

Chesapeake Executive Council

# Chesapeake Bay Waterfowl Policy and Management Plan

## Chesapeake Bay Program

Agreement Commitment Report

July 1990

# CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

## TABLE OF CONTENTS

ADOPTION STATEMENT .....	ii
PREFACE .....	iii
EXECUTIVE SUMMARY .....	v
POLICY .....	vii
INTRODUCTION .....	1
 THE WATERFOWL RESOURCE .....	 2
Types of Waterfowl .....	2
Migration .....	6
Defining the Waterfowl Resource .....	7
Status and Trends .....	8
 EXISTING MANAGEMENT PROGRAMS .....	 10
Federal .....	10
Maryland .....	12
Virginia .....	14
Pennsylvania .....	15
 NEW INITIATIVES .....	 17
Chesapeake Bay Agreement .....	17
North American Waterfowl Management Plan .....	18
North American Wetlands Conservation Act .....	18
 RESEARCH .....	 19
 NEW MANAGEMENT STRATEGY .....	 20
Goals and Objectives .....	20
Management Actions .....	21

## ADOPTION STATEMENT

We, the undersigned, adopt the Chesapeake Bay Waterfowl Policy and Management Plan for the Chesapeake Bay and its watershed in fulfillment of Living Resources Commitment Number 3 of the 1987 Chesapeake Bay Agreement:

"to adopt a schedule for the development of Bay-wide resource management strategies for commercially, recreationally, and selected ecologically valuable species."

We agree to work together to achieve the goal of the Plan:

"to restore, enhance, and protect waterfowl habitats and populations to derive the greatest long-term ecological, economic, and social benefits from the resource."

We recognize the need to commit long-term, stable financial support and human resources to the task of conserving, protecting, and enhancing Waterfowl.

In addition, we direct the Waterfowl Management Team of the Living Resources Subcommittee to guide efforts to meet the Plan's objectives and to prepare annual reports addressing progress in implementing the Plan.

Date: \_\_\_\_\_

For the Commonwealth of Virginia \_\_\_\_\_

For the State of Maryland \_\_\_\_\_

For the Commonwealth of Pennsylvania \_\_\_\_\_

For the District of Columbia \_\_\_\_\_

For the United States of America \_\_\_\_\_

For the Chesapeake Bay Commission \_\_\_\_\_

## Chesapeake Bay Waterfowl Policy and Management Plan

### PREFACE

In July 1988, members of the Chesapeake Executive Council approved the "Schedule for Developing Baywide Resource Management Strategies." The schedule is designed to commit certain members of the multi-agency Chesapeake Bay Program to develop management plans for a variety of "commercially, recreationally and selected ecologically valuable species." Five major groups of living resources have been identified for development of management plans: (1) Submerged Aquatic Vegetation; (2) Wetlands; (3) Waterfowl; (4) Finfish and Shellfish; and (5) Other Ecologically Valuable Species.

Waterfowl are the subject of this management plan. The Plan fulfills a commitment presented in the "Schedule for Developing Bay Wide Resource Management Strategies" to set forth specific actions to restore, protect, and enhance waterfowl habitat and populations. The Plan was developed by a team of federal and state waterfowl specialists and resource managers on behalf of the Resource Management Workgroup under the Living Resources Subcommittee. The Plan is for all species of waterfowl that use Chesapeake Bay. The Schedule for Developing Baywide Resource Management Strategies (Chesapeake Executive Council 1988) established the present approach for developing resource management strategies. In that document, the Executive Council determined that each resource management strategy should include a statement of the current status of a living resource, how far this status is from a preferred level of abundance and distribution, a policy and/or a set of goals for restoring and protecting the resources, and steps which could be taken to achieve these goals, both baywide and in critical habitats within the Bay ecosystem.

Actions identified in this Plan when implemented by signatories and their respective agencies will benefit waterfowl. It will be difficult to restore waterfowl without a strong cooperative effort to restore, protect and enhance habitat, and to relieve other pressures that may be detrimental to waterfowl species using the Chesapeake.

For the most part, short-term tasks of the Plan are being undertaken with existing resources and authorities. The ability to conduct long-term tasks naturally depends on future availability of the necessary funds and authorities.

Members of the Waterfowl Management Team (WMT) that developed this plan are:

John Dunn	Bureau of Wildlife Management Pennsylvania Game Commission
Richard W. Dyer	Northeast Regional Office U. S. Fish and Wildlife Service
Douglas J. Forsell	Chesapeake Bay Estuary Program U. S. Fish and Wildlife Service
Steven L. Funderburk	Chesapeake Bay Estuary Program U. S. Fish and Wildlife Service
John W. Gill	Chesapeake Bay Estuary Program U. S. Fish and Wildlife Service
G. Michael Haramis	Patuxent Wildlife Research Center, U. S. Fish and Wildlife Service

Fred J. Hartman	Bureau of Wildlife Management Pennsylvania Game Commission
Larry J. Hindman	Forest, Park and Wildlife Service Maryland Department of Natural Resources
Richard L. Jachowski	Patuxent Wildlife Research Center, U. S. Fish and Wildlife Service
David G. Krementz	Patuxent Wildlife Research Center U. S. Fish and Wildlife Service
Peter Poulos	Office of Migratory Bird Management U. S. Fish and Wildlife Service
Jerome R. Serie	Office of Migratory Bird Management U. S. Fish and Wildlife Service
Fairfax H. Settle	Wildlife Division Virginia Department of Game and Inland Fisheries

## EXECUTIVE SUMMARY

Historically the Chesapeake was rich in waterfowl abundance, to the point that they seemed to blanket areas of the Bay. Today, their numbers are greatly reduced. Wide-spread deterioration of shallow water habitats and wetlands, coupled with an ever-increasing human population, has reduced the value of many Chesapeake Bay areas to waterfowl.

Signatories of the 1987 Chesapeake Bay Agreement have committed to the protection and restoration of Chesapeake Bay's living resources. In support of this commitment, a "Schedule for Developing Baywide Resource Management Strategies" was adopted for a variety of "commercially, recreationally, and selected ecologically valuable species." Waterfowl, including ducks, geese, and swans, are one of the major categories of living resources for which management strategies are being developed.

The Waterfowl Management Team (WMT) of the Chesapeake Bay Program's Living Resources Subcommittee developed the strategy for protection and restoration of Chesapeake Bay's waterfowl resource. The workgroup includes representatives from the U. S. Fish and Wildlife Service, the Maryland Department of Natural Resources, the Pennsylvania Game Commission, and the Virginia Department of Game and Inland Fisheries.

The Plan will guide the protection and restoration of all waterfowl species using Chesapeake Bay. The Plan emphasizes protection and restoration of habitats these species are dependent upon throughout Chesapeake Bay, its tidal tributaries, and adjacent uplands.

### Management Issues

The goal of the Waterfowl Management Plan is *"to restore, protect, and enhance waterfowl habitats and populations to derive the greatest long term ecological, economic, and social benefits from the resource."* To achieve this goal, the Plan defines the resource, life history characteristics, research priorities, and it outlines three clear objectives:

*Objective 1: Prevent loss and degradation of habitat, and restore and enhance habitats presently degraded or unsuited for use by waterfowl.*

#### Actions

- o Identify essential habitat requirements for waterfowl in the Chesapeake Bay region, including water quality requirements.
- o Determine suitable habitat management practices for waterfowl, taking into account interests for conservation of other natural resource values.
- o Encourage measures to restore submerged aquatic vegetation to pre-1960s levels of distribution and abundance in Chesapeake Bay.
- o Provide guidance to agencies, organizations, and the public on habitat management practices needed to benefit waterfowl.
- o Encourage programs to control the spread of plants that diminish the value of wetlands for waterfowl.
- o Recommend measures to minimize the adverse effects on waterfowl from human disturbance and land development.

**Objective 2:** *Support responsible waterfowl management programs to restore waterfowl populations and habitats to at least 1970's levels by the year 2000.*

**Actions**

- o Promote responsible use of waterfowl resource by coordinating with the Atlantic Flyway Council and the U.S. Fish and Wildlife Service regarding harvest restrictions and provisions.
- o Minimize adverse effects of hand-reared mallards on wild populations.
- o Identify management actions to reduce concentrations of waterfowl where they damage habitat and are exposed to an increased risk of disease.
- o Survey waterfowl populations in the Chesapeake Bay region as needed to monitor their trends in relation to habitat conditions.
- o Support development and implementation of new or improved waterfowl management techniques.

**Objective 3:** *Improve public understanding of the waterfowl resource and its habitat needs.*

**Action**

- o Identify opportunities to develop new educational programs and products.

Specific waterfowl management statements and action items are in this plan. Meeting the 1987 Chesapeake Bay Agreement's goals for protecting and restoring Bay waterfowl populations provides an important opportunity for interested citizens, resource managers and legislators to focus their commitment to Chesapeake Bay living resources.

## POLICY

It is the intent of the Chesapeake Executive Council to set forth this policy for developing and implementing a comprehensive strategy for the protection and management of all Chesapeake Bay waterfowl and their habitats.

The goal of the Waterfowl Management Plan is to *restore, protect, and enhance waterfowl habitats and populations to derive the greatest long term ecological, economic, and social benefits from the resource.*

The objectives are to:

- o *Prevent loss and degradation of habitat, and restore and enhance habitats presently degraded or unsuitable for use by waterfowl.*
- o *Support responsible waterfowl management programs to restore waterfowl populations and habitats to at least 1970's levels by the year 2000.*
- o *Improve public understanding of the waterfowl resource and its habitat needs.*

The Waterfowl Management Team that developed this plan will become a permanent unit of the Resource Management Workgroup under the Living Resources Subcommittee to guide implementation of the Plan.



## INTRODUCTION

Waterfowl help define the wonder and beauty of the Chesapeake Bay. Historically the Chesapeake was rich in waterfowl. It is nearly impossible to know just how abundant waterfowl were hundreds of years ago. However, anecdotal information paints a rather awe inspiring picture. The 17th century explorer, George Alsop, reported that waterfowl "rose in flocks not of ten or twelve, or twenty or thirty, but continually, wherever we pushed our way; and as they made room for us, there was such an incessant clattering made with their wings on the water where they rose, and such a noise of those flying higher up, that it was as if we were all the time surrounded by a whirlwind." Waterfowl seemed to blanket areas of the bay. During the late 19th century and early 20th century, waterfowl wintering on the Chesapeake Bay were greatly reduced by uncontrolled market-hunting. Fortunately, the U.S. Congress passed the Migratory Bird Treaty Act in 1918 which prohibited uncontrolled take of waterfowl. It is this law that protects all migratory birds and that forms the basis for annual waterfowl hunting regulations.

The Chesapeake Bay area is of prime importance to waterfowl using the Atlantic Flyway. Today, about one million waterfowl winter on Chesapeake Bay representing about 35% of all waterfowl in the Atlantic Flyway. Although the total number of waterfowl has averaged about one million birds, species that rely on aquatic habitats have declined significantly. A quick synopsis of overall trends shows that over the last 40 years, the abundance of ducks has declined 70-80% from highs in the mid-1950's. Species showing significant declines are the American black duck, American wigeon, northern pintail, canvasback and redhead. In contrast, geese have increased over the last 40 years, because they have taken advantage of grains left in agricultural fields after harvest and are not dependent upon aquatic foods for survival.

