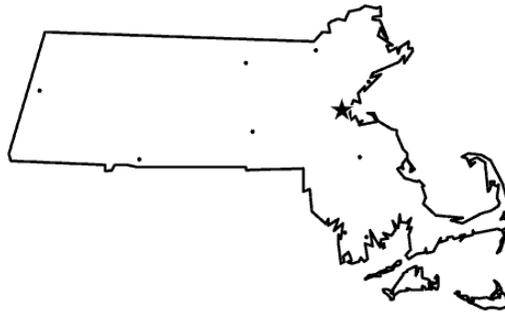


**State Wildlife Action Plan Characterization:  
MASSACHUSETTS**



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April 2008

## Introduction

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The biodiversity of Massachusetts was influenced primarily by glaciations, climate, and the geology of the region until the coming of the first human settlers. Massive glaciers moved through Massachusetts many times, carving broad highlands, narrow valleys, and north- to south-running hills, exposing bedrock and deposits of sand and gravel. During the last glacial period 10,000 years ago, entire mountain ranges were leveled and the sea level receded past the present-day islands of Nantucket and Martha's Vineyard, which then were connected to the mainland. As the glaciers melted and receded, kettle lakes and moraines formed, the Berkshires emerged, and the sea covered the land bridges between the islands and the mainland.<sup>1</sup> The resulting topography has created many different habitats for a variety of species.

Climate in Massachusetts has fluctuated over time as well. Today, Massachusetts has a temperate climate. Intense periods of rainfall combined with warm temperatures and snowmelt can cause widespread flooding. This, combined with the occasional 'northeaster' and tropical storms, serve to create and maintain floodplain habitats in the area. As a result of the temperate climate, periods of below average precipitation often result in droughts leading to an increase in the occurrence of naturally occurring fires, which played an important role in the ecology of Massachusetts, renewing forest and grassland. As human populations in the area grew, fires and floods were increasingly suppressed, resulting in changes to the landscape.

As one of the first areas of colonial settlement, Massachusetts has a long history of development for settlement, agriculture, and industry. This intense and sustained development had many repercussions on the environment of the region. Even as early as 1700, resources that had previously been plentiful were becoming scarce. By this time, settlement had expanded to the Connecticut River Valley, and forest clearing had expanded even further west to provide acreage for agriculture. The loss in forest habitat had a significant impact on the region – species composition and abundance changed from beaver, wolves, turkey, deer, and heron to grassland species both due to over hunting and habitat loss.<sup>2</sup>

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<sup>1</sup> Secretary of State, "Massachusetts Facts," Citizen Information Service, State of Massachusetts, <http://www.sec.state.ma.us/cis/cismaf/mf1c.htm#topography>.

<sup>2</sup> Massachusetts Division of Fish & Wildlife, Department of Fish and Game (MDFW), *Commonwealth of Massachusetts 2005 Comprehensive Wildlife Conservation Strategy*, (Boston, MA: 2005), pp. 3-7.

In the late eighteenth century, agriculture, and therefore deforestation, peaked in the state, and there was a noticeable shift from cultivation to husbandry. Shortly thereafter, the industrial revolution in America began when Francis Cabot Lowell built the first power loom in Lowell, MA. The industrial revolution, in addition to the enormous strides forward in transportation, significantly changed the region. By the mid-1800s, the centuries of intense land use was recognized in the writing of Henry David Thoreau. The conservation ethic was soon picked up by a number of influential and determined individuals in the state, resulting in the formation of the first land trust in 1891.<sup>3</sup>

Despite efforts to expand protection for species in the state, population and development trends since that time have further fragmented the landscape. In 1866, the state created a fisheries commission to respond to public concern about decreasing Atlantic salmon populations due to dams and pollution.<sup>4</sup> Today, the fisheries commission, now the Massachusetts Division of Fish and Wildlife (MDFW), is still working to ensure the survival of some species, including Atlantic salmon, and the abundance of many others. One of the tools they employ in this endeavor is the Comprehensive State Wildlife Strategy (CWCS).

#### *The Massachusetts Comprehensive State Wildlife Strategy*

Creating a CWCS was an opportunity for the MDFW to take stock of all that it was doing, identify overlapping interests within the various sections of the organization, and present that information in a manner not only useful within the agency, but to others in the state working to promote conservation of non-game wildlife. As such, the CWCS started out as a conglomeration of reports written by each of the different Division staff members on their area of expertise. These pieces were then joined together and the areas of overlap identified. These areas were then expanded to offer an analysis of the reasons that conservation efforts were needed in the state and strategies to ensure an improvement in the state of the Commonwealth's species of greatest concern.

The CWCS was based primarily on three previously published documents, existing programs, and programs that had already been planned but were just waiting to be funded. The publications were *Our Irreplaceable Heritage* (1998), *BioMap: Guiding Land Conservation in*

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<sup>3</sup> *ibid.*, p. 6.

<sup>4</sup> *ibid.*, p. 35.

*Massachusetts (BioMap)* (2001), and *Living Waters: Guiding the Protection of Freshwater Biodiversity in Massachusetts (Living Waters)* (2003). All three were the product of a particularly favorable political atmosphere in Massachusetts government for protection of biodiversity during the late 1990s and early 2000s. One specific cabinet member had an interest in biodiversity, and worked to educate and involve the Massachusetts public through events such as Biodiversity Days, community preservation initiatives, and programs such as Disappearing Heritage, which led directly to the production of the three publications.<sup>5</sup>

*Our Irreplaceable Heritage* (1998) was published by the Natural Heritage Section of the MDFW and Massachusetts Chapter of the Nature Conservancy. This document identified key community types as conservation targets for the protection of animals in need. *BioMap* (2001) was published by the Natural Heritage and Endangered Species Program of the MDFW. The focus was to identify areas most in need of conservation through an analysis of over 7000 site-specific records of rare plants, animals, and communities. *Living Waters* (2003) was also published by NHESP, and was created to identify and map freshwater ecosystems that should have the highest priority for conservation due to their diversity. Both *BioMap* and *Living Waters* incorporate GIS elements, and function as widely available, interactive tools for conservation planning.<sup>6</sup> In addition to these projects, the MDFW relied heavily on the *Losing Ground: At What Cost* (2003) report published by Mass Audubon.

