APPENDIX D
Pre-Workshop Focus Questions

This list has been sorted to help demonstrate numbers and range of comments on specific issues.

1. List 3-5 important challenges that fishery management will face over the next quarter century.

Institutional/ Governance (Some key issues—role and authority of the manager; who does the management; the cost efficiency of management; tension between stakeholders, industry, and government in terms of who should be responsible for management; rights and allocation.)

General
- Implement strategies to overcome the loss of historical, cultural, and resource knowledge as many users, managers, researchers etc. leave
- Integrate/assimilate new fishery management processes developed in such workshops into existing fisheries management
- Development of governance systems for multiple ocean use and conflict resolution
- Redefining the part(s) to be played by public authorities
- Failure to develop and implement effective capacity management, which leads to stock collapses in spite of Total Allowable Catch (TAC) management in place
- Co-ordination of all fisheries users

Funding/efficiency
- Development of efficient-effective fishery management institutions
- Declining government budgets
- Reduced government expenditure and increased cost-recovery will result in limited funding for fisheries management
- Delivering the best and most efficient use of fisheries management budget, particularly in context of cost recovery
- Management costs and efficiency
- Adequate financial resources

Lawsuits
- Managing the lawsuits
- Increasingly litigious environment

Legislative/policy issues
- Time it takes for council to approve fisheries management plan (FMP) in regard to it becoming law
- Integrating multi and conflicting federal laws
• Contributing to and implementing the governments’ Ocean’s Policy

Co-management
• Developing and implementing co-management arrangements
• Government/industry co-management
• Develop, implement, and work with effective co-management (partnership) agreements
• Arrange funding and provide accountability for funds
• Evolving fisheries management from a mostly top-down process to one that is more stakeholder-based with strong research and technical support from academic and government sides
• Reaching an appropriate balance between industry desire for self management and government stewardship responsibilities

Decision making
• Developing integrated rationale and values-based decision-making frameworks
• Being able to make appropriate management decisions in the presence of the inherent uncertainty about stock, industry, enforcement, and government behaviour
• Timely decisions with little information

Rights/allocation
• Implementation of property-based management regimes
• Allocation of fish resources amongst stakeholders, including commercial, recreational, and indigenous
• Property rights
• Changing industry ownership
• Completing an integrated rights-based fisheries management framework
• Resource privatisation
• The transition to rights-based management systems
• Dealing with future failures in poorly designed ITQ systems
• Accommodate and incorporate privatization of services.
• Allocations among recreational users
• Overcapacity, limiting access, and allocation
• Allocation of shares of the sustainable yield across sectors
• Dealing with compensation claims where existing rights are varied
• Improved recognition, inclusion, and capability for representation of the public's right to a share of the inshore fisheries, in New Zealand's fishery management process
• Fairly allocating available takes of fishery stocks among different user groups and fishing-dependent communities
• Allocation of limited resources among competing users
Global
- To fully understand where our fisheries fit into the global picture
- Globalisation
- Global pressure on fish stocks
- Increased global trade in fisheries products
- Managing high seas, shared, and trans-boundary fisheries
- Increasing global population and demand on fisheries
- Breaking down of trade barriers and opportunities created

Involvement/Stakeholders
- Need to deal with more diverse constituency
- To better understand the user/stakeholder groups in order to have a harmonic working relationship
- To continue a vertical-integrated positive working relationship with aquaculture management people
- Developing a transparent flexible working relationship with environmental groups and government agencies
- Balancing management decisions between the resources and the users
- Stakeholder involvement
- Public demand for real participation in all aspects of fisheries management
- Working with non-fishery stakeholders including environmental groups and other marine industries/interests such as shipping, recreation, or shore-based industries that will compete for shore and water access or may produce environmental or habitat effects that are detrimental to fish stocks
- The need to focus fisheries management on substantive issues rather than the short-term emotive issues
- Getting interested parties to agree; that is, bridging the gap between rational self-interest and rational common-interest
- Education of urban populations about rural resource use issues
- Facilitation of debate between different sectors on resource use and management
- To increase stakeholder involvement in the decision-making process
- To supplement scientific knowledge of the fish resources with stakeholder knowledge
- Relationships between scientists and non-experts
- The need to integrate and engage all fisheries stakeholders into the management process in a meaningful way