The Chesapeake Bay has not escaped problems in recent times. Habitat for breeding waterfowl, particularly black ducks, has been significantly degraded. Many species find it difficult to cope with the increasing human population on the bay, but the biggest problem faced by waterfowl in the final decade of this century is wide-spread deterioration of shallow-water habitats and marshes around the bay. Deterioration of aquatic habitats is caused by pollution that contribute excess nutrients and contaminants into the Chesapeake. The principal impact has been reduction in valuable food for wintering waterfowl, especially submerged aquatic vegetation, mollusks, and other invertebrates.

Special efforts are necessary on Chesapeake Bay to enable waterfowl to survive and increase in abundance. This plan establishes a solid framework for management, with particular attention to habitat and public awareness. It complements the North American Waterfowl Management Plan, signed by the United States and Canada in 1986, and helps fulfill the 1987 Chesapeake Bay Agreement. The plan defines the resource, its importance, threats, and needs. The plan is ambitious but illustrates clearly the magnitude of work needed to restore our valuable Chesapeake waterfowl.

## THE WATERFOWL RESOURCE

Waterfowl can be found in every available aquatic habitat from ocean surf and coastal marshes to inland potholes and bottomland forest. Each species has its own habitat preferences, breeding behavior, food preferences, and migration patterns. The one unifying aspect of waterfowl is their dependence on aquatic habitat or wetlands. To a large extent, the quantity and quality of our wetland resource will dictate the condition of our waterfowl resource in the Chesapeake Bay. Another condition that is common with waterfowl is that most migrate from breeding grounds to winter grounds, and back. Discussion on the unique characteristics of each waterfowl group follow. In this report, waterfowl are grouped into five general types: swans, geese, dabbling ducks, bay ducks, and sea ducks. It is essential to understand the various characteristics of these groups when deciding which management strategies are necessary for Chesapeake Bay.

### Types of Waterfowl

Twenty nine species of waterfowl use the Chesapeake Bay for wintering, breeding, or as a stopover during migration. Only a small portion of the birds breed in the Chesapeake Bay watershed. The major importance of Chesapeake Bay to waterfowl is the extensive wintering habitat it provides. To a lesser but largely unknown extent it is also important as a stopover for migrating birds. (Table 1).

#### Swans

Two species of swans, the mute swan and the tundra swan, are found on Chesapeake Bay. The mute swan, the common orange-billed swan of waterfront residences, city parks, and zoos, is not native to North America. It has established breeding populations in various regions of the country including Chesapeake Bay. Submerged aquatic vegetation (SAV) is the mainstay food item for the adult mute swan. The mute swan is in this plan because of potential habitat destruction behavior and conflicts with endemic waterfowl species. Control of mute swans may be necessary if local populations continue to increase.

Until recently, Chesapeake Bay has been the most important wintering area for tundra swans in North America. However, the population in North Carolina has recently increased to include more than half of the Atlantic Flyway population. Tundra swans have traditionally fed on the leaves, stems, and tubers of SAV and marsh plants. The decline in SAV throughout Chesapeake Bay has led to the southern shift in wintering distribution to the Carolinas. Additionally, with the decline in SAV during the early 1970s, swans began feeding in agricultural fields on waste corn, waste soybeans, winter wheat, and barley. They commonly fly as far as 15 miles inland to feed.

#### Geese

The three species of geese that winter on Chesapeake Bay are the snow goose, Canada goose, and brant. Although brant were once abundant on Chesapeake Bay during the 1930's, they declined drastically as a result of the almost complete disappearance of eelgrass, their principal food. Most brant now are found in coastal bays and lagoons where they feed extensively on sea lettuce, followed by eelgrass, widgeongrass, and smooth cordgrass.

Canada geese are the most abundant species of waterfowl in the Chesapeake Bay area. Canada geese wintering in Chesapeake Bay generally arrive in early October. Spring departure occurs around mid-February. Wintering Canada geese have greatly benefited from agriculture. On the Atlantic Flyway, Canadas have largely forsaken aquatic food plants for upland crops including waste corn, waste soybeans, winter wheat, and clover. This change in food use is so complete that the availability and quality of agricultural fields now determines the areas where Canada geese concentrate. The most attractive grain fields to geese are large and open in close proximity to an undisturbed body of water. Increases in populations of Canada geese have provided extensive recreational hunting opportunities on the eastern shore of Chesapeake Bay; however, over the past 5 years, Canada geese have declined considerably and hunting restrictions have been tight.

Table 1. Waterfowl and their use of Chesapeake Bay. The categories of use are: **high** = greater than 25,000 birds or high importance to Atlantic Flyway population; **medium** = 5,000 to 25,000 birds or moderate importance to flyway population; **low** = less than 5,000 birds and low importance to flyway populations; **none** = little or no use.

SPECIES	WATERFOWL USE		
	BREEDING	MIGRATING	WINTERING
<b>SWANS</b>			
Tundra Swan ( <i>Cygnus columbianus</i> )	none	medium	high
Mute Swan ( <i>Cygnus olor</i> )	low	none	low
<b>GEESE</b>			
Snow Goose ( <i>Chen caerulescens</i> )	none	medium	medium
Brant ( <i>Branta bernicla</i> )	none	none	low
Canada Goose ( <i>Branta canadensis</i> )	none	medium	high
<b>DABBLING DUCKS</b>			
Green-winged Teal ( <i>Anas crecca</i> )	none	medium	low
American Black Duck ( <i>Anas rubripes</i> )	high	high	high
Mallard ( <i>Anas platyrhynchos</i> )	high	high	high
Northern Pintail ( <i>Anas acuta</i> )	none	medium	low
Blue-winged Teal ( <i>Anas discors</i> )	low	medium	none
Northern Shoveler ( <i>Anas clypeata</i> )	none	low	low
Gadwall ( <i>Anas strepera</i> )	low	medium	low
American Wigeon ( <i>Anas americana</i> )	none	medium	medium
Wood Duck ( <i>Aix sponsa</i> )	high	high	low
<b>BAY DUCKS</b>			
Canvasback ( <i>Aythya valisineria</i> )	none	high	high
Redhead ( <i>Aythya americana</i> )	none	low	low
Ring-necked Duck ( <i>Aythya collaris</i> )	none	low	low
Greater Scaup ( <i>Aythya marila</i> )	none	high	medium
Lesser Scaup ( <i>Aythya affinis</i> )	none	high	high
Ruddy Duck ( <i>Oxyura jamaicensis</i> )	none	high	high
<b>SEA DUCKS</b>			
Oldsquaw ( <i>Clangula hyemalis</i> )	none	high	high
Black Scoter ( <i>Melanitta nigra</i> )	none	medium?	medium?
Surf Scoter ( <i>Melanitta perspicillata</i> )	none	medium?	medium?
White-winged Scoter ( <i>Melanitta fusca</i> )	none	low?	low?
Common Goldeneye ( <i>Bucephala clangula</i> )	none	medium	medium
Bufflehead ( <i>Bucephala albeola</i> )	none	medium	medium
Hooded Merganser ( <i>Mergus cucullatus</i> )	none	low	low
Common Merganser ( <i>Mergus merganser</i> )	none	low	low
Red-Breasted Merganser ( <i>Mergus serrator</i> )	none	low	medium

Two sub-species of snow geese, the lesser and greater, winter in the region. Greater snow geese are more abundant than lesser snow geese. Fewer than 4,000 lesser snow geese winter at Blackwater and Presquile National Wildlife Refuges. Greater snow geese feed in agricultural fields and roost on inland ponds and Bay tributaries. Greater snow geese are expanding their winter range to include more of the Chesapeake area, resulting in increased conflicts with agricultural interests.

Although snow geese have adapted to feeding in agricultural fields, favorite foods of this species are estuarine emergent wetland plants and rootstocks. Preferred food plants include: common threesquare, smooth cordgrass, and saltmarsh bulrush. Concentrations of feeding snow geese often root and dig-out marshes creating "eat-outs" in the coastal marshes of Delaware and Virginia; they have yet to cause similar problems in Chesapeake Bay marshes. This may become a more serious management concern if the greater snow geese population increases and expands its winter range.

### Dabbling Ducks

Dabblers (surface-feeding ducks, marsh ducks, puddle ducks) and wood ducks are associated with the small, shallow fresh to brackish tributaries of Chesapeake Bay as well as inland lakes, ponds, and marshes. Their ability to forage ashore, to feed efficiently in the shallows, and to dive moderately well makes dabbling ducks the most versatile feeders of all waterfowl. As a group, the dabblers make use of dozens of submerged, emergent, and moist soil aquatic plants; innumerable species of aquatic and terrestrial animals, especially invertebrates; and many kinds of farm crops. Species using the Chesapeake include the black duck, mallard, northern pintail, gadwall, green-winged teal, blue-winged teal, northern shoveler, American wigeon, and wood duck. The black duck and mallard are the most abundant. Dabblers which breed in the Chesapeake include black duck, mallard, gadwall, blue-winged teal, and wood duck.

A wide variety of habitat types are used by nesting black ducks; however, they generally construct ground nests well hidden in densely vegetated upland areas. In Chesapeake Bay, uninhabited offshore islands and remote marshes are the best black duck production areas. Black ducks raise their broods in intertidal flats, emergent marshes, beaver ponds, submerged aquatic beds, impoundments, and alder-fringed streams. Brood habitat close to nesting habitat is important. Intense development throughout the Chesapeake watershed has limited the area where these two types of unaltered habitats occur together. This coupled with the black duck's intolerance to human disturbance is greatly limiting local production.

Mallard breeding in the Chesapeake Bay Region has significantly increased in recent history from game-farm stock. In the 1940's the State of Maryland and private groups began releasing farm-reared mallards. Today, the Maryland Department of Natural Resources is mandated by law to spend up to 50% of the monies collected from its State duck stamp sales for its mallard release program. Between 1974 and 1986, over 200,000 farm-raised mallards have been released each year by private farms (Regulated Shooting Areas) and the Department of Natural Resources. Over 10% of the released birds came from State stock.

Nesting habitat preferences are similar between the black duck and mallard, although the mallard will nest in close association with humans. The majority of resident Chesapeake Bay mallards are semi-domesticated, and are often associated with housing, marinas, and other areas of intense human uses. Resident mallards may negatively affect black duck populations by competing for breeding and wintering habitat, and through hybridization with black ducks.

Wood ducks are one of the few locally breeding species of waterfowl common to Chesapeake Bay. Wood ducks use forested wetlands which provide food and nesting sites for these cavity-nesting ducks. The major wintering range occurs south of Maryland in the Atlantic States. The most important factor limiting wood ducks is the availability of mixed hardwood forested wetlands and stream corridors. A nest box program that provides predator-proof nesting has benefitted local production of wood ducks in areas where cavities are limited but where foods are plentiful. Preserving forested wetlands is the most critical need for wood ducks.

