WHC WILDLIFE MANAGEMENT PLAN (WMP)
SHORT EXAMPLE

US CLEAN ENERGY

New England Plant

WILDLIFE MANAGEMENT PLAN

2009

Prepared by:

WHC BIOLOGISTS

What is a Wildlife Management Plan (WMP)?

A Wildlife Management Plan (WMP) is a comprehensive strategy which outlines goals of the wildlife habitat program, describes projects to achieve these goals, makes provisions for monitoring projects, and presents implementation and evaluation schedules.

A WMP serves as a tool for you to use at the site. It provides direction and detailed information to guide you through the development of your program and each component is important in its own way. For example, knowledge of the background of the site, such as historical use and ecological description, aids in knowing which native plants are best to select for plantings. This way the Wildlife Team can chose restoration efforts that will most likely provide benefits to wildlife.

Keep in mind that a WMP should be a working document; it is intended to be modified as goals change due to site conditions and in response to the implementation of your projects. The WMP should be written so that if a new member joins the Wildlife Team, they would be able to quickly understand the program.

WMP Glossary

Four essential habitat components – Food, water, ***cover*** and ***space*** are four elements essential to all wildlife. Every ***project*** must address how these components are being met for the target wildlife.

Cover - Cover is any place an animal can use for living space, including vegetation and other natural or replicated features such as brush piles, fallen logs, snags, and/or tree cavities.

Space – Space is the area required for animals to carry out their biological functions, such as reproduction, rearing young, obtaining food/water and resting.

Program – The *Wildlife at Work* program, encompassing all ***projects***.

Mission – The mission is the overarching aim of a *Wildlife at Work* ***Program***.

Project – A project is a discrete wildlife enhancement venture, meeting the four essential habitat components for target wildlife and having one or more ***objectives.***

Objective – An objective is a broad action that must be achieved to accomplish a ***project***. Usually an objective will have multiple ***prescriptions***.

Prescription – Prescriptions are the specific management activities that must be completed to accomplish an objective. They are narrower than ***objectives*** and should be SMART: Specific, Measurable, Achievable, Relevant, and Time-bound.

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SUMMARY

The US Clean Energy New England Plant is located in Portland, ME, on land that was set aside for residential development. After years of fighting zoning regulations, the developer sold the 1000-acre plot to US Clean Energy. Currently the site hosts both wind turbines and solar panels, providing a clean energy option to the northeastern United States. Management at US Clean Energy feels very strongly that the land that these panels and turbines sit on should be used for wildlife habitat and as an educational tool for the public, which is why in 2004 our company became a member of WHC. The New England Plant was visited in the spring of 2008 by a WHC biologist, and since then we have implemented habitat management for the 4 acre stormwater management pond and 1 acre native meadow, and implemented a nest box and nest structure monitoring program.

1. Background

US Clean Energy has been a member of the Wildlife Habitat Council (WHC) since 2004, a standing that exemplifies its commitment to improving wildlife habitat through the enrichment of pre-existing habitat and the establishment of new habitat on the company's landholdings. Induction into the *Wildlife at Work* program will enable the New England Plant to get assistance from the Wildlife Habitat Council in its efforts to improve the site's wildlife habitat. Furthermore, partnership with WHC provides US Clean Energy with an opportunity to demonstrate responsible corporate environmental stewardship by formulating and implementing a balanced and operative wildlife management program

1.1. Corporate Environmental Stewardship

US Clean Energy is the first energy company dedicated to providing only renewable energy options to our clients. Current plants offer wind, solar, and geothermal power to both residential and industrial areas, and research is in progress to offer cost-effective wave power, infrared solar energy, and new designs in wind turbines. All of our plants, both manufacturing and energy sites, are zero-landfill, re-using or recycling all waste materials.

1.2. Site Description

The New England Plant is located on the outskirts of Portland, Maine, which is Maine's largest city. The site was originally zoned to be a suburb, but was eventually bought by US Clean Energy for an energy site, where wind turbines and solar panels provide a clean energy alternative to the citizens of Portland. 80% of the site is available for wildlife habitat, the rest is taken up by the main office building, parking lots, and the footprints of the solar panels and wind turbines. 500 acres of the site is taken up by wind turbines, each located on approximately 50 acres. The other 500 acres is dedicated to solar panels, which is where the nest boxes are located. The stormwater management pond is located near the solar panels.

