

Marine Scotland

Priority for Action 2.5. A Strategy for Mixed Stock Fisheries: – Science Overview

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marinescotland

Objectives:



- Clarify and agree definitions of commonly used terms
- Look at available evidence for defining mixed stock fisheries (MSFs)
- Describe future approaches to investigating MSFs in Scotland

Definitions/commonly used terms I



Mixed ~~stock~~ fishery

- many interpretations
- need a working definition to allow Group's work to proceed

Stock/population used synonymously

Population is a biological entity

- optimum management unit
- **but** don't yet have a clear picture

Stock is a management entity

- defined by management aim

Definitions/commonly used terms II



NASCO has definitions of both “stock” and “mixed stock fishery”

STOCK : “A management unit comprising one or more salmon populations. This would be established by managers, in part, for the purpose of regulating fisheries. (The term may be used to describe those salmon either originating from or occurring in a particular area. Thus, for example, salmon from separate rivers are referred to as “river stocks” and salmon occurring at West Greenland may be referred to as the “West Greenland stock”).”

MIXED STOCK FISHERY: “A fishery exploiting a significant number of salmon from two or more river stocks.”

We suggest that the NASCO definition of a MSF could be used by the MSF PFA Group.

Evidence for existence of MSFs I



N Esk stock – location and number of recaptures:
 Gironck stock – location and number of recaptures:



Region
 Region
 Combined district
 Combined district

Number of recaptures by

At 2 sites, North Esk and Gironck
 Burn, emigrating smolts have
 been externally tagged with
 modified Carlin tags and
 subsequent adult recaptures
 recorded by method and location

Tweed
 Tay
 N Esk
 N Esk & Berwie
 Dee
 Don
 Ythan
 Deveron
 Spey
 Firth
 Lossie
 Firth
 North West
 Gironck & Alness
 Halladale & Strath
 Incharde to Kirkaig
 Nith

Number of recaptures by

Method	Fixed	Net	Rod
Fixed	51	181	37
Net	2	4	8
Rod	2	1	4
Spey	3	1	7
Firth	2		5
Lossie	1		1
Firth	4	1	
Gironck & Alness	1		
Halladale & Strath	1		
Incharde to Kirkaig	1	1	
Nith			1

Adult recapture data allow us to
 assess the degree to which all
 three types of legal fishery may
 be considered MSFs