## Bay Ducks

Although wintering bay ducks use most aquatic habitats of the Bay region, they most often use extensive open water shoals with fresh to brackish water. The species of Bay ducks in the Chesapeake Bay are the canvasback, redhead, greater scaup, lesser scaup, and ring-necked duck. Formerly, two of the most significant areas for Bay ducks were the mouth of the Chester River and the Susquehanna Flats. These areas were hard hit by declines of SAV and no longer attract large numbers of ducks.

The canvasback is the most abundant Bay duck on the Chesapeake. These birds rely heavily on small clams for food, although in years past they preferred wild celery in the Susquehanna Flats when this plant was abundant. Declines in wild celery caused canvasback to shift to eating clams. Canvasback continue, however, to be the most abundant Bay duck wintering on Chesapeake Bay.

Redheads tend to feed in shallow waters, and unlike other pochards rely extensively on SAV. Because of drastic declines in SAV, and an apparent inability to switch to animal foods, redheads now use Chesapeake Bay only in small numbers.

Ring-necked ducks feed in shallower water than other Bay ducks, usually less than 6 feet. They are often associated with tidal freshwater wetlands and impoundments where they feed on vegetation to a large extent.

Greater scaup feed upon both plant and animal life; however, in most areas clams constitute the principal food item. SAV is a preferred food item in areas of the Chesapeake where it is available. Lesser scaup feed primarily on animal life, but will consume the seeds and foliage of pondweeds and widgeon-grass. Habitats as diverse as farm ponds only a few feet deep to estuarine bays up to 25 feet deep are used as feeding sites.

The ruddy duck is found on the open Bay as well as on creeks and small ponds. Chesapeake Bay winters nearly 30% of the Atlantic Flyway population, with most of the population arriving by early December. Ruddy ducks are primarily vegetarians and secondarily consumers of animal life. Animal food appears to be used only when suitable plant items are unavailable.

## Sea Ducks

Sea ducks use coastal marine and open estuarine waters. These species feed mainly on aquatic animal foods such as mollusks, crustaceans, amphipods, and fish. The group includes bufflehead, goldeneye, scoters, oldsquaw, and mergansers.

Mergansers, have streamlined bodies and serrated narrow bills which are ideally adapted to pursue fish, their primary food. Upon arriving on the Chesapeake, the red-breasted merganser winters on the coastline, the common merganser uses both inland lakes, rivers, and coastal waters, and the hooded merganser remains almost entirely inland.

Common goldeneye and bufflehead are associated with open estuarine waters to a much greater extent. Buffleheads were traditionally the only species of sea ducks which were taken by hunters in significant numbers. In recent years, however, oldsquaw and scoters have been hunted to a greater extent as populations of other more desirable species have declined. Little is known about these species, relatively speaking, because of their off-shore habits and because previously they were subject to minor harvest pressure.

## Migration

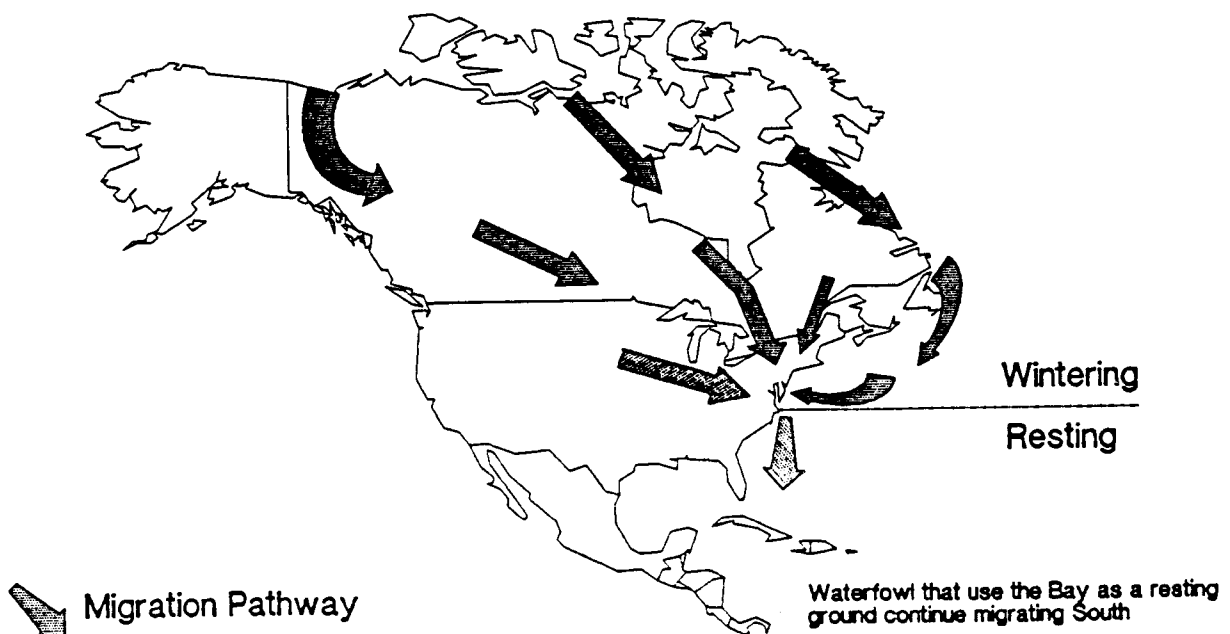
Most species of North American waterfowl are migratory, moving from northern breeding areas to southern wintering areas and back again. Many dabblers and divers breed in the prairie pothole regions and migrate south or to the coasts for the winter. Sea ducks migrate along the Pacific and Atlantic coasts. The Chesapeake Bay, located in the Atlantic Flyway, receives birds from all across northern Canada and parts of Alaska east to Labrador and Greenland.

Migration allows waterfowl to escape harsh winter conditions in Canada and Alaska by moving to warmer areas of the country, including Chesapeake Bay. Waterfowl breeding at northern latitudes can take advantage of a brief but insect-rich arctic summer (insects are an important protein source for waterfowl broods), and then fly south or to the coasts to more hospitable climates.

Waterfowl tend to return to the same breeding and wintering areas; however, food supply can alter migratory patterns. Tens of thousands of Canada geese now winter several hundred miles north of traditional winter grounds as a result of availability of both feed and cereal grains from agriculture. Likewise, when hurricanes opened up dense coastal marshes in Louisiana, tens of thousands of ducks began wintering there rather than continuing to the traditional wintering grounds on the Yucatan Peninsula of Mexico. It is important to recognize from a management perspective that waterfowl will take advantage of newly developed food and habitat resources.

The resources of the Bay are of primary importance to waterfowl spending the winter. Their ability to survive the winter and depart for their breeding grounds with energy reserves to make the migration and successfully reproduce depends largely on the Bay's resources. The Bay also provides important resting areas and food for waterfowl passing through the Bay during fall and spring migrations.

### Migration Pathways to Chesapeake Bay



### Defining the Waterfowl Resource:

An essential element in managing migratory bird species is to monitor population levels. Fluctuations in bird populations can indicate healthy or degraded habitats. That information, in turn, will influence management activities that help maintain healthy populations or that emphasize restoration of declining populations. The information is critical to establishing limits on the numbers of waterfowl that may be harvested annually.

Since the mid 1930's, extensive winter waterfowl surveys have been conducted annually for virtually all of the United States, and on less frequent occasions Mexico, Central America, and the West Indies. In the late 1940's, the U.S. Fish and Wildlife Service developed aerial waterfowl breeding and production surveys. These initial efforts have evolved into a cooperative U.S.-Canadian effort that surveys waterfowl populations and habitat changes over 1.4 million square miles. This breeding survey supplemented the mid-winter survey in the mid 1950's as a primary source of information used in the development of annual waterfowl hunting regulations.

Beginning in the spring of 1990, breeding survey coverage will extend farther into boreal areas of eastern Canada, the St. Lawrence lowlands, and portions of the northeastern U.S. Information derived from these surveys is expected to increase our knowledge of birds that winter in the Chesapeake Bay.

Numerous surveys that evolved from the "first" nationwide survey are oriented toward individual species and local populations. These surveys also are used extensively in our area to measure waterfowl abundance and distribution. These population data are used with other information to set waterfowl hunting regulations, to support habitat acquisition programs, develop mitigation plans, assess environmental impacts, provide information for legal actions, and appraise potential impacts of disease outbreaks. Specific surveys discussed in this management plan include the mid-winter waterfowl survey, November Canada goose survey, and Maryland waterfowl breeding survey.

Several points should be kept in mind in any discussion of waterfowl surveys. First, due to annual variations in weather and habitat conditions, distribution of waterfowl may differ from year-to-year and, second, an effort is always made to conduct surveys during the same time period each year simultaneously throughout the flyway.

The mid-winter survey is considered by many biologists as the most important survey in the Atlantic Flyway. It is conducted by all the states in the flyway, and counts are made of all species of ducks, geese, and swans observed. The mid-winter is an aerial survey and is conducted the first 2 weeks of January. It is used to estimate population size, trend, and distribution of geese and swans and to determine the relative numbers of waterfowl on wintering grounds. Since black ducks are so difficult to survey on their breeding grounds in eastern Canada and the northeastern U.S., this survey is also used as an index to the population trend of this species. This survey is the basis of our population estimates of most species in the Bay.

A second survey that is conducted by Maryland, Virginia, and Pennsylvania covers virtually all of the Chesapeake Bay region is the November Canada goose survey. This survey had been conducted by the Atlantic Flyway states since the early 1960's and was originally designed to determine when goose populations peak during the year. While some flyway states no longer conduct this survey, Maryland and Virginia also use this survey as an opportunity to monitor the abundance of greater snow geese, brant, tundra swans, and 4 species of diving ducks.

Maryland also conducts a breeding waterfowl survey in the spring that was originally designed to determine the effects of captive mallard releases on the native breeding ducks. The survey has been done annually from 1974-1987, but in 1989 Maryland will incorporate the survey into a multi-state mallard and black duck breeding survey effort. Virginia also conducts this breeding waterfowl survey and plans to continue at least through the spring of 1991.

Other surveys that occur in the area include the November canvasback survey, Maryland and Virginia mute swan survey, greater snow goose inventory, December swan survey, Pennsylvania breeding pair survey, and Pennsylvania brood survey.

### Status and Trends

Knowing the status of the waterfowl population, and trends over long periods of time, is essential to management. Gaining a clear picture of status and trends for migratory birds, however, can be extremely difficult because they are so mobile and influenced by numerous environmental conditions. This Plan focuses on the Chesapeake Bay region; however, population levels of ducks, geese, and swans may be influenced by environmental conditions outside the Chesapeake Bay. For example, canvasback numbers in any given year may be down in the Chesapeake Bay because of drought conditions in the prairie pothole region. The following information considers status and trends of certain species, with the understanding that conditions in the Chesapeake Bay may satisfy only a portion of a species' needs during an annual cycle.

The Chesapeake Bay's primary contribution to the nation's migratory bird resource is to provide an area that is a major migration and wintering site. Although some waterfowl breeding occurs in the Bay, this is a relatively minor component of the Bay's overall waterfowl value. It is estimated that nearly one million waterfowl winter on the Bay each winter (unpublished data, Office of Migratory Bird Management, USFWS, Laurel, MD, 1948-1986) (Table 2). This represents more than 35% of all waterfowl wintering along the Atlantic coast. Twenty-nine species of waterfowl have been identified wintering on the Bay, although 4-5 species make up the largest percentage of birds using the Bay.