1.2.1. Wildlife Team

The England Plant Wildlife Team has at its heart 15 dedicated employees. The team also enlists the help of volunteers, professionals, and community members on a frequent basis.

1.2.2. Ecological Background

The U.S. Department of Agriculture (USDA) Forest Service (USFS) uses a land classification system of terrestrial ecoregions as described by Robert G. Bailey[1]. This classification of terrestrial ecoregions is hierarchical, and is based on elements of climate, geology, topography, and vegetation. This widely recognized system separates the United States into large domains, followed by divisions in which provinces are described. Ecoregions are a geographically based system for organizing our knowledge about ecosystems and ecosystem responses to our management. They provide a framework for prioritizing land conservation, preservation and restoration projects. The USFS National Hierarchy is a classification system that includes 8 levels of nested map units of which 4 are commonly used in site habitat projects: domain, division, province, and section.

Undertaking habitat enhancement projects on a corporate site adds ecological and functional value to both the immediate area and the entire ecosystem. Furthermore, connective efforts have shown greater results than isolated actions. It is important to understand the site's ecologic location and its relation to native flora and fauna. The following section provides information necessary to understand the ecological background of the land surrounding the New England Plant.

The Humid Temperate Domain is a middle latitude domain affected by both tropical and polar air masses, resulting in pronounced seasons and strong annual cycles of temperature and precipitation. Winter frost determines six divisions within this domain.

The New England Plant is located within the Hot Continental Division of the Humid Temperate Domain. This division is classified by hot summers and cool winters. Typical vegetation is the winter deciduous forest, with a weakly developed understory of small trees and shrubs. Herbaceous groundcover flourishes in the springtime but diminishes as trees leaf out and block sunlight from the forest floor. Soils in this division are rich in humus, which contributes to the division's value as agricultural land and the subsequent conversion of areas with suitable topography.

As rainfall decreases with increasing distance from the ocean, the Hot Continental Division has been further subdivided into provinces of moist oceanic and dry continental. The New England Plant lies

[1] Bailey, R.G. 1995. Description of the ecoregions of the United States. 2nd edition. USDA Forest Service Miscellaneous Publication 1391. U.S. Department of Agriculture Forest Service, Washington, District of Columbia.

within the Eastern Broadleaf Forest (Oceanic) Province. This province experiences cold winters and warm summers, with annual average temperatures between 40° and 60° Fahrenheit. Precipitation received is typically 35 to 60 inches per year, and occurs mostly in the summer when evapotranspiration and moisture demands are highest. The terrain is hilly to mountainous, and land in the northern part of the province has been glaciated. Soils are characteristically Alfisols, with Ultisols found in lower latitudes and Inceptisols found on the plateaus. The three major forest plant communities that occur in this province are the mixed mesophytic forest, Appalachian oak forest, and pine-oak forest (also called "pine barrens").

Within this province, the New England Plant is located in the Lower New England Section. This section gradually descends in a series of broad, hilly plateaus to the coastal zone. Some of the important vegetation types occurring in this section include northern hardwood-hemlock-white pine, central hardwoods, coastal pitch pine, maritime oak, and maritime red cedar. The faunal communities of this section have been drastically affected by European settlement and subsequent land development. Large predators such as the gray wolf have been extirpated, while other large vertebrates such as moose, white-tailed deer, and wild turkey have been exterminated, reduced, or otherwise restricted by hunting and habitat loss. Medium-sized predators such as the coyote and bobcat now serve as the main predators. Hard tree mast (i.e., acorns, walnuts, beechnuts) drives many of the section's faunal processes. Wildlife commonly found in the section now include mammals such as the white-tailed deer, gray squirrel, and white-footed mouse; birds such as the red-eyed vireo; and amphibians such as the red-spotted newt. In addition, work to reintroduce Atlantic salmon to the Merrimack and Connecticut rivers is ongoing.

