

# New Zealand fisheries; How research underpins existing management, and priorities for the future

MariFish Symposium: Future Demands for Fisheries Research;  
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## Overview

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- New Zealand fisheries & fisheries management
- Current research & management arrangements:
  - Institutions
  - Research planning process
  - Stock assessment & management processes
  - Industry-led research
  - Cost recovery
- Objectives-based management & implications for research

## Key features: New Zealand Fisheries

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- EEZ & Territorial Sea: 4.4 m km<sup>2</sup>
- Coastline: 15,000 km
- Fishery productivity: medium
- Climate: Sub-tropical to Sub-Antarctic
- Species commercially fished: 130
- Recreational fisheries:
  - Estimated participation: 20% of population
  - Estimated annual take: 25,000 tonnes
- Customary Maori take provided for: 4,700 tonnes
- Current status information available on 65% of stocks
- 85% of these at or near target size

## Key features: Commercial Fisheries

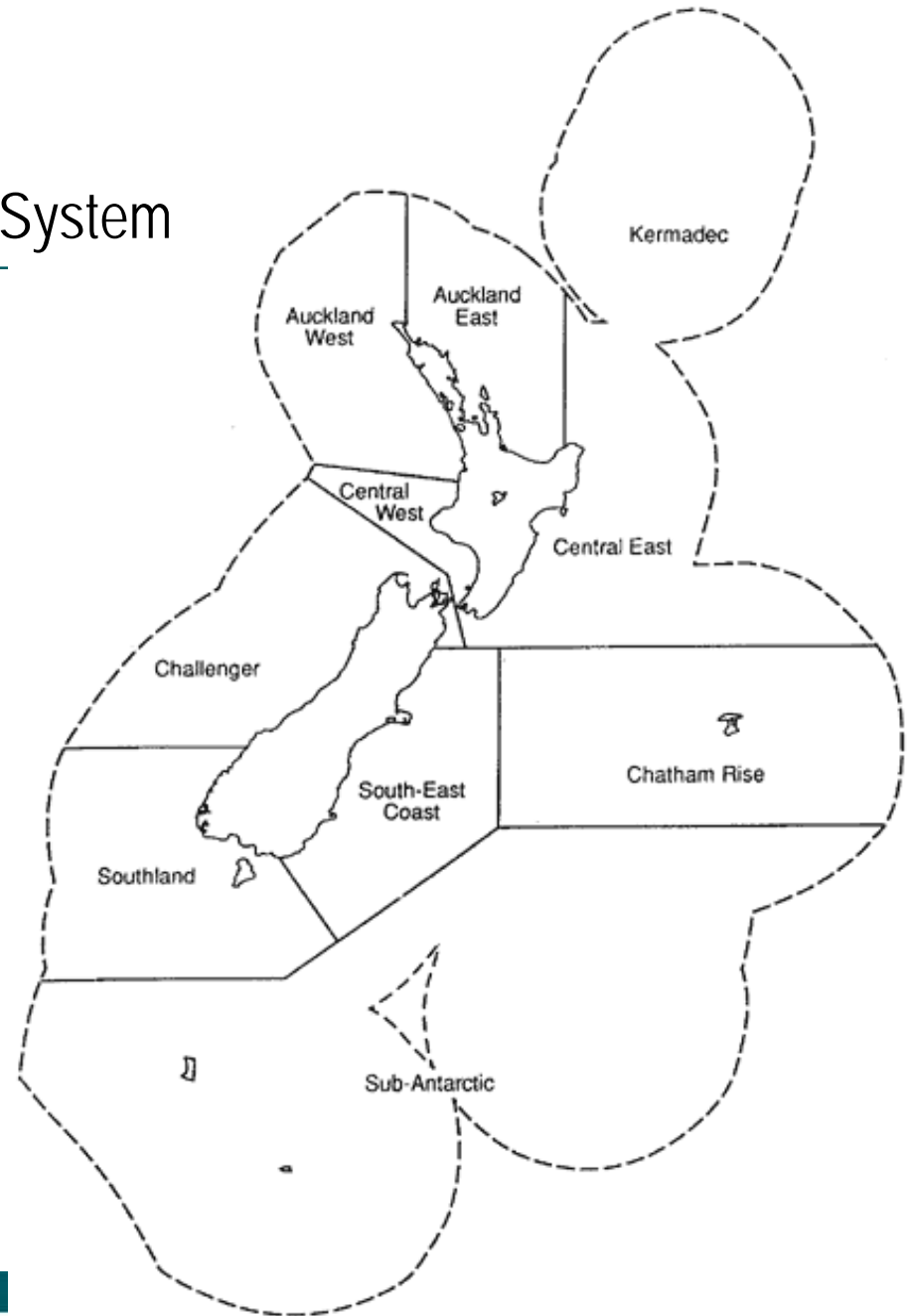
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- Catches
  - Sum of TACCs: 589,000 tonnes
  - Total Catch: 517,000 tonnes
- Fish Exports
  - Approx 90% of total production
  - 2006 Value: NZ\$ 1.3 billion (0.7 billion Euro)
  - Wild capture NZ \$1.1B
  - Aquaculture NZ\$ 240M
- Total quota value: \$3.8 billion
- Vessels: 1,372; VMS on all vessels >28m
- Quota owners: 1,678
- Direct employment: 7,155
- Aquaculture species: Mussels; oysters; salmon
- Direct subsidies: Nil