**Despite a stable average of one million birds during the 1980's, there were major changes in species composition. Populations of Canada geese during the early 1980's were three times higher than the average levels recorded in the 1950 's; however, in the late 1980's populations exhibited a sharp decline. During this same period, all ducks except mallards have shown sharp declines, which coincides with the degradation of aquatic habitats in Chesapeake Bay.**

Graphs of Status and Trends to be included in printed final Plan  
(In preparation by USFWS Office of Migratory Bird Management)



Table 2. **Summarized results of winter waterfowl surveys for Maryland and Virginia.** For the most part the data are representative of Chesapeake Bay, but they also include the birds recorded on the Atlantic coastal bays. For the 1980s data, these coastal areas account for 10% of the swans; 11% of the geese; 23% of the dabbling ducks; 2% of the bay ducks; and 20% of the sea ducks. These numbers probably still underestimate Chesapeake Bay populations because the surveys do not record all birds, occur after the hunting season, and are primarily coastal, thus, they under estimate the numbers of sea ducks in open waters. Nevertheless, the data are very useful as an index of change.

Species	Highest Recorded 1940-1990	Year Recorded	MEAN FOR DECADE			
			1950s	1960s	1970s	1980s
SWANS						
Tundra Swan	75,854	1955	32,337	40,065	38,790	34,100
GEESE						
Snow Goose	127,200	1985	6,634	23,885	27,600	62,906
Brant	62,200	1954	19,600	10,310	9,415	23,331
Canada Goose	701,400	1981	177,710	318,040	561,340	570,138
DABBLING DUCKS						
Green-winged Teal	55,927	1941	3,100	2,330	1,970	1,062
American Black Duck	281,485	1955	142,922	86,600	54,420	49,338
Mallard	182,195	1956	71,379	41,260	47,160	56,812
Northern Pintail	78,211	1956	40,428	14,186	4,000	3,381
Blue-winged Teal	10,700	1949	550	40	35	43
Northern Shoveler	18,900	1966	85	960	905	194
Gadwall	15,300	1980	1,000	1,085	4,080	3,475
American Wigeon	144,350	1955	74,230	18,710	8,010	4,925
BAY DUCKS						
Canvasback	399,320	1954	179,072	102,450	63,890	52,963
Redhead	118,900	1956	76,429	34,485	10,930	3,162
Ring-necked Duck	18,500	1942	5,090	2,825	865	2,081
Greater and Lesser Scaup	403,700	1954	101,545	71,610	54,630	30,900
Ruddy Duck	124,740	1953	65,995	30,720	18,060	17,262
SEA DUCKS						
Oldsquaw	21,900	1972	3,550	3,615	9,500	7,088
Black, Surf, and White-winged Scoter	130,900	1971	19,064	8,350	32,085	6,538
Common Goldeneye	40,700	1956	22,068	25,920	12,060	12,563
Bufflehead	24,700	1967	9,105	11,730	22,470	17,112
Hooded, Common, and Red-Breasted Merganser	33,400	1955	8,073	5,180	2,840	5,213
TOTAL			1,059,996	854,356	985,587	964,460

## EXISTING MANAGEMENT PROGRAMS

For most of this century, waterfowl on Chesapeake Bay and in the nation have been managed for harvest. Management encompasses a wide variety of activities but can generally be grouped as either population management or habitat management. Population management primarily involves factors affecting mortality; recreational hunting is of primary importance here. Other concerns include diseases, lead poisoning, illegal killing, human disturbance, and conflicts with man (e.g., geese on golf courses). Habitat management is equally important. It involves activities designed to prevent loss or degradation of waterfowl habitat, or to restore areas that have already suffered loss or degradation. These activities include acquisition of important habitats, wetland restoration, marsh management, wetland creation, and improvements of water quality.

An important consideration for management of migratory waterfowl is that they require different habitats at different times of the year, and habitat needs vary between species. Consequently, waterfowl management strategies must encompass breeding habitat requirements, migratory stopover habitats, and wintering habitat requirements for each species. For the majority of waterfowl, Chesapeake Bay will only provide one or two habitat components (e.g., migration or wintering habitat). The specific actions put forth in this plan to restore, protect, and enhance waterfowl habitats and populations are intended to complement other waterfowl management efforts that address factors outside of Chesapeake Bay.

Much has been done on Chesapeake Bay to protect waterfowl from excessive harvest and to provide wintering habitat. Following are descriptions of the long-standing activities of state and federal agencies toward those goals.

### Federal

Harvest Management (Federal) The Fish and Wildlife Service has the responsibility to provide federal leadership for the conservation, protection, management, and enhancement of the nation's waterfowl resource. The Service's goal is to perpetuate and improve migratory bird populations for the benefit of people. With a limited resource in high demand, management is needed to provide optimum opportunity for people to use and enjoy migratory birds. Under provisions of the Migratory Bird Treaty Act, annual hunting regulations are used to regulate sport hunting of migratory birds, afford significant recreational opportunity, and play an important role in migratory bird management.

The objectives of annual regulations for the hunting of migratory birds are:

*To provide an opportunity to harvest a portion of certain migratory game bird populations by establishing legal hunting seasons.*

*To limit harvest of migratory game birds to levels compatible with their ability to maintain their populations.*

*To provide equitable hunting opportunity in various parts of the country within limits imposed by abundance, migration, and distribution patterns of migratory game birds.*

The regulatory process has evolved dramatically from its inception in 1918 when it was a liberal, brief, simple, and uniform procedure. Severe drought conditions, concern about habitat, and a growing general interest in the welfare of migratory birds led to more restrictive regulations in the 1930's; however, they still remained uniform and relatively simple. In the 1940's, state involvement and investment in migratory bird programs grew and demands for greater participation in the process of developing annual hunting regulations increased. Responding to these demands, regional differences in hunting conditions were recognized and by 1947, the nation was divided into four administrative 'flyways' for purposes of setting

regulations. By 1952, all states had organized along flyway lines into flyway councils: Atlantic, Mississippi, Central, and Pacific. In 1953, the National Waterfowl Council was established.

As a result of these changes, regulations became more complex. Waterfowl populations were generally abundant in the 1950's and with flyway and state input, regulatory activities proceeded without difficulties. In the 1960's, however, waterfowl populations were down and regulations became more restrictive. Public and private interests became focused on habitat protection. Restrictions in harvest also led to more specialized regulations, such as identifying regional harvest units. By the 1970's special harvest strategies, such as the point system, were used to reduce hunting pressure on more desirable species which were declining.

Restrictions also were introduced to protect declining species such as the black duck and special harvest strategies were initiated. The 1970's were a decade of greater public awareness in environmental issues. Laws such as the National Environmental Policy Act began regulating certain wetland alteration activities. Consequently the regulatory process became more complex. By the 1980's waterfowl numbers nationally were down, demand for the resource was even higher, and a commitment to habitat conservation was stronger than ever.

Annual regulations are divided into two categories, framework regulations and special regulations. Framework regulations are the oldest and include a window of time for opening and closing seasons, season length, and daily bag limit. Special regulations generally are species-, area-, or situation-specific. They employ measures such as split seasons, zoning or bonus bag limits. Most have been developed in response to specific interests and management needs. These regulations tend to be complex and they now comprise most of the volume of annual regulations.

In summary, regulations permitting the hunting of migratory waterfowl serve a number of management goals and objectives. Dating back to 1918, these regulations have evolved from simple, uniform, and liberal, to large, complex, and more restrictive. The demand for the waterfowl resource has increased while the supply has decreased. Management capabilities have increased with the advent of surveys and better knowledge of bird populations, and the states and public have become more actively involved. Management agencies and the public are now more aware of the importance of the habitat protection component of management and have begun to approach this problem with the intensity that had been reserved for the regulatory process.

Habitat Protection (Federal) In 1918, the Migratory Bird Treaty Act emphasized the need to acquire lands to protect and conserve migratory bird populations. Through enactment of the Migratory Bird Conservation Act in 1929, Congress set in motion acquisition of refuges to preserve important waterfowl habitat.

Although lands have been donated to the Service, most National Wildlife Refuges have been established on either withdrawn lands or acquired lands. Withdrawn lands are those that were in the public domain and were reserved for wildlife by Executive Order, Presidential Proclamation, or Public Land Order. Acquired lands are those that were privately owned and were obtained for wildlife pursuant to a specific authorization under laws such as the Migratory Bird Conservation Act, (which authorizes Federal Duck Stamp sales), the Endangered Species Act and the Federal Aid-in-Wildlife Restoration Act.

Each refuge has one or more primary purposes for which it is established and around which its management is designed. The purposes of individual refuges range from very narrow ones, such as preserving or managing the habitat for a single species, to much broader ones such as conserving natural diversity, fulfilling international treaty obligations, ensuring water quality, and providing opportunities for scientific research and public use.

All National Wildlife Refuges (NWR) within the Chesapeake Bay drainage are located in Maryland or Virginia. The following summarizes existing holdings:

MARYLAND		VIRGINIA	
Blackwater NWR	15,687 acres	Featherstone NWR	164 acres
Eastern Neck NWR	2,286 acres	Fisherman Island NWR	1,025 acres
Martin NWR	4,424 acres	MacKay Island NWR	874 acres
Patuxent NWR	4,682 acres	Marumsco NWR	63 acres
Susquehanna NWR	4 acres	Mason Neck NWR	2,277 acres
		Nansemond NWR	208 acres
		Plum Tree Island NWR	3,276 acres
		Presquile NWR	1,329 acres
	Total 27,083 acres		
			Total 9,216 acres

Research (Federal) Information to support waterfowl management at the national level is generated by Wildlife Research Centers of the Fish and Wildlife Service. Most of the Service's research on waterfowl in Chesapeake Bay is performed by Patuxent Wildlife Research Center, in cooperation with universities, state agencies, and wildlife refuges. Studies are undertaken in response to needs of the Service for regulation of the waterfowl harvest and for management of habitat. Recently, habitat-oriented research has emphasized the North American Waterfowl Management Plan and the Chesapeake Bay Program.

Patuxent Wildlife Research Center has conducted waterfowl research on the Chesapeake Bay for 50 years. Current efforts include an investigation of the survival rates of female black ducks and mallards during breeding and of their broods during the pre-flight period. This study uses radio-marking of birds to help answer questions about the long-term decline of black duck populations.

Extensive research on the ecology of canvasbacks on Chesapeake Bay involves three studies by Patuxent Wildlife Research Center: (1) effects of age, sex, and body weight on winter distribution, (2) habitat use and survival of juvenile canvasbacks wintering on the Bay, and (3) influence of foraging habitat on survival, energetics, and reproduction of canvasbacks wintering on the Bay.

Canada goose populations are the subject of intensive study, involving the Fish and Wildlife Service and states throughout the Atlantic Flyway. Data from observations on geese marked with numbered neck collars are treated using sophisticated statistical methods to analyze regional changes in the survival and distribution of populations.

