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Strategic Planning for Research and Management of the Albacore Tuna Fishery

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Abstract—The National Marine Fisheries Service (NMFS) employed the principles of interactive management, supported by consensus building techniques for facilitating meetings, to produce a strategic plan for research on and management of an important fishery. A technically oriented task force aided by a planner was assigned the task of facilitating the production of the plan; an important first step was the production of a probable future scenario of the fishery. Interested citizens, informed by the scenario, were invited to state their goals for the fishery and to list what they considered desirable future trends and events. An options field for the research and management strategy consisting of 17 design categories was produced by the task force and knowledgeable members of NMFS management. The pros and cons for including each option in the NMFS strategy were discussed in a meeting of NMFS Headquarters, Regional and Laboratory management. A set of options was chosen by consensus to represent the NMFS strategic plan for its research and management of the north Pacific albacore fishery.

INTRODUCTION

THIS PAPER presents a description of the process employed by the National Marine Fisheries Service (NMFS) to develop a strategic plan for its program of research and management for the U.S. north Pacific albacore fishery.

The National Marine Fisheries Service, an agency of the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA), is responsible for conducting research and management programs for the nation's fisheries resources. Its mission includes ensuring the long-range viability of populations of marine fish to help sustain American fishermen's catches and consumer supplies at reasonable levels and prices.

An important U.S. fishery of concern to the NMFS is the north Pacific albacore tuna fishery. The north Pacific albacore is harvested primarily by the Japanese and American fishing fleets but Taiwanese and Canadians also participate in the fishery. The fish are caught as they migrate throughout the temperate north Pacific Ocean from the coast of Japan to the coast of North America.

Total catches of all countries have averaged 93,000 metric tons annually for the 10-year period 1971–1980. During the same period the U.S. portion of the annual catch has averaged 18,300 metric tons caught by approx. 900 small boats that fish along the U.S. west coast from Mexico to Washington state and as far west as Hawaii and Midway Island. At current ex-vessel prices ($1300/ton), the average annual U.S. catch was worth $23.8 million. Although there is a growing fresh fish market, presently, nearly all of the albacore that is caught is canned and sold as white meat tuna.

In addition to the domestic catch large quantities of foreign caught albacore are imported for canning; for example, during 1983 nearly 23,000 mt of north Pacific albacore were imported and canned by U.S. owned companies. The international north Pacific fishery currently yields about 42% of the U.S. canned supply of white meat tuna or nearly 10% of the entire supply of U.S. canned tuna. The north Pacific albacore fishery currently contributes over 100 million cans of tuna to the U.S. consumer annually [2].

NMFS faces several management and research problems concerning the albacore resource and fishery. First, the life history of the albacore is complex; for example, the species migrates in complicated patterns throughout the north Pacific. Second, the dynamics and interactions of the multinational tuna fisheries and the ebb and flow of world-wide economics can affect the intensity of U.S. fishing and thereby the levels of the resource. Superimposed on the already complex problem is the lack of adequate understanding of the effects of environmental elements.

Perhaps most importantly, recent analyses show that the average annual American catch has dropped to about 9000 mt—a situation that warrants increased attention and closer monitoring of the albacore fishery situation by NMFS.

With this background information in mind, the NMFS's Southwest Regional Office (SWR) and Southwest Fisheries Center (SWFC)—the NMFS offices responsible for fisheries management and research in the Southwestern Region of the U.S. respectively—decided in 1980 to increase their monitoring of and research on the albacore fishery. As a result of the need for increased monitoring and the growing complexity of the situation, it became clear that a comprehensive long-range plan for research and management of the albacore would be of benefit to both NMFS and its constituents.

Simultaneously, the SWFC was investigating better ways and means to evaluate, plan, and carry out its research programs. The SWFC installed an interactive planning and management system which integrated the results of normative, strategic and operational planning and put an emphasis on long-run efficiency through consensus building [4]. The key elements of the SWFC's interactive management approach are broad participation by constituents and staff in the planning and management of the Center's research objectives and programs and the formulation of ideals (normative planning) as a starting point for developing strategic and operational plans. Another important feature of the SWFC's system is the training and development of staff members as meeting facilitators skilled in the application of several interactive, consensus-building processes for conducting meetings.

The interactive management system was installed to help the Center approach important management and planning problems, especially those involving inter-disciplinary complexities of biology, economics, oceanography, sociology, domestic politics and international affairs. Subsequently, the SWR and SWFC began the planning for the albacore program based on this interactive planning and management process as it is described in this paper. The formation of the planning organization, the planning and meeting processes that were followed and examples of the intermediate and final results of the strategic planning are described.