## Key features: Quota Management System

- Implemented: 1986
- Quota Management Areas for species based on combination of Fishery Management Areas
- Annual TAC for each species in each QMA
- TACs divided into ITQs
- ITQ allocation based on catch history
- ITQs in perpetuity
- Initially 26 species; 156 stocks
- Initial buy-back of catching rights





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## Key Developments

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- 1990 - ITQs changed: kgs to shares
- 1992 - Settlement of Maori fisheries claims
- 1994 - Cost recovery implemented
- 1996 - Stronger environmental protection provisions
- 1999 - Fisheries Amendment Act
  - Provision for devolution of fisheries services
  - Long-term and within-year rights separated; Annual Catch Entitlement (ACE)
  - New mechanism for managing fish bycatch in multi-species fisheries
- 2001 - Hoki fishery MSC certified
- 2007 - 96 species; 618 stocks in QMS
- 2007 – Environmental Certification fund established

## Major Fisheries Research & Management Institutions

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- Ministry of Fisheries
  - Science Team (15): Oversees fishery assessment & purchase of research; advises Ministry on status of stocks
  - Fisheries Operations: Advises Minister on fishery management options; implements & monitors management decisions
- Department of Conservation (Protected species)
- NIWA: Major research provider (Govt-owned)
- Other research providers (NZ & overseas)
- NZ Seafood Industry Council
  - Industry owned
  - Small science unit
  - Also contracts overseas stock assessment expertise



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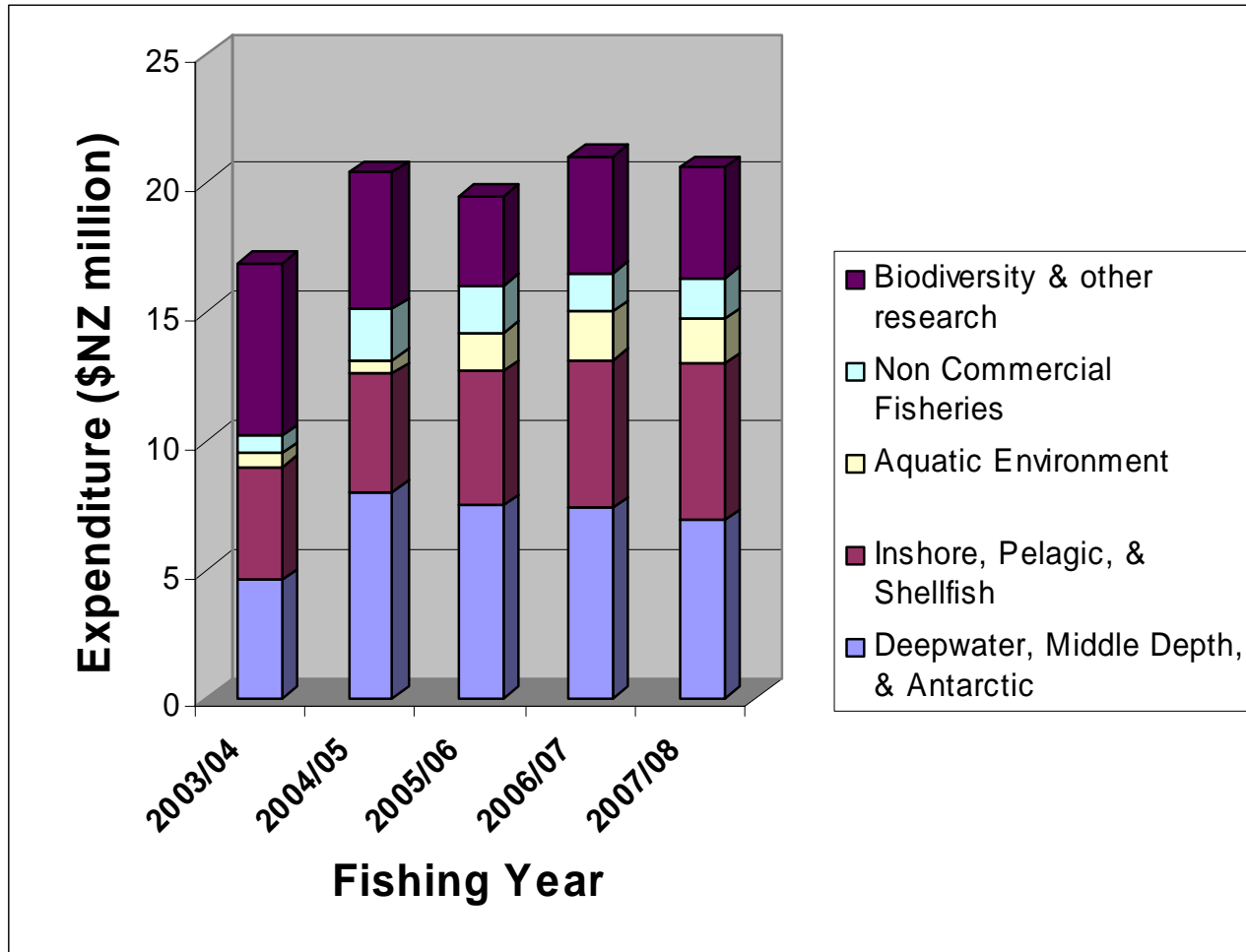
## Research Planning Process: Research Expenditure