Toxic materials in Chesapeake Bay might have contributed to the decline of waterfowl populations. Patuxent Wildlife Research Center is conducting studies (1) to assess metal residues from oldsquaws in the Bay, (2) to determine the effects of contaminants on submerged aquatic vegetation from the Bay, (3) to investigate the relationship of benthic invertebrate assemblages to the waterfowl that forage in Baltimore Harbor and to contaminants that may be in the benthic organisms, and (4) to survey the contaminant loads of waterfowl wintering in Baltimore Harbor.

#### Maryland

Management of waterfowl by the Maryland Department of Natural Resources is the responsibility of the Migratory Bird Program, whose long-range goals are to: (1) ensure the continued existence of the migratory bird resource and (2) meet the demand of recreation oriented toward this resource.

Harvest Management (Maryland) Maryland, after careful review of biological data, publicly advertises hunting regulation proposals for public input. Each year in late August, 3-4 public hearings are held in the state to solicit public opinion regarding these proposals. Following the public review process, the Secretary of the Maryland Department of Natural Resources, in consultation with the Department's biological staff and 12

member Wildlife Advisory Commission, makes season and bag limit recommendations to the U.S. Fish and Wildlife Service. The Service promulgates and publishes the final season and bag limits. The state recommendations can be more restrictive than federal frameworks, but may never exceed them. State regulations have been more restrictive than federal regulations in the past, particularly for Canada geese.

The Department is represented on the Atlantic Waterfowl Council by the Assistant Secretary, Forest Park and Wildlife Service, and on the Council's Technical Section by the manager of the agency's Migratory Bird Program. These groups meet semi-annually in March and July to discuss waterfowl management and to formulate flyway recommendations to the Fish and Wildlife Service concerning hunting season regulations and related issues.

Habitat Protection and Enhancement (Maryland) Habitat activities include the development and enhancement of waterfowl habitat on public lands using revenues from the sale of Maryland Migratory Waterfowl Stamps. Also, landowners are offered a tax credit for expenditures used to develop and enhance waterfowl habitats on private lands by entering into a 10-year licensing agreement for approved projects.

The Department also offers landowners a wildlife enhancement program known as the Wildlife Habitat Improvement Program (WHIP). This program pays farmers to leave crops unharvested to provide winter food for Canada geese and upland wildlife. This program is offered to landowners provided they commit at least 10 acres of unharvested crops in fields that are at least 20 acres in size. Foods may include corn, sorghum, millet, grasses, and clover. Waterfowl hunting is not permitted on the property.

Under the North American Waterfowl Management Plan's Atlantic Coast Habitat Joint Venture, a minimum of 140,000 acres are proposed for enhancement and protection by the year 2000. Five focus areas in Maryland have been initially targeted for habitat enhancement. Maryland already has a number of state areas protected for waterfowl (Table 3).

Table 3. Maryland State Waterfowl Areas.

AERA NAME	ACREAGE	COUNTY
Bowen	919	Prince George's
Cedar Island	2,880	Somerset
Deal Island*	11,902	Somerset
Dierrsen	40	Montgomery
Earleville	190	Cecil
E. A. Vaughn	17,501	Worcester
Ellis Bay	2,094	Wicomico
Fairmount	3,883	Somerset
Fishing Bay*	17,208	Dorchester
Islands of the Potomac*	329	Montgomery
Isle of Wight	256	Worcester
McKee-Beshers*	1,947	Montgomery
Myrtle Grove	831	Charles
Pocomoke River	505	Worcester
Pocomoke Sound	922	Somerset
Sinepuxent Bay	25	Worcester
South Marsh Island*	2,969	Somerset
Taylor's Island*	1,020	Dorchester
TOTAL	65,421	

\* more acreage is expected to be added to these areas

Research Projects (Maryland) The Department is currently expanding the use of wood duck nest boxes to increase wood duck production. Annual survival rates of adult female wood ducks are being monitored by capturing and banding incubating females and recapturing them in subsequent years. This technique provides a reliable indicator of wood duck population trends and requires smaller samples of banded birds than banding programs that depend upon hunter-killed recoveries.

Also under investigation is the relative effectiveness of taxidermy-mounted Canada goose decoys in decoying geese within gun range. This popular decoy is being compared to two commercially available decoy types. This research should help managers decide whether the increase in the use of taxidermy-mounted decoys significantly influences harvest success. Results of this research could lead to restrictive use of this decoy type as a means of reducing harvest in lieu of reducing hunting opportunity.

In 1991 Maryland will initiate a 3-year Canada goose banding project to mark a representative sample of both resident and migrant Canada geese. This research will provide an estimate of geese breeding in the state, the effects of harvest regulations upon annual survival, and survival outside of the hunting season for both resident and migrant geese. This research is a cooperative effort between Atlantic Flyway states and the Fish and Wildlife Service.

The Department is currently involved in the development and implementation of a production assessment for Canada geese in northern Quebec. This is a cooperative venture with the Fish and Wildlife Service and the New York Cooperative Fish and Wildlife Research Unit. This work will be initiated in spring 1990 and will involve an aerial survey in mid-June to determine nesting effort and an aerial survey in July to determine gosling production. This information will be available to managers prior to the setting of harvest regulations in August.

## Virginia

Harvest Management (Virginia) Management of waterfowl by the Virginia Department of Game and Inland Fisheries is a responsibility of the Wildlife Division. The 10-member Virginia Department of Game and Inland Fisheries Board of Directors conducts an advertised public meeting in late August each year to receive staff and public recommendations for waterfowl seasons and bag limits to be selected within the federal frameworks regulations established by the Fish and Wildlife Service. The Board votes on the waterfowl regulation options at the public hearing meeting. In recent years the Board has established regulations more restrictive than those allowed under the federal frameworks.

The agency is represented on the Atlantic Waterfowl Council by the Director and on the Technical Section of the Council by a staff biologist. These groups meet semi-annually in March and July to discuss waterfowl management and to formulate recommendations to the Fish and Wildlife Service concerning hunting regulations.

Survey and Inventory (Virginia). Division personnel are involved in numerous surveys including: spring breeding waterfowl surveys; fall goose, swan, and canvasback surveys; and midwinter waterfowl inventories. Weekly waterfowl surveys are conducted by project personnel on certain Wildlife Management Areas during the October-March period. Productivity surveys of greater snow geese, Atlantic brant, and tundra swan are made by both federal and state personnel. Division personnel participate in special waterfowl population, harvest, and hunting pressure surveys as needed. Plans to expand waterfowl surveys are under consideration.

Habitat Protection and Enhancement (Virginia). The Virginia Department of Game and Inland Fisheries is deeply committed to the goals set forth in the North American Waterfowl Management Plan with particular emphasis on the Atlantic Coast Habitat Joint Venture, which targets 60,400 acres of waterfowl habitat in Virginia for protection or enhancement. Eight of the ten focus areas identified in Virginia are located within the Chesapeake Bay watershed. These Bay focus areas total 36,600 acres; 34,775 of which are to be protected; 1,825 enhanced. Protection can be accomplished by any of several methods (e.g., fee acquisition, easement, lease, cooperative agreement, legislation).

Many varied waterfowl habitat programs are underway at the current time which will move Virginia forward toward achieving habitat objectives. There are nine state wildlife management areas (WMA) in Virginia totalling over 28,000 acres operated with waterfowl management as a major priority (Table 4). Additionally, cooperative wildlife agreements exist with eleven Department of Defense bases in Virginia. Sikes Act-funded waterfowl projects are being conducted on a number of these installations.

Table 4. Virginia Waterfowl Management Areas.

AREA NAME	COUNTY	ACREAGE
Chickahominy WMA	Charles City County	5,155
Game Farm Marsh WMA	New Kent County	429
Hog Island WMA	Surry County	3,907
Kittewan WMA	Charles City County	250
Lands End WMA	King George County	463
Saxis WMA	Accomack County	6,385
Ragged Island WMA	Isle of Wight County	1,537
TOTAL ACRES		18,126

The Virginia Department of Conservation and Recreation maintains a natural area preserve system of some 15,000 acres protecting natural heritage resources (endangered species and significant natural communities) including natural habitat corridors critical to migratory waterfowl and neotropical migrants. The Department also cooperates with Ducks Unlimited, the National Fish and Wildlife Foundation, and The Nature Conservancy to acquire significant habitat consistent with the North American Waterfowl Management Plan.

Research (Virginia). Virginia has been involved in an Atlantic Flyway Canada goose movement and survival study using neck-collared birds and is embarking on a wood duck banding and survival study. A newly-hired waterfowl research biologist will carry out scheduled projects.

## Pennsylvania

Harvest Management (Pennsylvania) In Pennsylvania, waterfowl management is the responsibility of the Pennsylvania Game Commission (PGC). The 8-member PGC Board of Commissioners enacts basic and framework waterfowl regulations at a public meeting of the Board. The PGC personnel meet with and receive comments from waterfowl hunters and other interested groups and individuals about proposed regulations. Appropriate Harrisburg staff and personnel of the Waterfowl and Migratory Game Bird Section (WAMGABS) (of the Bureau of Wildlife Management) complete the specific items for waterfowl regulations. At times, PGC has implemented regulations more restrictive than provided by the federal framework. The PGC Executive Director represents PGC on the Atlantic Waterfowl Council and the PGC Waterfowl Biologist serves as the representative on the Technical Section.

A number of PGC personnel, especially WAMGABS members, are involved in many and diverse projects that directly and indirectly deal with or influence waterfowl populations, management, and regulations. Programs are directed toward benefitting local and migratory waterfowl, waterbirds, other wetland associated wildlife, and providing ample opportunities for consumptive and non-consumptive users.

Survey and Inventory (Pennsylvania): WAMGABS staff, plus other PGC staff conduct a number of waterfowl surveys to monitor local and Atlantic Flyway populations. The winter waterfowl inventory has been conducted along the same areas of the Susquehanna River for many years and will continue. A November goose survey is done annually in each county. Regular, periodic observations are made for collared geese during fall and winter. Three waterfowl production surveys are conducted: A PGC breeding pair survey, a PGC brood survey, and an AF breeding survey. Portions of all surveys and inventories are in the Chesapeake drainage area. As needed, various waterfowl population, harvest, and hunter surveys are conducted.

Habitat Management (Pennsylvania): PGC is participating in two Joint Ventures of the North American Waterfowl Management Program (NAWMP): Lower Great Lakes-St. Lawrence Habitat Joint Venture and the Atlantic Coast Habitat Joint Venture (ACJV). Much of the ACJV in Pennsylvania is in the 8 focus areas in the ACJV in Pennsylvania; 4 are in the Chesapeake Bay Drainage. In these 4 Focus Areas, these acreage needs have been identified: Protection - 14,800 acres and Enhancement - 18,300 acres.

Since the 1930's the PGC has acquired almost 1.5 million acres of land as State Game Lands (SGL). Of this acreage, about 113,000 acres are of importance to waterfowl and are situated in the Chesapeake watershed. Considerable waterfowl habitat management has been done on these SGL's.