THE BASES FOR EMPLOYING THE INTERACTIVE MANAGEMENT APPROACH

The interactive management approach used to develop the albacore strategic plan was applied to help NMFS solve an apparent planning and management dilemma. The dilemma arises when, on the one hand, management tries to overcome the well-known failure of homogeneous groups to solve problems adequately and, on the other hand, in trying to avoid groupthink, is faced with the problem of establishing heterogeneous and therefore potentially more effective groups and getting them to work cooperatively and efficiently in solving problems and developing plans [6]. The trade-off is between quickly determined but deficient decisions and more deliberate but better decisions.

It is important to the long-range viability of an organization to solve this dilemma. A homogeneous group formed to study a problem and offer solutions deceptively appears efficient, because it predictably reaches decisions quickly, never mind if the decision or solution is based on a limited number of possibilities, ignores risks and drawbacks, avoids evaluation of minority opinions, neglects cost–benefit information, and selectively perceives outside criticism. These deficiencies of groupthink can lead to long-run inefficiencies or even disastrous results for the organization [6].

The interactive approach tries to avoid these problems by employing a group whose members collectively possess all the disciplines and points of view needed for better decisions and solutions. However, the operation of such a heterogeneous group presents another set of problems for management. The heterogeneous group's work may at first appear to be inefficient because more time is required for overcoming the shortcomings mentioned previously: more ideas are entertained, risks and drawbacks are discussed, minority opinions are evaluated, cost–benefit information is integrated and outside values and opinions are taken seriously. In addition, members may need time to learn each other's technical language and jargon. However, all of these actions contribute to increasing the probability of finding better solutions to complex problems and to making good decisions. One of the challenges to management then, is to find a means of making the work of heterogeneous groups efficient as well as effective. The SWFC and SWR attempted to do just that in undertaking the strategic planning program described in the following sections.

THE FORMATIVE STAGES

After the independent decisions to increase research activities related to the albacore fishery and to install an interactive planning and management system at the SWFC, the SWFC and SWR directors agreed that a comprehensive planning operation should be undertaken for the albacore program. Although other planning needs were also apparent, especially for the Pacific coast groundfish fishery, lack of experience in the new system and the relatively small number of trained facilitators on hand, made it prudent to undertake only one major planning activity at this stage, and the albacore fishery problem was chosen. It was further agreed that the Center's interactive management system

would serve as a model for the planning and that the joint planning endeavor would offer an opportunity to evaluate the effectiveness and efficiency of the interactive management system for planning involving a number of different people, responsibilities, disciplines and points-of-view.

The Directors of the SWFC and the SWR initiated the albacore strategic planning process by appointing a task force whose duty was first to facilitate the strategic planning and then to carry out operational planning and program execution. The task force was made up of scientists and technically oriented individuals all of whom were working on various aspects of albacore fishery research or management; the planning officer for the SWFC was assigned to assist the task force. The task force members were responsible for the content and technical aspects of the work while the planning officer was responsible for establishing and facilitating the planning processes employed by the task force.

The original task force was made up of three biologists, an oceanographer and a fishery management specialist. However, it was apparent after the first meeting that fishery economics and systems analysis expertise were also needed for proper planning, and individuals with these disciplines were added to the task force. The task force members were of very high caliber, nearly all with a Ph.D. degree and each one with several years of experience in his field. The task force members, besides representing a variety of disciplines, also represented five different organizational elements each of which was responsible for an aspect of current albacore research or management. Thus four SWFC Laboratories or Divisions and the SWR office were represented. The individuals on the task force had no previous experience working as a team although from time to time two or more had collaborated on short-term research projects or in writing a scientific paper. Concurrently, with the strategic planning project, most of the SWFC task force members were also assigned to a technical committee which began to work towards its objective of building a computer-oriented model of the dynamics of the north Pacific albacore fishery.

THE PLANNING PROCESS

There were seven major steps in the development of the National Marine Fisheries Service's (NMFS) strategic plan for research and management of the north Pacific albacore fishery (Fig. 1):

1. An analysis of the current situation and the definition of issues that needed to be addressed.
2. The definition of probable trends and events in the fishery and its related entities.
3. The writing of a probable scenario incorporating the issues and projections of the current trends into the future.
4. The definition and structure of the constituents' desirable objectives for the fishery.
5. The definition of trends and events that would obtain if the desirable objectives were being achieved.
6. Development of an Options Field, i.e. the specification of the viable options that could be made a part of NMFS's strategy for meeting the objectives and a classification of the options into similar groups called design categories.
7. Selection of the best option(s) within each design category.

The features of each of these steps along with a description of the process used to accomplish them are provided in the following sections.