Ecosystem management and sustainability
- The conduct of viable, sustainable commercial fisheries given fishing pressure, habitat concerns, “species at risk,” other use pressures, etc.
- Managing for multiple species
- Developing and implementing ecosystem-based fisheries management policies
- Broadening management to encompass ecosystem management
- Managing for sustainable development (economic, social, and ecological)
- Increasing habitat and enhancing the resource by increasing the use of artificial reefs made of historical materials
Ecosystem and integrated fisheries management

Ability to address fisheries management from an ecosystem-based approach, which includes interactions with non-harvested species, as opposed to a species-by-species approach, but being able to recognise when the ability to do so is hindered by current knowledge and management realities and then knowing what the second best option is

Ecosystem management—beyond single stock/species management

Improving our understanding of natural system variability and anthropogenic impacts on fisheries (e.g., habitat alteration at sea, in estuaries, in watersheds; pollution; fishing mortality) and their interactions, i.e., building good, whole-system conceptual models that can be tailored to different areas to understand key fisheries

Complexities of ecosystem-based management

Coordination with other environmental issues, e.g., climate change

Designing/implementing management strategies and techniques for the sustainable use of still-healthy fishery stocks

Bringing about recognition of, and allowance for, environmental and associated species impacts from target species fishing

Rebuilding depleted fishery stocks

More efficient fishing technology will increase the challenges of sustainability and precaution. It is not easy to give precise meaning to these concepts for fish stocks that fluctuate enormously for environmental reasons beyond human control. Fishing may, however, enhance the adverse effects of environmental fluctuations and perhaps make some changes irreversible, all the more so and all the more quickly the more efficient the fishing technology is.

Marine protected areas

The resistance to closed access in any form and the resulting tendency to overinvest because of the common property problem; this is an old problem but not all countries have dealt with it successfully, and what has been accomplished is often challenged

Being able to intelligently address the likely ever-increasing demands to implement marine protected areas as a fisheries management tool or as a means to accomplish other goals such as biological diversity or stock preservation

The conflict between commercial uses of fish resources and environmental goals; Whales and seals have been elevated to a status of sacred animals beyond exploitation even if their products are valuable and there probably is a case for keeping these stocks down because of predation on commercially valuable stocks. More generally there is a growing tendency to regard the world oceans as wilderness to be preserved for its own sake and not as a source of valuable food or other products. Marine protected areas are a good example. If we only could get the fishermen out of the way.

Using marine reserves as a management tool

Deal rationally with the no-take reserve issue
Public/environmentalist or green pressure
- Public demand for higher environmental standards
- Relationships between fisheries and society as a whole
- Environmental issues
- Green pressure and public tolerance of fisheries policy
- Increased opposition to commercial fishing, based on concerns over the environmental impacts
- Integration of conservation agendas beyond stock conservation to the satisfaction of the contingencies of these agendas while sustaining economically viable fisheries
- Lack of acceptance in general public that fisheries management is responsible

Economic sustainability
- Changing industry and consumer needs
- Foster innovation to traditional fishery management practices to more effectively grapple with increasing complexity
- Promoting cost-effective compliance
- Incorporate rational economic principles into fishery management.
- Develop management strategies that allow for business planning
- The need to better integrate socio-economic issues into management decision making in a more formal and structured way

Competition
- Increased competition between fisheries and aquaculture and other uses of coastal space
- Integrating aquaculture and hatchery (enhancement) systems in fisheries management
- The importance of recreational fisheries will undoubtedly increase as people become more wealthy and leisure increases; recreational and commercial fisheries compete for the same resources
- Being able to effectively address the perennial problem of balancing the short-run need to support current fisheries-related industries and activities and the long-run need to maintain viable fish stocks. Part of this involves the allocation of current available harvest among competing recreational and commercial stakeholders.
- Increased demand for limited seafood resources from all sectors; commercial, recreational, customary (and non-harvest)
- Increased demand for seafood

Accountability/evaluation
- Better define expectations, measures of success, accountability and participants involved/affected by fishery management actions
- Increased accountability to both government and the community
Best science/management science/research needs (also see ecosystem/sustainability)

- Lack of basic science and social information, e.g., fish stocks; environmental; ecosystem; economic data from commercial, recreational, and non-consumptive users
- Improved assessment of noncommercial harvest, both public and customary Maori
- Demand for more and better data
- Matching capacity to resource availability
- Lack of applied science tools to incorporate the above (matching capacity to availability) into management and decision making
- Inability to deal with uncertainty: 1) incorporating uncertainty into decision making; 2) communicating need to incorporate uncertainty into management; 3) describing tractable vs. intractable uncertainty, i.e., some types of uncertainty can be reduced by improved technology and tools (e.g., predicting El Nino events), other types of uncertainty will never go away
- To change the management approach from prediction to adaptation
- Translation of complicated model results into management advice
- To understand how fishers adapt to changes in imposed regulations (fishing practice, compliance, investments, etc.)