An MDFW representative said that F&WS, Mass Audubon, and DEP were the three biggest contributors to the plan: Mass Audubon for the *Loosing Ground* document, F&WS for information and coordination, and the MA DEP for the water quality assessments that informed management suggestions and species inclusion.<sup>7</sup>

The plan incorporates these projects and reports in addition to other previous projects (e.g. the Fish Habitat Initiative and Sustainable Forestry program), then builds on them by including additional species and habitats identified as being in need. The hope of the plan is that it

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<sup>5</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, April 26, 2007, Ann Arbor, MI.

<sup>6</sup> *BioMap* may be viewed by visiting the following web address:

<http://www.mass.gov/dfwele/dfw/nhesp/nhbiomap.htm>

*Living Waters* is accessed through the following web portal:

[http://www.mass.gov/dfwele/dfw/nhesp\\_temp/land\\_protection/living\\_waters/living\\_waters\\_home.htm](http://www.mass.gov/dfwele/dfw/nhesp_temp/land_protection/living_waters/living_waters_home.htm)

<sup>7</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

promotes new efforts within the agency and with their partners to become more “proactive and strategic”<sup>8</sup> in working to conserve the biodiversity of MA.

There is a great deal of background information in the plan, making it obvious that the controls and influences on the landscape and biota of Massachusetts have not only been researched, but have been taken into consideration when dealing with the problems and issues associated with biodiversity loss. One entire chapter is devoted to the history of land use in the state. Massachusetts, being one of the first states settled by Europeans, has a very good first-hand understanding of the significance of the changes brought about by agricultural and industrial development of the land. Likewise, another chapter is wholly given over to an overview of the MDFW, the agency not only in charge of putting together the plan, but the primary action agent.

Overall, the plan is incredibly thorough. The depth, clarity, and relevance with which each topic is tackled makes for a comprehensive, well-thought through strategy for the conservation of species and habitat in Massachusetts.

## **1. Identification of Species of Greatest Conservation Need (SGCN)**

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There were 257 animal species identified by the Massachusetts CWCS as Species in Greatest Need of Conservation. This list includes:

- All of the federally listed animal species in the state
- All of the state’s Special Concern, Threatened and Endangered animal species
- Globally rare species
- Animal species of regional concern by the Northeastern Association of Fish and Wildlife Agencies
- Other species which are of conservation concern with the Commonwealth

Each of these species is assigned to one of 22 habitats, based on which is most essential to the survival of the species. The listing of Species in Greatest Need of Conservation is provided in two forms in the CWCS, first in the species summaries and then also in the table of Species of Greatest Need of Conservation.

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<sup>8</sup> MDFWa, p. 2.

A summary is provided in the plan for each species, including a map of the most recent distribution information available at the time of publication, where the updated information is available, a life history narrative of the species, and a listing of key threats facing the species.

Besides detailing how species and habitats were identified for inclusion in the CWCS, the chapter on the Methodology and Approach clarifies the thought process that went into the creation of the plan. It also specifies the origin of sections that built on previously existing projects, and explains the reason for the choice to include those instead of creating something new.

For Massachusetts, GIS analysis and mapping proved invaluable. With it they were able to more precisely determine land use changes, forest coverage, and distribution of species across habitats. A large part of the plan itself is based on GIS mapping and application, while monitoring and education are continuously served by the GIS component.

Despite the importance of the *BioMap* and *Living Waters* programs to addressing species and habitats of concern in Massachusetts and the value they have as planning and conservation tools, some stakeholders regret that more was not done to integrate these two tools into one, cohesive project.<sup>9</sup> At the same time, however, the stakeholders realize that this step was likely not taken due to budget and funding constraints. Additionally, one interviewed stakeholder mentioned that despite the absence of a formal merging of the many programs included in the CWCS, on the whole, the plan is “better than anything else that’s happened in the state”<sup>10</sup>

## **2. Identification of Key Habitat and Community Types**

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The CWCS was organized around 22 habitat types that range from large areas to small-scale, seasonal habitats (e.g. vernal pools). The chapter detailing habitat in greatest need of conservation includes information describing the habitat, the species in greatest need of conservation associated with the habitat, a state map showing habitat types where available, a description of the threats facing the habitat and its species, conservation strategies needed for each habitat, and monitoring requirements for each habitat that will lead to successful enactment

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<sup>9</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.

<sup>10</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.

of conservation strategies. Essentially, all practical aspects of the CWCS are rolled up into the habitat profiles.

In the conservation world, aquatic resources and ecosystems often get overlooked in favor of focusing attention on terrestrial species and habitat, the thought being that if the land around a stream is protected, then the stream itself must benefit from its protection as well. In a state such as Massachusetts, however, there must be equal discussion and attention for freshwater and marine resources as there is for terrestrial species and habitats. The concern the Commonwealth has for these habitats and species is evident from the information provided and strategies outlined in the CWCS.

### **3. Identification of Threats to Species and Habitats**

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The section in the CWCS dealing with the issues affecting biodiversity begins by identifying the physical controls on species in the area. In Massachusetts, the factors determining biodiversity include glaciation, climate range and impending change, geology, and the diverging habitats that are created by the interplay of these three elements. The pages devoted to this information represent an effort on the part of the MDFW to call attention to the specificity with which each species is linked with its habitat, and also why Massachusetts has the biodiversity it does.