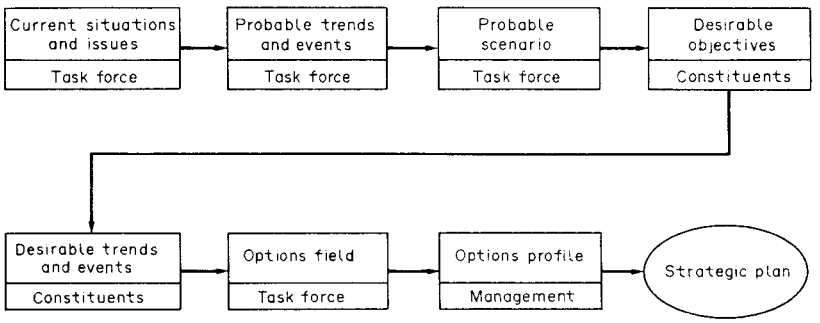

Fig. 1. The seven major steps in the development of the National Marine Fisheries Service's (NMFS) strategic plan for research and management of the north Pacific albacore fishery. The responsibility for the completion of the steps shifted among the task force, constituents and NMFS management.

ANALYSIS OF CURRENT SITUATION AND ISSUES

One of the first activities of the joint SWFC/SWR Task Force for Albacore Program Planning was to explore the issues involved with improving the situation in the north Pacific albacore fishery and to document the existing situation of the fishery and its related entities. At its first meeting the task force discussed the purpose and nature of its assignment and the overall status of the fishery. The group was engaged in a Nominal Group Technique (NGT) process to elicit the issues that the group felt needed to be addressed. The NGT process is a group decision-making process led by a meeting facilitator who usually does not have a personal stake in the outcome of the meeting. The NGT process [1] consists of the following four major steps:

1. Silent generation of ideas in writing in response to a pertinent question about the problem at hand.
2. Round-robin feedback from group members and recording of each idea.
3. Discussion and clarification of each idea.
4. Individual voting on priority ideas with the group decision derived through rank-ordering or rating.

The NGT question which the task force addressed was: 'What issues (concerns) do you think will need to be addressed in planning and carrying out a program for research and management of albacore?'

In response to this trigger question, the group generated 58 issues which were classified into seven categories. Learning and team-building began very early in the discussion period of this first NGT process. As examples, it was agreed to standardize a number of technical terms and, as the issues were discussed, agreements and disagreements were voiced which allowed members to judge the extent to which colleagues understood or appreciated their particular insights or points of view. The generation, discussion, clarification and classification of these issues occupied the first day of the two-and-a-half day meeting.

Probable trends and events

After the issues were set forth and classified, the task force identified the current and probable trends in the fishery. A facilitated brain-storming session was employed to identify important trends in the fishery that would help to characterize the present and probable future situation in the fishery. Systematic discussions of each trend resulted in (1) consensus on the current and future direction and magnitude of the trend, based on the facts on hand, (2) an agreement that sufficient data were available to quantify the trend through subsequent analysis, or (3) that pure speculation was required. The facilitator kept the group's discussion notes and graphs on a flip-chart. The group's work on trends took a full day.

Development of a probable scenario

After these discussions, task force members were assigned, on the basis of expertise and interest, the job of further analyzing some of the trends, making judgements about their future projections, and describing the trends and their probable effects in more detail. This work, which was actually the beginning of the development of the probable scenario, presented difficulties for some task force members. It is hard to identify exact causes, but the difficulties seemed to have stemmed from:

1. an uneasiness on behalf of some scientists in going outside of the scientific method and beyond the range of the data to speculate on the trends;
2. the lack of a clear precedent or model for the probable scenario; and
3. an insufficient initial explanation by the planning officer of how the scenario was to be used, accompanied by a possible fear that mere projections of trends for the probable scenario would somehow make their way into the scientific peer-review process and be misjudged as an individual's scientifically based forecast of what actually will happen.

When these difficulties were settled (through the provision of example scenarios from other planning problems and further explanations by the planning officer, coupled with strong support from upper management) the members did write a probable scenario of the future of the north Pacific albacore fishery to 1993 based on the projection of current trends. The scenario was divided into five interrelated sectors of the fishery and a chapter describing each sector was written. Albacore resources, international and domestic harvesting, domestic processing and consumption, research on the resource and fishery, and national policies and management comprised the five sectors.

A sub-committee of the task force reviewed the draft to assure that the probable scenario was internally consistent from chapter to chapter. The scenario revealed the possible problems and opportunities that the fishery might encounter in the future if current trends were allowed to continue uninterrupted. Thus it represented a picture of the status quo projected to the future.

