

Appendix I. ASMFC Habitat Statement and SAV Policy Statement and Implementation Plan (Source ASMFC 1998).

***Atlantic States Marine Fisheries Commission*
Submerged Aquatic Vegetation Policy
Implementation Plan**

The ASMFC Submerged Aquatic Vegetation (SAV) Policy was adopted in May 1997. This policy outlines many actions for both ASMFC and its member states. This implementation plan was developed to assist in identifying activities that would accomplish designated actions for conserving SAV in state waters. Activities are grouped in the following sections: policy distribution, activities specific to policy action items, activities for accomplishing the implementation section of the policy, and activities to review policy effectiveness. Activity timeframes are estimated as follows: *Short term* - approximately 1 year; *Medium term* - approximately 2 years; *Long term* - more than 2 years. Quotations from the SAV Policy are indicated by bold and quotation marks.

Policy Distribution

1. Distribute 1 copy of policy to each Commissioner, board member, technical committee chair, and Management and Science Committee member. (short term)
2. Distribute 10 copies to NMFS Office of Habitat Conservation and NE and SE regions. Request that they distribute to NMFS satellite offices and laboratories. Distribute two copies each to the three Atlantic fishery management councils. (short term)
3. Distribute 10 copies to each USFWS Ecological Services office on the Atlantic coast and other FWS offices. (short term)
4. Advertise availability of the policy in *Fisheries Focus* and *Habitat Hotline Atlantic* in 2-3 concurrent issues, and also in the NMFS publication *Habitat Connections*. (short term)
5. Distribute policy to state and local governments and other statewide organizations by:
 - a. State marine fishery agency directors review habitat managers database for their state;
 - b. ASMFC staff drafts a transmittal letter;
 - c. ASMFC provides policy copies, draft transmittal letter on disk, and labels to state fisheries director for distribution to state habitat managers. (medium term)
6. Distribute 1 copy to each federal habitat manager listed on the updated habitat managers database. (medium term)
7. Distribute 1 copy to each major Atlantic coast stakeholder, such as conservation and fishermen's groups which are not included on the habitat managers database. (medium term)

Activities for Policy Action Items

Section I. Assessing the Resource

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1. Assist the NOAA Coastal Change Analysis Program (C-CAP), working through the NOAA Coastal Services Center, in identifying state partners for SAV mapping, including identifying ongoing programs and initiating new projects. (short term)
2. Assist in revision of C-CAP methodology, if necessary, or identify alternate methodology. Use the South Atlantic Fishery Management Council's SAV/Seagrass EFH work group as an impetus and vehicle for this work. Methodology must be flexible and adaptable. Encourage monitoring programs to develop methodologies for identifying baseline variability. Programs should note any shift in vegetation from SAV to other plant species such as *Ulva* or *Gracilaria*. (medium to long term)

State: ASMFC members should encourage their appropriate state agency or department to implement regular statewide or regional SAV monitoring programs which will identify changes in SAV health and abundance cumulatively on a coastwide basis. Surveys should optimally be on a five year basis at a minimum, and preferably annually, for areas considered to be especially at risk of severe declines from anthropogenic activities, disease, or other factors.

Activities

1. A summary of SAV activity within each state should be prepared by the state marine fisheries agency in consultation with other authorities and research agencies. This summary should include research (all sources), mapping, monitoring, and restoration activities, planning documents, etc.; and should identify the agencies or individuals undertaking these programs. The summary should be submitted to ASMFC for compilation into a coastwide compendium. This information will be the basis for identifying more specific implementation of this policy. (short term)
2. State marine fisheries agencies should initiate discussions on monitoring program implementation with the state agency that would be responsible for these activities if such activities do not already exist. States should notify ASMFC of these discussions. (medium term)

Section II. Protection of Existing Submerged Aquatic Vegetation

Action:

ASMFC and member States: Review and evaluate the effectiveness of existing regulatory, proprietary and resource management programs to protect existing SAV and their habitats (including mitigation, dredging, water quality standards, and vessel impacts such as elevated wakes, suspended sediments, placement of mooring fields, and direct impacts from hulls, mooring tackle, propellers, and personal watercraft).

