stable and are being used optimally. The exceptions are the stocks of eel and ruffe which have been decreasing catastrophically.

We have many problems concerning investigation and estimation of resources of Baltic salmon, sea trout, brook trout, and other valuable species and the effectiveness of their natural spawning in the rivers of Lithuania. Today we have to start these operations on a larger scale, because 20 years ago these operations, including artificial breeding of Baltic salmon, sea trout and vimba were halted without any reasons by persons responsible for inland fisheries during the Soviet time. And till now we have not the necessary financial possibilities for the development of these important operations. We are expecting methodological, technical and financial support in this sphere.

In order to protect the decrease of resources of salmonid species and to guarantee their optimal level in the fishery zone of Lithuania, we have to build, in the nearest future, at least one salmon hatchery with full capacity of 200 000 salmon smolts per year. We have to reconstruct other Lithuanian hatcheries according to the latest technological demands.

International cooperation

We have good relations and cooperate with all our neighbours. The Latvian Fisheries Research Intitute helped us to commence investigations in the Baltic - we have recieved methodological support and biological data on main fish species in Subdivision 26 for the last 10 years. The Institute of Ecology cooperates with the Kalinigrad institute ATLANTNIRO in the investigations of fish stocks in the Couronian Lagoon. Since 1991 we cooperate with the Institute of Coastal Research in Öregrund within the pogramme "Introductory courses in integrated coastal monitoring", financed by BITS. Thanks to this cooperation and Programme we have had invaluable methodological and instrumental support in developing coastal research in the Couronian Lagoon and the Baltic Sea.

We would cordially like to thank the Swedish side for the cooperation in fisheries research and express our hope that in the future it will become even closer and wider.

Note. The Structure of fisheries administration in Lithuania, the Structure of fishery, environmental, and hydrological investigations in the Couronian Lagoon and in the Baltic Sea, as well as the scheme for Financing of environmental and fish resources investigations in Lithuania are given in Figs. 7, 8, 9, respectively.

Fig. 7

Structure of the Fisheries Administration in Lithuania

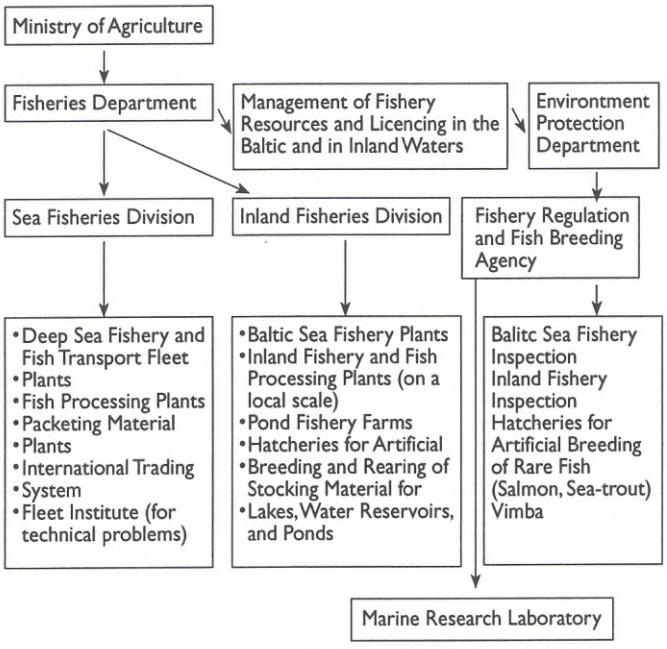


Fig. 8

Structure of Fishery, Environmental, and Hydrological Investigations in the Couronian Lagoon and in the Baltic Sea