The scenario was presented to constituents as part of the background information to prepare them for the long-range planning workshop. It helped focus the workshop participants' attention on the future of the fishery and helped them develop their ideas about a desirable or ideal future.

CONSTITUENTS' WORKSHOP ON LONG-RANGE PLANNING

A Workshop on Long-range Planning for the north Pacific albacore fishery was convened at the SWFC during June 1983. It was attended by a number of invited citizens who represented a cross-section of points of view or interests in the albacore fishery; commercial and recreational fishermen, canners, boat owners, industry spokesmen and a State legislator were represented at the meeting. All the participants were individuals outside of the Federal government. As a result of the workshop, NMFS hoped to gain valuable information about what interested citizens would like to see happen in the north Pacific albacore fishery over the next decade; this information would help NMFS plan its programs. At the same time, it was hoped that the workshop participants would feel that they had contributed in a useful way toward improving their government and in helping to create the future they desired for a valuable fishery [3].

The constituents' long-range planning workshop was arranged by the task force and conducted by a facilitator contracted by the SWFC and SWR. One of the most important steps in arranging the workshop was deciding who was to be invited as a participant. The task force began to solve this problem in its first meeting by brainstorming to develop a list of attributes and specialized knowledge required to be represented at the meeting for the constituents' group to achieve a comprehensive overview of the fishery's problems and possible solutions. Thus, about 20 categories of specialized knowledge or experience were listed, e.g. long-range fishermen, boat owners, recreational fishermen, food processors, canners, economic expertise, consumer requirements, financing, population dynamics, etc.

With the categories specified, a matrix was formed by listing names of individuals or organizations and checking-off the attributes possessed by the person or a representative from an organization. In some cases the people that were identified could represent two or more attributes.

The task force worked for approx. half a day to complete the list of categories and to identify the individuals. Afterwards, however, considerable time and effort was spent on logistics by support staff to invite the participants and make the other arrangements for the workshop. A group of 11 citizens representing all the required attributes was invited to attend the workshop on a volunteer basis; 10 actually attended. Travel expenses but no honoraria or fees were paid.

The two-and-a-half day workshop began with an overview of the probable scenario and a discussion of the problems in the fishery. An NGT session produced a list and discussion of the constituents' desirable objectives for the albacore fishery. The NGT trigger question to elicit these objectives was: what are desirable goals and objectives for the future of the north Pacific albacore fishery? Following the NGT session the objectives were structured into a support relationship using Interpretive Structural Modeling (ISM) (Fig. 2).

ISM is a computer-assisted group learning process that culminates in the development of a structure displaying the relationships among the elements of an issue, problem, plan or project. The structure is developed in a meeting assisted by a skilled facilitator. The ISM methodology allows the structuring of a large set of elements, often involving a very large number of possible combinations and permutations, while the group considers at any one time only the relationship between two elements [7, 8]. Inferential logic is applied in the ISM computer program to reduce considerably the number of queries that need to be addressed.

As in the NGT process, a 'trigger' question is used in the ISM process to focus the discussion and to establish the relationship between pairs of elements. The question used in this case was: 'In the context of a desirable future for the north Pacific albacore fishery, will the achievement of objective X significantly support objective Y?'

When the objective statements are substituted for X and Y the question can only be answered with a yes or no. However, a great deal of discussion may ensue before the group can answer the question. The pairs of objectives that were considered were selected by the ISM computer program with the text of the objectives displayed on a large television screen. A typical question from this ISM session would be as follows: 'In the context of a desirable future for the north Pacific albacore fishery, will the achievement of the objective *improve forecasting of annual and geographic fluctuations in the fish stock* significantly support the objective *conduct research to improve efficiency of fishing methods of domestic fishermen*?'

With the support relationship among the objectives identified and displayed, the participants were then asked to describe what desirable trends and events one would experience in the future if indeed the objectives were being pursued. To accomplish this, the objectives were grouped into four major categories. Two categories were assigned to each of two sub-groups of workshop participants. Each sub-group was then engaged in an NGT and an idea writing session to produce a list of desirable trends and events for each category.