Activities

1. Under Section I.1, the states should identify state agencies and other organizations responsible for or participating in SAV management or monitoring. (short term)
2. Develop model ordinances and regulations to protect SAV for use by state and local governments. (long term)
3. Inform state agencies in charge of regulating SAV that the ASMFC requests notification of any changes to regulations that may impact SAV. Respond to state agency requests for comments or notification of rulemaking when proposed regulation changes may impact SAV. (medium term)
4. a. Adopt technical guidelines and standards for state programs against which effectiveness could be compared and evaluated. Include flexible measures based on permits, research, enforcement, fishery management, etc., as appropriate for each state. (medium term)
- b. Review state programs every five years to update Ernst and Stephan 1997. (long term)

c. Review existing data and reports to identify information gaps and resource trends. (medium term)

5. Inform state agencies in charge of regulating and or managing recreational access and/or harbor facilities of appropriate measures for SAV conservation and protection. (short term)

ASMFC: i1) Support and promote the development of water quality standards by the Environmental Protection Agency that member states can implement to protect SAV habitat (i.e. light attenuation, total suspended solids, chlorophyll a, dissolved inorganic nitrogen, dissolved inorganic phosphorus, critical life period).

2) In partnership with National Marine Fisheries Service and Fish and Wildlife Service, develop technical guidelines and standards to objectively determine gear impacts, and develop standard mitigation strategies.î

Activities

1. Identify the process for development of EPA water quality standards. Include also annual loading limits for total nitrogen and criteria for nutrient concentrations. (medium term)

2. Develop a plan to implement the above process. (medium term)

3. Under the auspices of the ASMFC Management and Science Committee, with reference to recent AFS gear studies, develop technical guidelines and standards to objectively determine fishing gear and fishing activity (including prop scarring and anchoring) impacts and develop standard mitigation strategies where appropriate. (medium term)

4. Provide standards and mitigation strategies to relevant fishery management boards for their consideration in development of management plan compliance criteria. (medium term)

State: îASMFC members should encourage their appropriate state agency or department to propose improvements necessary in state regulation and management of SAV habitats based on the standards developed in the above actions. Include elements such as dredging windows and conditions pertaining to harvesting shellfish or finfish in SAV beds by use of mechanical means.î

Activities

1. Once standards have been identified and/or adopted by EPA, state marine fisheries agencies should ensure that the appropriate state agency and local municipalities are aware of this information, and encouraged to adopt the standards. States in which the adoption of water quality standards is overseen by an ASMFC Commissioner should ensure that the new standards are adopted. States should notify ASMFC of these activities. (long term)

Section III. Restoration of Submerged Aquatic Vegetation

Action:

State: îASMFC members should encourage their appropriate state agency or department to set regional or state restoration goals for SAV acreage, abundance and species diversity considering historical records of abundance and distributions and estimates of potential habitat. Identify reasons for losses, and address any need for habitat improvement prior to restoration. Based on scientific protocols, identify areas currently suitable for SAV restoration, and consider them for protection and future use, or immediate use in restoration projects. Implement scientifically-based transplanting and planting protocols, and support their use by other organizations.î

Activities:

1. States should identify whether state or regional restoration plans exist in activity under Section I.1. (short term)

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2. If restoration goals or plans do not exist, states should identify the appropriate state agency and encourage them to develop restoration goals or plans. States should notify ASMFC of this activity. (short term)
3. ASMFC will develop minimum recommended components for any SAV restoration plan. These components may include historic distribution and abundance, potential causes of loss, viable restoration sites, and sites to be preserved. (medium term)

Section IV. Public Education and Involvement

Action:

ASMFC and member States: ASMFC in coordination with member States, Federal agencies, and non-profits will promote and support the improvement of public understanding of the value, habitat requirements, status, significant threats, human impacts, and trends in abundance of SAV. States should include this information in their aquatic education programs.