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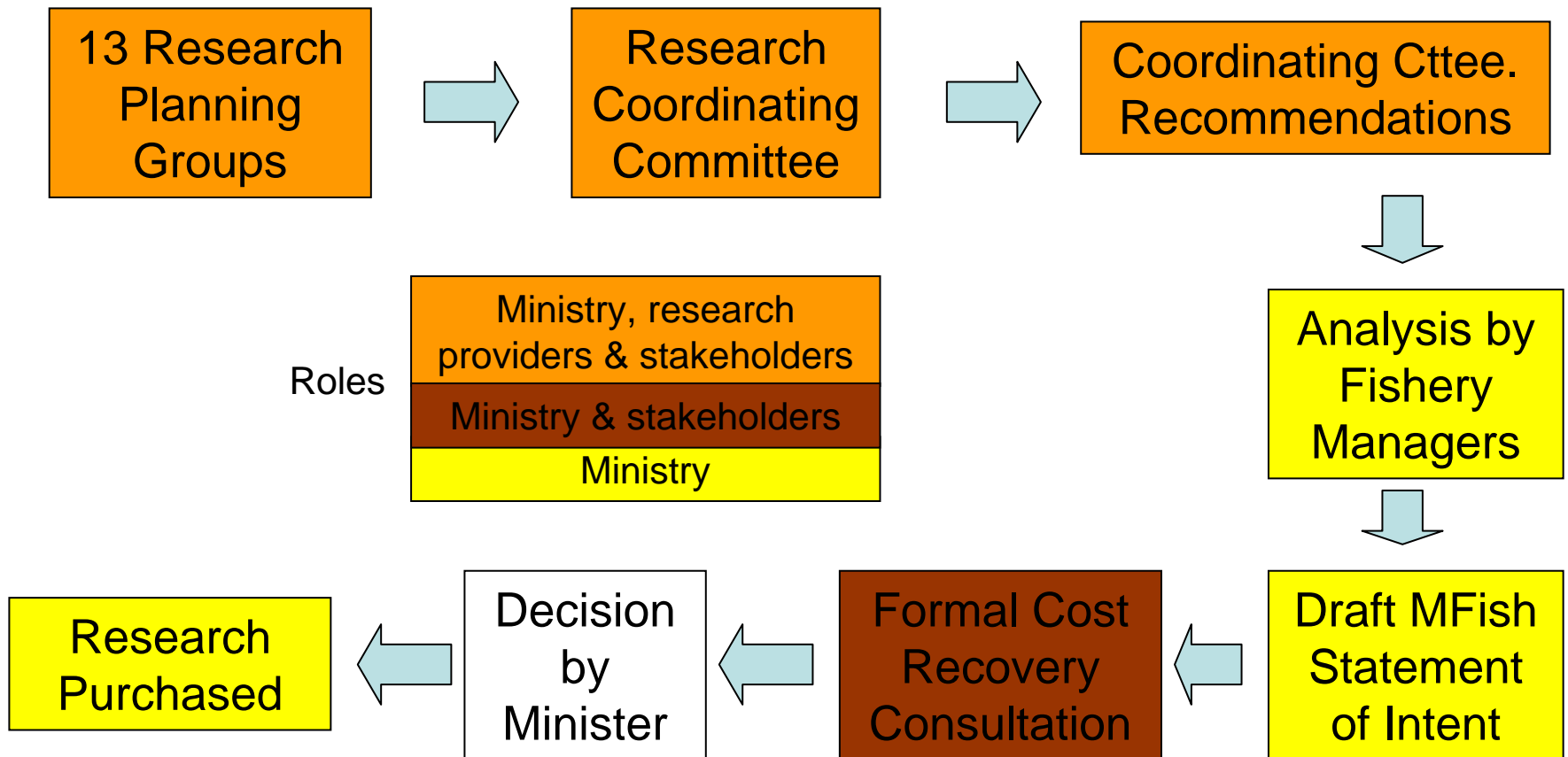
- MFish purchases fisheries research:  
Approx NZ\$ 20 million (11 million Euro)
- Dept of Conservation purchases research  
on impacts of fishing on protected species  
(Approx NZ\$ 1.8 million)
- Foundation for Research Science &  
Technology funds strategic research  
(Approx NZ\$ 15 million related to aquatic  
environment)
- NZ Seafood Industry Council undertakes  
and purchases research & stock  
assessment (Approx NZ\$ 1.5 million)
- Some commercial stakeholder  
organisations also purchase research
- Total fisheries research expenditure  
approx NZ\$ 40 million (21 million Euro)