The CWCS section then continues by discussing landscape changes leading to the problems facing the wildlife species today. These are identified as habitat destruction by development, fragmentation by development, suppression of fire and other ecological processes, and exotic invasive animals. The CWCS is not shy about pinpointing the exact causes of biodiversity loss. Additionally, by including separate sections in which aquatic resources and fragmentation are specifically discussed, the Commonwealth shows that it is looking at the ecosystem level implications of this threat— especially in an ecosystem that people think less of as being “fragmented” since it is free flowing. Another interesting aspect of Massachusetts’ treatment of Required Element 3 is that they begin to offer both current and speculative strategies for mitigation.

In a state as small and as intensely developed as MA, it is perhaps not surprising that the destruction and fragmentation of habitat are still the leading contributors to biodiversity loss.

Residential, commercial, and industrial development have all been occurring at unprecedented rates in the state. Through interpretation of a series of aerial photographs taken in 1971 and 1999, it has been determined that developed area in Massachusetts has risen from about 17% to roughly one-quarter of the land.<sup>11</sup> The areas hit hardest by development and highly concentrated use are the low-lying lands along the coast and river valleys. This includes Cape Cod, the Islands, and the Housatonic and Connecticut River Valleys – areas that house most of the Species of Concern, have some of the highest property values, and some of the most lucrative development deals. This speaks to another important trend in the Commonwealth – the move toward using larger and larger acreage for each residential unit. A staggering statistic: “From 1950 to 2000, the population of Massachusetts increased by 28%, but the area of developed land has increased by 200%.”<sup>12</sup>

Despite the numbers, the plan cautions managers and conservationists not to jump at any chance to protect land without really thinking of its relative worth:

Development threats to biodiversity and development threats to undeveloped land are not necessarily the same thing. Analysis of loss of land to development needs to be considered on a large scale, such as an ecoregion, in order to best prioritize land acquisitions to protect biodiversity.<sup>13</sup>

The CWCS authors are not promoting a mad rush to protect everything that can possibly be protected, but rather a concentrated effort to identify the most effective parcels and acquire those – in other words, Massachusetts wants to make sure it’s getting the biggest bang for its buck.

Although climate change is mentioned as being an issue affecting biodiversity, neither management incorporating climate change nor a plan for dealing with the effects of climate change in the state are developed within the CWCS.

#### **4. Description of Conservation Actions for Species and Habitats**

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<sup>11</sup> MDFW<sub>a</sub>, p. 11.

<sup>12</sup> NHESP, 2001; Breunig, 2003, as quoted in MDFW, p. 11.

<sup>13</sup> MDFW<sub>a</sub>, p. 12.

Despite the Executive Summary listing only six, there are seven strategies outlined in the chapter “Overview of Conservation Strategies.” These strategies are:

- Proactive habitat protection
- Collection of biological information
- Conservation planning
- Environmental regulation
- Habitat restoration and management
- Coordination and partnerships
- Conservation and environmental education<sup>14</sup>

Habitat protection is identified as the foremost priority among all the strategies for “proactive protection” of the Species in Greatest Need of Conservation.<sup>15</sup> At the same time, the plan acknowledges “opportunities to protect suitable habitat and the funding with which to protect land are both dwindling rapidly in this state.”<sup>16</sup> Despite the fact that the Massachusetts CWCS is well put together, well researched, and makes use active and frequent use of GIS technology, it is apparent that funding is always in short supply. Funds go first to projects that are already in place, to ensure that programs yielding results are continued, and then go to new programs.

*BioMap* and *Living Waters*, both of which are used as the basis for this CWCS, allow managers to make more informed decisions about land acquisition. However, together they cover only about 25% of the total area in Massachusetts. Of that area, only 40% is protected.<sup>17</sup> Even just working to protect the 60% currently vulnerable to development would be a massive undertaking, one that the plan describes as “almost impossible.”<sup>18</sup>

Both *BioMap* and the *Living Waters* project need to be expanded through surveys and inventories of not only the CWCS species and habitats, but the rest of the Commonwealth’s vast resources as well. Additionally, they are nearly five years old and must be updated. The bulk of

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<sup>14</sup> *ibid.*, p. 132.

<sup>15</sup> *ibid.*, p. 132.

<sup>16</sup> *ibid.*, p. 132.

<sup>17</sup> *ibid.*, p. 132.

<sup>18</sup> *ibid.*, p. 133.

this section is really a detailed list of the information that is still needed to make accurate and up-to-date decisions about land acquisition for species and habitat protection.

Massachusetts does not have any national forests or parks, only a national seashore – most of the state’s land is in private ownership. The state and local towns do own a good portion of land, but it is nothing to the vast amount that is held by private individuals and corporations. This void has been filled by land trusts, which play an increasingly important role in helping MDFW reach its goals through habitat acquisition.

The land trust movement had its beginnings in Massachusetts, and the state has a large amount of private conservation land. The Trustees of Reservations, the first private, not-for-profit land trust, was founded by Charles Eliot in 1891 in Massachusetts. Eliot started the land trust because he was alarmed at the rapid rate of development in and around the city of Boston at the time. He was worried that people living in the city would forget their ties to the countryside, and so decided to preserve “specific places of natural beauty”.<sup>19</sup> Other states in New England joined the movement quickly – the Society for the Protection of New Hampshire Forests was formed next, in 1901.

Despite being one of the smallest states by acreage, Massachusetts boasts 143 operating land trusts – more than any other state in the nation.<sup>20</sup> Additionally, Massachusetts is sixth in the nation for protection of open space. Fully one-fifth of the Commonwealth’s entire acreage is protected.<sup>21</sup> However, the CWCS still identifies development as one of the largest threats facing biodiversity in Massachusetts. The current rate of development in the state is 75 acres of habitat per day.<sup>22</sup> With approximately 57% of the Commonwealth’s acreage unprotected and undeveloped, the MDFW sees the CWCS as an opportunity to further develop its conservation strategy.<sup>23</sup> Specifically, the CWCS gives land trusts and other interested groups and individuals the framework they need to see what species and habitats are important and make decisions based on this information.

