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Project acronym: IMPASSE

Environmental impacts of alien species in aquaculture

COORDINATION ACTION

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SUSTAINABLE MANAGEMENT OF EUROPE'S NATURAL RESOURCES

Periodic Activity Report 2

Publishable Executive Summary

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Project coordinator organisation name: University of Hull, International Fisheries Institute

IMPASSE Objectives

The IMPASSE project is a CA designed to support the Community provisions concerning non-native and locally absent species in aquaculture (Council Regulation: 708/2007). In view of the lack of a comprehensive assessment of the impact of non-native species in aquaculture, and the limited number of national guidelines for risk assessment and procedures for dealing with introductions, there is a need for a project to define and develop such protocols. The overall goal of the IMPASSE project is to develop guidelines for environmentally sound practices for introductions and translocations in aquaculture, guidelines on quarantine procedures and risk assessment protocols, and procedures for assessing the potential impacts of invasive non-native species in aquaculture. The verifiable scientific and technological objectives of IMPASSE are:

1. review of introductions and translocations in aquaculture and for aquaculture-based restocking and assess the economic importance of introductions and translocations resulting from aquaculture and aquaculture-based restocking in the Community;

2. audit the state of knowledge of the results of operations concerning introductions and translocations of aquatic organisms for aquaculture purposes, particularly concerning environmental and economic impacts and genetic interactions with wild populations; to analyse the economic importance of restocking, particularly for community aquaculture enterprises;

3. develop risk assessment protocols for future aquatic species introductions and aquaculture, with specific models and sub-routine assessments to consider economic issues, the potential environmental and economic impacts of diseases in wild aquatic organisms and ecosystems, genetic interactions with wild populations, and the disruption of ecosystem structure and function. Special attention will be given to assessing whether modern land-based closed aquaculture facilities can be considered bio secure and to what extent movements into these facilities can be differentiated from movement into open aquaculture facilities under Community rules;

4. provide guidelines for quarantine procedures to account for phylum-specific peculiarities, developmental stages and risk levels, including procedures for containment and control where invasive species are identified as a problem; and

5. provide guidelines for environmentally sound practices for introductions and translocations in aquaculture and stock enhancement operations.

IMPASSE Work Packages

The IMPASSE project produced a scientific reviews of current knowledge in the field, stimulate the exchange of knowledge and scientific opinion, developed guidelines for environmentally sound practices for introductions and translocations in aquaculture, and identified needs for future research and management action, all of which are essential issues related to the development of policy and legislation, both at the European and national levels.

The project was organised into six work packages (WP): WP1 Review of scientific information on non-native species for aquaculture and other purposes; WP2 Analysis of the impacts of non-native species on aquatic ecosystems; WP3 Risk assessment and modelling; WP4 Development of guidelines; WP5 Consultation and dissemination; WP6 Scientific coordination and project management.

These work packages were linked to ensure delivery of the project outputs, particularly: reviews of current knowledge in the field; methods and protocols to assess the environmental and economic risks of species introductions; stimulation of the exchange of knowledge and scientific opinion; and, guidelines for environmentally sound practices for introductions and translocations in aquaculture. This will provide managers and policy makers with the information necessary to develop mitigation measures to minimise adverse impacts and develop of policy and legislation both at European and national levels. The project used a comprehensive consultation and dissemination plan to ensure involvement of stakeholders and uptake by the aquaculture and fisheries sectors.

The IMPASSE consortium

The IMPASSE consortium consists of fourteen partners from 9 countries. The project is coordinated by the University of Hull, International Fisheries Institute, Hull, UK.

