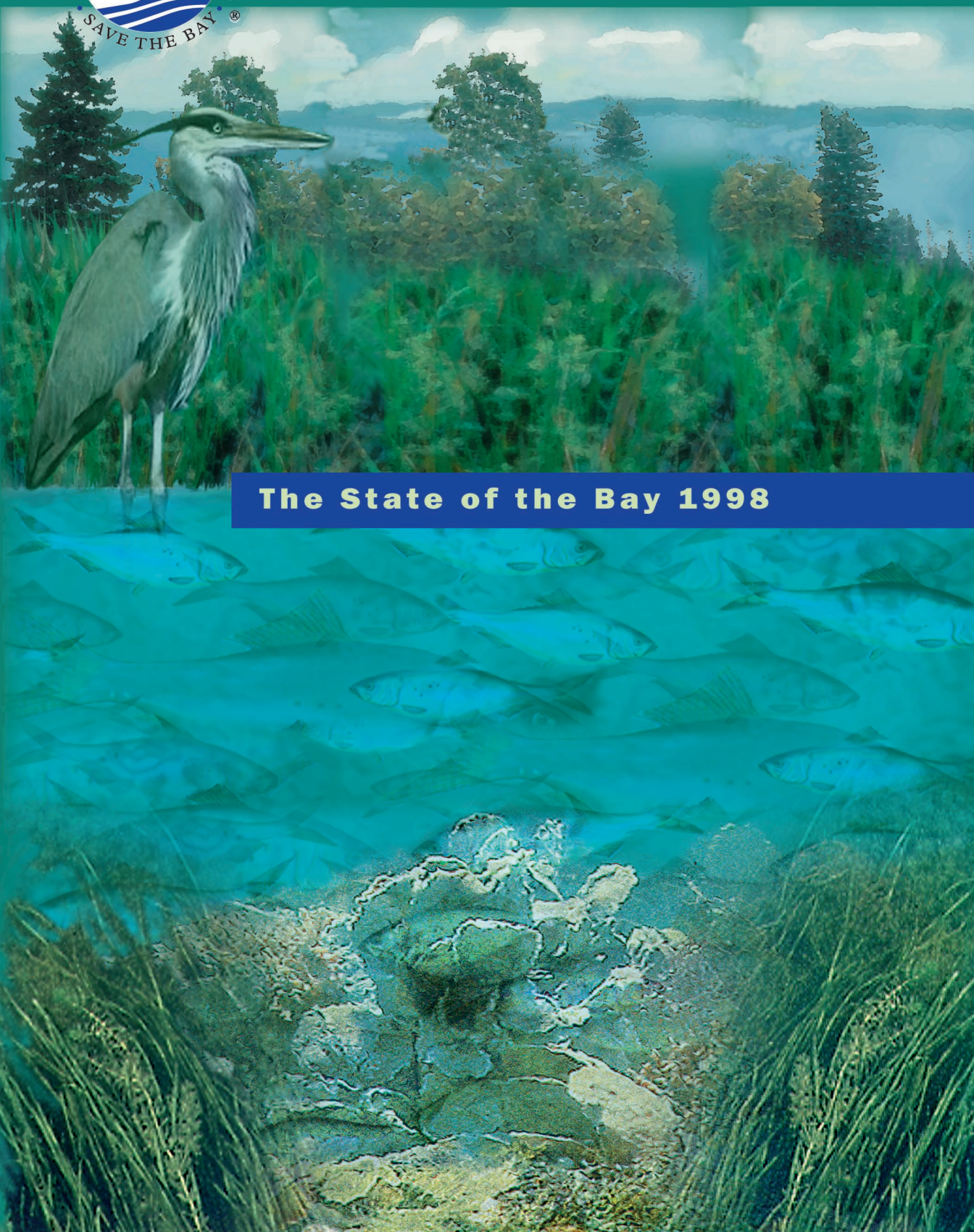
CHESAPEAKE BAY FOUNDATION

The State of the Bay 1998



So, how's the Chesapeake Bay doing?

It's a question we're frequently asked. The Chesapeake Bay Foundation's answer is that, as a whole, the Bay functions at barely more than one-quarter of its capacity; that on a scale of 100 the Bay's health can be charted at 27.

This simple number describes the health of a nearly unimaginably complex system woven from the threads of the living and the physical worlds. It relates the health of the Bay we know to the healthiest Bay we can describe, the Bay Captain John Smith recorded in his exploration narratives from the early 1600s.