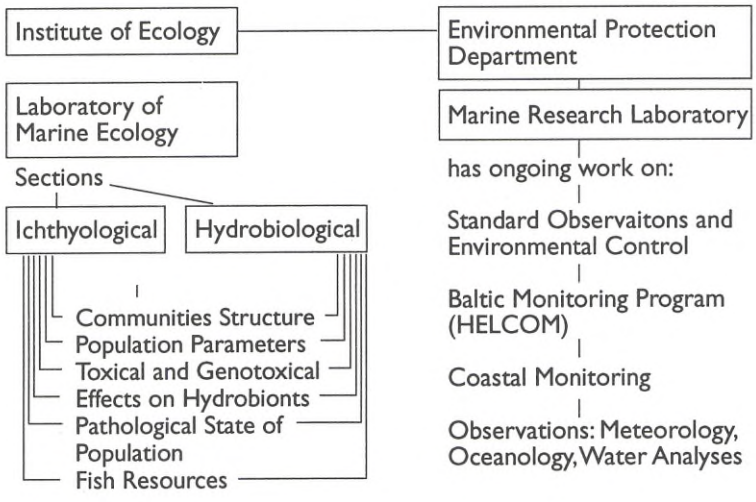


Fig. 9

Financing of Environmental and Fish Resources Investigations in Lithuania

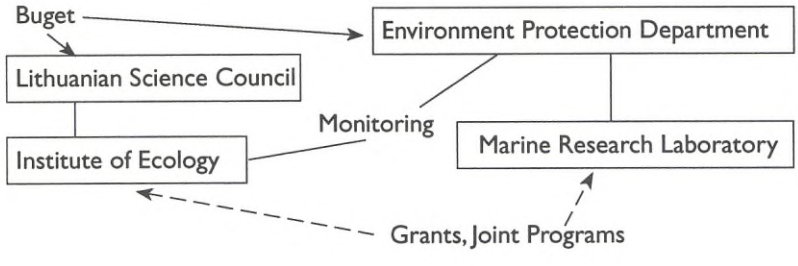


Table. 3.
Lithuanian commercial catches (in tons) of marine fish species in the Baltic Sea

Year	Herring	Sprat	Cod
1980	5651	3039	26 621
1981	4933	2667	18 184
1982	4962	2028	15 874
1983	5968	1624	14 139
1984	5613	2210	18 755
1985	5810	3273	12 900
1986	5804	3266	11 735
1987	6280	4348	9 386
1988	6547	3159	8 044
1989	6943	4488	4 551
1990	8257	5415	2 941
1991	6467	6655	1 849
1992	3337	3285	497 only farm "Baltija"

Table. 4.
Lithuanian commercial catches in the Couronian Lagoon (in cwt)

Year	Smelt	Pike	Eel	Roach	Bream	Turbot	Perch	Zander	All fish
1981	661	299	202	7 161	4 682	58	868	1 094	19 430
1982	355	383	170	11 537	4 587	130	1 011	1 198	23 133
1983	335	320	148	10 876	4 614	289	901	1 502	21 601
1984	1 014	437	110	9 090	4 508	418	689	2 095	21 763
1985	577	235	175	7 683	4 239	365	442	3 932	20 510
1986	208	248	198	2 813	4 458	408	379	564	18 034
1987	426	267	107	7 051	5 840	529	1 180	292	19 877
1988	1 025	374	147	5 744	7 085	701	2 035	345	20 801
1989	1 388	333	104	6 925	6 042	524	1 558	603	22 406
1990	389	309	83	7 153	6 517	564	2 108	914	23 972
1991	284	105	63	6 153	3 864	352	1 478	866	14 653

Annex 6

Baltic Fisheries Information Management System. Estonia, Latvia, Lithuania.

Establishing a network for extended fisheries cooperation between the states bordering the Baltic Sea.

The independent Baltic States shall participate in international exchange of fisheries information. Such a programme may be complicated but can be solved through special computer-based information management system. The elaboration and implementation of this system is an essential precondition for effective cooperation between the states bordering the Baltic Sea in conservation and rational utilization of the Baltic marine fishery resources.

The two-level Baltic Fisheries Information Management System will fulfil both national and international commitments of the Baltic States concerning the collection, processing and presentation of the fisheries information.

The system is at an international high level since it is based on the electronic mail (E-mail) international network. The components of this system are the national computer networks for administrative and scientific purposes. The development of national information management systems is an essential prerequisite for successful fish stock assessment and management.

The aims of the system are:

1. to provide fisheries information (statistics etc.) required by numerous national and international organizations (FAO, ICES, etc.);
2. to provide scientific and technical information for decision making in conserving, developing and utilizing marine fishery resources;
3. to advance scientific understanding and research capabilities through the development of special data bases and new perceptions of biological, ecological, economical and sociological principles.