Areas of further information need are highlighted by the CWCS. This, as stated in the plan, is an absolutely essential part of the strategy involved in protecting habitat and species,

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<sup>19</sup> *ibid.*, p. 6.

<sup>20</sup> CA is second with 132, MDFWa, p. 7.

<sup>21</sup> Massachusetts Executive Office of Environmental Affairs, p. 17.

<sup>22</sup> Audobon 2002 as cited in MDFWa, p. 7.

<sup>23</sup> About 1,100,000 acres of the 5,200,000 acres of land in Massachusetts are developed. 1,100,000 are under some form of protection from development. 3,000,000 acres are undeveloped and unprotected, according to the Massachusetts Executive Officer of Environmental Affairs. MDFWa, p. 7.

especially on the level of assessing relationships between ecosystem functioning, population needs, and development dynamics. Information concerning invasive species is also lacking – a void that must be filled. Pinpointing areas where there are gaps in information shows that the MDFW is thinking ahead, and has identified issues that need further research but perhaps are lacking the funding.

## **5. Proposed Plans for Monitoring Species, Habitats and Conservation Actions**

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The monitoring associated with the CWCS is mentioned in the habitat profiles as well as in a chapter that speaks specifically to monitoring strategies in general. The monitoring regime that Massachusetts has put in place for itself looks not only at individual species or groups of species, but at different scales of the habitats as well.

There are three different types of monitoring planned. All three – biological monitoring of species and habitats, monitoring the effectiveness of conservation actions, and adaptive management – are detailed thoroughly in the plan, some so much so that they almost appear to be step-by-step instructions. The species that would be covered under each monitoring regime are broken into groups and discussed individually. This provides yet another opportunity to see the depth to which Massachusetts has gone in covering these species and habitats. The information included in the full chapter is more generalized than that included in the species and habitat profiles, but at the same time provides a much more detailed description of the theory behind the monitoring strategy, its goals, and how it is trying to accomplish and ensure conservation.

## **6. Procedures for Strategy Review**

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The information concerning the review procedures for the CWCS is one of the least developed aspects of the plan. However, Massachusetts fully embraces adaptive management in its plan, and is expecting to ‘fine-tune’<sup>24</sup> the CWCS on an ongoing basis based on “professional judgment, new information gained as a result of our activities or provided by our partners, and recognition of changing threats to the species in greatest need of conservation.”<sup>25</sup>

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<sup>24</sup> *ibid.*, p. 710.

<sup>25</sup> *ibid.*, p. 710.

There will also be a formal review process taking place on a ten-year timetable. At the conclusion of the ten year period, the MDFW will publish and make publicly available a progress report, which will be the beginning of a transparent formal public review process before the MDFW Board, public, Federal, State, and local agencies, and the Tribes, all of which manage significant areas of conservation land. At this time, these stakeholders will have the opportunity to make suggestions to or ask for revision of the material in the plans including the list of Species and Habitats in Greatest Need of Conservation.

The state's reasoning behind waiting the full ten years to publish a progress report or do any type of formal review has to do with time. Ten years is a long enough amount of time to meaningfully show changes in trends in development, conservation land acquisition, education, and monitoring. This data can then be used to assess whether the CWCS strategies have been successful in preserving the biological diversity of the Commonwealth.

An MDFW representative has stated that it is unlikely that any changes will be made to the plan until the 10 year formal review because the revision process is so time-consuming.<sup>26</sup> It was described as essentially going through the entire process for the CWCS all over again to possibly change one small item.

However, it is difficult to understand how the agency will be able to balance this rigidity with the flexibility necessitated by adaptive management. The CWCS specifically mentions that there is room for further improvement, and that the plan is not so much a fixed document, but one that the MDFW would like to see evolve.<sup>27</sup> If flexibility is indeed built into the agency and the plan, then the CWCS can evolve to successfully conquer the challenges it most certainly will face in the future, and, most importantly, stay relevant in pursuing its mission. A Division representative mentioned that they were watching the Pennsylvania amendment process to see how it went.<sup>28</sup>

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<sup>26</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

<sup>27</sup> MDFW a, p. 710.

<sup>28</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

## 7. Coordination with Federal, State and Tribal Agencies

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There is no more than a paragraph in the CWCS written about strategies for coordinated management. However, in the CWCS, the MDFW specifically mentions the fact that one of the primary goals in drafting the plan is to “provide information and guidance to our partners” and that “implementation... by all conservation partners will be encouraged.”<sup>29</sup> It is then explained, however, that based upon the long history of coordinated action between agencies in the state, as well as the methods by which the species lists were created and the CWCS review process during which comments were made by partner organizations, the MDFW has “[been led to believe] that these priorities are shared priorities” which will be implemented “as feasible”.<sup>30</sup>

Coordination between federal, state, local, and tribal agencies at the incipient stages of the CWCS existed, but to different extents depending upon the partner and project. Although the first draft of the plan was completed solely by the MDFW staff, it was then made available to their partners and the public for comment. These comments and associated requests were then integrated into the plan. The agency relied on partners for information, but these partners did not help draft the plan, projects, or monitoring techniques. Non-agency interviewees felt that the actual writing of the CWCS was “a state-driven thing,”<sup>31</sup> a process in which there was little to no collaboration with outside agencies or organizations. The CWCS did, however, incorporate data previously supplied by organizations and individuals outside of the agency or gathered through collaborative programs.

An area that could have been addressed more directly in the Massachusetts CWCS is an outline for a coordinated management strategy for species/habitats that cover more than one state. It would be beneficial to include information about shared threatened resources, and information as to what programs are currently in effect, how the resource is being managed, and how it will be managed under the new state plans. The anadromous fish program in the Connecticut and Merrimack Rivers, which works to restore salmon & shad in place since the 1960’s, and the Eastern Brook Trout Initiative, part of the national fish habitat initiative, are two such programs mentioned in the Massachusetts CWCS.