Activities

1. Continue to distribute the Commission's vessel related pollution brochure (ASMFC). (short term)
2. Seek funding for reprinting, and distribution of the brochure to recreational fishermen and boaters. (short term)
3. Advertise availability of SAV background document; distribute it to ASMFC participants and as requested. (short term)
4. Compile information on citizen involvement in SAV monitoring, protection and restoration programs, and publish as a document in ASMFC's Habitat Management Series. (medium to long term)
5. Request that USFWS Federal Aid offices require a habitat (SAV) component in all state aquatic education programs. (medium term)
6. Develop and implement an outreach program directed at the marine trade industry and various user groups which may impact SAVs. These groups would include marinas, boat builders, personal water craft, recreational shellfishermen, power boaters, etc. (long term)
7. Develop a generic video on SAVs, including information on their ecological importance and the results of human impacts, which could be shown to different user groups. The video could include suggested mitigation designs and methods to protect and preserve SAVs. (long term)
8. Compile a list of SAV protection and management references with contact names in addition to those included in the background document. (medium term)
9. Create an SAV specific brochure. (medium term)

State: ASMFC members should encourage their appropriate state agency or department to promote the involvement of citizen's groups in activities such as groundtruthing of remotely sensed and mapped SAV locations; water quality monitoring programs; reporting of impacts, losses, or perturbations; and SAV restoration and protection activities.

Activities

1. State marine fisheries agencies should provide the ASMFC compilation of information on citizen participation projects to other appropriate state agencies or regional organizations, including ecosystem management teams, and encourage them to promote citizen involvement

in SAV restoration and protection activities. All citizen involvement should be encouraged to include the use of standard methodologies, with good QA/QC. ASMFC should be informed of these activities. (long term)

Section V. Scientific Research

Action:

ASMFC and member States: On a coastwide basis, support research in the following areas:

- 1) The relationship between SAV and the environmental quality of fish habitat on a coastwide basis, and the relative importance of SAV to other, high quality habitat types. This should include the development of specific habitat functions of SAV (e.g. spawning, feeding, growth, refuge), taking into consideration the benefits to managed fish species.**
- 2) Improving methodologies for SAV transplanting; define specific habitat requirements of SAV; and determine the ecological functioning of transplanted vs. naturally vegetated areas.**
- 3) Improving our understanding of the relationships between SAV and managed fish species, including patterns associated with different landscape or bed forms and sizes within the context of location within the system, as well as the influence of human disturbance and consequences of altering seagrass landscapes vis-à-vis fragmentation and isolation.**
- 4) The effects of eutrophication, sediment loading, toxics, disease, physical disturbance, and natural perturbations on growth and survival of SAV.**
- 5) The effects of reduced genetic diversity on the ability of seagrass populations to survive habitat alterations.**

Activities:

1. Include research needs in ASMFC's research priorities document. (medium term)
2. Distribute the research priorities document broadly. (medium term)
3. Add following research priorities (short term):
 - o potential seed harvesting and sowing methodologies and techniques
 - o develop mitigation designs or methods to reduce the impact of existing docks, floats, boats, etc. on SAV beds, since many SAV beds are impacted by grandfathered structures.
 - o evaluate the effects of the designs or construction methods of new docks floats or moorings.
4. Encourage and foster partnerships between state management agencies, federal management and research agencies, and universities to design, seek funding for, conduct and disseminate the results of research which meet ASMFC management needs. (continuous)

Activities for Policy Implementation Section

1. Habitat Chair will notify fishery management board chairs and technical staff for the species with demonstrated reliance on SAV habitat (croaker, red drum, menhaden, spot, spotted seatrout, eel, black sea bass, tautog, bluefish, summer flounder, lobster, striped bass, and weakfish) of the importance of SAV to the managed species. (short term)
2. Habitat Chair will request that the policy be incorporated into plans or amendments for these species (short term), and that action items in the policy or activities designated by this implementation plan be incorporated into the plans as recommendations or compliance criteria. (short to long term)

Options for Reviewing Policy Effectiveness

1. Determine the net gain in states adopting and implementing standards and adopting and implementing restoration programs.
2. Determine the increase in monitoring or citizen involvement programs or restoration programs.
3. Determine the net gain in the number of entities that are:
 - a. mapping
 - b. protecting SAV through use of policy or criteria resulting from policy guidance,
 - c. initiating restoration projects or new initiatives,
 - d. implementing new research initiatives.
4. Review the implementation of specific activities designated in policy or implementation plan by way of surveys or state reporting.