The workshop resulted in two major sets of information that formed the basis for further planning: (1) a set of desirable goals and objectives for the future of the albacore fishery from the

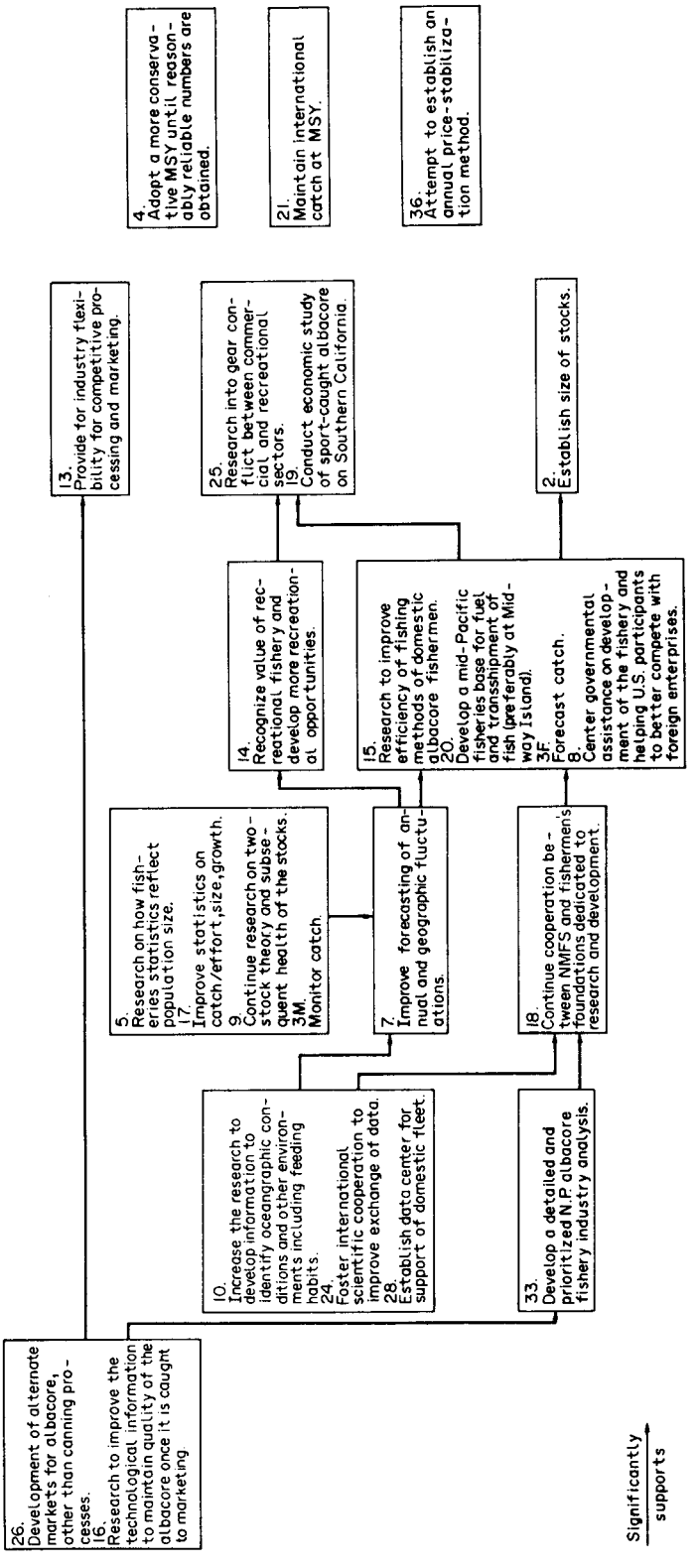

Fig. 2. Desirable goals and objectives for the future of the north Pacific albacore fishery.

constituents' point of view, and (2) a set of desirable trends and events that, if realized over the next 10 years, would indicate to the workshop participants that the desirable goals and objectives were actually being pursued and realized.

These sets of information, together with the information from the probable scenario and an examination of the issues, formed the basis for the options that were later developed for the design of the strategic plan for the NMFS albacore program. The participants in the workshop also completed an evaluation of the workshop itself. Their remarks made it clear that a large majority of the participants regarded the workshop as an efficient one and as being beneficial to both NMFS and themselves.

PREPARATION OF INFORMATION AND THE OPTIONS FIELD

Following the constituents' workshop, the task force combined the desirable trends and events developed by the constituents with the probable trends and events developed earlier by the task force. These trend statements, numbering about 130, were then grouped into 17 categories on the basis of similarities; duplicates were eliminated. The meaning and implications of the various trends were discussed during this process which was carried out in a facilitated ISM session. In this way, the task force members were able to learn a great deal about the citizens' requirements and desires and the interrelationships among the trends and issues.

With the detailed trends and events classified, the SWFC senior staff was able to develop a set of options for the NMFS strategy. Option statements were formulated by consolidating individual detailed statements of desirable trends and events within each category. Table 1 shows a portion of this original set of options arrayed by category into what is called an Options Field. In this case, the options in each category are annotated by the original statements of desirable trends and events obtained from the constituents or from the probable scenario. This preliminary options field for guiding the design of the NMFS program for albacore research and management was used as a background document for the Directors' meeting on strategic planning for the NMFS Program for North Pacific Albacore Research and Management.