Training

- Recognize the difference between, and the need for, a transition from technician to policy-maker
- Raise the level of technical competence and issue sophistication of staff without losing touch with the physical marine environment (fish, water, fish harvesters)
- Recruiting and training

Enforcement/compliance

- Improved awareness of, and compliance with, amateur regulations
- Compliance and enforcement
- Complying with Sustainable Fisheries Act (SFA)
- Control over fishing on the high seas will become more important. This has two aspects. First, are the institutional arrangements (the straddling stocks treaty) adequate? Second, policing the high seas is a costly process. Who will do it and who should pay for it?

2. List 3-5 skills that managers will need in order to successfully address these challenges.

Specialization vs. generalization

- A caveat is in order when making this list. It would be not be practical to have all fisheries professionals in government agencies, fisheries businesses, and other
related organizations acquire all listed skills. While all participants will need to
become familiar with more areas, there will still be a need for specialization.

**Communication/conflict resolution/consensus building**

*Negotiation/Facilitation/Consensus*

- Facilitation skills
- Consensus building
- Facilitation and team building
- Ability to mediate interests and negotiate
- Ability to facilitate dialogue between all fisheries stakeholders and
  meaningfully engage them in the fisheries management process.
- Negotiation
- Negotiation skills
- Conflict resolution procedures and strategies.
- High level negotiation and conflict resolution
- Group process, facilitation, negotiation and bargaining, community-based
  planning processes, public involvement methods
- Ability to organise confrontation of all relevant points of view

**Communication**

- Communication skills
- Strong communication skills
- Ability to communicate effectively with diverse audiences
- Communication skills, both the ability to simply talk to people and effectively
  present technical information
- Ability to explain scientific knowledge to stakeholders and policymakers
- Ability to transform technical documents into laymen’s terms so that the
  public understands

**Liaison/people skills**

- Liaison skills with a wide range of stakeholders
- Highly developed cross-cultural interpersonal skills
- The ability to interact with people whose beliefs/actions are not determined on
  the basis of scientific information
- Speak the fishermen’s language and have their confidence
- People skills to better deal with all sectors

**Multi or Interdisciplinary**

- Interaction of multiple disciplines (economics, biology, etc.)
- Integration of competing demands on the resource
- Ability to integrate information from a wide spectrum of disciplines
- Ability to integrate basic understanding of science, social science, and policy into
  effective fisheries management
- Holistic understanding of the dynamics of fishing and the ecosystem (biology,
  economics, management, and social)
- Ability to understand the various components of real fisheries management
Co-management
• Sharing of management responsibility with constituents

Science knowledge
• Basic understanding of science, social science, and policy
• Science understanding—stock assessment and ecology
• Robust scientific understanding of fisheries
• Good knowledge of fisheries biology
• The ability to understand the exploitation of technologically and biologically interrelated species in time and space
• Better understanding of species interactions
• Improved knowledge of the actual impacts on the environment and associated species
• Fundamentals of marine and climate sciences, including physical, biological, geological, and chemical oceanography, atmospheric sciences, and integrated marine ecology

Science-based technical Skills
• Conducting population estimate studies/ socio-economic studies
• Accessing data on fisheries oceanography and industry behaviour
• Improved methods of assessment of the noncommercial harvest
• Geospatial statistics and data handling, GIS design and implementation, integration of remotely sensed data
• Knowledge of principles of stock assessment, responsible fishing
• Principles of stock assessment
• Competent computer skills set

Decision science
• Methodologies to assess the likely biological, economic, and social effects of different management regimes and regulations, taking into account likely changes in the behaviour of participants
• Methodologies to assess in real time the actual biological, economic, and social effects of different management regimes and regulations, to see if management objectives are being met, and procedures to appropriately modify management actions where necessary
• Models and model building: whole ecosystems, with nested time and space scales; stock assessment; stock allocation; community and regional economy; etc.