## Ministry of Fisheries-Purchased Research: Types of Research



## Annual Research Planning Process: Steps and Roles





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## Research Planning Process: Goals

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Provide information on:

- Sustainable yields and stock status
- Levels of commercial and non-commercial catch
- Ensuring aquaculture and enhancement are sustainable
- Effects of fishing on aquatic environment and assess impacts of diseases and exotic organisms on fishery sustainability
- And through related processes:
  - Cultural, economic and social factors for fisheries management
  - Traditional and customary factors for fisheries management

## Research Planning: Planning Groups

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- Purpose: To discuss, evaluate, and recommend proposed future research activity
- Reviews 3 – 5 year Medium Term Research Plan and uses it to determine annual research priorities
- Membership:
  - MFish staff (Scientists and Managers)
  - Stakeholders representatives:
    - Commercial
    - Customary Maori
    - Environmental
    - Recreational
  - Other government departments
  - Science providers



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## Research Planning: Planning Groups

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- Deepwater
- Antarctic
- Hoki/Middle depths
- Snapper
- Inshore finfish
- Pelagic
- Shellfish
- Freshwater eels
- Non-commercial fisheries
- Stock assessment methods
- National Rock Lobster Management Group
- Aquatic environment
- Biodiversity Research Advisory Group



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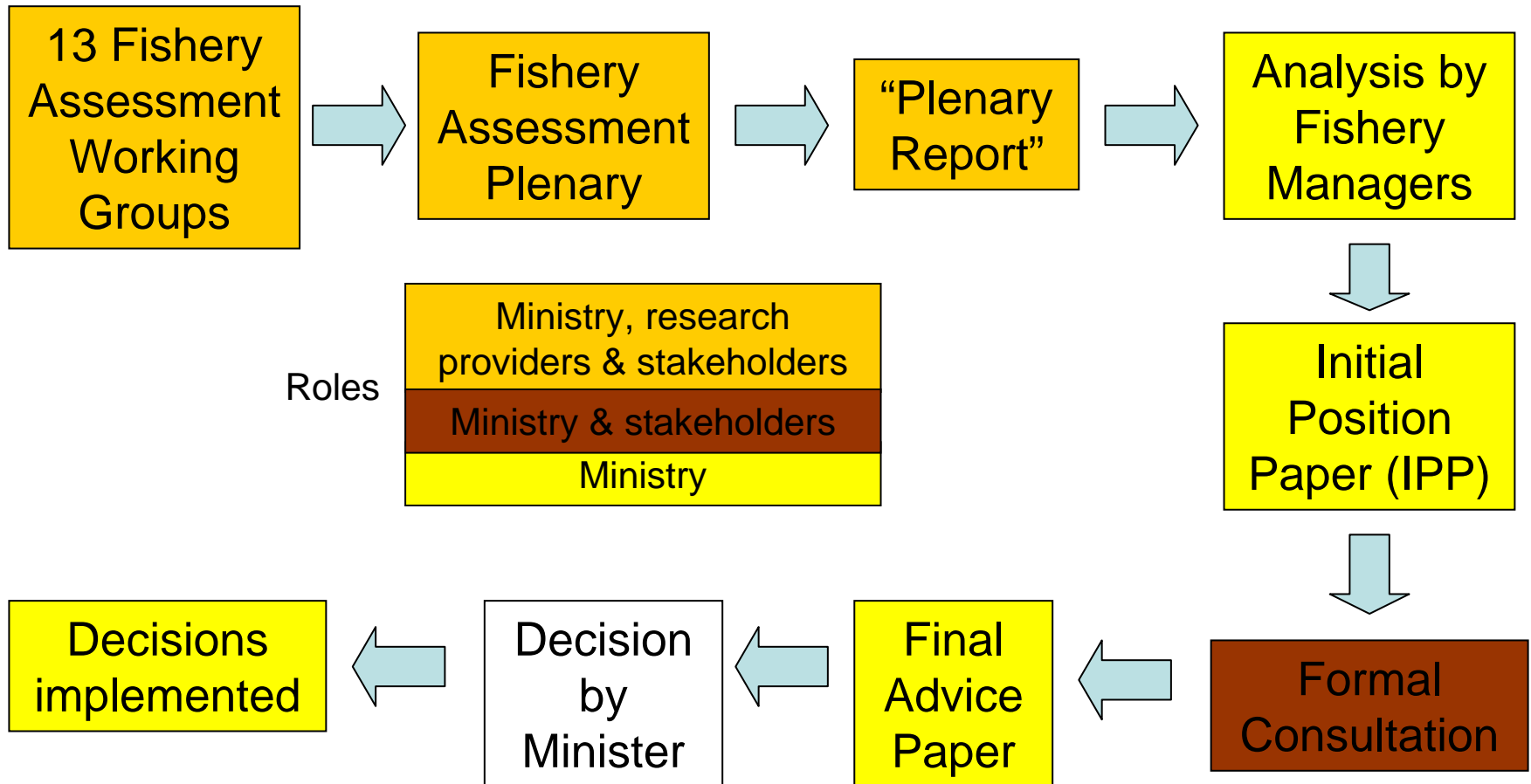
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## Research Planning: Coordinating Committee