In the context of today's realities, Smith's narratives depict an almost mythic Bay of clear water with abundant growths of submerged vegetation and teeming with oysters and fish. Ancient forests canopied the rivers and streams with huge trees. The Bay's 64,000 square-mile basin was sparsely inhabited by Native Americans who lived lightly on the land. In that old Bay, the energy and chemical building blocks of life that flowed into the Bay were balanced by the mature communities of plants and animals that thrived there. Modern science confirms much of what Smith described, and the records of our forebears from as recently as the earlier parts of this century bolster it as well. That old Bay rates 100. It is our benchmark.

To understand how our Bay compares to that old Bay, we chose and analyzed factors in three broad categories: pollution, habitat, and fish and shellfish. In all categories--even those in which "hard" benchmark data was scarce—CBF scientists compiled and examined the best available historical and up-to-date information and sought direction and advice from other scientists who study the Bay.

The index reports that the work of public agencies and private groups and individuals is beginning to show small signs of success. During the 31 years the Chesapeake Bay Foundation has worked to Save the Bay, the steady downward trend in the Bay's health has stabilized and, since about 1983, begun slowly improving. There are success stories, such as the restoration of rockfish to the Bay. And there are stories of continued decline, such as the depletion of oysters. On balance, however, the Bay is somewhat better.

This State of the Bay report is intended to provide a reference point for how far we have fallen from the old Bay, and how far we have to go to reach the saved Bay. The "saved" Bay is a Bay rich in resources and resilient enough to withstand the storms of nature and of man. The Bay will never again reach the level described by Smith, yet we think a Bay with an index of 70 is achievable. We must remember how rich our Bay was, and not settle for a small fraction of what it could be.

Habitat

Wetlands — Status: 43

Basis: According to an authoritative review of historical losses of wetlands, the three Bay states have lost 56% of their wetlands since colonial times. Assuming that the rate of loss within the watershed was roughly comparable to the statewide losses, the estimate of 1.551 million acres in the watershed in 1983 made by the USFWS (1994) represents the same 44% of the pre-colonial total, or 3.525 million acres. Using the annual loss rate of 2,900 acres per year from the USFWS study, the region has lost another 1% of its wetlands since 1983, leading to an index value of 43.

Observations: Wetland restoration efforts have accelerated recently, but protection of existing wetlands remains precarious. Recent court rulings and proposed changes in legal and regulatory programs that govern existing regulations threaten existing wetlands. Although the rate of loss of existing wetlands may have slowed somewhat from the 1980s, proposals for large projects that would destroy hundreds of acres of wetlands at a time are being considered.

Forested Buffers — Status: 53

Basis: The value of 53 is based on the statement in a Chesapeake Bay Program fact sheet (*A Snapshot of Chesapeake Bay: How's it doing?*) that states that 53% of the basin's 110,000 miles of streams and shorelines are buffered by riparian forests.

Observations: Efforts to restore forested buffers have expanded recently, and acreage of restored buffers is increasing. At the same time, however, inadequate laws and inadequate enforcement of existing laws is resulting in losses of existing buffers. It is not yet clear whether current restoration efforts can succeed without additional attention to preserving existing buffers.

Underwater Grasses — Status: 12

Basis: 1997 acreage of underwater grasses was 69,000 acres. 600,000 acres is a reasonable and widely held estimate of historical submerged aquatic vegetation (SAV) acreage. The index value of 12 indicates that 12% of that historical acreage is currently covered by SAV.

Observations: Submerged aquatic vegetation Bay-wide has increased in the last two years, but Tangier Sound has lost 50% of its beds since 1992. Although underwater grasses have increased substantially from the historic low levels of the early eighties, we have not regained the recent high set in 1993. Restoration of underwater grasses depends directly on efforts to reduce nutrients and sediments from all sources. In addition, we must pay increased attention to activities that damage grass beds, such as hydraulic dredging.

Dissolved Oxygen — Status: 15

Basis: Studies by Johns Hopkins University researcher Dr. Grace Brush indicate that anoxia (total deprivation of oxygen) was rare to absent before colonial settlers cleared forests and increased the flow of sediment into the Bay. The levels of anoxia and hypoxia (extremely low levels of oxygen) we see today reflect both nutrient inputs and consequences of river flows that were probably changed forever following land clearing. An index of 15 reflects the severely degraded state of the Bay with respect to dissolved oxygen.

Observations: Average dissolved oxygen levels are still severely degraded due to continued nutrient inputs, and there is no evidence of improvement in recent years. Improved levels of dissolved oxygen are essential to healthy habitat for fish and shellfish and will depend on the reduction of nutrients from all sources.