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<sup>29</sup> MDFW a, p. iii.

<sup>30</sup> *ibid.*, p. iii.

<sup>31</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.

## 8. Public Participation

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Public participation is discussed numerous times throughout the CWCS. All MDFW policy activities must first include a formal public review process and then be approved by the Fish and Wildlife Board. The CWCS was no exception to this rule, and once the draft was completed, it was formally presented to the Fish and Wildlife Board and the Natural Heritage and Endangered Species Advisory Committee at public meetings. Detailed biographies are included for the board members in attendance at these meetings, as well as their regular and associate members. A complete listing of the public meetings, informational meetings, and public presentations, as well as the method for informing stakeholders of these events is included in the CWCS.

The agency stated that stakeholders were asked to contribute to the drafting and review of the plan. Non-agency stakeholders stated, however, that they were really only involved in the review of the plan after national F&WS sent the plan back to Massachusetts and told the agency their stakeholder commentary period was inadequate and had to be redone.<sup>32</sup>

It appears that, in addition to the meetings and presentations, much of the interaction with the public took place through the MDFW website, email announcements, and newsletters. The MDFW also used traditional methods such as mailing and faxing announcements of the availability of the draft release to organizations, businesses, media outlets, clubs, associations, land trusts, colleges, municipal officials, etc.

Despite this effort, only twelve comments were received during the public review of the Draft CWCS, which were duly reviewed and incorporated into the plan. A likely explanation for the low number of comments received was provided by one of the stakeholders, who stated “I think the plan makes sense, I think they got the right ones.”<sup>33</sup> In other words, there weren’t many comments because stakeholders felt like the MDFW identified the right species and habitat priorities.

The comments included requests to add two species to the list that were not originally included. Comments were also submitted by agencies. Others comments received were supportive in nature. The specific comments are not listed in the report, nor is there any

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<sup>32</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.

<sup>33</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.

information on where they can be accessed. The report, however, does mention what species information was affected and where in the CWCS the updated information can be found.

## Implementation

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### *Overview*

- Monitoring
- Transformative
- Activities and the extent to which they are a result of the plan (general assessment)
- Priorities
- External Changes
- Changes to plan
- Successes and Challenges
  - Successes mentioned by the state (Text Boxes)
    - Turkey Federation, WMI, MADFW
    - Surrenden Farms, Groton, MA
    - GIS walkthrough

## Monitoring

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Implementation of the CWCS in Massachusetts has, in part, been underway since the publication of the plan. In that the CWCS itself is a compilation of preexisting programs in addition to new, additional projects, pieces of the plan have been in action since before the plan itself was written. While the older programs that made up the plan still continue to receive funding and are in progress, new projects have yet to be initiated. The lack of forward movement on these portions of the CWCS, including the education component, are largely due to a lack of funding for the capital, personnel, infrastructure, and technology.

## **Transformative**

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The Massachusetts CWCS has been transformative in a number of ways. First, it has redefined the direction of the agency's management priorities. Previously, the agency worked on a species-by-species basis, each group working as a separate unit. The plan has encouraged the agency to look at the habitat level and work interdepartmentally and collaboratively with other interested and knowledgeable individuals. The CWCS has also served as a tool to leverage funding, both from state and private sources. Stakeholders at advocacy organizations mention pointing to the CWCS while asking for state money for general conservation spending to say that the state is going in the right direction.<sup>34</sup> It is also now the standard used by many agencies, municipalities, private organizations, etc., to develop their conservation strategies and projects.

Implementation will also be a transformative process for the agency, and for conservation activity in the state in general. The Teaming With Wildlife Coalition is working to build relationships of trust and partnerships between the state agency and conservation groups in the state. This improvement in working relationships will likely translate into greater accomplishments and more, richer collaborative projects and programs.

## **Activities and the Extent to Which they are a Result of the Plan**

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Both agency and non-agency interviewees stated that there has been indirect implementation of certain portions of the plan. Other agencies within the state, such as the Natural Resource Conservation Service (NRCS), are using the CWCS as the guide for funding wildlife incentive programs. Additionally, stakeholders agree that many non-governmental groups are using the CWCS to fulfill grant requirements.<sup>35</sup> Individual towns have also been making use of the CWCS in a similar way. However, it is difficult for the state to track all of the ways the CWCS has been used. An MDFW representative stated:

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<sup>34</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.; & Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

<sup>35</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.; & Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

“...our idea always was to provide the framework and provide it in a way where people could go online and find information and search through our Biodiversity Information and... get hooked into it where they can implement the plan at whatever scale they happen to be operating at. So that’s the intent of this. Can I show you that it’s had this effect? No. But that’s what we’re trying to do... to make it so there are strategies out there, no matter what scale you’re working at, there’s some ability to play into the framework.”<sup>36</sup>

Due to these developments, Massachusetts has seen increased spending in accordance with the priorities and actions set out by the CWCS even though the agency has been unable to increase the breadth and scope of their projects.

## **Priorities**

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The priorities and priority actions outlined in the CWCS are what the agency and its partners are indeed working toward at this time, where current levels of funding permits. Stakeholders and the agency agree that the areas that have seen the most action since the plan was created are in agreement with those set out in the plan.<sup>37</sup> These include acquiring and managing large chunks of unfragmented intact habitat. The coastal areas and coastal water birds, beaches, dunes, small islands, vernal pools, and ponds. Grasslands and early successional forests are also priorities for the state.

## **External Changes**

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A number of changes have occurred outside of the agency that have impacted the implementation of the CWCS through their effects on funding for conservation at the state, federal, and local level. Within the state, the government changed hands – the Patrick

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<sup>36</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

<sup>37</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI; Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.; & Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

administration on the whole is much more inclined toward environmental spending than the previous Romney administration.