Risk assessment
• Improved understanding of risk assessment and management
• The ability to manage fisheries in an environment characterised by high levels of uncertainty and a high risk of litigation
• Risk analysis and procedures and strategies for decision making under uncertainty
• Understanding biological and economic risks associated with use strategies

Economics skills/knowledge
• Understanding externalities and how to account for them
• Economics understanding
• Good knowledge of fisheries economics and how economic incentives work
• Strong understanding of market institutions
• Biostatistics/econometrics
• Knowledge of resource economics
• Economic management

Policy/law
• Good knowledge of the international law of the sea, not least enforcement aspects (what constitutes a breach of international law, who has the power to prosecute, what sanctions can be applied to those who break the rules or refuse to prosecute their own vessels and fishermen?)
• Ability to understand and apply institutional structures to enhance fisheries management objectives and outcomes
• Better legal/legislative process grounding
• Knowledge of federal laws, regulations and policies
• Understanding the Sustainable Fisheries Act (SFA) and being able to comply to eliminate lawsuits
• Legal framework of management

Sociology/Anthropology History
• Better understanding of fishing and aquaculture industries and their communities
• Understanding of human behaviour and how it affects people’s actions
• Better understanding of socio-economic indicators associated with fisheries
• Understanding of the history of fisheries
• Social structure of stakeholder communities, including fishers, environmental, and management
• Resource user (fishers, environmental, and management) groups—myth and belief structure

Business/industry
• Be commercially-minded in terms of running a business
• Understanding of global industry
• Business administration
• Business/marketing of seafood, recreation, and management

Personal character/leadership qualities
• Well-directed passion
• Have a vision of the future and to lead this vision
• Strategic thinking and long-range vision
• Trust and respect within own company/user group
• Building relationships (identifies key contacts, develops partnerships)
• Initiative (addresses current opportunities, manages crises, plans ahead)
• Ability to work under huge pressures and stress
• Coherent delegation skills
• Listening, understanding, and responding (communicates clearly, responds to concerns, motivates to action)
• Ability to proactively work collaboratively and draw upon resources and talents from people with a wide variety of interests, goals, knowledge, and skills
• Ability to find enjoyment/some measure of success in one’s fishery manager efforts, even under difficult conditions
• Ability to create positive change and enable others to support it
• Open-minded
• Good listener and willing to listen to all user groups and be able to use laymen’s terms to explain management procedures—a people person
• Improved understanding of and ability to engage with members of an increasingly pluralistic society
• Ability to sell concepts
• Strong leadership
• Ability to see big picture and small details
• Thick skin/powerful friends!
• Adaptability
• Ability to look beyond personal prejudice and self-interest
• Ability to be creative and innovative to ensure proper adaptation
• Unlimited patience and tolerance!
• Principles of statesmanship and integrity

Business management skills
• Executive management skills, i.e., personnel, budgets, workload planning, etc.
• Strong organisational skills

Staff management
• Ability to provide in-service training to subordinates, particularly to prepare technicians to be promoted into policy positions
• Recognition of and provision for professional advancement of staff
• Recognition of the limitations of staff and the need to fill gaps from outside, particularly for special problems

Critical thinking/problem solving
• Proactive and lateral thinking and acting processes
• Analytical thinking (can see complex relationships and plan strategically)
• Robust analytical skills (social, economic, societal)
• Problem solver
• Ability to simplify problems and find solutions
• Problem solving and decision making
Decision making
- Judgement, decision making (facts-based, applies knowledge and experience, develops new approaches)
- Team decision making and planning
- Decision making
- Ability to decide in due time, what has to be decided at his or her level

Planning
- Planning skills (business/project/fish management)
- Strategic planning capability

Real world exposure
- Have knowledge and/or exposure of real world activities regarding fisheries and their habitat

3. Describe up to five educational/training strategies that will support the development of these skills.

Post-grad/post-secondary training
- Post-secondary training at universities and colleges
- Post-graduate education in multi-disciplinary programmes and professions
- University degree/short courses
- More field training in resource economics programmes
- Improved university-based training
- Periodic short courses where current employees of government agencies or fisheries business can study appropriate topics in fisheries biology, economics, and other social sciences
- Streamlined 1-year MBA/Masters of Economics/Masters of Biology programs (or a combination of the three) designed for current employees of fisheries agencies or fisheries businesses
- Use experimental economics as a tool to test and design better institutions
- In New Zealand, we need a post-graduate fisheries management course, with opportunity for on-going training