2. Development

2.1. Site Inventory

Conducting a thorough inventory of the plants and animals present at the site is a priority of the Wildlife Team, as an inventory helps the New England Plant Wildlife Team members to become familiar with the plants, animals, and habitats found at the site. The wildlife inventory is an ongoing process that provides useful information to the *Wildlife at Work* program and future outreach and education programs. The goal is understand the site habitats by identifying as many plants and animals as possible, using seasonal inventories conducted in the spring (April), summer (July), and fall (September) to provide a relatively comprehensive list of resident and transitory (including migratory) species. Beyond the inventory, the New England Plant Wildlife Team has set a goal of using permanent transects and other survey techniques to collect data on how species, mainly plants, are distributed in and around the stormwater management pond.

For example

TABLE 1: FLORA AND FAUNA IDENTIFIED ON SITE

TYPE	COMMON NAME	SCIENTIFIC NAME	DATE OBSERVED	AREA OBSERVED
Plants	Eastern red columbine	*Aquilegia canadensis*	6/09/08, 6/27/08	Around stormwater pond
	Swamp milkweed	*Asclepias incarnata*	6/09/08, 6/27/08	Around stormwater pond
	Vernal water-starwort	*Callitriche palustris*	6/09/08, 6/27/08	Around stormwater pond
	Marsh marigold	*Caltha palustris var. palustris*	6/09/08, 6/27/0	Around stormwater pond
	Inland sedge	*Carex interior*	9/16/08, 6/27/08	Around stormwater pond

TYPE	COMMON NAME	SCIENTIFIC NAME	DATE OBSERVED	AREA OBSERVED
	Marsh horsetail	*Equisetum palustre*	6/27/08, 9/16/08	Around stormwater pond
	Purple loosestrife	*Lythrum salicaria*	6/27/08, 9/16/08	Around stormwater pond
	Phragmites	*Phragmites australis*	6/27/08, 9/16/08	Around stormwater pond
Birds	Wood duck	*Aix sponsa*	5/23/08, 6/6/08, 6/20/09	Stormwater management pond
	Red-shouldered hawk	*Buteo lineatus*	5/16/08, 6/10/09	Perched on tree outside of office
	American kestrel	*Falco sparverius*	6/19/09	Perched on powerline
	Hooded merganser	*Lophodytes cucullatus*	4/26/09, 6/6/09	Stormwater management pond
Mammals	Snowshoe hare	*Lepus americanus*	2/24/08, 5/16/09	In the solar panel field
	White-tailed deer	*Odocoileus virginianus*	frequently	Graze in solar panel field
	Eastern grey squirrel	*Sciurus carolinensis*	frequently	In the trees by the main office
	Water shrew	*Sorex palustris*	2/24/09	In moss around the stormwater pond
Invertebrates	Beetle	Order Coleoptera	7/22/08	Around stormwater pond
	Meadow fritillary	*Boloria bellona*	7/22/08	Around stormwater pond
	Spring azure	*Celastrina ladon*	7/22/08	Around stormwater pond
	Monarch	*Danaus plexippus*	7/8/08, 7/22/09	Around stormwater pond
	Eastern tiger swallowtail	*Papilio glaucus*	7/8/08, 7/22/09	Around stormwater pond
	Pearl crescent	*Phyciodes tharos*	7/8/08	Around stormwater pond
	Cabbage white	*Pieris rapae*	7/8/08	Around stormwater pond
Reptiles	Ringneck snake	*Diadophis punctatus*	5/23/08, 7/8/09	Rock pile by stormwater management pond
Amphibians	Toad	*Bufo* ssp.	5/23/08, 5/12/08	Stormwater management pond
	Northern dusky salamander	*Desmognathus fuscus*	5/23/08	Rock pile by stormwater management pond
Fish	Chain pickerel	*Esox niger*	6/13/08, 7/1/09	Naturally occurring in stormwater management pond