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- Purpose: To discuss, evaluate, coordinate development of, and recommend proposed future research activity
- Membership:
  - MFish staff
  - Stakeholders representatives:
    - Commercial
    - Customary Maori
    - Environmental
    - Recreational
  - Other government departments
  - Science providers

## Annual Stock Assessment & Management Process



## Stock Assessment Working Groups: Terms of Reference

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- Review any new information on stock structure, productivity and abundance
- Estimate MSY for stocks (in terms of CAY or MCY)
- Determine if stock is above, below, or at a level that can produce MSY
  - Determine if recent removals and TAC will allow stock to move towards or be maintained at level that can produce MSY
  - Identify interdependence of stocks indicating larger stock is appropriate
  - Where appropriate, identify biological characteristics affecting rebuild rate
- Incorporate non-commercial catch information into stock assessments
- Advise on management issues to determine sustainability measures
- Provide information on effects on stock of alternative strategies
- Determine which species will be fully assessed
- Compile list of assessment issues and research needs
- Notes on Terms of Reference:
  - TORs determined in part by the requirements of the Fisheries Act
  - Different TORs for Data, Methods, Recreational, Biodiversity, & Aquatic Env Groups



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## Stock assessment working groups: Groups

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- Shellfish
- Middle depth
- Deepwater
- Rock lobster
- Snapper
- Hoki
- Freshwater eels
- Stock assessment methods
- Marine recreational
- Adaptive management
- Fisheries Data
- Aquatic environment
- Biodiversity

## Stock Assessment: Plenary

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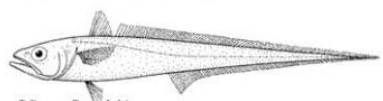
- Purpose: Peer review of recommendations from Working Groups
- Membership:
  - MFish staff (Scientists & Managers)
  - Stakeholders representatives:
    - Commercial
    - Customary Maori
    - Environmental
    - Recreational
  - Other government departments
  - Science providers
- Output: Plenary Report (used as basis for management recommendations)

- ▲ Status of Fisheries
- ▲ MSY Harvest Strategies
- ▲ Stock Status
- ▲ Commercial Quota Value
- ▲ Export Earnings
- ▲ Export Analysis
- ▲ Ministry Resourcing
- ▲ Cost Recovery

**Species:**  
 [▶](#)

- Links:**
- ▲ Stock Status
  - ▲ Commercial Quota Value
  - ▲ Export

[Home](#) > [Status of Fisheries](#) > [Species](#)



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## HOKI (HOK)

*Macruronus novaezelandiae*

Hoki are widely distributed throughout New Zealand waters from 34° S to 54° S, from depths of 10 m to over 900 m, with greatest abundance between 200 and 600 m. Large adult fish are generally found deeper than 400 m, while juveniles are more abundant in shallower water. In the January 2003 Chatham Rise trawl survey, exploratory tows with mid-water gear over a hill complex east of the survey area found low density concentrations of hoki in mid-water at 650 m over depths of 900 m or greater in January 2003 (Livingston et al. 2004)(please refer to Plenary document for reference list). The proportion of larger hoki outside the survey grounds is unknown. Commercial data also indicate that small catches of older hoki are targeted over other hill complexes outside the survey areas of both the Chatham Rise and Sub-Antarctic (Dunn & Livingston 2004), and are also caught as a bycatch by tuna fishers over very deepwater (Bull & Livingston 2000).

[more...](#)

Biology	
<b>Fishery Assessment Group</b>	Middle depth
<b>Depth Range (m)</b>	10-900
<b>OMS</b>	Yes (1986)
<b>Plenary</b>	Yes (2005)
<b>Target Fishery</b>	Yes
<b>Bycatch Fishery</b>	Yes
<b>Maturity Age (years)</b>	4-5
<b>Maximum Age (years)</b>	25
<b>Maturity Length (cm)</b>	60-65 (m), 65-70 (ft)
<b>Maximum Length (cm)</b>	115 (m), 130 (ft)
<b>Natural Mortality Rate</b>	0.25-0.3
<b>Maximum Weight (kg)</b>	7 (ft)
<b>Fecundity</b>	1 million eggs (moderately high)