Atlantic States Marine Fisheries Commission Submerged Aquatic Vegetation Policy

Introduction

Background

Submerged aquatic vegetation or SAV systems, which include both true seagrasses in saline regions and freshwater angiosperms that have colonized lower salinity regions of estuaries, are among the most productive ecosystems in the world. They perform a number of irreplaceable ecological functions, which range from chemical cycling and physical modification of the water column and sediments, to providing food and shelter for commercial, recreational, as well as ecologically important organisms (Thayer et al., 1997). Many ASMFC managed species are directly dependent upon SAV for refuge, attachment, spawning, food, or prey location (Laney, 1997). Since all species managed by the Atlantic States Marine Fisheries Commission (ASMFC) are dependent upon coastal habitats for which SAV often serves vital functions; in essence, all ASMFC managed species are influenced by SAV to some degree.

ASMFC is establishing this policy on submerged aquatic vegetation, emphasizing both the true seagrasses and freshwater species, because of the important role SAV plays in the habitat of ASMFC managed species, and because some of these species utilize both seagrass and freshwater SAV habitats during their ontogenetic development. Diverse regional management strategies (Ernst and Stephan, 1997) and human activities (Goldsborough, 1997) can reduce local and regional SAV abundance, and result in impacts to fisheries. Recent declines have been reported in most Atlantic coastal states (Ernst and Stephan, 1997). Some regions have experienced severe declines, such as Chesapeake Bay, where SAV communities underwent an unprecedented decline in the late 1960s and early 1970s that affected all species in all areas of the bay (Orth and Moore, 1983). Although this region has experienced recent gains over the last decade (Orth et al., 1996), overall abundance undoubtedly remains low compared to historic levels. In order to protect and enhance its trust resources, ASMFC adopts this policy, and encourages its implementation by state, federal, local, and cooperative programs which influence and regulate fish habitat and areas impacting fish habitat; specifically SAV.

The development of this policy was overseen by the ASMFC Habitat Committee, with scientific guidance from experts in the field of SAV ecology. Literature and policy reviews were compiled to serve as background information, and are included in the document "Atlantic Coastal Submerged Aquatic Vegetation: A Review of its Ecological Role, Anthropogenic Impacts, State

Regulation, and Value to Atlantic Coastal Fish Stocks." The policy relies on these reviews; for more extensive background information, please refer to these reviews and their cited references.

ASMFC Trust Resources

Twenty-four finfish species are managed by ASMFC and its member states for which 20 management plans are either implemented, under preparation, or being amended. Species for which plans are in the implementation phase include:

Spanish mackerel (*Scomberomorus maculatus*)
Atlantic menhaden (*Brevoortia tyrannus*)
red drum (*Scianops ocellatus*)
tautog (*Tautoga onitis*)
spot (*Leiostomus xanthurus*)
spotted seatrout (*Cynoscion nebulosus*)
Atlantic striped bass (*Morone saxatilis*)
Atlantic croaker (*Micropogonius undulatus*)
weakfish (*Cynoscion regalis*)
winter flounder (*Pleuronectes americanus*)
scup (*Stenotomus chrysops*)

Plans for the following species are currently undergoing amendment:

American lobster (*Homarus americanus*)
Atlantic herring (*Clupea harengus*)
Atlantic sturgeon (*Acipenser oxyrinchus*)
black sea bass (*Centropristis striata*)
bluefish (*Pomatomus saltatrix*)
northern shrimp (*Pandalus borealis*)
summer flounder (*Paralichthys dentatus*)
shad/river herring (includes American shad, *Alosa sapidissima*, hickory shad, *A. mediocris*, alewife, *A. pseudoharengus*, and blueback herring, *A. aestivalis*).

Species for which plans are under preparation include:

American eel (*Anguilla rostrata*) and horseshoe crab (*Limulus polyphemus*).

Additional species of interest to the ASMFC and its member states include:

blue crab (*Callinectes sapidus*)
rainbow smelt (*Osmerus mordax*)
black drum (*Pogonias cromis*)
bay scallop (*Argopecten irradians*)
gulf and southern flounders (*Paralichthys albigutta*, *P. lethostigma*)
white and striped mullet (*Mugil curema*, *M. cephalus*)
brown, pink and white shrimp (*Penaeus aztecus*, *P. duorarum*, *P. setiferus*)

Definition of Submerged Aquatic Vegetation

As considered in this policy, submerged aquatic vegetation refers to rooted, vascular, flowering plants that, except for some flowering structures, live and grow below the water surface. Because of their requirements for sufficient sunlight, seagrasses are found in shallow coastal areas of all Atlantic coast states, with the exception of Georgia and South Carolina, where freshwater inflow, high turbidity and tidal amplitude combine to inhibit their growth.