2.2. Timeline of Completed Activities and Future Goals

TABLE 2: NEW ENGLAND PLANT TIMELINE

DATE / SEASON	PROJECT 1. ENHANCE AQUATIC HABITAT
Spring 2008	Project monitored on a regular basis. Data included in Monitoring Log.
May 2008	Planted stormwater pond's submergent, shoreline, and upland banks with native plants.
July 2008	
August 2008	Small patches of purple loosestrife hand pulled to prevent sprouting.
October 2008	Project monitored on a regular basis. Data included in Monitoring Log.
Spring 2009	Project monitored on a regular basis. Data included in Monitoring Log.
July 2009	Applied for *Wildlife at Work* Certification.

3. Implementation

3.1. Mission of New England Plant's Wildlife at Work program

The mission of the New England Plant's *Wildlife at Work* program is to increase the site's biological diversity. Individual projects will be actively managed and monitored to ensure that they adhere to this plan. Additionally, the New England Plant program provides educational opportunities to Wildlife Team members, New England Plant employees and the general public.

- **Project 1. Enhance aquatic habitat**

  ***Reasoning Behind Project*:** Structures provide a variety of functions for wildlife including habitat for breeding, nesting, hunting, and roosting; solid objects will provide a substrate for algae and egg-laying by insects, both of which are important in aquatic food chains. Adding a buffer around the stormwater pond will filter sediment and pollutants, provide food and habitat, and control erosion.
  Project's Background Information: The stormwater pond on our site stays full year round both because of the amount of precipitation and the high water table in the area. It is important that this stormwater pond serve its function in reducing run-off, but also that it serves as valuable wildlife habitat. Adding vegetative buffers will help to reduce erosion and sedimentation, while also providing food and cover for wildlife species, while structural enhancements will provide shelter, resting space, and egg-laying substrate for many species.

  - **The four essential habitat components** are provided by enhanced aquatic habitat:
    - **Food**- The plants will directly provide food to insects, birds, mammals, fish, reptiles and amphibians due to the abundance of seeds, nectar, and plant material. Indirectly, these organisms will serve as food sources for a variety of other organisms.
    - **Water** – Water is readily available in the stormwater pond.
    - **Cover** – The rock piles, downed trees, brush piles, and floating islands will provide cover for birds, mammals, fish, reptiles and amphibians. These structures will provide areas for the organisms to rest unseen by predators.

- **Space** – The enhancement of the stormwater pond will provide an area previously lacking in essential habitat components of food and cover. This area will provide space for foraging, breeding and resting for a variety of wildlife.

- **Enhanced aquatic habitat monitoring:** The success of the project is monitored by evaluating plant growth and establishment through casual observation, photographs, and data collection. All documentation is recorded in the Monitoring Log, as well as animals using the structures.
  - **Data Collection –** Biannually, ideally in spring and summer, plots will be set up at three locations along the shoreline, the same locations will be used every time. Each plot will consist of a one meter square area. All plants within the plot will be identified, and the number of each species will be recorded. Also, the percent of ground visible will be estimated and the height of the plants will be recorded. The first round of monitoring will occur shortly after planting, to provide baseline data.

- **Objective 1.** Add shoreline and emergent vegetation
  - **Prescriptions**:
    - Monitor shoreline for invasive plant species
    - Remove any invasive species from the stormwater pond edges
      - Small patches of purple loosestrife exist on site. The small patches will be entirely hand pulled to prevent sprouting. We will not cut or mow the purple loosestrife, as this will only serve to spread plant fragments that could increase the infestation.
      - If the infestation increases despite the hand pulling, the wildlife team will apply an herbicide that is registered for use in wetlands, such as Rodeo®. The cut and paint method will be used in areas with sensitive native plant. This method will only be used late in the season leading up to dormancy (when they are most effective for purple loosestrife control). If the infestation becomes large and unmanageable, we will use a foliar spray.
    - Plant native emergent vegetation in the shallow areas of the stormwater pond according to the plant lists recommended in WHC's Opportunity Report. Planting will be done in the summer.
    - Plant native shoreline vegetation at the edges of the stormwater pond in the spring or summer.
    - Plant native trees and native shrubs on the upland banks of the stormwater pond in the spring.
    - At least twice a month, monitor plantings for survival, monitor and control for invasive species.