Effect of fishery type and distance

North Esk stock - distribution of recaptures



Number of tag returns per reported catch of 10,000



0



0 - 1



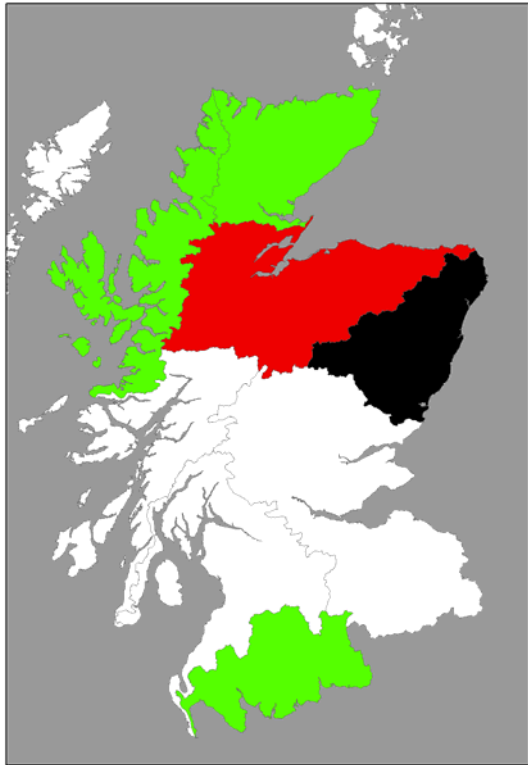
1 - 10



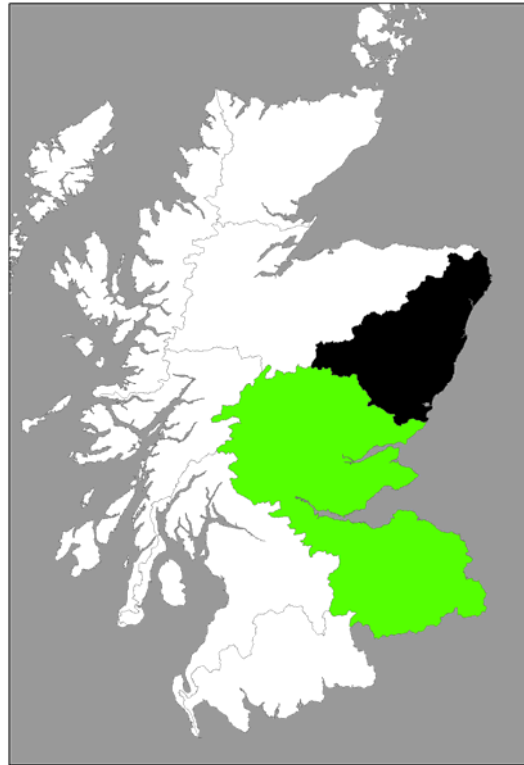
10 - 100



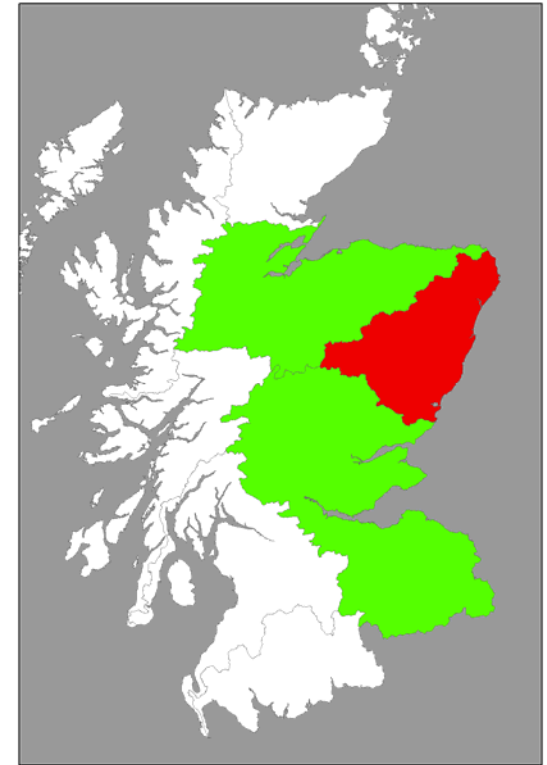
100 - 1,000



Fixed engine



Net and coble



Rod and line

Future approaches to investigating MSFs in Scotland



Mixed stock fisheries are not inherently detrimental to stock status. These techniques require baseline samples. Any fishery, single stock or mixed stock, only poses a problem if it exploits stocks where there is no exploitable surplus.

Marine Scotland is currently involved in SALSEA which aims to do, however, present particular management difficulties in establish a baseline which will allow origin to be determined at a regional level within 3 years. that an assessment of the stock composition of such fisheries is required before their impact on a given stock may be assessed. In

this regard the results of the smolt tagging analysis outlined here Further, Marine Scotland and RAFTS are about to commence a provide some insights.

collaborative genetic programme to understand the structuring of river stocks. The information collected will have the potential for However, a more rigorous analysis based on population genetic techniques offers the best and most cost effective route to identifying MSFs within and outside rivers. It is anticipated that within 3 to 4 years the RAFTS Marine Scotland data would provide understanding which stocks are exploited by fisheries in Scotland. a suitable basis for the assignment of fishery catches to river stock

Routinely applied to West Greenland

(continent), at finer scale wrt rivers of L Feochan and to tributary level in Finland.

Summary



Need for an agreed definition of a MSF. Clarification of the terms “population” and “stock”. Suggest we use the NASCO definition of a MSF: “A fishery exploiting a significant number of salmon from two or more river stocks.”

Evidence. Smolt tagging experiments show that fixed engine, net and coble and rod and line can all be MSFs.

Genetic stock identification techniques have the potential to identify MSFs and to determine the relative contributions made by the different contributing stocks. Within 3 to 4 years it is expected that suitable data will be available to assign fishery catches to river stock origin for a substantial part of Scotland.