In addition, in 2006 the state adopted the Community Preservation Act (CPA) into its general laws, which set up a state matching fund for land acquisition by raising the filing fees on real estate documents. Municipalities may pass a property tax surcharge of up to 3%, the proceeds of which may be used for three purposes: affordable housing, historic preservation, and land protection. If the municipalities choose to pass the surcharge they are entitled to a 100% match from the state fund. Any property acquired by the community with CPA funds must give an overlying conservation restriction to a qualified land trust. So far, 127 out of 351 municipalities have passed the act so far, and according to stakeholders, they are using this money for all three purposes, but primarily for land conservation.<sup>38</sup> That has spurred the involvement of land trusts in ballot measures to pass the CPA, and then work with the town community preservation committees to implement open space plans using community preservation money. Since land trusts and local community preservation committees use the priorities outlined in the CWCS to make their conservation and open space plans, the state is able to indirectly leverage an increasing amount of additional monies.

Federally, the LIP matching funds were discontinued. This has especially been a blow to Massachusetts, where one of the top priorities was acquiring habitat for conservation purposes.

### *Changes to plan*

Please refer to Element 6 as discussed earlier for this information.

## **Successes and Challenges**

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An MDFW representative points to three projects when asked about the successes of the CWCS in Massachusetts. The first, a partnership between the Turkey Federation, Wildlife Management Institute, and MADFW, is a management success (Box 1). The second, Surrenden Farm, is an acquisition success (Box 2). The third is a GIS cross-walk through the state's holdings designed to ground truth their GIS databases (Box 3). An MDFW representative

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<sup>38</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

attributes the success of each of these projects to being able to build on a history of success, access to good knowledge and having a strong information base, and also to good agency infrastructure.<sup>39</sup>

However, the plan has been successful in a number of other ways as well. It has leveraged funds from other agencies and organizations for implementing the CWCS. Additionally, it has profoundly impacted the philosophy of the agency, and will hopefully continue to do so in a productive way. First, it forced the agency to change its scope from species-based management to habitat-based management. Then writing the CWCS made agency members work together to collaborate on species and habitat management and monitoring regimes. Now, it's allowing for the agency to improve its relationships with many of the state land trusts and conservation organizations through the Teaming With Wildlife Coalition. This may end up being the most profound and long-lasting success of the CWCS – being the catalyst for collaborative management of conservation land in Massachusetts.

***CWCS in action: Program Success Stories***

**Turkey Federation, Wildlife Management Institute, and MADFW Partnership**

An example of the successful implementation of active habitat management due to the CWCS is the partnership created between the Turkey Federation, Wildlife Management Institute, and MDFW. Through this partnership, the state has been able to leverage funds for innovative management of species of greatest conservation need in the state's wildlife management areas. The techniques employed by volunteers and MDFW staff are sensitive to the rare species in the area. The partners wanted to create open, grassland habitat in an area that was getting too overgrown. However, this area was also home to wood turtles, a species of concern in the state, and as a MDFW representative said, "...you don't want to be running wood turtles through the mowers."<sup>1</sup>

Through the partnership and the resources it created, the MDFW has been able to clear the area by using sheep and llamas. The representative at MDFW thought everything about the project was exciting: the partnership it created between different groups (sportsmen, agency, and environmental group) and the fact that this method of management had never before been used in the state.

<sup>1</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

<sup>39</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

***CWCS in action: Program Success Stories***  
**GIS cross-walk**

GIS-based tools are an integral tool in the MDFW acquisition process. In Massachusetts, two of the best places to find information regarding conservation planning are in the BioMap and Living Waters programs at the MDFW. These two programs are also invaluable to the planning processes of the many land trusts and non-profits in Massachusetts, as well as the other state agencies.

Building on the GIS programs incorporated in the BioMaps and Living Waters was one of the next steps for the MDFW after the plan was complete. While funding constricts the agency in terms of expanding its GIS programs, MDFW decided to head out into the field and make sure the information included in GIS databases they already had compiled was still accurate, as well as to ensure the priority habitats were being captured in the GIS-identified focus areas. As an MDFW representative explains, "...we might have had an area that looks like a square – now going back with the mapping information [we're] seeing that there's certain types of habitat that are just off to the left or near the south east or whatever, going back and redrawing those focus areas to try to capture that new information to make those focus areas more functionally correct."<sup>1</sup> These actions will not only give the agency staff the opportunity to see what's happening on the ground in these areas, but to capture valuable information that will translate directly into better habitat protection and management.

<sup>1</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

## ***CWCS in action: Program Success Stories***

### **Surrenden Farms, Groton, MA WCE (Wildlife Conservation Easement)**

Massachusetts has a long history of sustained development. The pace of development has continuously accelerated ever since the colonial era, but is especially noticeable now that the population is so dense and available land is so scarce. Because of this, the MDFW has placed a special emphasis on acquiring land for conservation in the CWCS. By protecting high quality open space next to or near already existing conservation lands in quickly developing areas, the state hopes to protect its valuable resources. By 2006, over a half-million acres of the Massachusetts landscape is owned by the state, with another half-million under the ownership of the federal and municipal governments, as well as non-for profits such as land trusts.<sup>1</sup> Although this represents about one-fifth of the Massachusetts land area, development pressure has continued to increase at an alarming rate and real estate prices have risen, making further acquisition more difficult especially for larger parcels of land.<sup>2</sup>