The national systems will be designed individually under supervision of Swedish specialists and the personnel should be trained in Sweden.

To commence the implementation of the system each Baltic State needs two personal computers: one computer (server) within the fisheries administration body and another one within each country with two modems and some standard software supporting networks and databases. These computers will be used to work out the reasonable design for the whole systems.

Estimated time frame: 12 months.

The following man power resources are needed: Swedish specialists visiting Estonia, Latvia, and Lithuania; training in Sweden of specialists from each of the three Baltic countries.

It is envisaged that the following equipment is needed: Network servers (8Mb internal memory, 630Mb HD or equivalent), workstation (2Mb internal memory, 40 Mb HD or equivalent), modems (9600 Bd or equivalent); adequate software supporting networks and databases.

Annex 7

Acoustic assessments of fish stocks

1. OPEN SEA

To establish TAC and national catch quotas in IBSFC, acoustic surveys of fish stocks are necessary. Among the Baltic states only Latvia has a research vessel suitable for such surveys and specialists experienced in acoustic research. At the Latvian R/V "Baltijas Petnieks" base and Swedish Institute of Marine Research the training of Latvian, Estonian and Lithuanian specialists in acoustic surveys and data processing methods takes place. For this it is necessary that the hydroacoustic laboratory of R/V "Baltijas Petnieks" is modernized according to international standards of hydroacoustic research in the Baltic.

The programme extends to 3 years. In 1993 equipping of an acoustic laboratory on R/V "Baltijas Petnieks" and training in Sweden takes place. In 1993-1995 the R/V "Baltijas Petnieks" performs acoustic surveys in eastern Baltic according to the program of ICES with the participation of specialists from Estonia and Lithuania. The results of the surveys are presented to Latvia, Estonia, Lithuania, Sweden and ICES.

2. COASTAL ZONE

The development of acoustic surveys of fish stocks inside the territorial waters of Estonia and Lithuania and also in the Peipus Lake in Estonia is planned during the second stage of the project (1994-1995) and will be developed in connection with the project described in Annex 8. In the surveys portable acoustic complexes for small vessels will be needed.

ESTIMATED TIME FRAME: 1993 – 1995

Man power required for items 1. and 2.: Swedish experts for training of scientists from the Baltic states, starting as soon as possible. Equipment needed for item 1.: scientific echosounders of type EK-500 or equivalent, calibration spheres for echosounders, software; PC hardware and software. In addition: running costs of R/V "Baltijas Petnieks" are needed.

For item 2.: portable hydroacoustic equipment including PC hardware and software (at a somewhat later stage).

Annex 8

Assessment and monitoring of coastal fish resources

BACKGROUND

After the collapse of the USSR, the fishery industry of Estonia, Latvia and Lithuania has changed radically. The earlier dominating herring and sprat trawl fisheries have dropped and the less expensive coastal fishing with fixed gear for exploitable species has increased rapidly. As a result of this, the exploitation rate of many coastal fish stocks is high and there is a risk of overfishing. This threat together with the pollution of large parts of the coasts of the Baltic republics makes assessment and monitoring urgent. Due to the former political restrictions of fishing and research in the coastal zone, there is no model for this work.

DESCRIPTION

Cooperation in coastal fish monitoring is now carried out in Estonia, Latvia, Lithuania and Sweden thanks to funding from BITS. This programme, "Integrated coastal fish monitoring", is directed towards pollution and is based on stationary fish. Biologists from the three Baltic republics are trained by the Institute of Coastal Research (Swedish National Board of Fisheries) and in 1993 monitoring will be established in one area in each of the three republics. Within the project, fishing gear, computers and other equipment are transferred to the three countries.

Our suggestion is to use the competence and equipment in the "Integrated Coastal Fish Monitoring" project for establishing a system of assessment and monitoring of the fish resources of the coastal zone in Estonia, Latvia and Lithuania. The system will be based on experimental fishing,

PRELIMINARY TIMETABLE AND AGENDA

1. Creating a model for assessment of coastal fish stocks. This will be done during a seminar in Estonia.
2. A course in methods for studies of fish recruitment in Sweden.
3. Testing the model and establishing a monitoring in two areas in each country, one of them being the one studied in the present project.
4. Defining important recruitment areas in connection with the investigation areas and estimating their capacity.
5. Adjust the model during a final seminar.