The NMFS Directors' meeting

A meeting attended by NMFS Directors was held for the purpose of establishing program objectives and selecting the options to form the NMFS strategic plan for albacore research and management. The objectives and strategy were to be established in light of the constituents' desirable goals and objectives, and in support of these objectives to the extent that the NMFS mission and capabilities could accommodate them. The NMFS managers at the meeting were asked to:

- —consider the issues and opportunities involved with the north Pacific albacore resources and fisheries;
- —discuss the pros and cons of the possible and feasible options for resolving the issues or taking advantage of the opportunities;
- —reach a consensus on the preferred options to be included in the long-range NMFS program for albacore research and management; and
- —determine the roles and responsibilities of the various NMFS offices for carrying out the NMFS albacore program.

The participants were provided with background materials before the meeting, including reports on the fishery, a draft of the options field and the report of the constituents' workshop.

The meeting was facilitated by a professional, nongovernment facilitator, the same person who conducted the constituents' workshop. All of the options were displayed on a magnetic board visible at all times to the participants (Fig. 3). The participants first discussed the meaning of each of the options within each of the design categories, one at a time. SWFC and SWR technical staff from the albacore planning task force were available to answer questions and to explain the significance of options, issues or opportunities based on material from the constituents' workshop or based on known facts. After NMFS Directors were satisfied that the meanings of the options were understood, they reorganized the options field slightly by combining the four research categories into a single category and by adding a few additional options.

When the final options field was established, the group discussed the pros and cons of including each option in the NMFS strategy and selected those to be included in the NMFS albacore program. A combination of facilitated discussion and voting was used to arrive at a consensus for selecting or rejecting individual options for the strategy.

Because there were logical relationships among some of the options or categories, it was possible that selections of certain options in one category could eliminate choices in the remaining categories. Therefore, during the meeting, logically inconsistent options in the remaining categories were removed from consideration after the selections were made for a category. Only a few options were thus affected. From the Directors' point of view, the final choices in each of the design categories constituted the best alternative design of the NMFS albacore strategy (Fig. 4).

Table 1. The Options Field for three of the 17 original design categories. The options were developed by SWFC Management from the individual statements of desirable trends and events from the constituents (asterisked items) and some of the probable trends and events from the probable scenario (non-asterisked items)

4. FISHERY DEVELOPMENT	5. CENTRAL PACIFIC FISHERY BASE	6. NEW PRODUCTS
—Investigate potential for increasing: total catch, U.S. share of total catch, efficiency (lower costs) —Conduct gear research and development program —Conduct research program on fishing strategies —Continue cooperation with S-K projects	—Promote development of Fishery Base —Monitor the State/industry efforts —Oppose development of base at Midway	—Actively develop new albacore seafood products (utilization labs) —Assist industry through grants (e.g. S-K)
1. Number of Japanese pole-and-line vessels declines. (PH)	1. Infrastructure is required to develop a U.S. fishery in more distant fishing grounds. (I)	1. Canned tuna consumption at 93,000 tons by 1988; 104,000 tons by 1993. (PP)
2. Decrease in U.S. pole-and-line vessels. (PH)	2*. Develop statistical data to show benefits of Midway base development. (11DD)	2. Existing processing plants produce domestic demand through 1993. (PP)
3. U.S. vessels move farther west. (PH)	3*. Develop a plan for the necessary infrastructure in Hawaii to support the Midway Island fishing port. (20DD)	3. Domestic retail demand for albacore in all product forms approaches 119,000 tons annually by 1993. (PP)
4. U.S. longline fleet increases. (PH)	4*. Feasibility study to determine various economic development plans to use Midway Island as a fishing port. (15DD)	4. Increased industry R & D funds devoted to fresh-frozen and 'over the counter' items. (PP)
5. Increase in gillnet vessels. (PH)	5*. Develop a Midway fishing base to increase fleet efficiency. (27DD)	5*. Develop alternative albacore products. (11DA)
6. Increase in larger combination vessels. (PH)	6*. Assess level of proper government participation in developing Midway base. (28DD)	6*. Analysis of all possible ways of using albacore for the market. (11DA)
7. Indirect constraints on albacore fishery determined. (I)	7*. Provide NMFS assistance for establishing Midway base. (11DD)	7*. Develop albacore sandwich spread. Develop sliced albacore (bologna-like). (14DA)
8. Fishing efficiency increases. (PH)	8*. State of Hawaii assistance for establishing Midway base. (11DD)	8*. Establish a fishery product development and utilization laboratory in Hawaii. (36DD)
9. Determine if albacore fishery can be used to absorb fishing effort diverted from other U.S. fisheries. (I)	9*. U.S. Navy assistance for establishing Midway base. (11DD)	9*. Establish a utilization lab outside of Hawaii. (12DA)
10*. Assistance for development of U.S. high seas longline and gillnet fleets through the use of S-K, AFRF, or other funds for charter vessels. (1DD) (2DD) (3DD) (6DD)	10*. Establish a fuel and transshipment base at Midway Island. (17DD)	
11*. Continue close communication and cooperation between government and industry for fishery development. (1DP)	11*. Establish a cooperative or association, to manage the Midway facility. (25DD)	
12*. Establish SWFC and Navy assistance to obtain oceanographic and fishery data in support of longline and gillnet development. (1DD–6DD)	12*. Develop a mothership operation at Midway if feasible. (29DD)	
13*. R & D for domestic high-seas gillnet albacore fishery. (3DD)	13*. Use of U.S. Navy mothballed fleet (refrigeration and cargo) for development of U.S. fishery. (30DD)	
14*. R & D for domestic high-seas longline fishery. (3DD)		
15*. Continue R & D on new types of fishing gear. (14DR)		
16*. Improve vessel and machinery designs. (19DD)		
17*. Develop new materials for vessels and gear. (4DD)		
18*. Develop an effective longer-lasting fish aggregation buoy (FAB). (37DD)		
19*. Test fish aggregation devices with fishermen/government participation. (4DP) (5DP)		
20*. Place aggregating devices in oceanic and mid-Pacific waters. (11DP)		
21*. R & D on new methods for fishing albacore at depth. (12DD)		
22*. Expand aquaculture research to assist commercial fisheries, e.g. baitfish culture in sea-holding pens.		
23*. Engineer a breakthrough in rearing mullet for use as a baitfish. (10DD–40DD)		
24*. Increase congressional support for fishery development. (29DD)		

