

# Evaluating Partners in Flight Partnership Lands in the Mid-Atlantic Region: Converting Conservation Plans into Conservation Actions<sup>1</sup>

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## Abstract

Within the mid-Atlantic Coastal Plain, lands owned or controlled by government agencies and organizations within the Partners in Flight (PIF) program are highly fragmented. These lands represent tens of thousands of habitat patches that are managed by hundreds of individuals responding to a diversity of directives. Moving this patchwork of lands forward to achieve regional conservation goals will require orchestration of management activities on a large scale. Between 2000 and 2002 we conducted an assessment of partnership lands within the mid-Atlantic Coastal Plain to evaluate the status of priority habitats. This project was designed to bridge the disconnect between regional plans and local land management. We interpreted digital orthophotographs and mapped patches of priority habitats within all lands owned by the PIF collective. These properties contained 672,696 ha of land distributed among 19,018 patches. For some priority habitats, the PIF collective appears to control a significant portion of the regional total. Linking habitat and partner-specific data will allow for the development of customized action plans and highlights the role of individual partners in the recovery of species suites. In a very real sense, the application of regional habitat assessments to conservation plans serves to identify the role that individual land managers may play in achieving specific regional targets.

*Key words:* conservation plan, habitat assessment, land management, mid-Atlantic Coastal Plain, scaling objectives.

## Introduction

In 1995, the PIF program initiated a comprehensive planning process. This process culminated in the development of bird conservation plans for every physiographic region in North America (Pashley et al. 2000). Eco-regional plans are intended to serve as “blueprints for action”, focusing available funding and manpower on identified research, management, and

educational priorities. Since the completion of initial area plans, there has been considerable interest in making the transition from plan development to plan implementation. However, throughout the early phase of this transition it has become increasingly clear that there remains a region-to-local disconnect. Translation of region-based goals down to the management of individual habitat patches is a necessary first step toward the local to regional integration that will be needed to achieve conservation targets. This is particularly evident within those physiographic areas where both habitat and ownership are highly fragmented.

The mid-Atlantic Coastal Plain (PIF physiographic area 44) was the site of the first successful European settlement in North America and its landscape has been subject to influence by European culture for nearly four centuries. The landscape of the region is highly dissected due both to the historic influence of man and to the complex interface between land and water. The urban crescent from Baltimore south to Richmond and east to Norfolk is experiencing one of the fastest human growth rates in North America. The living space and infrastructure required by this expanding human population is continuing to alter the availability and distribution of priority habitats. Hundreds of thousands of habitat patches are distributed among an even larger number of owners. Lands owned or controlled by government agencies and organizations within the PIF program are also highly fragmented. These lands represent tens of thousands of habitat patches that are managed by hundreds of individuals responding to a diversity of directives. Moving this patchwork of lands forward to achieve regional conservation goals will require orchestration of management activities on a large scale.

A bird conservation plan was completed for the Mid-Atlantic Coastal Plain in the spring of 1999 (Watts 1999). Translating this conservation plan into meaningful conservation action will require the integration of region-based objectives with local recommendations. The overarching objective of this project is to bridge the region-to-local disconnect and begin the process of mobilizing the collective partnership embodied in the PIF program from conservation planning to conservation action within the mid-Atlantic region. A series of complimentary sub-objectives have been identified for this purpose including: 1) identification of parcels

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controlled by PIF partners, 2) identification of land managers for all parcels, 3) assessment of partnership lands with respect to priority habitats, 4) conducting a collective assessment to determine status relative to regional conservation goals, and 5) development of parcel-specific recommendations. We refer to this approach as scaling down region-based conservation goals to the management of land parcels while simultaneously scaling up local management actions to achieve regional goals. This paper presents the results of the assessment of priority habitats within the region (sub-objective 3 above). Information resources associated with other objectives are available on a dedicated habitat assessment website (<http://www.ccb-wm.org>) or will be presented elsewhere.