(1) University of Hull, UK
(2) Environment Agency, UK
(3) Centre for Environment Fisheries &Aquaculture Science, UK
(4) Universita' degli Studi di Firenze, Italy
(5) Gollasch Consulting, Germany
(6) Institut Français de Recherche pour l'Exploitation de la Mer, France
(7) Bundesforschungsanstalt fuer Fischerei, Germany
(8) Federation of European Aquaculture Producers, Belgium
(9) Università degli Studi di Pavia, Italy
(10) Coastal Research & Planning Institute, Klaipeda University, Lithuania
(11) Halászati és Öntözési Kutatóintézet Hungry
(12) Bournemouth University, UK
(13) Central Science Laboratory, Defra, UK
(14) Veterinaermedisinsk Oppdragssenter AS, Norway

Work performed

The first project period was dedicated to collection of information on the scale and impacts of introductions of species for aquaculture and other purposes throughout Europe, to underpin the development of the protocols and guidelines. A central database was established to store all available information on when, where and for what purpose species were introduced into Europe. This was complemented by information on the impacts of these introductions on transfers of disease and pathogens, disruption of ecosystem functioning and ecological interactions, including biodiversity, and genetic interactions with wild populations. In addition, mechanisms for assessing the economic and social impacts of introductions were examined, because of the considerable societal implications of invasive species on ecosystem functioning and loss of biodiversity. The central database holds information about 1945 introduction events from all European countries, concerning 703 species introductions, of which 325 were indicated as target species, 295 as non-target.

A comprehensive review of available information indicated, unsurprisingly, most introductions, either deliberate or accidental, were found to have negative effects on indigenous fish communities and other fauna through predation, competition, loss of genetic integrity, reduction of biodiversity, introduction of pathogens and change in ecosystem dynamics.

The second project period was dedicated to preparation of risk assessment protocols and guidelines for the responsible introduction of species for aquaculture.

A review of existing risk assessment protocols relating to operations concerned with the introduction and translocation of species was undertaken and a scheme was developed in WP3 using a modular framework approach. The scheme assesses the environmental and economic risks of species introductions, and provides managers and policy makers with the information necessary to develop mitigation measures to minimise adverse impacts. Primary versions of these risk identification toolkits, developed by Partner 3 (Cefas), are now available for download from Cefas' 'Projects' web pages under 'Non-native Species' (http://www.cefas.co.uk/projects.aspx). The toolkits available packages are:

- Non-native risk assessment toolkits
- FISK (freshwater fish)
- FI-ISK (freshwater invertebrates)
- MFISK (marine fish)
- MI-ISK (marine invertebrates)
- AmphISK (Amphibia)

These modules remain in the preliminary stage of development and further resources are needed to make them readily accessible on the Internet.

The extent of which invasive alien species and their impacts are covered by existing legislations was examined and found to be limited. There are no comprehensive instruments at an EU level to tackle invasive alien species; existing legislation suffers from incomplete coverage, legal uncertainty, variation in the level of response among Member States level of response and insufficient co-ordination. For that reason, Council Regulation (No 708/2007) was considered appropriate to cover introduction of non-native species for aquaculture purposes. However, strategies to implement the regulation are needed and a framework is provided.

A report on quarantine procedures, in the broadest sense, for a range of organisms for use in aquaculture operations was prepared. Information on technical characteristics of facilities (open versus closed facilities), effluent and waste treatment and disposal, physical containment, biosecurity and personnel is provided. Guidelines for future aquatic species introductions and transfers were developed specifically to minimise alien species impacts. Guidelines for quarantine procedures, intended for use at country of origin or entry were produced to minimise spread of pathogens and disease. Furthermore, procedures were developed to assist eradication, containment and control procedures.

Considerable effort was put into consulting stakeholders over the proposed risk assessment protocols and guidelines and the information was presented at the final project conference held in Florence, Italy in November 2008 (see www.hull.ac.uk/hifi/impasse.html for details).

The project has offered considerable support to the Commission, advising on species that should be included in Annex IV of the Council Regulation 708/2007, which allows them to be imported into the EU without a specific licence.

Dissemination the knowledge

An objective of the IMPASSE project was to develop guidelines and protocols for environmentally sound practices for introductions and translocations in aquaculture. It was recognised as important that these guidelines are accepted by the endusers and stakeholders. To meet thus requirement, the outputs were delivered directly to the end-users through Partner 8 - the Federation of European Aquaculture Producers. Two of workshops were carried out: one for Eastern Europe, in Szarvas, Hungary in November 2007 and the second associated with the international conference for practitioners and stakeholders held in Florence Italy in November 2008. In addition, the outputs have been, and will continue to be, disseminated through numerous meeting, workshops and conferences involving the aqauculture sector.

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