There are a minimum of 13 species of seagrasses common in US waters to which this policy may apply. In the New England and northern mid-Atlantic regions, eelgrass (*Zostera marina*) dominates, with two other species also occurring - Cuban shoalgrass (*Halodule wrightii*) in North Carolina and the more cosmopolitan widgeon grass (*Ruppia maritima*). In Florida, turtlegrass (*Thalassia testudinum*) and manatee grass (*Syringodium filiforme*) become dominants along with Cuban shoalgrass and several species of *Halophila*, one of which (*H. johnsonii*) has been proposed for listing by NMFS as an endangered plant species.

Approximately 20-30 species of freshwater macrophytes may be found in the tidal freshwater and low salinity areas of the estuaries of the eastern United States. These lower salinity communities can be quite diverse, with as many as 10 species co-occurring at a single location. Wild celery (*Vallisneria americana*), redhead grass (*Potamogeton perfoliatus*), sago pondweed (*Potamogeton pectinatus*), horned pondweed (*Zannichellia palustris*), common elodea (*Elodea canadensis*), coontail (*Ceratophyllum demersum*), and southern naiad (*Najas quadalupensis*) are a few of the native species that will dominate these areas while two non-native (exotic) species, milfoil (*Myriophyllum spicatum*) and hydrilla (*Hydrilla verticillata*), will also be found in many areas. Widgeongrass (*Ruppia maritima*) which can tolerate both fresh and saltwater, has the broadest range of all species. (Orth, 1997) This policy acknowledges that there will be cases, such as with exotics, where it may be appropriate to undertake management control measures.

This policy acknowledges that where native species have been eliminated, exotic species are of functional value; however, restoration of native species should be undertaken as appropriate.

Implications for Atlantic Coastal States and Other Organizations

The Atlantic States Marine Fisheries Commission was formed by the Atlantic coastal states in 1942 to assist in managing and conserving their shared fishery resources. The Atlantic member States of the Commission typically carry out these responsibilities through state marine fisheries agencies. Frequently state agencies regulating habitat protection are not involved with, nor even aware of, the activities of the Commission.

Many of the suggested state actions outlined in this policy will apply to agencies other than state marine fisheries agencies. The intent of this policy is not to hold marine fisheries agencies accountable for the suggested state activities, but rather to provide for the transmission of this policy and its objectives to the agencies or organizations that can best carry out the prescribed activities, and encourage the participation of these agencies in achieving policy goals.

States have taken diverse approaches in SAV management (Ernst and Stephan, 1997), and may already have some or all of the prescribed activities in place. Collateral purposes of this policy are to encourage states in the early stages of SAV management to implement these activities, and, by implication, to congratulate and provide additional encouragement to those states that are leading the way towards achieving policy goals. ASMFC also recognizes that non-governmental organizations in some states or regions may have implemented some of the prescribed state activities, such as SAV mapping or research. In these instances, the state activity recommended in this policy may be amended to support the activities already underway, in order to promote cooperation and avoid duplicative programs. Further information on implementation of this policy can be found under Policy Implementation on page 7.

Policy Statement

Goal

The goal of this policy is to preserve, conserve, and restore where scientifically possible, in order to achieve a net gain in SAV distribution and abundance along the Atlantic coast and tidal tributaries, and to prevent any further losses of SAV in individual states by encouraging them to:

1. Protect existing SAV beds from further losses due to degradation of water quality, physical damage to the plants, or disruption to the local benthic environment;
2. Set and achieve state or regional water and habitat quality objectives that will result in restoration of SAV through natural re-vegetation;
3. Develop and attain state SAV restoration goals in terms of acreage, abundance, and species diversity, considering historical distribution records and estimates of potential habitat.

There are six key components to achieving the goal of this policy: 1) Assessment of historical, current and potential distribution and abundance of SAV; 2) Protection of existing SAV; 3) SAV Restoration; 4) Public Education and Involvement; 5) Research; and 6) Implementation.