### Plenary Documents

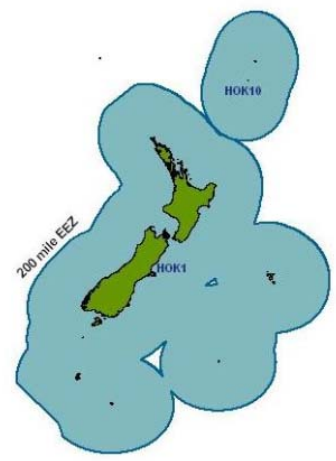
[HOK\\_06.pdf \(326 KB\)](#)

Allowable Catches						
Stock	Fishing Year	TAC	TACC	Cust Allowance	Rec Allowance	Other Mortality
<a href="#">HOK1</a>	2006-07	101,040	100,000	20	20	1,000
<a href="#">HOK10</a>	2006-07	-	10	-	-	-
<a href="#">HOKET</a>	2006-07	-	-	-	-	-

All values are shown in thousands of Kg (except OYU which is counted in individual shellfish). Non-numeric stock codes refer to other locations (eg. ET=Extra Territorial, STR=South Tasman Rise). The TAC (Total Allowable Catch) does not include any in-season increases; Ref: Section 13(7) FA 1996. TACC is the Total Commercial Allowable Catch. The Monthly Harvest Return (MHR) Data for the current year is incomplete and therefore not shown.

Quota Values										
	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
<b>\$m</b>	757	759	646	457	659	559	1,043	730	808	1,260

Export Earnings							
	2000	2001	2002	2003	2004	2005	2006
<b>\$m</b>	310.9	345.5	308.7	229.9	174.1	152.1	90.0
<b>Tonnes</b>	74,900	83,000	75,400	64,200	50,987	42,748	26,209



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# Status of Fisheries Website

[www.fish.govt.nz](http://www.fish.govt.nz)

## Stock Assess. & Res. Planning: Advantages & Potential Concerns

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### Advantages:

- Open processes; good documentation; improved transparency
- Stakeholder involvement is an important aspect of co-management
- Input by stakeholders and contestability of assessments => better assessments
- Better stakeholder understanding of stock assessments & research needs
- Research planning responds to stock issues raised in assessments
- Clear rationale for research

### Potential Concerns:

- Time consuming; expensive; lag between identifying research needs and purchasing research
- Lack of funding for effective participation by non-industry groups
- Environmental NGO concerns about undue industry influence
- Industry concerns at their lack of influence on cost-recovered research
- Consensus approach in stock assessment process can limit reporting of different views and lead to emphasis on uncertainties
- Insufficient strategic direction; not adequately linked to management needs
- Research provider market is small

## Stakeholder-purchased research: Overview

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- Stock assessment process allows for stakeholder-purchased research to be considered
- Examples:
  - Fine scale rock lobster catch effort and biological data; tagging
  - Fine scale catch data for paua (abalone)
  - Acoustic surveys of orange roughy
  - Catch sampling
  - Habitat mapping
  - Development of Sea Lion Excluder Devices

## Stakeholder-purchased research: Advantages and Potential Concerns

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### Advantages

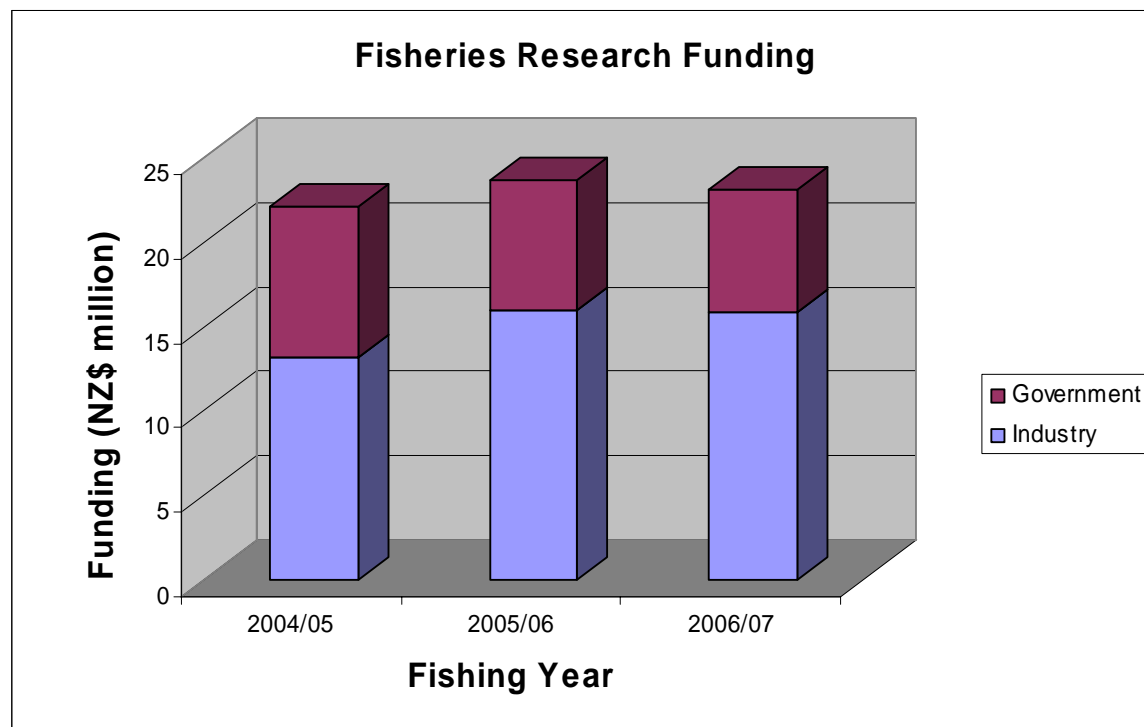
- Increased stakeholder buy-in to research & management
- May be more cost-effective:
  - Stakeholders may give their time without charge
  - Vessels can be used during commercial harvest operations
  - No government overheads in purchase process (but costs remain for reviewing results)
- Innovative methods developed
- Faster: exempt from research planning process
- Administratively simpler; not cost-recovered