Additional waterfowl management activities include the following: An extensive wood duck nesting box program on SGL and to a limited degree on other agency lands and private lands. PGC also cooperates with other public agencies, private organizations, and individuals to provide them with proper assistance for waterfowl management. PGC is an active participant in the land-use permitting process and actively reviews all permits that affect wetlands. PGC is an active participant in the Ducks Unlimited MARSH program. In the last several years PGC has initiated a stream-side fencing program to exclude farm animals from streams and to reduce degradation to streams and stream banks. The Fish and Wildlife Service and the Chesapeake Bay Program have provided funding for this most worthwhile program. Thus far, 118 farms are participating with a total of 41 miles of streams fenced. The resultant vegetative growth and waterfowl use (especially nesting) is impressive. Each year PGC provides \$10,000 to Ducks Unlimited for habitat management that benefits waterfowl that nests in eastern Canada, migrates through Pennsylvania, and winters in Chesapeake Bay.

Research (Pennsylvania): PGC has expended considerable efforts on waterfowl banding, both local breeders and migrants, chiefly wintering birds. From 1975 to 1985, 100,000 waterfowl have been banded in Pennsylvania. PGC is participating in an Atlantic Flyway (AF) preseason banding program to assess AF breeding duck populations. Participation in an AF Canada goose banding and neck collaring program has been a major endeavor. Other recent or current waterfowl research projects include analyses of game farm mallard releases, experimental plantings of aquatic plants, marsh ecology, and waterfowl ecology.



## NEW INITIATIVES

Well over one million birds use the Chesapeake Bay during fall and winter. As brought out in the Status and Trends Section of this document, however, serious problems exist for a number of species, particularly ducks. Existing waterfowl conservation programs do much to protect our valuable waterfowl. However, many other problems exist that cannot be satisfied under the existing waterfowl conservation programs. The other problems include loss of wetland habitat from development, degradation of water quality from toxic pollution and surface runoff from farm fields and urban landscapes, and significant declines in food resources. Poor water quality has caused the loss of submerged aquatic vegetation (SAV) and benthic invertebrates, especially mollusks. Lead poisoning from lead shot can be a serious problem in given areas, and recreational activities of man may be a form of harassment for local populations of waterfowl. Constriction of migrating and wintering birds into pockets of available habitat pose threats of disease outbreak and increased pressure from predators.

Many other activities outside the bounds of typical waterfowl management must be done to enhance the survival and reproduction of waterfowl. These activities include new and innovative measures, such as the 1986 North American Waterfowl Management Plan, and changes to other programs that may benefit waterfowl, as can happen if water quality is improved because of Federal and State pollution abatement efforts. Commitment under the 1987 Chesapeake Bay Agreement can do much to benefit waterfowl habitat if properly managed and implemented. These commitments include fulfillment of the Basin-wide Wetlands Policy and the Basin Wide Policy for Submerged Aquatic Vegetation. Other initiatives that may benefit waterfowl include use of the Agreement report "Habitat Requirements for Chesapeake Bay Living Resources" to guide pollution abatement programs on meeting improved habitat requirements.

Following are discussions of these new areas that are important opportunities for improving the way we manage and affect habitats important to waterfowl.

### Chesapeake Bay Agreement

- o Wetlands Policy and Implementation Plan: The Chesapeake Bay Wetlands Policy was approved in January 1989 and calls for a long-term net gain in wetland resources. The Wetland Implementation Plan will be approved in mid 1990. The policy emphasizes the importance of Chesapeake wetlands to migrating and wintering waterfowl. Action items presented in the policy will directly or indirectly benefit waterfowl. One action item calls for development of a strategic plan for wetland acquisition. Development of that plan should include a strong consideration for use of potential wetland areas by waterfowl. In addition, development should consider goals and purposes of the North American Waterfowl Management Plan.
- o SAV Policy and Implementation Plan: The Chesapeake Bay SAV (submerged aquatic vegetation) Policy was approved July 1989, and calls for a net gain in SAV. The SAV Implementation Plan was approved July 1990. Action items identified in the Plan will promote restoration of waterfowl. The Plan calls for research to further our understanding of the relationships between SAV and waterfowl. This will be helpful to assess waterfowl habitat areas deserving immediate attention.
- o Habitat Requirements: In 1988 the Chesapeake Executive Council approved "Habitat Requirements for Chesapeake Bay Living Resources." This report fulfilled the first commitment of the 1987 Chesapeake Bay Agreement, and provides guidelines for orienting pollution abatement programs with habitat requirement of 30 target species. Four species of waterfowl (canvasback, redhead, black duck, wood duck) are included in the report, and their habitat requirements have been summarized. A comprehensive revision of the report will be completed by the end of 1990.

- o Other Resource Management Plans: A wide variety of living resource management plans are called for under the 1987 Agreement. These include ones for blue crab, oysters, American shad, striped bass, bluefish, weakfish, spotted sea trout, croaker spot, summer flounder, American eel, red drum, black drum, and ecologically valuable species (to be defined). Components of these plans often call for habitat preservation and improvements in water quality. Successful implementation of these plans should also benefit waterfowl.
- o Nutrient Reduction Strategy: The Bay Agreement commits to reducing nutrient levels in Chesapeake Bay by 40% over levels recorded in 1985. Reductions of nitrogen and phosphorous by this amount are expected to improve ambient water quality and promote higher levels of dissolved oxygen. This should enhance light penetration for SAV, and help sustain oxygen levels for benthic invertebrates. Resurgence of these food resources would benefit Chesapeake waterfowl.

#### North American Waterfowl Management Plan (NAWMP)

The NAWMP was signed by the United States Secretary of the Interior and the Canadian Minister of the Environment on May 14, 1986. The plan is a broad international agreement which sets forth specific goals and objectives for the conservation and management North America's waterfowl populations through the year 2000. The plan also serves as a catalyst and establishes a framework for cooperative efforts among federal, state, and private organizations in needed waterfowl and wetland conservation programs.

The NAWMP has a strong focus on protection and management of wetland habitats. Six geographic areas in the United States are recognized in need of special conservation efforts due to their significance to wintering or migrating waterfowl. The Atlantic Coast from Maine to South Carolina is one of those six priority habitat. "Joint Ventures" are recommended as the means to initiate action.

The concept of joint ventures recognizes that the conservation and management of our waterfowl resources and the preservation of our remaining wetland habitats are bigger issues than any one agency or organization can effectively address. To be successful in stemming the loss of wetlands and returning waterfowl population levels to those observed during the decade of the 70s, as called for in the NAWMP, a revitalized spirit of cooperation is needed among a broad spectrum of federal, state, and private interests. Federal and state natural resource agencies, national and local conservation organizations, and private landowners will need to combine their collective talents and funding sources, to work together in a renewed spirit of cooperation to reverse the decline of North America's waterfowl populations.

#### North American Wetlands Conservation Act (NAWCA)

The NAWCA was signed in December 1989. Approximately \$25-30 million is potentially available each year to support NAWMP projects in the U.S. and Canada. Funds would be generated by short-term investments of federal excise tax revenues in the Pittman-Robertson Act fund, fines and forfeitures resulting from federal wildlife law enforcement activities, and an authorized Congressional appropriation of \$15 million. Approximately 50% of the funds would be spent in Canada. Acquisition, enhancement, restoration, and development projects are all eligible. Funds would be provided on a matching basis. The President's budget has earmarked \$15 million for NAWMP projects in FY 1991.

## RESEARCH

Research is an essential part of each resource management strategy, providing new information and ideas upon which management decisions are based. Specific needs for information will arise while this strategy is being implemented. Those anticipated at the outset are listed as tasks under actions specified in this report. However, the strategy is not intended to identify all of the waterfowl research needs. Instead, it establishes processes for identifying and fulfilling those needs, and it outlines broad areas of investigation where needs are expected.

State agencies, universities, and the Fish and Wildlife Service maintain active research programs that address a wide range of issues related to conservation of waterfowl and their habitats in the Chesapeake Bay region. Studies focus on the status, distribution, and trends of populations, and on a wide range of environmental factors influencing waterfowl. Some research activities are concentrated on species of special emphasis, such as the black duck or canvasback, while others are more generally oriented to concerns affecting a range of waterfowl species.

The Waterfowl Management Team identified the following major types of research needed specifically to support waterfowl management in the Chesapeake Bay region. These needs are reflected to some extent in the actions and tasks listed later in this report. Some of the needs are now being addressed, but further work is required in all of them to guide management decisions.

- (1) Improved survey methods need to be developed to provide better estimates of regional waterfowl populations.
- (2) Better understanding is needed of the population dynamics of waterfowl, with emphasis on immigration, emigration, and survival of populations in the Chesapeake Bay region.
- (3) Knowledge of habitat requirements of waterfowl using the Bay needs to be strengthened, not only for those species listed in the Bay Program's "Habitat Requirements for Chesapeake Bay Living Resources" report, but for all other waterfowl regularly occurring in the region.
- (4) The relationship of waterfowl to other components of the Bay ecosystem needs to be understood, including interactions between waterfowl and SAV and benthic invertebrates. Research also is needed on how foods available to waterfowl wintering in the Bay region affect physical condition and reproductive ability of the birds.
- (5) Effects of environmental contaminants and disease on survival of waterfowl in the Bay region are poorly understood, and require fundamental research.

The Waterfowl Management Team identified these research needs to the Scientific and Technical Committee's Research Planning Advisory Group for consideration in the development of the 1990 Research Priorities report, and will continue to do so in future years to promote the goal of this plan.

## NEW MANAGEMENT STRATEGY

There is concern about the downward trend in waterfowl populations throughout North America. Many factors are responsible for yearly population changes, and fluctuation causes are complex and often difficult to investigate. Obviously, natural phenomena (e.g., drought or inclement weather on the breeding grounds) will affect waterfowl trends regardless of management efforts. However, many other habitat and mortality variable affecting waterfowl are direct consequences of human activities. It is these activities which are the emphasis of management strategies in the Plan.

### Goals and Objectives

The goal of this plan is:

*"to restore, enhance, and protect waterfowl habitats and populations to derive the greatest long-term ecological, economic, and social benefits from the resource."*

The objectives are to:

- o *Prevent loss and degradation of habitat, and restore and enhance habitats presently degraded or unsuitable for use by waterfowl.*
- o *Support responsible waterfowl management programs, to restore waterfowl populations and habitats to at least 1970's levels by the year 2000.*
- o *Improve public understanding of the waterfowl resource and its habitat needs.*

### Management Actions

Following are the specific management actions that will be implemented over time to help achieve the goal of this plan. The actions are numerous and ambitious. Actions may change as time progresses and waterfowl populations fluctuate; however, actions now defined will be conducted with every expectation of fulfilling the goal of this plan. The Waterfowl Management Team believes these actions will do much to promote waterfowl conservation and restoration in Chesapeake Bay.

## CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

### OBJECTIVE 1: Prevent Loss and Degradation of Habitat, and Restore and Enhance Habitats Presently Degraded.

Action 1. *Identify essential habitat requirements for waterfowl in the Chesapeake Bay region, including water quality requirements.*

**Background:** Considerable information exists on the use of various habitats by most species of waterfowl. Little is known, relatively speaking, on exactly what characteristics of a given area are particularly conducive to waterfowl use. Additionally, more information is needed on the daily activities and feeding behavior of waterfowl species on Chesapeake Bay. Having a full appreciation of a species behavior and nutritional requirements is essential, and knowing where nutritional requirements (food availability) can be met is critical. Once habitat characteristics are fairly well understood, then information can be obtained on what environmental influences either degrade or enhance the availability of those habitats, thus refining management of water quality and land use to benefit waterfowl.