I. Assessing the Resource

Determining current status and identifying trends in health and abundance are key factors in management of SAV resources. In an effort to develop consistent monitoring techniques among regions, SAV mapping protocols have been identified by NOAA's Coastal Change Analysis Program (C-CAP; Dobson et.al., 1995). Applicability of the C-CAP protocols should be evaluated.

Policy:

At a minimum, each member state should ensure the implementation of a SAV resource assessment and monitoring strategy which will provide for a continuing quantitative evaluation of SAV distribution and abundance and the quality of supporting environmental parameters. The optimum coastwide situation would be a monitoring system which would establish consistent monitoring techniques among regions so that the data are comparable.

Action:

ASMFC: Support and promote adoption of a protocol for mapping of SAV which all member states can use to provide for data consistency and development of a centralized database.

State: ASMFC members should encourage their appropriate state agency or department to implement regular statewide or regional SAV monitoring programs which will identify changes in SAV health and abundance cumulatively on a coastwide basis. Surveys should optimally be on a five year basis at a minimum, and preferably annually, for areas considered to be especially at risk of severe declines from anthropogenic activities, disease, or other factors.

II. Protection of Existing Submerged Aquatic Vegetation

Before a net gain in SAV distribution and abundance can be realized, a concerted effort should be made to protect those areas where SAV currently exists. Impacts which result in losses of SAV such as direct alterations to a vegetated area or indirect actions within a watershed should be curtailed. While there have been numerous documented restoration successes, protection and conservation are a much more assured and cost effective approach to perpetuation of SAV. Because SAV habitat requirements are more stringent than those of many coastal marine living resources, controlling the type, extent, intensity and duration of impacts which damage SAV will further other efforts to restore and protect coastal fish habitat.

Policy:

Member states should use existing regulatory, proprietary, and resource management programs, and develop new programs, to limit permanent and irreversible, direct, and indirect impacts to SAV and their habitats.

Action:

ASMFC and member States: Review and evaluate the effectiveness of existing administrative procedures, regulatory, proprietary and resource management programs to protect existing SAV and their habitats (including mitigation, dredging, water quality standards, dock placement, marina expansion and vessel impacts such as elevated wakes, suspended sediments, placement and maintenance of moorings, and direct impacts from hulls, propellers, and personal watercraft).

ASMFC: 1) Support and promote the development of water quality standards by the Environmental Protection Agency that member states can implement to protect SAV habitat (i.e.

light attenuation, total suspended solids, chlorophyll a, dissolved inorganic nitrogen, dissolved inorganic phosphorus, critical life period).

2) In partnership with National Marine Fisheries Service and Fish and Wildlife Service, develop technical guidelines and standards to objectively determine gear impacts, and develop standard mitigation strategies.

State: ASMFC members should encourage their appropriate state agency or department to propose improvements necessary in state regulation and management of SAV habitats based on the standards developed in the above actions. Include elements such as dredging windows and conditions pertaining to harvesting shellfish or finfish in SAV beds by use of mechanical means.

III. Restoration of Submerged Aquatic Vegetation

In addition to protecting existing SAV habitat, restoration of former habitat is an important part of achieving an overall net gain. Planning will induce maximum restoration program effectiveness. Habitat quality which is necessary for SAV perpetuation and will provide for natural revegetation must be attained before restoration can occur. The use of scientifically-based restoration protocols will help ensure success where environmental conditions warrant.

Policy:

Restoration programs should be based on goals, and include establishment of habitat quality necessary for SAV prior to restoration. Restoration through planting or seed dispersal should incorporate scientifically based protocols, and may be used to augment natural re-vegetation.

Action:

State: ASMFC members should encourage their appropriate state agency or department to set regional or state restoration goals for SAV acreage, abundance and species diversity considering historical records of abundance and distributions and estimates of potential habitat. Identify reasons for losses, and address any need for habitat improvement prior to restoration. Based on scientific protocols, identify areas currently suitable for SAV restoration, and consider them for protection and future use, or immediate use in restoration projects. Implement scientifically-based transplanting and planting protocols, and support their use by other organizations.

IV. Public Education and Involvement

An informed and involved public will provide a firm foundation of support for SAV protection and restoration efforts. Education and involvement is an important facet of increasing public awareness and stewardship.