## Methods

The habitat assessment presented here is restricted to lands within the “PIF collective” that fall within the mid-Atlantic Coastal Plain (PIF physiographic area 44). This collective includes lands owned and managed by agencies and organizations that are actual signatories to the PIF agreement (for a listing of partners, see: <http://www.partnersinflight.org>). Within the mid-Atlantic Coastal Plain, this community of landholders includes various agencies of state and federal governments, non-governmental organizations, and private corporations. The mid-Atlantic Coastal Plain currently covers 56,220 km<sup>2</sup> and includes all coastal lands of Virginia, Maryland, Delaware, and New Jersey. The area is bounded to the east by the Atlantic Ocean and to the west by the fall line. The fall line is an erosional scarp where the metamorphic rocks of the Piedmont meet the sedimentary rocks of the Coastal Plain. The geologic formations along this boundary frequently determine the landward extent of tidal influence. The state border of New Jersey forms the northern boundary of the region. The original southern boundary of the region (the boundary used in this study) was the Virginia/North Carolina Border. It should be noted that in recent years the southern boundary for this physiographic region has been shifted north to include only the southern drainage basin of the Chesapeake Bay.

We worked collaboratively with PIF landholders to develop a directory of all properties included in the regional PIF collective. For the purpose of this project, a “property” refers to a parcel or group of parcels addressed by the same name and under a common management team. The directory linked all parcels with their respective management contacts and served as a master list to guide the assessment. Digital shape files that delineated boundaries were compiled or developed for all properties.

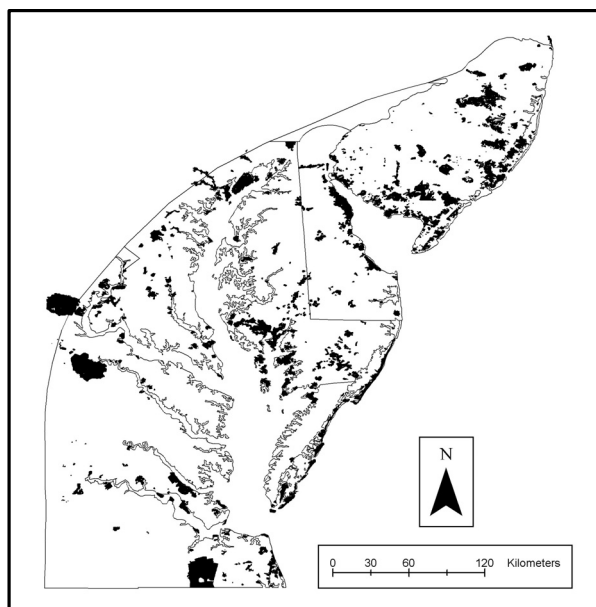
The bird conservation plan for the mid-Atlantic Coastal Plain identifies eight different habitat types that are critical to the long-term health of priority bird

populations (Watts 1999). In order of regional priority these habitats include pine savanna, barrier and bay island, salt marsh, forested wetland, mixed upland forest, early successional, pine plantation, and fresh/brackish marsh. These habitats are broadly defined with several subtypes being recognized within the conservation plan. To the extent possible, we maintained specified subtypes within the habitat assessment. However, in order to simplify the presentation within this report, information is provided by broad habitat categories.

We conducted the habitat assessment manually by interpreting digital orthophoto quarter quadrangles. Source imagery was color-infrared with a resolution of 5 m. We used ArcView 3.2 (Environmental Systems Research Institute, Inc.© 1992-2000) software for all digital manipulation and interpretation. Digital shapefiles of property boundaries were superimposed onto digital orthophotos to allow for habitat delineation and mapping. For identification of priority habitats, we used the Anderson land-use and land-cover classification system (Anderson et al. 1976). Anderson uses a hierarchical system of classification that scales down to appropriate levels based on the resolution required to distinguish critical habitat features. We used a modified Anderson classification incorporating Levels 2 and 3 of the Anderson system. All habitats were evaluated and mapped at the patch level. For the purpose of this study, a “patch” is a “contiguous area of relatively homogeneous habitat.” Patches were delineated from the surrounding landscape by hard boundaries such as rivers or roadways or by rapid transitions to homogeneous areas of other habitat types. All attributes of patches and higher order designations were entered into a central database to allow the greatest flexibility in retrieving information over different spatial scales and to accommodate a wide range of uses.