The condition of water plays an important role in the quality of habitat used by waterfowl. On Chesapeake Bay, as elsewhere, habitat includes areas of cover for breeding protection, open water areas for loafing, and shallow to deep waters rich in food resources. Water quality will largely influence the foods available to waterfowl. Highly turbid waters from sediment runoff and nutrient enrichment will eliminate valuable submerged aquatic grasses such as wild celery and sago pondweed. Eutrophication depletes deep and shallow waters of oxygen, thus killing large expanses of benthic food items such as worm, small clams, and crustaceans. Deterioration of water quality in Chesapeake Bay has already limited the abundance and distribution of canvasback, redhead, northern pintail, gadwall, and American wigeon. Without an abundance of food, waterfowl will be more susceptible to mortality, especially while migrating north to breeding grounds. Clean water quality is a critical need for Bay waterfowl.

Implementing Tasks	Lead Group or Agency	Schedule for Completion
A. Complete the revision of "Habitat Requirements for Chesapeake Bay Living Resources", particularly for Canvasback, Redhead, Wood Duck and Black Duck.	H a b i t a t O b j e c t i v e Workgroup	September 1990
B. Conduct literature synthesis on habitat requirements for tundra swan, Canada goose, and oldsquaw. Identify where inadequate habitat information exists, and promote appropriate research.	Maryland Forest, Park, and Wildlife Service (MFPWS)	December 1990

Implementing Tasks	Lead Group or Agency	Schedule for Completion
C. Develop new management strategies based on new habitat information acquired via Action 1.B.	Waterfowl Management Team (WMT)	June 1991
D. Determine the optimum levels of nitrogen and phosphorus that must be maintained to promote growth of submerged aquatic vegetation; rely on efforts of SAV Technical Workgroup.	SAV Technical Workgroup with WMT member	July 1990
E. Determine research needs for the acute and chronic impacts of contaminants (heavy metal, organics) to waterfowl and geographic areas of high use: insure that the information is used by EPA and States in developing criteria and standards.	U.S. Fish and Wildlife Service (USFWS)	June 1991
F. Determine research needed on select contaminants (herbicides, insecticides, etc.) which could potentially threaten food resources of waterfowl and their broods; initiate necessary research within 2 years of need assessment.	W M T   a n d USFWS	June 1991

## CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

### OBJECTIVE 1: Prevent Loss and Degradation of Habitat, and Restore and Enhance Habitats Presently Degraded.

**Action 2.** *Determine suitable habitat management practices for waterfowl, taking into account interests for conservation of other natural resource values.*

**Background:** The management and manipulation of habitat to benefit one species or a group of species most often involves action that affect non-target organisms as well. The manipulations may, in fact, be detrimental to the target species over the long term. For example, the flooding of an anadromous fish spawning streams for waterfowl may be detrimental to commercial or recreational fisheries and the created impoundment may be used by waterfowl, but it may also expose them to heavy harvest pressure. The careful examination of these impacts to other fish and wildlife species and the unknown impacts to waterfowl, resulting from waterfowl management actions needs to be improved so that biologically sound judgement can be made in the best interest of all species.

Implementing Tasks	Lead Group or Agency	Schedule for Completion
A. Develop immediate policy on wetland management practices that benefit waterfowl but that are known to have no or minimal affect on non-target species.	WMT	December 1990
B. Conduct a full literature review and synthesis on known impacts of wetland habitat manipulation for benefiting waterfowl (with particular attention to impoundments and marsh burning). Literature should be reviewed toward impact assessment to all applicable wetland dependent fish and wildlife species, and ecosystem functions.	USFWS	December 1991
C. Base on literature review (2.A.), research should be identified, planned for, and budgeted, and conducted.	WMT	Plan by March 1992
D. Develop new policies and agreements based on information obtained via 2.B. and 2.C.	WMT	June 1992

## CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

### OBJECTIVE 1: Prevent Loss and Degradation of Habitat, and Restore and Enhance Habitats Presently Degraded.

Action 3. *Encourage measures to restore submerged aquatic vegetation to pre 1960's levels of distribution and abundance in Chesapeake Bay.*

Background: Submerged aquatic vegetation is an essential component of the Chesapeake Bay ecosystem. It is of immense value as food to waterfowl and its abundance directly effects the use of the Bay by waterfowl. SAV also harbors small fish, insects, and crustaceans that are also valuable food items to waterfowl. The ability of waterfowl to complete their annual life cycle, migrating to and from breeding grounds, is heavily influenced by a bird's ability to store food reserves for the long flight. Protection and enhancement of SAV will do much to promote waterfowl populations on Chesapeake Bay.

Implementing Tasks	Lead Group or Agency	Schedule for Completion
A. Provide WMT representative to SAV Technical Workgroup to promote the Implementation Plan for the SAV Policy.	SAV Technical Workgroup a n d W M T representative	July 1990
B. Refine existing knowledge on the life history requirements of SAV to promote management of these species.	WMT/USFWS	December 1990
C. Determine the need for research on the impacts of contaminants (heavy metals, organics) and herbicides on the abundance and distribution of SAV.	SAV Technical Workgroup	per SAV plan
D. Assess the impact of commercial clamming on SAV survival.	MFPWS	December 1991



## CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

### OBJECTIVE 1: Prevent Loss and Degradation of Habitat, and Restore and Enhance Habitats Presently Degraded.

Action 4. *Provide guidance to agencies, organizations, and the public on habitat management practices needed to benefit waterfowl.*

Background: Within the Chesapeake Bay area, critical areas for wintering and migration of waterfowl have been identified. Some of the areas are also important for waterfowl production, especially the wood duck and black duck. All areas listed have also been targeted for wetland protection and enhancement efforts as part of the Atlantic Coast Joint Venture of the North American Waterfowl Management Plan, designed to promote wetland protection from Federal, state, local, and private organizations. The total acreage that needs to be protected or enhanced within each area is also identified. Protection means the long-term viability of the area needs to be secured via acquisition, easement, agreement, lease, or donation. Enhancement means the capability of the area to support waterfowl needs to be improved through application of proven wildlife management practices.

In addition, there are actions that can be taken by individual landowners, agencies, and organizations to promote land management practices that will directly or indirectly benefit waterfowl. These would include establishment of forest buffers along streamsides and shorelines and leaving crops in fields for waterfowl. Moreover, certain government programs can be detrimental to protecting waterfowl habitats and they need to be carefully examined.

Implementing Tasks		Lead Group or Agency	Schedule for Completion
A. Develop a strategy for protecting and enhancing areas to promote the Atlantic Joint Venture effort. Areas already identified include:		WMT	June 1991
<u>Maryland</u>			
Blackwater and Nanticoke River Marsh	53,500	5,000	58,500
Lower Eastern Shore Marshes	34,000	6,100	40,100
Dickenson Bay	1,250		1,250
Patuxent River Marshes	14,500	500	15,000

---

Implementing Tasks

Lead Group  
or Agency

Schedule  
for Completion

---

Virginia

Virginia Easter Shore	7,000	800	7,800
Pamunkey River Marshes	9,200	100	9,300
Chickahominy River Marshes	4,400	50	4,450
James River Marshes	3,650	50	3,700
Rappahannock River Marshes	4,150	200	4,350
Mattoponi River Marshes	2,500	100	2,600
York River Marshes	1,400	250	1,650
Western Bayshore Marshes (Reedville-Mobjack Bay)	2,475	275	2,750
Lower Susquehanna River	<u>8,300</u>	<u>2,500</u>	<u>10,000</u>
Totals	146,325	15,925	162,250

Other important areas, particularly areas subject to development, will be considered by the WMT as the strategy is developed.

B. Promote the use of new and existing programs to protect and enhance habitats for waterfowl on private lands. Programs may include:

- o Expanded use of Conservation Reserve Program under Food Security Act
- o Financial or Tax Credit Incentives for leaving crops unharvested for waterfowl, and for leaving fallow fields adjacent to wetlands.
- o Promote use of forest buffer strips, particularly hardwood forests.

W M T v i a  
P r o g r e s s  
Report July 1991

Implementing Tasks	Lead Group or Agency	Schedule for Completion
<ul style="list-style-type: none"> <li>o Provide financial or tax credit for creation of waterfowl habitat in areas that would not adversely affect other fish or wildlife habitat.</li> <li>o Develop give-away programs that provide private landowners with plants that benefit waterfowl.</li> <li>o Develop agricultural land preservation via zoning or legislation.</li> <li>o Promote stream fencing programs similar to the program by the Pennsylvania Bureau of Wildlife.</li> <li>o Full use of existing BMP cost-share programs for agricultural lands.</li> </ul>	Wetlands Policy Workgroup with W M T Representative per Wetlands Plan	per Wetlands Plan Schedule
C. Determine the impacts of existing government programs that adversely affect waterfowl and wetlands and summarize in a report changes that would be beneficial to waterfowl. The determination should consider the full range of Federal and State cost-share and assistance programs that influence land use, and programs that regulate land use activities.		

## CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

### OBJECTIVE 1: Prevent Loss and Degradation of Habitat, and Restore and Enhance Habitats Presently Degraded.

**Action 5.** *Encourage programs to control the spread of plants that diminish the value of wetlands for waterfowl.*

**Background:** Phragmites and purple loosestrife exhibit aggressive growth patterns which enable the species to out compete traditionally dominant wetland plants. Both species can invade a marsh to the point of forming predominantly monotypic stands.

As with other hydrophytes, phragmites and purple loosestrife provide resource values such as detrital production and export, pollutant uptake, and erosion control. However, neither species provides much in the way of wildlife habitat. Expanding ranges of the two species negatively impact waterfowl, waterbird, and furbearer habitats by decreasing desirable food plant abundance, habitat heterogeneity, and open water interspersions. Phragmites presents other problems by being a serious fire hazard, restricting wildlife access to food items, and providing roosts for nuisance blackbird concentrations. Of the two species, phragmites is of serious concern within the Chesapeake watershed. Purple loosestrife is a significant problem in the northeast, and could present a future problem in the bay region. The extent and rate of range expansion is unknown.

Implementing Tasks	Lead Group or Agency	Schedule for Completion
A. Develop a means to monitor invasive species; incorporate monitoring into 5 year Status and Trends survey called for by Wetlands Implementation Plan.	W e t l a n d s Workgroup a n d W M T Representative	per Wetland's Plan
B. Determine the affect of prescribed burning on phragmites growth, and recommend necessary management actions.	MFPWS USFWS	June 1991
C. Determine if herbicides can be used safely to control phragmites, and implement actions that will not harm non-target species.	MFPWS	June 1991
D. Determine growth characteristics of phragmites to improve techniques for control.	USFWS	June 1991
E. Inform the public about negative habitat qualities of phragmites and recommend ways the public can reduce the spread of this plant.	USFWS	December 1990

## CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

### OBJECTIVE 1: Prevent Loss and Degradation of Habitat, and Restore and Enhance Habitats Presently Degraded.

Action 6. *Recommend measures to minimize the adverse effects on waterfowl from human disturbance and land development.*

Background: The Chesapeake Bay Region has exhibited exponential growth since the 1950's. The trend is continuing, with projections of 2.6 million new residents in the region by the year 2020. This projected 20% growth in the human population will significantly alter the undeveloped areas remaining.