### Potential Concerns

- Explicit research standards and strict monitoring required to ensure integrity and quality of research
- Increased variety of research methods may complicate assessment processes (coordination with MFish-purchased research important)
- Stakeholder expectations about usefulness of information sometimes unrealistic

## Cost Recovery: Overview

- Government's costs of managing commercial fisheries are recovered from the industry
- Includes research and compliance
- Costs allocated to individual fisheries where possible
- Costs for multi-sector fisheries are shared with the government
- Total costs recovered: NZ\$30-35 million (currently about 30% of total Ministry budget)



## Cost recovery for research: Advantages and Potential Concerns

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### Advantages

- Costs required to support activities resulting in private benefits are not paid by the taxpayer
- Encourages strong links between research objectives and management objectives
- Requires justification of proposed research
- Provides strong focus on cost-effective research methods
- Allows total value of fishery to be considered in management

### Potential Concerns

- Contentious: ongoing debates about what activities should be cost-recovered
- Administratively complex; difficult to handle budget under and over spend
- Industry has strong incentive to reduce research costs
- Debate on scientific merits of research clouded by cost considerations
- Interpretation of precautionary approach is important (management response when information is poor)



## Move to Objectives-based management: Why?

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- 20-years experience with Quota Management System; Positive outcomes but scope for improvement
- Few fisheries have formal plans
- Concerns that management measures and services don't maximise value
- Demands for improved performance from our fisheries due to:
  - Pressures on industry: Markets; Exchange rates; Fuel costs
  - Increasing expectations from recreational & customary fishers
  - Changing social values concerning environmental effects of fishing



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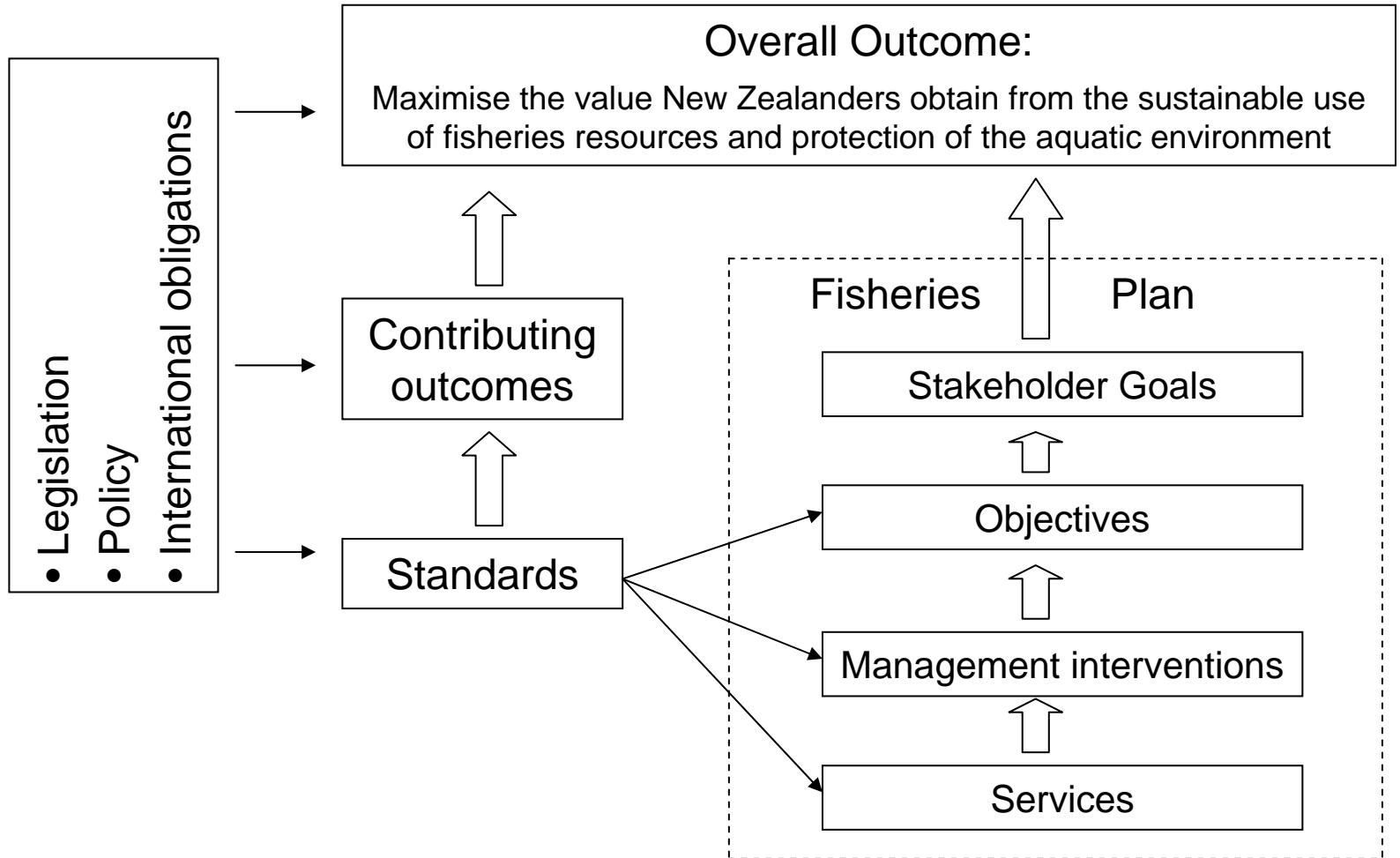
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## Objectives-Based Management: Key features