Fisheries

Rockfish — Status: 70

Basis: Rockfish (striped fish) numbers and spawning stock biomass are higher than they've been since relatively good records started being kept in the 1960s, yet we consider 70 the index of health of rockfish stocks for three reasons. First, there are not yet enough large, old fish to produce a fully healthy age distribution. Second, there is concern over the health of the individual fish (a persistent disease afflicts many of the fish). Third, there is concern that their forage base, primarily menhaden, is reduced in numbers.

Observations: The striped bass population has grown from near collapse in the mid-1980s due to cooperative, coastwide controls on harvest. More old, large fish are needed in the population to maximize spawning potential, and continued vigilance is needed to ensure that rockfish populations are never overfished again.

Crabs — Status: 50

Basis: The value for crabs of 50 represents our judgment that the blue crab population is far below its pre-exploitation level for two reasons: extremely heavy fishing and extremely reduced levels of the underwater grass habitat critical to the species' life cycle.

Observations: Only the high inherent resilience of the Bay's blue crab population prevents a lower number in view of the historically high level of fishing effort now targeting this species following the decline of the Bay's other commercial fisheries. The excessive level of effort increases the risk from poor production of young crabs. Widely varying abundance from season to season and a smaller average crab size reduce the fishery's value.

Shad — Status: 2

Basis: The shad population in the Bay is widely accepted as "severely depleted." The index value of two indicates a population almost, but not quite, as depleted as oysters; for example, the current population of shad in the upper Bay is only 3% of the restoration target for the Susquehanna, let alone pre-exploitation levels.

Observations: Encouraging, modest improvements in the upper Bay contrast with historic lows in most other areas. Increased interest in restoration (for example, fish passages on the Susquehanna and James rivers) and controls on the ocean fishery give cause for guarded optimism.

Oysters — Status: 1

Basis: Although there is no definitive way to estimate the oyster population either in pre-colonial times or today, it has been estimated that oyster biomass in the late 1980s was only one percent of what it was before the period of heavy oyster harvest in the late 1800s; numbers of oysters in the Bay, at least as indicated by harvest, have declined since the late 1980s. An index of one represents an oyster population of less than one percent of its abundance in John Smith's time.

Observations: Oysters continue to be held to an historic low due to lack of habitat, disease pressure, and irregular reproduction. Efforts to restore oyster reefs in MD and VA have shown promising results, and citizen participation in oyster restoration represents an encouraging avenue to bring back oyster reefs and raise awareness about the value of oysters to the Bay system.

Pollution

Toxics — Status: 30

Basis: Among all threats to the Bay, toxic chemicals are the most difficult to measure. We know very little about their effects, including what effects occur at low levels. Seemingly harmless chemicals when mixed together are deadly. Some chemicals, such as PCBs, dioxins, and DDT, do damage in extremely small doses. Many chemicals accumulate over time until they, too, do a great deal of damage. The index value of 30 indicates that the Bay is deeply degraded, far from the toxics-free Bay with a value of 100.

Observations: During the past 15 years the tonnage of reportable industrial discharges of toxic materials from some industries has declined. Regulatory and monitoring systems remain insufficient. The approach of using fewer toxic materials has not been widely adopted.

Water Clarity — Status: 20

Basis: Although we recognize that the Bay never had water as clear as a mountain lake, it is apparent that the water we know today is far murkier than the water of 300 years ago. Reliable reports of widespread underwater grasses that grew in 9 feet of water only a century ago are one indication of this deterioration. An index of 15 indicates a severely degraded Bay in this component.

Observations: Water clarity is an indicator of nutrient and sediment loading to the Bay. Excess nitrogen and phosphorus levels in the Bay result in unbalanced algae growth that clouds the water. Nutrient reduction is critical to the improvement of water clarity, which has shown no trend to improvement in recent years. Although erosion and sediment control programs are in place, they are not well-enforced in most areas. In addition, losses in the Bay's natural filters (such as forested buffers and wetlands) have reduced its ability to filter nutrients and reduce erosion. On a positive note, underwater grasses in some areas of the Bay grow more than 10 feet deep, suggesting that water clarity restoration is possible.

Phosphorus/Nitrogen — Status: 15

Basis: While nitrogen and phosphorus occur naturally, man has introduced levels so artificially high that the Bay cannot sustain them. Estimates are that nutrient loading to the Bay are seven times what they were in pre-colonial times. The index value of 15 represents the inverse of 7 times the loading, or one seventh.