Both large-scale and small-scale alterations of wetland and adjacent upland habitats have occurred in the region due to past growth. Development has resulted in direct and indirect waterfowl habitat loss, water quality degradation, and a decrease in the value of many remaining waterfowl habitats due to human disturbance. Procedures currently used throughout the Bay region for managing growth and regulating development do not adequately address the needs of waterfowl.

Much of the habitat loss problem is associated with the regulatory or management approach. Historically, the approach has been to react to an individual proposal (e.g., wetland permit review), or optimize growth potential (e.g., local planning and zoning) without assessing cumulative impacts and the overall affect on "public interest." To improve Chesapeake Bay's waterfowl value, growth and land use must be directed.

Implementing Tasks	Lead Group or Agency	Schedule for Completion
A. Develop maps or reports that identify waterfowl habitats on concern and needing permanent protection. Use and expand concept by MFPWS to record waterfowl concentrations by longitude/latitude coordinates.	WMT	December 1991
B. Provide information and technical assistance to local governments and municipalities to direct population growth and land development away from valuable waterfowl habitat, or to reduce potential adverse effects of approved development.	WMT	On-going
C. Assess the need for open water sanctuaries that would offer protection from boating activities and hunting; summarize findings in a report.	WMT	June 1991

## CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

### OBJECTIVE 2: Support Responsible Waterfowl Management Programs to Restore Waterfowl Populations and Habitats to at Least 1970's Levels by the Year 2000.

Action 1. *Promote responsible use of waterfowl resource by coordinating with the Atlantic Flyway Council and the U.S. Fish and Wildlife Service regarding harvest restrictions and provisions.*

Background: Harvest of waterfowl for recreational purposes is a longstanding tradition in the United States and Chesapeake Bay region. Establishing yearly harvest regulations is a laborious and complex procedure whereby waterfowl harvest is regulated to assure sustained long-term reproduction and population stability. Federal regulations cannot always ensure full protection for local populations. States often must enforce more restrictive regulations to provide for their own waterfowl resource. There is a need to coordinate with all of the harvest regulation development to assure that population goals of the Chesapeake Bay Waterfowl Management Plan are fulfilled.

Implementing Tasks	Lead Group or Agency	Schedule for Completion
A. Coordinate priority concerns regarding harvest to the Atlantic Flyway Council and U.S. Fish and Wildlife Source annually (if necessary).	WMT	Annually
B. Assess the need to impose greater restrictions on harvest of sea ducks (oldsquaw and scoters), including zoning restrictions designed to offer open water sanctuaries for sea ducks.	WMT	June 1991

## CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

### OBJECTIVE 2: Support Responsible Waterfowl Management Programs to Restore Waterfowl Populations and Habitats to at Least 1970's Levels by the Year 2000.

Action 2. *Minimize adverse effects of hand-reared mallards on wild waterfowl populations.*

Background: Both the State of Maryland and the private sector rear and release captive mallard for recreational purposes. Maryland DNR currently releases about 28,000 mallards annually. Most private releases occur on Regulated Shooting Areas (RSA), which are state licensed shooting preserves. At the present time, there is concern that captive released waterfowl may be negatively affecting wild waterfowl populations, particularly the black duck. Numbers of RSA's have increased in Maryland from 34 in 1985 to more than 100 in 1988. In Dorchester County alone, approximately 150,000 game farm mallards were released for harvest during the 1988-89 hunting season. Federal regulations permit the taking of any number of captive reared mallards at any time on RSA's provided that the birds are properly marked. Little information exists on past hunting season survival of released birds, or reproduction. Regulated restrictions on the taking of wild populations (which are attracted to feed put out for captive reared birds), the potential conflict with management of wild populations, and the lack of information on the impact of released birds on waterfowl habitat of the region, make an assessment of these state and private release programs essential.

Implementing Tasks	Lead Group or Agency	Schedule for Completion
A. Determine whether special migratory bird regulations for harvest of captive-released mallards allowed by the U.S. Fish and Wildlife Service (50 CFR 21.13) pose threats to wild populations in the Chesapeake area.	USFWS	June 1991
B. Research is required to determine if RSA's increase or decrease hunting pressure on wild populations at the local level (e.g. decoying wildbirds). WMT should ensure research efforts address this information need.	WMT	June 1991
C. Research is required to determine if and how released mallards negatively impact migration and wintering habitats important to wild birds. WMT should ensure research efforts address this information need.	WMT	June 1991

Implementing Tasks	Lead Group or Agency	Schedule for Completion
D. Research is required to assess the significance of hybridization between released mallards and wild black ducks, and other possible impacts to wild black duck reproductive potential. FWS and MFPWS should ensure research efforts address this information need.	WMT	June 1991
E. Determine if research is required to assess the disease threat from interaction of captive reared mallards with wild stock. WMT research efforts address this information need.	WMT	June 1991
F. Determine if research is required to assess the impact of released mallards on Atlantic Flyway winter surveys and U.S. Fish and Wildlife Service harvest estimates.	WMT	June 1991
G. Reassess the proportion of Maryland State Duck Stamp money spent on the captive mallard release program. Much of this money could be used to protect and enhance waterfowl habitat.		June 1991



## CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

### OBJECTIVE 2: Support Responsible Waterfowl Management Programs to Restore Waterfowl Populations and Habitats to at Least 1970's Levels by the Year 2000.

Action 3. *Identify management actions needed to reduce concentrations of waterfowl where they damage habitat or are exposed to an increased risk of disease.*

Background: Waterfowl are gregarious by nature, particularly during migration and wintering periods when the largest numbers are in the Chesapeake Bay region. Heavy waterfowl concentrations can result in adverse habitat impacts from intensive foraging, stressful intra and inter-specific competition, agricultural field damage disease threats (e.g., avian cholera, avian botulism, duck plague, etc.) and increased potential for bird/aircraft strikes near airports.

Implementing Tasks	Lead Group or Agency	Schedule for Completion
A. Create and maintain habitat diversity; provide a wide spectrum of waterfowl habitats including natural wetlands, moist soil areas, impoundments, and a variety of buffer forest and agricultural areas present progress in WMT annual report.	WMT members and Agencies	Ongoing
B. Geographically distribute management activities by dispersing acquisition of state/federal wildlife areas, cooperative/easement areas and management on private lands; present progress in WMT annual report.	WMT members and Agencies	Ongoing
C. Design waterfowl harvest management programs to disperse bird concentrations by adjusting season dates (timing), season length and bag limits; present progress in WMT annual report.	WMT members and Agencies	Ongoing
D. Discourage artificial feeding programs through educational programs. Such feeding causes unnatural concentrations of waterfowl which can result in a dependency on people, spread of disease and poor nutrition.	WMT members and Agencies	Ongoing

## CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

### OBJECTIVE 2: Support Responsible Waterfowl Management Programs to Restore Waterfowl Populations and Habitats to at Least 1970's Levels by the Year 2000.

Action 4. *Survey waterfowl populations in the Chesapeake Bay region as needed to monitor their trends in relation to habitat conditions.*

Background: The primary waterfowl survey of the Chesapeake Bay area is the nationwide Midwinter Waterfowl Survey. This survey was initiated by the U.S. Fish and Wildlife Service in 1935 to monitor waterfowl populations in support of the Service's regulatory responsibilities and is currently conducted in all the states of the Chesapeake Bay region. It is held annually in the first full week of January. This survey is used by the various states and the Service to monitor distribution of waterfowl, to determine habitat conditions and for regulatory consideration. As useful as the survey is, however, it fails to satisfy all management needs. A more comprehensive waterfowl survey is needed. Currently, several smaller scale surveys are also conducted in the region. These include the Mid-November Canada Goose survey, Coordinated Canvasback survey, and the Atlantic Flyway Tundra Swan Survey.

Implementing Tasks	Lead Group or Agency	Schedule for Completion
A. Assess strengths and weaknesses of existing survey methods and summarize in a report; incorporate recommendations for improvement.	WMT	December 1990
B. Based on 4.A. report, design necessary new surveys and seek agency support to accomplish surveys.	WMT	December 1991
C. Promote acquisition of waterfowl concentration data from mid-winter survey, model approach after existing effort of MFPWS.	WMT	December 1990

## CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

### OBJECTIVE 2: Support Responsible Waterfowl Management Programs to Restore Waterfowl Populations and Habitats to at Least 1970's Level by the Year 2000.

Action 5. *Support development and implementation of new or improved waterfowl management techniques.*

Background: In the face of increased human population pressure and a degraded Bay environment, the future of the waterfowl resource on Chesapeake Bay will depend first on improved understanding of waterfowl-habitat relationships and second, on development and implementation of new and innovative management actions. New emphasis must be placed on improving both population and habitat management and, in particular, assessing a wide variety of environmental influences on the waterfowl resource.

Implementing Tasks	Lead Group or Agency	Schedule for Completion
A. Identify and promote priority research that is aimed at enhancing management techniques; summarize findings in a brief report; submit to Scientific and Technical Advisory Committee via Living Resources Subcommittee.	WMT	March 1991
B. Seek support for research on the benefits of artificial island creation using clean dredge spoil material for waterfowl habitat.	USFWS	March 1991
C. Seek support for research on potential benefits of restoring wetlands containing borrow areas originating from dredging activities.	USFWS	March 1991
D. Host special conferences as necessary to solve general and specific waterfowl problems. Invite recognized experts.	WMT	Annually

## CHESAPEAKE BAY WATERFOWL POLICY AND MANAGEMENT PLAN

### OBJECTIVE 3: Improve Public Understanding of the Waterfowl Resource and its Habitat Needs

Action 1. *Identify opportunities to develop new educational program and products.*

Background: Informing the public about our valuable waterfowl resources is of critical importance to maintaining support for conservation and management. Waterfowl probably are some of the more visible forms of wildlife, and the public is generally aware of these birds, particularly hunters and nature enthusiasts. What waterfowl represent about the relative health of the Chesapeake Bay is little known or understood by the public at large. More information needs to be distributed about the various species that use the Bay, their preferred habitats, their behavior, and how their abundance is affected by the quality of habitats on the Bay.

Implementing Tasks	Lead Group or Agency	Schedule for Completion
A. Develop a plan identifying new ways to educate the public, including product descriptions, audience, time frames, equipment and budget needs.	WMT	July 1991
B. Develop educational materials for use in agricultural extension program to create or improve waterfowl habitat	WMT	December 1991
C. Generate public interest and support for conservation of waterfowl in Chesapeake Bay through production of posters, fact sheets, status and trends report, and other educational materials.	WMT	July 1991
D. Produce educational materials to promote public support for measures to minimize disturbance of wintering waterfowl flocks, including support for marine sanctuaries.	WMT	July 1991