## Results

Within the mid-Atlantic Coastal Plain, lands controlled by the PIF collective are widespread and account for just below 12 percent of the total land surface (*fig. 1*). The collective was found to include 527 separate properties that contained 672,696 ha of land arranged within 19,018 patches of priority habitat (*table 1*). Collectively, government-owned lands accounted for the largest portion (77.6 percent) of landholdings followed by industry (18.1 percent) and NGOs (4.3 percent) respectively. The U.S. Department of Defense was the single largest landholder (21.4 percent of PIF collective) followed by the U.S. Fish and Wildlife Service (19.0 percent), the forest products industry (18.1 percent), and the state of Maryland (15.0 percent).



**Figure 1**—Map of mid-Atlantic Coastal Plain physiographic area illustrating the lands (black polygons) included within the PIF collective. Note that industry lands are not shown due to proprietary interests.

Priority habitats varied considerably in distribution and abundance within the PIF collective (*table 2*). Most of the priority habitat types were well represented within the holdings of the collective and were widely distributed across the region and between partners. Pine savanna was the least abundant priority habitat accounting for only 0.5 percent of landholdings. This habitat type has declined dramatically within the region due to shoreline development and conversion to other land uses. Many of the patches that do remain have been degraded by fire suppression. Wetland habitats are more concentrated within partnership lands than

within the region in general and accounted for more than 44 percent of all landholdings. This same general pattern was detected for early successional habitats that accounted for more than 9 percent of landholdings. The barrier and bay islands contained within partnership holdings are the best examples within the region. Other habitats such as upland forests are represented within partnership lands by only a fraction of those distributed throughout the region.

## Discussion

The PIF collective within the mid-Atlantic Coastal Plain controls lands that are essential to the recovery and maintenance of many species listed as conservation priorities within the region. Despite the small number of partners currently included, the collective contains a surprising portion of the total surface area within the region. As a whole, the collective likely has higher conservation value per ha than most other lands within the region. Many of these lands were protected because they contain habitats that are regionally significant. In addition, declining or rare habitats appear to occur with higher frequency within the collective. For example, early successional habitats represent 9.4 percent of the area within the collective compared to less than 2 percent of the area within randomly chosen landscape scenes throughout the region<sup>3</sup>. It is also likely that the relative conservation value of these lands will continue to rise into the future as they become increasingly isolated within an urbanized landscape.

<sup>3</sup>Watts, unpublished data.

**Table 1**—Summary of assessment results by Partners in Flight (PIF) partner.

PIF Partners	Properties	Patches	Area (ha)
Federal agencies			
Department of Defense	58	4,258	144,165
Fish and Wildlife Service	30	2,085	127,664
National Park Service	15	685	20,922
State agencies			
Virginia	78	112	13,142
Maryland	85	2,028	100,693
Delaware	18	647	25,715
New Jersey	80	7,323	89,686
Non-governmental organizations			
New Jersey Audubon	10	48	345
New Jersey Conservation Foundation	38	338	2,653
The Nature Conservancy	75	917	25,711
Industry	40	630	122,000
<b>Total</b>	<b>527</b>	<b>19,018</b>	<b>672,696</b>