In 2006, the Trust for Public Land and Groton town officials announced their intent to acquire the 360 acre Surrenden Farm property in Groton a town in northeastern Massachusetts. The property is significant for a number of reasons – it is part of an area of environmental concern (AoEC), it includes an extensive section of river-front holdings along the Nashua River, and is in direct or near-proximity to other large blocks of preserved lands.<sup>3</sup> About 164 of the 360 acres were zoned for subdivision development, and certain lots had already been put up for sale. TPL provided a \$5 million deposit on the \$19.4 million purchase price while the town of Groton and TPL worked to come up with the rest of the funding. As part of their Fiscal Year 2007 bond spending, the MA DFW joined the effort by purchasing a 160-acre portion of the Surrenden Farms property for \$2 million.<sup>5</sup> They are currently working on a conservation easement on the farm to protect this valuable piece of property from development. While the state's work is a just a piece of the total acquisition, playing their role in this larger project is exciting for the agency. A MDFW representative explains why by stating "...it brings in all those partners – the town, the schools out there – there are a whole lot of folks trying to do something big in that area, and we're playing our part in that."<sup>6</sup>

<sup>1</sup> Massachusetts Executive Office of Environmental Affairs, *The State of Our Environment 2006*, [http://www.mass.gov/envir/press/pressreleases/state\\_ofthe\\_envir2006.pdf](http://www.mass.gov/envir/press/pressreleases/state_ofthe_envir2006.pdf).

<sup>2</sup> The difficulty arises both from the incredibly high price of real estate and also from the trouble in finding continuous, unbroken, large-acreage areas in the state. Massachusetts Executive Office of Environmental Affairs, p. 17. [http://www.mass.gov/envir/press/pressreleases/state\\_ofthe\\_envir2006.pdf](http://www.mass.gov/envir/press/pressreleases/state_ofthe_envir2006.pdf)

<sup>3</sup> These include including the Oxbow National Wildlife Refuge, Nissitissit River Wildlife Management Area, and the Groton Town Forest and Hunt Club Meadows.

<sup>4</sup> Trust for Public Land, "Agreement Would Preserve 360-Acre Farm in Groton, MA," Trust for Public Land, [http://www.tpl.org/tier3\\_cd.cfm?content\\_item\\_id=20432&folder\\_id=260](http://www.tpl.org/tier3_cd.cfm?content_item_id=20432&folder_id=260).

<sup>5</sup> Massachusetts Division of Fisheries & Wildlife, Department of Fish and Game (MDFW), *Division of Fisheries and Wildlife Land Acquisitions FY 2007 (July 2006 -June 2007)*, [http://www.mass.gov/dfwele/dfw/habitat/land/land\\_2007.pdf](http://www.mass.gov/dfwele/dfw/habitat/land/land_2007.pdf).

<sup>6</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

Funding was identified by all interviewees as being the major barrier facing the agency as it moves to implement the CWCS. The funds for implementing the CWCS come from the state and federal government. According to the MDFW, federal funds for the CWCS had not, as of spring 2007, been made available yet. State funds are determined through the legislature in earmarks, general funds, and the Environmental Bond, and are also not available yet. According to one interviewee, Massachusetts is 49<sup>th</sup> out of 50 states in environmental spending.<sup>40</sup> The fiscal challenges facing CWCS implementation also include finding funds for programs that have recently been dropped from the state's annual appropriations, such as the National Heritage program.

According to stakeholders, the Romney administration was particularly averse to providing government funding for land acquisition, one of the primary goals of the Department in its implementation of the CWCS. It felt that conservation should be funded through private donations, and that if the government stopped providing funds it would stimulate NGOs, individuals, and foundations to invest at a higher level. The move had exactly the opposite effect, however. The private sector saw that the government was unwilling to put conservation and land acquisition in its top priorities, and found other places to invest their money. In the words of one stakeholder, investors didn't support land conservation because "if the state isn't going to make a commitment, then you can hardly say hello to a foundation officer without hearing the world leverage, and that applies very much to individual donors as well these days, so if they're contributions weren't going to leverage state money, they were going to go do something else. And they did."<sup>41</sup> The Patrick administration has committed \$50 million a year in bond funding, resulting in the return of private and philanthropic investor interest in conservation funding. In the meantime, however, land prices have jumped by 30% over the last five years.<sup>42</sup> This has forced groups to try to do more with less.

While the new Patrick administration is seen as being much friendlier to environmental and conservation efforts in the state than the previous Romney administration, the amount of funding that the Department will receive is still in question. Raising the importance of MDFW

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<sup>40</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.

<sup>41</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

<sup>42</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

funding in the legislature is proving difficult. Some stakeholders believe it has to do with politics: “It’s mostly of interest to rural legislators, and rural legislators have no meaningful clout whatsoever in a state where the legislature is utterly controlled by the urban delegation.”<sup>43</sup>

Currently, the MDFW isn’t receiving general fund money from the Massachusetts legislature. As mentioned previously, the Heritage program is no longer receiving these funds either, and is now solely funded through tax checkoffs and the proceeds from a few small permitting programs that it oversees. The MDFW, in order to keep the program going, is now funding it. The MDFW is also experiencing a decline its traditional funding source – hunting and fishing license fees.

An MDFW representative sees another success of the plan as being a change in agency philosophy and way of doing business internally. The CWCS has moved the agency forward in their thinking to embrace a landscape-scale management regime. Writing the CWCS forced the different departments in the agency to work together, and also to understand the different projects that were already going on within the agency and how their projects fit into them.

Stakeholders, however, believe it’s too early to say whether or not the agency is going to stick to that habitat approach.<sup>44</sup> Primarily, they see the challenge to the agency in this regard as being the political culture of the MDFW, which would inhibit the pace at which the agency actually *did* change its philosophy. Part of this political culture is managing for game species. One stakeholder described the situation by saying, “...the plan is very much focused in many ways on what the endangered species program does, which is a small component of the Division of Fisheries and Wildlife.”<sup>45</sup> This could create potential inconsistencies in management.

## **Who is Involved and What are They Doing?**

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- Impact of the plan on others
- Regional/multi-state

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<sup>43</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

<sup>44</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.

<sup>45</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.