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- Being clear about what we want to achieve from each fishery (objectives)
- Designing management measures and services (including research) to achieve those objectives
- Opportunity to further develop co-management
- Government leads setting of outcomes and standards
- Major stakeholder involvement in determining goals, objectives, management measures, and services

## Objectives-Based Management





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## Objectives-Based Management: Proposed Standards

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### **Consultation Completed for:**

- Harvest Strategy
- Management of Non-QMS species
- Consultation

### **To be released soon:**

- Benthic Impacts
- Seabirds
- Sharks

### **To be released later:**

- Reporting
- Allocation
- Environmental Impact Assessment
- Risk analysis
- Marine mammals
- Sealions
- Hector's/Maui Dolphins
- Input and participation of tangata whenua
- Deemed values
- Governance and representation
- Purchase
- Service Delivery



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## Objectives-Based Management: Fisheries Planning Groupings

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### Deepwater Fisheries

#### Inshore Finfish

- Southern finfish (3,5)
- Southern reef fish (3,5)
- Challenger mixed finfish (7)
- ECNI mixed finfish (2)
- NECNI mixed finfish (mostly 1)
- WCNI mixed finfish (8,9)
- Chatham Island (4)

#### Freshwater

- Freshwater general
- North Island Eels
- South Island Eels

### Shellfish/Seaweed

- Southern shellfish (3,5)
- Challenger shellfish (7)
- ECNI shellfish (2)
- WCNI shellfish (8,9)
- NECNI shellfish (1)
- Rock Lobster
- Paua
- Northland scallops
- Coromandel scallops
- Challenger scallops
- Foveaux oysters
- Seaweed

## Objectives-Based Management: Expected Benefits

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- Increased transparency
- Improved understanding of fisheries management and input by stakeholders
- More efficient decision-making
- Stronger link between fisheries objectives, management measures, and services
- Improved value from fisheries



## Objectives-Based Management: Progress

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- Consultation on first batch of standards under way
- 3 Proof of Concept Plans prepared
  - Foveaux Strait Oyster Fishery
  - Southern Blue Whiting
  - Coromandel Scallop Fishery
- Plans describing current management for all fisheries to be completed in June 07
- New information systems under development

## Objectives-Based Management: Implications for Science & Research

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- Expert scientific support critical for development of fisheries plans; scientists will be part of management forums to be established for each fisheries grouping
- Expect increased focus on:
  - Evaluating potential harvest strategies, including options for research and other services
  - Assessment of fisheries against explicit harvest strategy standard and environmental standards
  - Research on impacts of fishing on the aquatic environment
  - Innovative, cost-effective information collection methods
  - Stakeholder-purchased research
  - Managing to defined levels of risk (more information is not always better!)



## Example: Southern blue whiting

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### Current situation

- High cost, low value, seasonal fishery
- TACCs: 35,648 t; 2005/06 Catch: 30,278 t
- 2006 export value approx NZ\$14 million
- Assessment: biennial acoustic survey (cost approx NZ\$ 1.5 – 2.0 million)
- Average annual cost recovery levies:  
Approx NZ \$1.4 million

### Possible future scenario

- Reduce TACCs
- Reduce frequency (and cost) of surveys
- Risk unchanged