Integrated training (some of these could apply to continuing education programs)
- Integrated/interdisciplinary marine policy graduate (and undergraduate) programs
- Integration of multiple expertise areas (economics, population dynamics, human relations)
- Exposure to the whole fisheries picture (e.g., training in all sectors as an induction before specialising in a species or aspect: we need both generalists and specialists. The generalist, who would be an employee of a government ministry or industry organization, needs some knowledge of all three areas mentioned above. This must be at a college/university level. In addition we
need specialists with in-depth knowledge of fisheries biology, economics, and international law. Some of those people will probably be needed in government ministries dealing with fisheries but they would often be found in universities and research institutions. The specialists must have a Ph.D. training in the relevant field. Insights into other fields is an asset, but the same person can hardly be a specialist in fisheries biology, economics and international law. The specialist must primarily be trained in the relevant discipline, knowledge of the fishing industry is an add-on.)

- More interdisciplinary training for biologists who have or aspire to policy roles.
- Hiring staff from interdisciplinary educational programs.
- Broad-based training in integrated coastal and ocean management (ICM), along with the place of fisheries management and development within broader international, national, and regional frameworks
- International cooperation
- Good mix of education and industry experience
- Fisheries biology and fisheries economics
- Offer postgraduate studies in natural resource management/business administration

**On-the-job training**

- Promote one-on-one opportunities for diverse, real-life, and quick experiences, such as job exchanges, mentoring, shadow assignments, etc.
- Internships where undergraduate and graduate students can work in government agencies or fisheries businesses while undertaking their studies
- Exchange programs with other natural resource management agencies or related industries
- Exchanges between government, private sector, and universities
- Staff secondments and exchanges, and leave-without-pay arrangements to encourage staff to gain experience with overseas fisheries management agencies
- Staff secondments between organisations within the fisheries sector should be explored
- Internships for managers in industry, and vice versa
- Required field experiences with fishers, managers, and processors/marketers
- On-the-job training and mentoring
- On-the-job training
- Life experience is a major component of education/training
- A sound knowledge in parallel industries
- An ability to assimilate successful “business management” from parallel industries
- Work experience
- Spend time at sea onboard a fishing vessel
- Good mix of education and industry experience
- Lots of exposure to all parts of industry
- Experience through exposure
- Networking opportunities
• Basis should be learning while extracting experiences from one’s own work. This could include:
  1) Ongoing follow up of outcomes, preferably systematically as research programs in cooperation with research organizations and including recurrent communication of research results as an integral aspect of adaptive management.
  2) Recurrent dialogue meetings with stakeholders including an evaluation of outcomes
  3) Recurrent update seminars communicating experiences from similar management schemes elsewhere
• Improved industry-based training programmes

Career development
• Provide sustained (career-long) and progressive education/training opportunities, with a variety of courses, experiences and opportunities
• Fostering career-long learning by a hierarchical curriculum
• Create career pathway for new managers

Recognition/certification/competencies
• Developing a certificate programme to recognise educational accomplishments
• Opportunities for staff to obtain certification as fishery professionals
• Establish a certification and review process
• Establish a set of core competencies and desired qualifications
• Developing measurable learning objectives and evaluating their achievement
• Accreditation program for marine resource agencies

Leadership and management-related training
• Training in facilitation and conflict management
• Ongoing national and international training in management and leadership
• Ability to network on a global scale
• Development of facilitation skills and conflict resolution/conflict management
• Training/experience in group facilitation, alternative dispute resolution, planning process design
• Development of project management skills
• Source (contract) suitable mediation training courses
• Establish working groups (learning by doing) to make recommendation for specific problems supported by facilitator(s)
• Understanding of all stakeholders and cultural groups that make ownership

Case studies
• Develop of case studies to share world-wide
• Knowledge of best practice world-wide
• Knowledge of different fishing management strategies around the world
• Develop role plays to demonstrate the need for a holistic approach
• Case study analyses
Technical training (these fit better with question no. 2)
- Training in the use, development, and history of artificial reefs to provide habitat to enhance the resource
- Training in social and psychological areas to understand the effects of fishery management on local fishing communities
- Improve training in statistics
- Development of technical skills in socio-economics, ecology, fisheries science, human behaviour, etc.
- Data handling skill building: statistics, data processing, GIS, models of all sorts, etc.
- Technical forums