Policy:

ASMFC and member states should promote and support public education and stewardship programs that will increase the public's knowledge of SAV, its importance as fish habitat, and commitment to SAV conservation.

Action:

ASMFC and member States: ASMFC in coordination with member States, Federal agencies, and non-profits will promote and support the improvement of public understanding of the value, habitat requirements, status, significant threats, human impacts, and trends in abundance of SAV. States should include this information in their aquatic education programs.

State: ASMFC members should encourage their appropriate state agency or department to promote the involvement of citizen's groups in activities such as groundtruthing of remotely sensed and mapped SAV locations; water quality monitoring programs; reporting of impacts, losses, or perturbations; and SAV restoration and protection activities.

V. Scientific Research

Through scientific research, we will improve our knowledge and understanding of SAV to ensure that efforts to protect and restore the resource will be effective. Further information on growth, physiology, reproduction, life cycles, disease, transplanting, environmental requirements, and anthropogenic impacts is needed to protect and restore SAV.

Policy:

ASMFC and member states should promote and support those research projects which will improve our knowledge of SAV and its benefits as fish habitat.

Action:

ASMFC and member States: On a coastwide basis, support research in the following areas:

- 1) The relationship between SAV and the environmental quality of fish habitat on a coastwide basis, and the relative importance of SAV to other, high quality habitat types. This should include the development of specific habitat functions of SAV (e.g. spawning, feeding, growth, refuge), taking into consideration the benefits to managed fish species.
- 2) Improving methodologies for SAV transplanting and restoration techniques; define specific habitat requirements of SAV; and determine the ecological functioning of transplanted vs. naturally vegetated areas.
- 3) Improving our understanding of the relationships between SAV and managed fish species, including patterns associated with different landscape or bed forms and sizes within the context of location within the system, as well as the influence of human disturbance and consequences of altering seagrass landscapes vis-à-vis fragmentation and isolation.
- 4) The effects of eutrophication, sediment loading, toxics, disease, physical disturbance, and natural perturbations on growth and survival of SAV.
- 5) The effects of reduced genetic diversity on the ability of seagrass populations to survive habitat alterations.

Policy Implementation

Habitat Program

This policy will be distributed to all ASMFC Commissioners and other interested persons for use in promoting local and regional protection of SAV. Implementation of the policy will be reviewed on a regular basis to evaluate policy effectiveness and recommend revisions as necessary.

ASMFC federal partners, including the US Fish and Wildlife Service and National Marine Fisheries Service, are encouraged to adopt and implement this policy. Other federal agencies, such as the US Army Corps of Engineers and the Environmental Protection Agency, will be briefed on the policy, and encouraged to adopt it as well.

ASMFC will continue to progress in its commitment to facilitate communication between State and Federal fishery and habitat managers. The Commission will assist marine fisheries agencies in transmitting this policy to habitat protection agencies.

Fishery Management Planning

Under the Atlantic Coastal Fisheries Cooperative Management Act, the ASMFC may require that states implement certain facets of fishery management plans, termed "compliance criteria." As discussed in the introduction, most state marine fishery agencies do not have the necessary jurisdiction for implementation of many of the activities prescribed in this policy. As a result, ASMFC may choose not to adopt these specific actions as compliance criteria in fishery management plans. However, compliance criteria relative to the policy which can be implemented by state fisheries agencies may be adopted. The following is a list of compliance criteria which ASMFC will consider for adoption in fishery management plans (FMP) for species with demonstrated reliance on SAV habitat (Laney, 1997; croaker, red drum, menhaden, spot, spotted seatrout, eel, black sea bass, tautog, bluefish, summer flounder, lobster, striped bass and weakfish):

- 1) Preparation of an annual status report by each state on implementation of each aspect of the policy.
- 2) Transmission of the policy by each state to all agencies with habitat regulatory and management authority or organizations which can have a significant positive or negative impact on SAV.
- 3) Preparation of state plans to identify fishing gear and practices employed by any state regulated fishery which may negatively impact SAV; and development and implementation of strategies to eliminate negative impacts identified pursuant to Section II where appropriate to achieve SAV objectives.

In addition, the policy should be incorporated by reference into FMPs for species with demonstrated reliance on SAV habitat. These FMPs should include background information on the importance of SAVs, and recommendations which parallel the prescribed activities of the policy.

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