Observations: By 1989, phosphate in detergents were banned in Maryland, Virginia, Pennsylvania, and the District of Columbia, which dramatically reduced the level of phosphates in sewage discharges. Past fertilizer use and agricultural application of manure has caused a saturation of phosphorus in soils in many locations. Nitrogen continues to reach the Bay from a variety of sources, including air pollution, sewage treatment plants, and agriculture. New nutrient management laws in Pennsylvania and Maryland have not yet reduced levels, while legislation in Virginia is still under consideration.

Interim Goals for a Healthy Bay

To save the Bay—to restore it so its system can counter the swings of nature and the pressures of man–we must rebuild its resilience and restore its complex web of life.

To guide its efforts CBF has set restoration goals for nine indicators of the Bay's health. They include: toxics, water clarity, dissolved oxygen, underwater grasses, forested buffers, wetlands, resource lands, oysters, and migratory fish. CBF conducts projects designed to help meet these goals and is working to have these goals shared by all partners in the Bay restoration effort.

CBF believes that if the goals are met, the Bay will be far more resilient and approach the point where, with continued protection and restoration, it will sustain itself. Our estimation is that if these goals are reached, the Bay's health would be charted at roughly 40. These goals are interim measures that CBF has set for the year 2005. The condition of each indicator in 1995 is used as the baseline for measuring increases or decreases.

Toxics—reduce by half the tons of toxic substances used in the watershed.

Water Clarity—clear the water enough to allow sunlight to penetrate six feet during the growing seasons for underwater grasses.

Dissolved Oxygen—raise oxygen levels to healthy levels (5 parts per million) from surface to bottom in spawning and nursery areas; in deeper waters, oxygen should stay at the threshold of health (3 parts per million) at least 90 percent of the year.

Underwater Grasses—expand to cover 225,000 acres in the Bay and the tidal portions of its rivers.

Forested Buffers—expand wooded buffers by I,500 miles along streams, rivers, and shoreline.

Wetlands—increase wetlands by 125,000 acres.

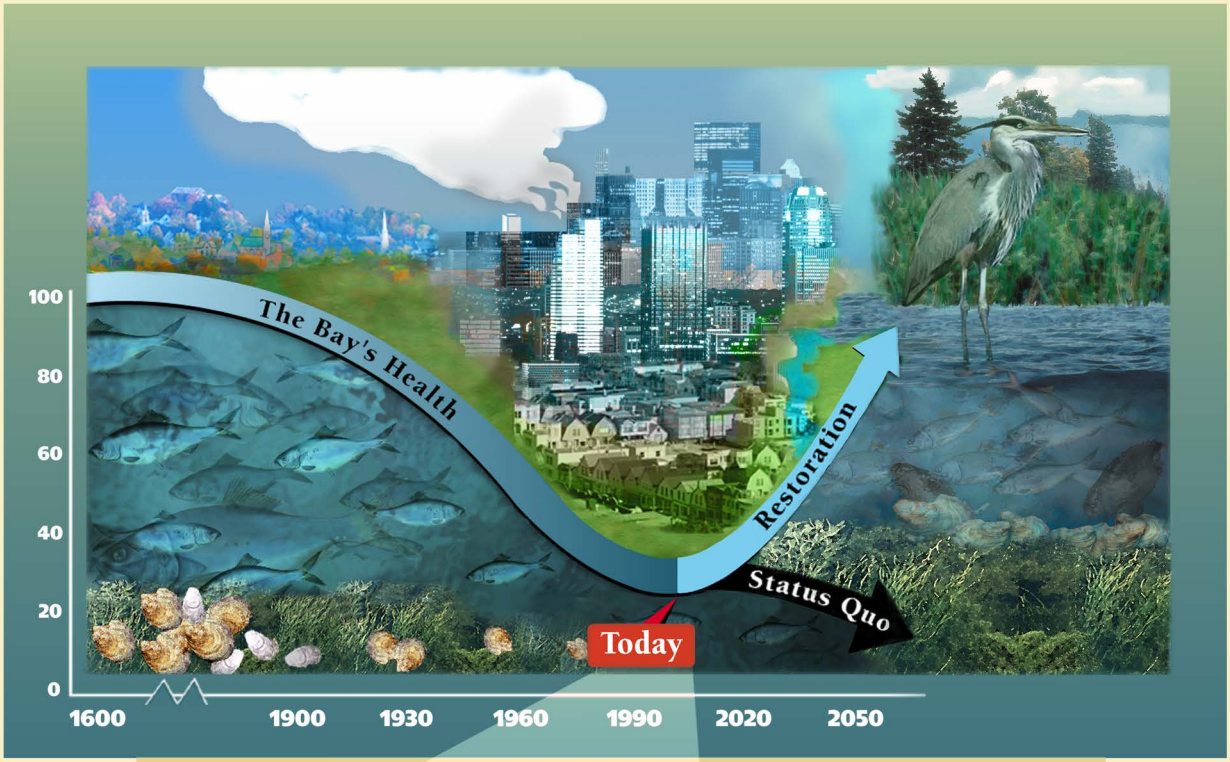
Resource Lands—reduce by 25 percent the amount of land lost to development, saving about 22,500 acres of land annually.