Continuing education
- Workshops and conferences
- International, national, regional training workshops
- Private/public training workshops
- Training courses at national level
- Inclusion of NGOs and interested parties (e.g., commercial and recreational fishers) in training workshops
- Assistance in joining and being active in professional associations, attending conferences, etc.
- Tutorial workshops
- Periodic short courses where current employees of government agencies or fisheries business can study appropriate topics in fisheries biology, economics, and other social sciences (also included under academic training)
- Incorporation of short courses into management body meetings
- In-service training for agency personnel
- Continuing education opportunities
- Create internet interactive programs to develop needed skills

Needs assessment
- Assessing needs of fisheries managers

Compare with successful programs
- Draw upon strategies that have proved successful in other, similar disciplines/industries (e.g., forestry, mining, agriculture)
4. List three to five incentives, rewards, responsibilities, or changes in the working environment necessary to attract and retain successful managers of 21st century fisheries.

Training/learning opportunities

*Continuing education*
- Opportunities for continuous training and upgrading of skills
- Recognition by employers of comprehensive continuing educational effort
- Commitment of managers to lifelong learning
- Availability of funding and time for managers to participate in continuing education
- Incentives to attend workshops, e.g., sponsorship
- Establish a dedicated and targeted training program for managers updated every 3-5 years
- Opportunities (requirements?) for continuing education provided by university outreach programs (e.g., week-long courses, “sabbaticals”)
- Funding for post-graduate studies
- Creation of a learning environment
- Provide the opportunity for research and line personnel to participate in national and international professional organisations

*Exchanges/mentorships/sabbaticals—cross sector, international*
- Encourage staff members to gain overseas experience
- Provide for inter-organisational personnel agreements where employees of academic institutions, government agencies, and fisheries businesses can have meaningful and short-term learning assignments in other organisations
- Opportunities to work in different interest groups (e.g., industry, indigenous people, government, NGOs, etc.)
- Opportunity for intergovernmental or private sector internships or sabbaticals
- Formalise cooperative education and research opportunities with state and federal fishery management agencies (e.g., internships, short-term training, shadowing, etc.)
- Formalise cooperative education and training opportunities with fishing industry organisations and individual businesses
- Set up sabbaticals

*Recruitment*
- Attempt to attract students from the fishing and aquaculture communities
- Develop fishery management scholarship and other support opportunities to attract the best and brightest to the field
- Develop a greater number of skilled individuals, to minimise burnout and to provide increased creativity and other contributions from more people.
- Design recruitment processes to select the right people
Work environment
- Challenging work in a complex environment
- Foster a positive work environment—one of trust, inclusion, innovation, responsibility, recognition, and rewards.
- Working conditions
- Good working environment
- Balance between actual “on the water” interaction and office work
- Incentives should include working from home on some projects or flexible office schedules

Group/team
- Being part of a dynamic group
- Ownership of the project backed up with support of the group
- Working in multi-disciplinary teams

Accountability
- The right people thrive on accountability
- Being given accountability and responsibility for specific fisheries management outcomes

Meaningful work
- Meaningful work with environmental and social consequences
- Interesting work that makes a difference
- Doing work that one finds meaningful and that will earn respect among colleagues
- In addition to the basic day to day routines and the inevitable necessity to put out brushfires, ensure that the workload of research and line professionals provides for the opportunity to do “out of the box” thinking and innovative work to improve the field of agency and business fisheries management
- Provide for inter organisational personnel agreements where employees of academic institutions, government agencies, and fisheries businesses can have meaningful and short-term learning assignments in other organisations
- Openness with users in a constructive atmosphere

Recognition
External—profile among public/among other sectors/within government
- Public recognition for jobs well done
- Lift profile of seafood industry
- Promotion of success stories in the media
- Start awareness in schools at an early age through learning
- An improved industry profile
- Solid support from government agencies on the extreme importance of sustained fisheries resources on social, economic, and environmental areas
- Greater awareness of the role of the fishery manager
- Securing a better coverage of fishery-related issues by public media
A more mature and open-minded sector

**Internal—Employee/Employer – recognition with organization**

- Employee recognition and reward incentives. Awards and other recognition for individual and team achievement and success
- Making sure the difficulty of the task is properly appreciated
- Recognition of accomplishment
- Associate success in the position with successful management of the fishery