CONCLUDING REMARKS

The NMFS strategic plan developed for the north Pacific albacore fishery research and management—or more specifically the collective experience of the planning process—is already guiding the programming, budgeting and operations within NMFS. For example, the Southwest Fisheries Center and Southwest Regional Office are reviewing their albacore fishery-related operations, making better operational plans (some involving fishermen) and making program decisions based on the planning experience.

The strategic planning process also lead to a great deal of learning by all of the people involved. The task force members learned many technical facts and scientific approaches from each other; they learned to trust each other more, and to work together more as a team. The task force also learned the explicit desires of the constituents and NMFS management. Thus the people who shared a common planning experience gained a common understanding of the albacore fishery situation and of NMFS goals and strategy for the fishery.

The citizens who were invited to participate in the long-range planning workshop also learned, as did a number of other constituents who later became informed about the results of the planning. Recreational and commercial interests learned that they shared some explicit common goals and desires for the fishery and that they both could and should provide their thoughts to the NMFS planning process. NMFS management learned explicitly what the stakeholders desired for their fishery and, as importantly, what common desires were shared by the various components of the fishery—commercial and recreational alike. Everyone, including NMFS management, learned that it is always difficult to make judgments about the directions one should take to ensure a desirable future result, but that a systematic, open consensus-building approach, involving those who will be affected by the decisions is a worthwhile approach which minimizes confusion and improves the probability of making better decisions.

This approach used to develop the strategic plan has, in the author's opinion, helped overcome the apparent planning and management dilemma mentioned previously, i.e. the problems concerning the differences in results and operations between homogeneous and heterogeneous groups.

The approach taken here attempted to establish a heterogeneous group not only for the task force but also by the involvement of constituents, management and staff in the overall solution to the problem.

Fig. 3. National Marine Fisheries Service's top management met to select the options that were to be included in the Services Strategic Plan for the north Pacific albacore fishery.

The approach also employed ways and means of running meetings efficiently, consistent with dealing with the complexity and importance of the problem and the number and difficulty of the disciplines required to solve the problem. Unfortunately, it is difficult to judge, in any particular instance, how much better or worse an interactively derived decision might be, compared to a hurried decision made in some other mode of operation. What we do know is that over the long run, if the interactive approach is pursued, better decisions should result. Thus in the case of the strategic plan for the albacore fishery we have no absolute way of knowing how much better the result would be than if the decision were derived in the traditional manner. However, we believe that we have increased the probability that the solution is a good one.