**Table 2**—Summary of assessment results by priority habitat and PIF partner.

Partner	Pine savanna	Barr/bay island	Salt marsh	Forested wetland	Upland forest	Early success.	Pine plantation	Fresh/brack. marsh
DOD	286	356	3,495	16,773	82,327	23,624	9,331	7,973
FWS	518	2,428	32,523	62,817	6,015	7,059	2,393	13,911
NPS	598	2,489	2,296	1,626	11,164	1,273	652	824
VA	445	5	6,530	1,647	2,492	440	416	1,167
MD	79	251	28,847	19,179	25,368	12,688	7,377	6,904
DE	983	124	3,162	1,744	3,676	5,250	3,728	7,048
NJ	-	133	32,198	23,730	20,901	11,413	92	1,219
NJA	-	-	79	150	8	13	-	95
NJCF	-	-	111	968	1,037	513	-	24
TNC	748	2,538	10,687	4,356	3,902	1,157	716	1,607
IND	-	-	-	-	12,000	-	110,000	-
TOT	3,197	8,324	122,928	132,990	168,890	63,430	134,705	40,772

The composition of holdings within the PIF collective does not appear to reflect the composition of habitats within the region. More than 44 percent of all current holdings are wetlands reflecting the acquisition targets of resource agencies and conservation organizations. For some priority habitats, the PIF collective appears to control a significant portion of the regional total. For example, virtually all of the undeveloped barrier islands are owned by the PIF collective. The habitat composition within the collective also reflects the management objectives of the partnership. These objectives may be considerably different than those within the broader landscape. This difference led to some unexpected discoveries during the course of the assessment. One such discovery was the number of large grassland patches occurring on partnership lands. The assessment located 57 early successional patches that exceeded 50 ha in area, 31 that exceeded 100 ha, and 8 that exceeded 200 ha. These patches were unknown to the conservation community and represent opportunities to manage for species of high priority within the region such as the Henslow's Sparrow (*Ammodramus henslowii*).

Linking the habitat assessment information to individual partners serves, for the first time, to quantify the relative responsibility that each of these landholders have in the maintenance of regional bird populations. The finding that the three large federal agencies account for more than three quarters of the collective landholdings suggests that they have a large potential to influence populations of priority species. The Department of Defense, in particular, has a concentration of installations within the physiographic area. Evaluation of the relationships between partners and individual habitats further refines the role that these partners may play in the maintenance of specific species suites. For example, due to the composition of their holdings and the fact that they control nearly 40 percent of the early successional lands, the Department of Defense must

play a lead role in the conservation of grassland species. Similarly, The Nature Conservancy controls significant barrier island complexes and must play a central role in the conservation of beach-nesting birds in the region.

One of the most difficult obstacles to overcome in making the transition from planning to on-the-ground implementation is being able to communicate a regional vision of conservation objectives to the community of land managers who are responsible for the condition of habitats. This project has compiled an electronic directory of land managers that is linked directly to all properties and habitat patches. This connection will allow regional planners to sort for managers who are responsible for particular priority habitats and communicate customized management recommendations. This resource provides a powerful approach to mobilizing the management community in the direction of conservation targets.

Conservation is an iterative process that involves planning, action, and adaptive monitoring. Development of an action plan that translates regional objectives down to local patches where actions may be taken is a difficult process even after goals have been established and an assessment has been completed. This process is ongoing within the mid-Atlantic Coastal Plain. Information from the habitat assessment is being used to evaluate the status of priority species relative to population targets. Research, management, and educational needs are being evaluated on a habitat-by-habitat basis. The unique responsibilities and opportunities of each partner within the PIF collective must be incorporated into an integrated plan. Effective communication will ultimately be one of the most important components of a successful strategy.

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## Literature Cited

- Anderson, J. R., E. E. Hardy, J. T. Roach, and R. E. Witmer. 1976. **A land use and land cover classification system for use with remote sensor data**. Professional paper 964. Washington, DC: Geological Survey, U.S. Department of the Interior.
- Pashley, D. N., C. J. Beardmore, J. A. Fitzgerald, R. P. Ford, W. C. Hunter, M. S. Morrison, and K. V. Rosenberg. 2000. **Partners in Flight: Conservation of land birds of the United States**. The Plains, VA: American Bird Conservancy.
- Watts, B. D. 1999. **Mid-Atlantic Coastal Plain bird conservation plan (physiographic area #44)**. Unpublished plan; 81 p. Available from: <http://www.partnersinflight.org>.