**Salary**

- Salaries competitive with private sector
- Merit-base salary/promotion system
- Great remuneration package
- Economically successful fisheries with attractive compensation
- Pay
- Good pay that at least equals private industry
- Benefits (insurance, etc.) low-cost on-site day care for families
- For existing managers, ask them early-on what they would consider an appropriate reward etc., and provide it to the extent practical
- Provide for research positions in fisheries management agencies where biologists, economists and other social scientists can advance to salary levels comparable to management personnel to prevent the brain drain from research lines to management lines
- Money!—fisheries managers tend to be lower paid than other professionals
- Money for salary increases
- Higher salaries in government positions

**Manager role/authority as related to governance/institution—within or outside an agency or organization**

**Authority**

- Support for decisions from supervisors
- Authority/ability to make management decisions without political interference
- Involvement with high-level officials/boards
- Provide staff with a clear idea of how their skills are expected to contribute to the particular fisheries management role that they are undertaking
- Reduce political influence from above and give managers more decision making and operational authority
- Provide managers with more and better tools and flexibility to resolve problems, enact change and make progress
- Provide necessary authority within agency structure for managers to perform management tasks they are responsible for
- Increase responsibility for the individual manager
- Clear definition of all responsibilities
Institutional framework
- Right institutional arrangements
- Enhancement of the role of policy advice/fisheries management (as opposed to lobbyist role) in organisations outside of Mfish (New Zealand Ministry of Fisheries)
- Restructure NMFS and the Council System in the United States
- Establishment of a management framework that that increases the probability of successful fisheries management outcomes
- In the United States, clear, consistent mandates (i.e., greater clarity within the Magnuson-Stevens Act)
- More distinct separation between science and policy, but with policies clearly based on science
- Clear agency policy guidance (contrasted with ad hoc approach)—clearly communicated
- A legal framework that provides a belief that one can make a difference
- Responsibilities or at least involvement to include the whole chain from policy through implementation to outcome evaluation
- Reduce bureaucracy
- Give possibilities for broader collaboration among managers with different backgrounds and among managers and researchers.

Resources/implementation
- Necessary resources to carry out mandates
- Budget increases for larger staffs
- Provide competent support staff
- Money for resource assessment
- Create an environment where fisheries managers actually believe they can make a difference
- Securing the proper transmission of all relevant information
- Information access: “information hubs,” i.e., clearing house to gather emerging information and make it widely available
- Resources
- Provide managers with more and better tools and flexibility to resolve problems, enact change, and make progress

Career path
- A better defined career path
- Stability of employment
- Accreditation program for marine resource agencies
- More diverse kinds of employment opportunities for fishery managers
- Specializing in one or more of the areas noted above
- Making sure that acting as a fishery manager is not a dead end in a professional career
5. List three to five actions that your organization can take individually, or in cooperation with other groups, to support development of the education, skills, and rewards/incentives necessary for successful management of 21st century fisheries.

Curriculum

Development/revision

- Review and update the graduate-level fisheries management curricula at Oregon State University, consistent with the consensus developed in this workshop
- Professional Masters-level programme in fisheries management
- Assist in curriculum development for fisheries managers
- Help curriculum developer focus on writing appropriate learning objectives
- Development of a training and development framework
- Identify skills, knowledge and experience requirements
- Participation in setting up an appropriate course
- Develop courses of study for Master’s Degree or Diploma programs in interdisciplinary fisheries management
- Revise our graduate programme in resource economics to include more experimental economics and decision theory
- Graduate programme to be revised and to include some natural science
- Develop curriculum for management personnel
- Develop business curriculum for biological types
- Develop biological curriculum for business/economic types
- Develop curricula with universities

Real world

- Education in modelling and combining real-world, present-time information into modelling activities
- Onsite observation and participation with affected fisheries
- Sharing of experience
- Allow for the flexibility in current educational programs for students to undertake internships as part of their course of study
- Incorporate more field trips in courses
- Bring fishermen and policy makers into the classroom
- Elucidation of staff attitudes toward incorporation of explicit socio-economic concepts into agency policy formulation; socio-economic sensitivity training

Research

- Increase research into social science side of management
- Develop research programmes

Resources/funding

- Offer scholarships and/or endowments to research chairs
• Commit sufficient financial and personnel resources for a long-term effort, with clearly defined goals and measures of progress, at an individual and organisational level
• Identify the people with the desired skills within the organisation and enlist them in the education/training effort, by providing them with appropriate incentives, etc.
• Provide resources
• Provide training