The work should be directed towards a few commercially important model species. It should be stressed that the system outlined will enable an important improvement of not only the fisheries management but also the environmental monitoring with due regard to guide-lines and standards elaborated by HELCOM.

ESTIMATED TIME FRAME: 1994-1996

Man power resources needed: Swedish experts visiting Estonia, Latvia and Lithuania; training in Sweden of scientists from the three Baltic countries, inter alia in the Institute of Coastal Research. Equipment needed in each country: adequate gear (gill-nets), car, boat, laboratory equipment. Gear for collecting ichthyoplankton, young fish trawl.

Timetable and Agenda

Tuesday, 9 February 1993
Evening: arrival at Karlskrona

Wednesday, 10 February 1993
Morning:

1. Opening statement by Dr. Per Wramner, Swedish National Board of Fisheries, immediately followed by

2. Presentations of ongoing fishery investigations and how they are funded; information from Estonia, Latvia and Lithuania on

2.1 Biology

2.2 Assessment

2.3 Coastal investigations

2.4 Environmental investigations

2.5 Hydrographical investigations

Afternoon: Continued

Thursday, 11 February 1993
Morning:
Continued, information from Sweden

Afternoon:

3. Summary of information provided: weaknesses in present efforts to manage fishery resources and identification of most urgent needs for funding.

Friday, 12 February 1993
Morning:
4. Adoption of Report

Afternoon:
Departure

Baltic fisheries cooperation comittee (Bafico)

-the idea of organized cooperation between the fisheries administrations around the Baltic Sea, and the Nordic Council of Ministers initiative by Mr. Johán H. Williams, Nordic Council of Ministers

The Idea

The Nordic/Eastern European Symposium on Cooperation in Fisheries, held in Tallinn and Espoo in October 1991, presented a number of recommendations on the future cooperation in fisheries matters between the Nordic and the other Baltic states.

Future cooperation could contain general cooperation between the Nordic and the Baltic states, and more specific cooperation between states bordering the Baltic Sea.

Cooperation should include matters on fisheries management and research on the Baltic fish stocks, matters regarding the development of the fisheries sector, with respect to the fishing fleet as well as the processing industry, matters regarding environmental issues affecting the fisheries as well as establishing common positions in matters of common interest in international fora.

The model for establishment of a "Baltic Fisheries Cooperation Committee" is to be found in the "Nordic Committee of Senior Officials for Fishery Affairs" which was established in 1986, with members from Greenland, Iceland, Faroe Islands, Norway, Denmark, Sweden, Åland Islands and Finland.

The Nordic Committee meets 2-3 times a year, with the main purpose of identifying matters of common interest to fisheries of all or most of the participating countries; matters of policy, of economic as well as of scientific nature. The Committee also prepares meetings of the Nordic Fisheries Ministers.

A "Baltic Fisheries Cooperation Committee" should be established with the task of establishing a firm network for extended fisheries sector cooperation sectors between the states bordering the Baltic Sea. This to include all levels and subsectors; Ministers, civil servants, researchers, the industry as well as the fishermen´s organizations.

The Initiative

The Nordic Council of Ministers has decided, in an attempt to meet the recommendations from the Tallinn/Espoo symposium, to take an initiative to establish a "Baltic Fisheries Cooperation Committee". The Nordic Council of Ministers has granted a small amount to be used in order to prepare the first meetings of the committee, as well as assist with travel expenses when necessary.

The Federation of Finnish Fisheries Associations and the Secretariat of the Nordic Council of Ministers act on behalf of the Council of Ministers in an attempt to establish the Committee and organize the first meetings.

Implementation

The draft plan is, with one of the Baltic states as host, to call for a first meeting, seeking participation from all Baltic Sea countries; Finland, Russia, Estonia, Latvia, Lithuania, Poland, Germany, Denmark and Sweden.

The first meeting will have to establish its mode of operation, its purpose, statutes, membership, secretarial functions, chairmanship etc.

The first meeting should also make clear distinctions between its mode of work and that of a number of other international organizations in the Baltic area.