Evidence for this assertion lies in the fact that the task force members, who are, at this stage, responsible for carrying out major portions of the plan, state that they share a common understanding of objectives and the overall program which they did not have before. This improved understanding coupled with a better appreciation of their co-workers' contributions allows them to coordinate their work much better. Inter-personal relationships among the task force members have improved also. NMFS management, though still having concerns about the future of the fishery and the resource, has a more relaxed and more confident attitude about the Service's ability to meet the research and management challenges that are before it. Overall, the SWFC and SWR staffs and management are pleased with the planning result. However, the overall implementation of the plan may have been improved if the NMFS Directors' meeting in addition to the assignment of responsibilities also included the development of a managerial monitoring and reporting system for better coordinating the albacore program among the Regional Offices, Research Centers and NMFS Headquarters.

Since the albacore program planning experience the SWFC especially has been inclined to employ the principles of interactive management in many other situations. Several more staff members have been trained in the principles of interactive management and the art of facilitation. The author is confident that as more experience with the methodology is gained and more successes are realized both the frequency of the application of interactive management techniques and the quality of the results will increase. A reinforcement to the commitment comes from the many favorable comments that are received about how the Center conducts its planning meetings from people outside the SWFC who have attended planning sessions organized by the Center. It is expected that this trend will continue.

Because a lot of time and energy are needed to design and install an interactive approach the traditional approach to solving problems seems at the present time to be on the path of least resistance for many managers and many organizations. Thus it seems likely that only the problems amenable to traditional or prescriptive solutions are adequately tackled and that important complex problems are either ignored or fitted with weak solutions in a great many instances. However, it is to be hoped that good experiences with the interactive management approach such as the one described here, will be of value to other managers and organizations and be an encouragement to them to apply it for solving those important and complex problems that seem to defy satisfactory solution through traditional approaches.

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FINAL OPTIONS FIELD/OPTIONS PROFILE FOR GUIDING THE DESIGN OF THE NMFS PROGRAM FOR ALBACORE RESEARCH & MANAGEMENT

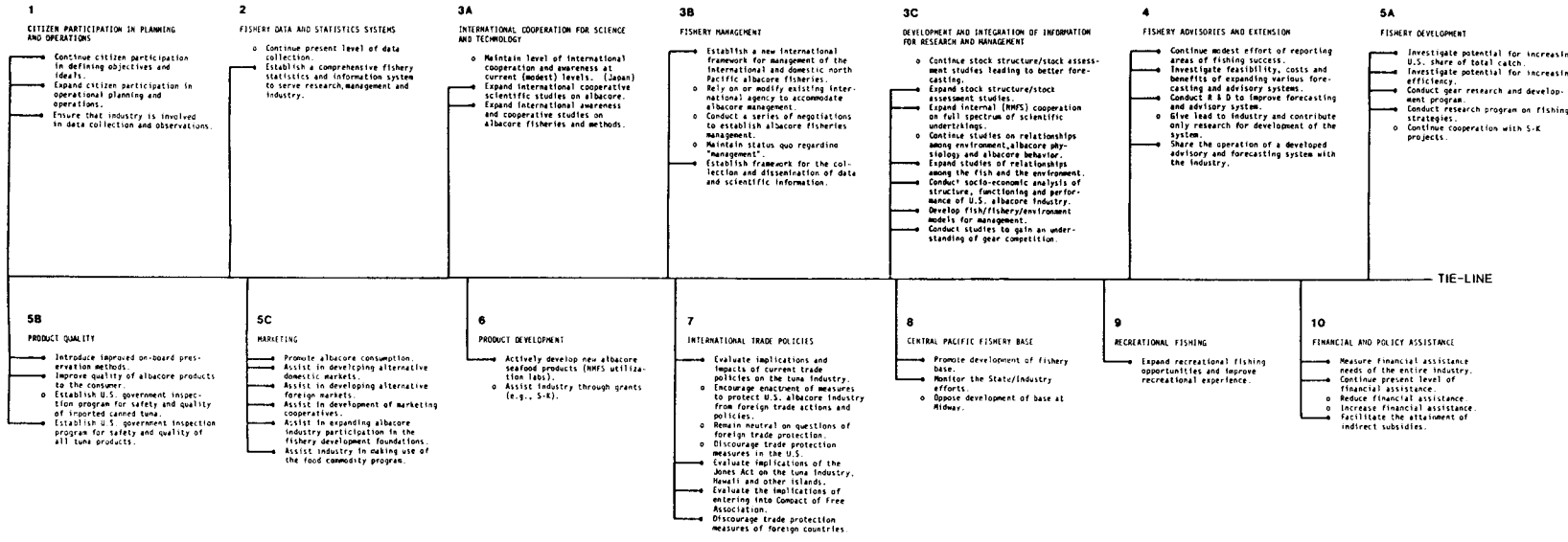

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FIGURE 4