### *Impact of the Plan on Others*

The CWCS has not impacted other organizations and agencies in the state, except to provide a new set of standards for use in conservation planning. The exceptions to this are the organizations that have received funding to help in plan implementation, such as the Environmental League of Massachusetts.

Implementation of the CWCS is guided by the Teaming with Wildlife Coalition, which has been working with the state agency since the completion of the plan. Although not much has been done so far, the Coalition is looking forward to January, when they will be meeting with the MDFW to begin their work. The Coalition is headed by the Environmental League of Massachusetts, a group that was not involved with the CWCS before it was published, but whose background and mission complement that of the Teaming with Wildlife Coalition.

In general, the hope is that the Coalition becomes the “NGO support network” of the CWCS. According to a coalition member, “We’re not interested in telling management professionals what they should be doing with their plan. We’re just trying to help them implement it by raising awareness and trying to get money out of the legislature. We’re advocates. We’re not wildlife managers.”<sup>46</sup>

The approach the Teaming With Wildlife Coalition is taking is two-part. First, they are trying to build a sense of partnership. In the past, NGOs and agency staff have not always seen eye to eye on management priorities, resulting in a tense relationship.<sup>47</sup> It is the aim of Teaming with Wildlife Coalition to address this issue, and move the NGOs and agency back into a productive partnership. In addition to discussions about priorities and management methods, the Coalition is encouraging both the agency and NGOs to stop paying attention to their divergent priorities and start paying attention to the overlapping, common priorities.

Second, they are trying to leverage or find funds for the Department to implement the plan. The Coalition is lobbying the MDFW to pay more attention to the projects that have matching funds. By improving the trust between the groups and focusing on common priorities,

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<sup>46</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

<sup>47</sup> In these situations, projects that NGOs placed in front of the agency that didn’t address one of the agency’s priorities were sometimes not funded in favor of other projects that did. NGOs became fed up, approached their legislator, and the funds for the NGO project would be earmarked in the MDFW’s budget. This situation created animosity and a lack of trust. Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

the Coalition hopes to move implementation on the CWCS forward at a greater pace than the current atmosphere and levels of funding have allowed.

### *Regional/multi-state*

The CWCS has not had a huge impact on regional or multi-state programs. Those that were in place previous to plan development have been incorporated into the plan, and since they were already being implemented, continue to be managed and monitored through the various avenues that were established previous to plan publication.

The agency and stakeholders are all excited about the regional programs that are materializing as a result of the state wildlife action plan process.<sup>48</sup> The mapping and monitoring framework portions of the regional efforts seem to be the areas generating the most excitement. The extra time, interest, and money going into the mapping has allowed the state to conduct an in-depth cross-walk of their lands to update and better define their information. They see the map that will eventually result from this process as an eminently useful management and planning tool. Stakeholders agree.<sup>49</sup>

## **How Has Funding for Non-Game Wildlife Changed?**

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- How has it been leveraged
- SWG funds and their uses

### *How has it been leveraged?*

On the whole, funding for non-game wildlife has changed due to the CWCS through increased state funding and leveraging of private and other federal money. The agency sees the most successful aspect of the plan as being funding because the CWCS has allowed the agency to leverage money from other agencies, NGOs, and other types of private investment towards the

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<sup>48</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.; Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.; & Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

<sup>49</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI. & Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.

species and habitats in greatest conservation need. An MDFW representative points to the NRCS as being a prime example of the CWCS' ability to leverage money for conservation purposes. The program now uses the CWCS to determine the priority of its acquisitions and partnerships.<sup>50</sup>

#### *State Wildlife Grants (SWG) funds and their uses*

SWG monies are used to fund current projects and any new projects that are possible after current projects have been budgeted. Additionally, the Natural Heritage Program is financed through SWG money. Salaries for the department staff, which includes the Natural Heritage Program, also sometimes are paid out of SWG funds when the budget calls for it.

### **How Has the Agency Changed?**

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- Staff
- Funding
- External changes

#### *Staff & Funding*

There have been no internal changes to the MDFW due to the CWCS. Staffing has remained the same, although increases in funding would allow the agency to expand their staff to better cover old projects and begin new ones.

Two interviewed stakeholders are positive that the agency will succeed in adapting a comprehensive approach to conservation, even if the change doesn't come right away. They point to a change in funding sources, not the CWCS, as being one of the main drivers of the eventual shift.<sup>51</sup> The MDFW is largely dependent upon revenues garnered from the sale of hunting and fishing licenses, while the Heritage program is funded by tax check-offs and the MDFW. The CWCS opens access to funding sources that are outside of license fees, which is important both because of the more comprehensive reach of many of the CWCS projects and

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<sup>50</sup> Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, April 26, 2007, Ann Arbor, MI. & Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

<sup>51</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI. & Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

because of declining hunting and fishing activity in the state. While stakeholders do not want to see hunting and fishing diminish, they are glad to know that there is money now being made available for programs addressing the needs of non-game wildlife.<sup>52</sup>

Additionally, stakeholders have noticed a marked change in the thinking of the Fisheries and Wildlife Boards, the policy making bodies of the MDFW, a change they believe will eventually lead to a more comprehensive management philosophy. These parties described top-level managers on down as being “quite sincere in their commitment to non-game species and to endangered and rare and threatened species.”<sup>53</sup> However, there is a distinction to be made between the philosophy of the policy makers and that of the actual, on-the-ground managers, who embrace the idea of comprehensive, habitat-based management as long as it includes traditionally prioritized species. One individual stated, “I honestly believe the reason that we have a habitat based comprehensive wildlife conservation strategy is because [the MDFW has] a commitment to preserving the full suite of species... but that better include woodcock!”<sup>54</sup> Old habits die hard.

### *External changes*

There have been no external changes that have impacted the agency except for the fluctuation in funding. Staffing and projects have been increased or decreased depending upon the amount of funding available.

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<sup>52</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI. & Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

<sup>53</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

<sup>54</sup> Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

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