The first meeting should establish an overview of sources possible for financing of projects and other activities initiated by the Committee.

The documents and other secretarial support for the first meeting would if necessary be prepared by the Nordic Council of Ministers.

The first meeting should be arranged not later than June 1993.

DIRECTORY

as of November 1993 (when this Report was sent to print)

ESTONIA

Administration

A. Ministry of Environment
Toompuiestee 24, EE-0001 Tallinn; Minister: Dr. Andres Tarand

National Estonian Board of Fisheries, Liivalaia 14, EE 0100 Tallinn, tel +372 2 682760, fax +372 2 683404, telex 173289 BRIIS EE
Research, administration, economics, legislation, industry.

Lauri Vaarja, Director-General
Taidus Linikoja, Deputy Director
Mr. Toivo Orgusaar, Head of Department, Fishery and resource management
Dr. Robert Aps, Head of Department, Information and development

Estonian Fisheries Association, Liivalaia 14, EE 0100 Tallinn
Heino Palu, Chairman

B. Ministry of Agriculture
Responsible for FAO matters, including fisheries.
Ruve Sank, Department of Foreign Relations, tel +372 2 601210, fax +372 2 602160, telex 173 216 TOMAT SU.

C. Foreign Ministry
Toivo Klaar, Assistant to the Minister, tel +372 2 443266, fax +372 2 441413, telex 173 269 EVM.

Research

1. Estonian Marine Institute

Fishery Section, Lai str 32, EE-0001 Tallinn, tel +372 2 44 24 61, 442460, 441198; Director 31 30 05, fax 31 30 04
Stock assessment, management, artificial reproduction and fish diseases, some investigations in fishing technology.
There are 3 field stations.
Dr. Ahto Järvik, Director
Dr. Evald Ojaveer, Deputy Director
Aleksei Turovski
Dr. Vello Kadakas, Head of Laboratory
Dr. Vaike Erm
Leili Järv
Kulliki Kivisilla
Dr. Tiit Raid, Head of Laboratory
Alide Lumberg
Sirje Timmusk
Dr. Mart Kangur, Head of Laboratory

Section for Ecology and Marine Research, Paldiski Rd 1, EE-0031 Tallinn.
tel +372 2 45 35 98, fax +372 2 45 37 48
Hydrography, marine physics, marine chemistry, marine biology (ecology), Baltic research

Dr. Jüri Elken, Physical Oceanographer
Lembit Talpsepp
and others

2. Academy of Sciences, Institute of Zoology and Botany, University of Tartu, with a minor department in Tallinn

Fish fauna, fish productivity, management of lakes.

3. University of Tartu
Institute of Zoology and Hydrobiology
46 Vanemuise str., EE-2400 Tartu
Tel +372 34 30615, fax +372 34 35440
Toomas Saat, Professor

Institute of Animal Breeding and Veterinary Science, Department of Fish Farming, 1 Kreutzwaldi St., EE-2400 Tartu
Tel 31062, 99290, fax +372 34 34897
Dr. Tiit Paaver, Head of Department
Fish genetics, selective breeding and farming. Main species carp, rainbow trout, crayfish culture.
Riho Gross, Research Scientist

4. Other institutes are carrying out research on waste water treatment and on other matters:

Estonian Meteorological and Hydrological Institute,
Monitoring Laboratory, Toomkooli 11,
EE-0001 Tallinn,
Tel +372 2 443213

LATVIA

Administration

A. Ministry of Transport, Riga.
Minister: Andrejs Dandzbergs

Fisheries Department,
63, Kr. Valdemara iela, LV-1142 Riga,
Tel +371 2 323877, (Director)
+371 2 334477 (Dep. Director)
fax +371 2 334892,
telex 161132 WEST SU

Andris Ukis, Vice Minister, Director
Normunds Riekstinsh, Dep. Director
Pavel Ivanov, Head, National Fishery Division

Planning and adminstration of fishing, fish processing and inland fisheries. Foreign affairs in fisheries, cooperation envisaged on information.