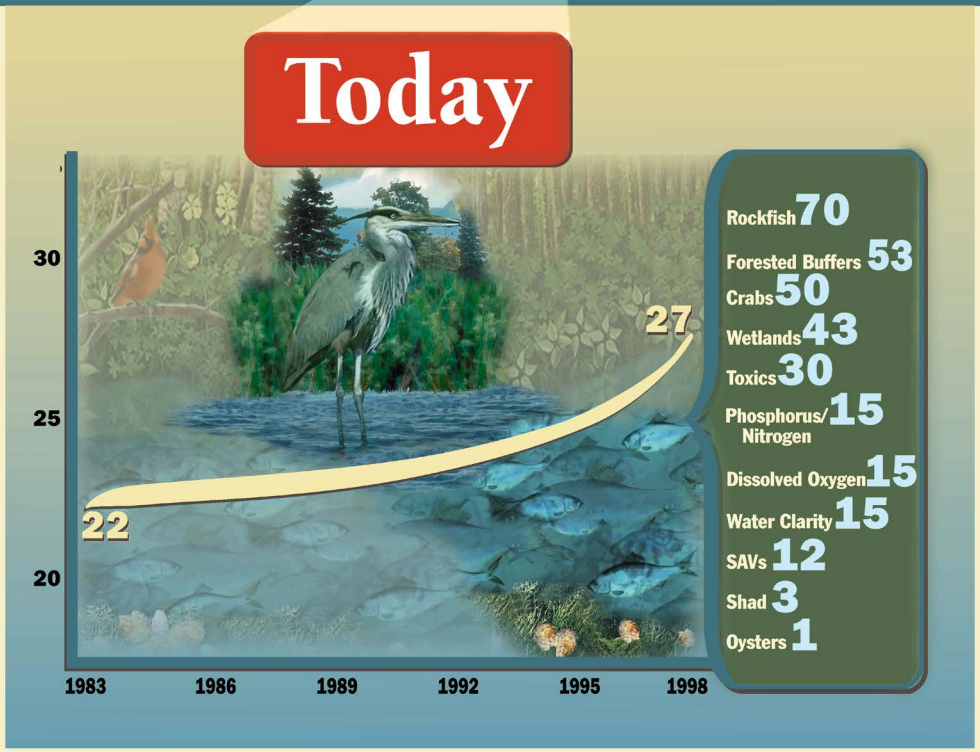
Oysters—increase the population of oysters in the Bay by 10 percent.

Migratory Fish—reopen 1,500 miles of rivers to migratory fish; improve water quality and fishery management so the population densities reach levels equivalent to those of the 1960's; manage blue crabs sustainably.

CBF won't save the Bay alone. It will take the effort of many organizations and thousands of active citizens. Work that reduces pollution, that increases the resilience and habitat provided by forested buffers, wetlands and underwater grasses, and that restores the populations of fish and shellfish will save the Bay.

The State of the Bay





This State of the Bay report is intended to provide a reference point for how far we have fallen from the old Bay, and how far we have to go to reach the saved Bay.

With more than 80,000 members, the Chesapeake Bay Foundation (CBF) is the largest nonprofit conservation organization working to Save the Bay. Founded in 1967, CBF employs a staff of 130 and has offices in Annapolis, Maryland (headquarters), Harrisburg, Pennsylvania, and Norfolk and Richmond, Virginia. CBF's programs focus on environmental education and resource protection and restoration.

For more information contact CBF's Public Affairs office at 410-268-7742.

CHESAPEAKE BAY FOUNDATION

Headquarters
Annapolis /410-268-8816
Baltimore / 410-269-0481
District of Columbia / 301-261-2350

Maryland Offices
Annapolis / 410-268-8833
Baltimore / 410-269-1870
District of Columbia / 301-261-1131

Pennsylvania Office
Harrisburg / 717-234-5550

Virginia Offices
Richmond / 804-780-1392
Hampton Roads / 757-622-1964
Northern Virginia / Alexandria / 703-684-5923
Southern Maryland / 410-326-6951

Printed on Recycled Paper 9/98