Continuing education
• Training programmes for current managers to update skills
• Provide training and special programmes for staff
• Offer mentoring services to junior staff, co-op study programmes etc
• Arrange update seminars regarding management experiences
• Undertake training seminars to explain the necessity to move from prediction to adaptation in the management approach

Short courses
• Participate in short-term training courses
• Preparation of educational presentations (short courses) related to the practical application of fishery bio-economic concepts to common fishery management issues

Workshops/networking
• Offer training/networking opportunities
• Attending workshops, seminars, and having your say
• Encourage and support attendance at workshops and conferences

Outreach
• Publish articles on useful tips for communicating in fisheries management
• Writing, editing, preparation of presentations aimed at conveying agency message
• Improved education/training of representatives from the public sector in the fishery management process; this is currently difficult to obtain in New Zealand
• Implementation of the Fishcare programme (a volunteer programme in South Africa, aimed at providing information to recreational fishermen)

Industry
• It would involve upper management within the company, so cannot say
• Pushing of modern apprenticeships and lifelong learning

Recruitment
• Identifying key people for future in industry
• Recruitment of good entry-level seafood processors
• Promotion of industry in schools
• Expansion of Honorary Fishery Officer network (New Zealand)

Collaboration

Cooperative training/cross training
• Partner with universities to deliver training
• Join with other groups to develop a worthy programme of existing or new courses and other opportunities
• Participating in conjunction with managers to gather much needed data on marine species and their environment
• Classes in educating the managers about your particular user group, their concerns and suggestions on solutions to problems facing that industry
• Outreach and follow-up communication on all issues for all sectors concerned
• Work with government, educational institutions, and NGOs on developing training programmes
• Foster positive working relationships with stakeholders
• Work with academic institutions, e.g., guest lectures (giving and receiving), student internships
• Help to agencies in the development of overall policy guidance to aid staff
• Establishing networks among managers, researchers, and stakeholders to improve dialogue among them
• Smaller organisations can cooperate with other groups

Research partnerships
• Participate with agency biologists in the preparation of fishery management plans to incorporate bio-economic concepts
• Conduct collaborative research with managers
• Partner with universities to do research associate professorships
• Facilitate the process of integrating scientific and stakeholder knowledge

Exchange/secondments/internships
• Participate in exchange programmes
• Provide exchange opportunities
• Exchanges, secondments, etc. with other organisations
• Establish/encourage opportunities for secondment to other organisations within the sector
• Encourage/establish opportunities for staff to gain overseas experience
• Provide active mentoring of “student” fisheries managers
• Provide work experience
• Set up sabbatical opportunities with universities, businesses, NGOs, etc.

Needs assessment/evaluation
• Regularly promote, evaluate, and report on the effort
• Promote debate and discussion
• Facilitate evaluation workshops and dialogue meetings
• Undertake a market survey of key communication issues/challenges in the sector
• Increase awareness among educational institutions of the changing focus of fisheries management and the role of fisheries managers

**Government/institutional support** *(related to incentives and to managers authority/profile)*
• Influence the legal/political environment
• Advocate greater involvement of industry and NGOs in the management of fisheries, increased devolution of government responsibilities to the private sector, and greater security of access and stability to resource users
• Develop the appropriate fisheries management frameworks to encourage people to enter the profession
• Ask Congress to provide clear, consistent mandates, and sufficient, long-term funding
• Ask federal and state agencies to make fishery management a high priority
• Lobby for laws that make sense

**Career path/competencies**
• Work with other organisations to identify career path progression
• Create career paths
• Implement certification and review process
• Develop core competencies or qualifications

**Information access**
• Supply information to “information hub”
• Assist in collecting experiences in a systematic way through research coupled to adaptive management

**6. Please indicate the country(s) in which you have had your primary experience in fisheries (actual distribution was not included).**

• USA
• New Zealand
• Chile
• Canada
• France
• Australia
• Some experience in a number of developing countries
• UK
• EU
• Norway
• Iceland
• Denmark
• A range of countries in Asia and Africa
• Southern Africa
7. Please select the sector(s) in which you have been employed in fisheries.

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* Participant in management activities on all levels from local to federal government
* Eco-labelling
* Iwi (New Zealand indigenous tribes)
* Private, independent research and advisory organisation
* Regional council
* Membership on various management bodies, marine conservation fellowship
* Non-commercial, both public and Customary Maori