B. Ministry of Environment and Regional Development, 25 Peldu iela, LV-1082 Riga
Tel. +370 2 227283,
fax +370 2 228159,
telex 161180 BITEC SU

Dzidra Hadonina, Head, Environment and Cadastre Division

Indrikis Barkans, Head, Water Quality Division
Visvaldis Kruminsh, Chief, Inspection of Inland Water Biological Resources

Reports to the Parliament. Limited resources, some support from abroad. Environmental matters, such as protection of marine environment in areas which have remained unaffected because of former military activities, control of utilization of bioresources in the sea and inland waters.

There is also a Hydrometeorological Department.

C. Ministry of Education, 2 Valnu iela, LV-1010 Riga, tel +370 2 21370

Department of Science and Research:
Atis Kapenieks, Director
Anatolijs Melnis, Chief Specialist

Research

1. Latvian Fisheries Research Institute (LATFRI),
6, Daugasgrivas iela, LV-1007 Riga,
tel +371 2 61 24 09,
fax +371 2 32 34 49, telex 161112 BARK SU

Research on fish stocks in the Baltic and management advice, on aquaculture (artificial reproduction of valauble species).

There are two laboratories: Laboratory of Marine Biology and Aquaculture Laboratory.

The research vessel "Baltijas Petnieks" (54.8m, 635 tons) carries out research in the Baltic and carries out hydroacoustical surveys.
Total staff ca 60, of whom 35 researchers.

Dr. Maris Vitinsh, Director
Dr. Inara Lablaika, Deputy Director
Dr. Andis Mitans, Head of Aquaculture Laboratory

Dr. Maris Pliksh, Head of Laboratory of Marine Biology
Dr. Faust Shvetsov

2. Latvian Academy of Sciences: Institute of Biology,
3 Miela iela, LV-3169 Salaspils,
tel +371 2 945426,
telex 161171 SILA SU

Dr. Gunars Andrushaitis, Director
(tel home +371 2 565150)

Dr. Peteris Cimdinsh, Head, Hydrobiol. Laboratory
Dr. Janus Viksne, Head, Ornithol. Laboratory

Dr. A. Andrushaitis leads the group for coastal investigations with a staff of about 10. Main task: investigations on how pollution has affected the marine environment, particularly in the Bay of Riga.
There is a research vessel "Emilia".

3. Hydrometeorological Board, Ministry of Transport, 19 Kr. Valdemara iela, LV-1010 Riga
Tel. +371 2 332829
fax +371 2 286783
telex 161151 SHAR SU

Gaida Matisone, Director
Aivars Yarkovskis, Head of Marine Monitoring Center

Oceanographic, hydrobiological and water quality monitoring of the Baltic.

LITHUANIA

Administration

A. Ministry of Agriculture, Vilnius. Deputy Minister: Algirdas Rusakevichius

Fisheries Department, 9 Jouzapavichiaus str.,
LT-2600 Vilnius, tel +370 2 358464
fax +370 2 352146, telex 261181 AGRO

Fisheries in the distant, the Baltic and in inland waters. Supervises a large part of fish culture activities (which is also done in a small scale by the Environment Protection Department). Responsible for fishing and fish processing industry matters. Plans for managing of the Lithuanian fishing zone in the Baltic. Establishes own infrastructure of fishery resources and research. Responsible for deep seas fishery statistics.

Algirdas Rusakevichius, Director
tel +370 2 353379, 35 84 64

Povilas Kindurys, Deputy Director,
Chief of Division of Inland Water Fisheries,
tel +370 2 353330, 353916

B. Lithuanian Environmental Protection Department,

9 Juozapaviciaus str., LT-2600 Vilnius,
tel +370 2 35 32 02,
fax +370 2 35 80 20,
telex 261191 GAMTA SU.
Immediate report to the Government.

Environmental control, establishes own infrastructure of research. Now even partly responsible for fishery matters (inland waters) and for fishery statistics. There is a Fishery Management and Pisciculture Agency, a Biological Laboratory, and an Institute of Marine Research, see below.

Evaldas Vebra, Director-General,
tel. +370 2 355868
Bronius Bradauskas, Deputy Director-General,
tel +370 2 353745
Dr. Romualdas Juknys, Head of Research Board

C. Ministry of Education
Universities of Vilnius, Kaunas and Klaipeda, see below

D. For coordination of foreign assistance:
Ministry of Economics, Department of Economical Strategy and Reform, Gedimino pr. 38/2, LT-232 600 Vilnius,
tel +370 2 624403,
fax +370 2 623974; Dr. Eugenijus Maldeikis

E. Fishery regulation in the Baltic Sea and Inland Waters.

Fishery Regulation and Pisciculture Agency, same address as the Fisheries Department in Vilnius.

Fishery regulation and control, fishery inspections, statistics, culture of salmonids and whitefish.

There is also some work carried out in field stations.

Algirdas Domarkas, Director,
tel +370 2 358543
Raimondas Bogdevicius, Deputy Director,
tel +370 2 353631, 353955

Research

1. Scientific Laboratory of Fisheries Investigations (belongs to the Fisheries Department),
Box 108, Smiltyné, LT-5800 Klaipéda,
tel +370 61 32237
Investigation of fish resources in the Baltic sea
Director: Dr. Sharunas Toliushis

2. Laboratory of Inland Fisheries (belongs to the Fisheries Department),
9 Jouzapaviciaus str., LT-2600 Vilnius,
tel +370 2 353262

Commercial fish culture; fish pathology; water quality control in ponds, lakes, water reservoirs; hydrobiology, fish nutrition; quality control of fish feed; investigation of fish resources in lakes.
Gintautas Balkus, Director

3. Biological Laboratory, Vilnius.

Combined biological-microbiological laboratory. Environmental matters

Judita Sukyte, Head of Central Environmental Research Laboratory

4. Lithuanian Institute of Marine Research (or Lithuanian Marine Research Laboratory; previously Hydrometeorological Observatory),
Taikos pr. 26, LT-5802 Klaipeda,
tel +370 61 503 24,
private 586 60,
fax +370 61 171 06,
telex 278113 ORAS-1

Research in the Couronian Lagoon, environmental monitoring within HELCOM. Fishery statistics are collected for the Baltic and the Couronian Lagoon.

There are two larger research vessels "Vejas" (ex "Lev Titov") and "Vetra" (ex "Rudolf Samoilovich") and two smaller vessels, with a total crew of ca 80. Number of employees in the main laboratory and in field stations 70, of which 15 are working with meteorological matters.

Dr. Algirdas Stankevicius, Director
Jouzas Dubra, Vice Director

5. Lithuanian Institute of Ecology,
Academijos str. 2, LT-260 Vilnius,
Tel +370 2 35 92 75,
fax +370 2 35 92 57;

(Also: Neringas str. 1 C, LT-5731 Rusné (close to Klaipeda; belongs to the Institute of Ecology, previously the Lithuanian Academy of Science.
Dr. Gerulaitis, Chief of Laboratory,
Tel +3702 359262)

Mainly eco-toxicological research on fish. Fish culture, fish pathology, fish resources in the Baltic Sea and Couronian Lagoon, hydrobiology.

Dr. Jouzas Virbickas, Professor, Head of the Institute, Leader of Laboratory of Ecology and Physiology of Hydrobionts

R. Volskis (Man and Biosphere)
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Dr. A. Bubinas, Senior Scientist, Laboratory of Marine Ecology, hydrobiologist
Dr. A. Burba, Senior Scientist, crayfish resources,
tel +370 2 766237

6. University of Vilnius, mainly marine geology/ sedimentology

7. University of Kaunas

8. University of Klaipeda, founded quite recently (1991), mainly ecological work.
Science Office: Ramonas Povilanskas, Head

Department of Ecology: fishery biology (inland waters), marine ecology (sediment and benthos), teaching, staff about10.

A. Olshauskas, Head of Laboratory.

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Institute of Coastal Research
Box 584, S-74071 Öregrund
tel +46 173 31305, fax +46 173 30949

A conference for coordination between Estonia, Latvia, Lithuania and Sweden on fishery investigations in the Baltic, was convened by the Swedish National Board of Fisheries in cooperation with The Baltic Institute san was attended by the high level representatives of all the countries involved. The need for cooperation in fishery investigations between the Baltic States and Sweden is obvious as the same marine living resources are used by all the countries and as financial resources for fishery investigations are limited. Three projects have been idenitfied as the most urgent needs, and were cooperation would be of mutual benefit: fishery information and statistics, acoustic estimation of fish stocks and coastal monitoring of fish resources.

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