- **Objective 2.** Add habitat structures to the stormwater pond
  - **Prescriptions**:
    - Construct rock piles by the edges of the stormwater pond
    - Gather tree limbs and brush on the frozen surface to sink in the stormwater pond after the spring thaw
    - Place a downed tree along the shore so it is partially submerged
    - Install floating islands in water 2 to 4 feet deep, away from the shoreline (more details in project 3)
    - Monitor structures for use by wildlife, and record observations

4. Evaluation and Project Status

The New England Plant's *Wildlife at Work* Program was established in 2008 and we already see some benefits to wildlife. The Purple loosestrife infestation along the stormwater pond has been contained somewhat, and food and cover has been enhanced in the area.

- **Project 1. Enhance aquatic habitat**
  - Project Start Date: May 2008
  - 5 New England Plant employees, 2 master gardener volunteers, Pollinator Plantings, Inc. representative, 15 Boy Scout & troop leader.
  - This project used local ecotype native plants exclusively.
  - Extensive efforts, involving cut & treat applications of concentrated herbicide, were used to control purple loosestrife in August. Other invasive plants are being monitored for and control methods will be implemented if necessary.
  - Enhancing the stormwater pond has been a priority for the Wildlife Team because of its visible location as well as a feeling among Wildlife Team members that it offers great habitat potential. The Wildlife Team contracted with Pollinator Plantings, Inc. to create an attractive design and is partnering with a local master gardener group to maintain the planting. The planting was done in May 2008 with the participation of the Wildlife Team, master gardeners, and a Boy Scout troop. The project is still in its early stages but everything seems to be going well. One potential problem is an area of purple loosestrife. The wildlife team plans to control this problem with a combination of hand-pulling of isolated plants and targeted herbicide applications on larger plants. Follow up measures will also be needed.
  - May 2008: The stormwater pond was planted with plugs and bareroot plants in three target zones: submergent, shoreline, and upland banks. A total of 1000 individual plants were planted.
  - Project 2 is still in its early stages but the plantings seem to be doing well. There has been some deer browse on the upland shrub & tree plantings and Wildlife Team members are considering fencing to protect young plants.
  - No future objectives are planned with this project at this time.
  - Please see the last page of this document for examples of documentation (i.e. monitoring sheets, seed mixes, receipts, lists of species planted and dates planted, Wildlife Team meeting minutes, the Wildlife Team's project journal, Wildlife Team emails, program flyers, pamphlets or checklists for visitors, event information, photo documentation, etc.).

4.1. New Projects

No major new projects are planned. However, a long term objective is for the New England Plant to continue to explore opportunities for biodiversity enhancement. A high priority target is to reduce the amount of mowed lawn at the site.

5. Documentation

Examples of documentation include monitoring sheets, seed mixes, receipts, lists of species planted and dates planted, Wildlife Team meeting minutes, the Wildlife Team's project journal, Wildlife Team emails, program flyers, pamphlets or checklists for visitors, event information, photo documentation, etc. The following sample documentation includes sample seed lists and sample Wildlife Team meeting minutes.
Download an example monitoring log at http://www.wildlifehc.org/apply

Native Species Nursery
Garden Suppliers of Maine
1234 Main Street
Portland, ME 01234

Purchase Order #0123456789

Description	Quantity
Wetland Seedmix #0169	
15 bulk lbs per acre or 1/3-1/2 lbs per 1,000 ft²	30 lbs
Species Included in Mix:	

Common Name	Scientific Name
Eastern red columbine	*Aquilegia canadensis*
Swamp milkweed	*Asclepias incarnata*
Vernal water-starwort	*Callitriche palustris*
Marsh marigold	*Caltha palustris var. palustris*

Inland sedge (*Carex interior*), container grown	5 flats
Marsh horsetail *(Equisetum palustre*), container grown	5 flats

Delivered 6/1/08

Received By:

Jane Doe
Print Name

Jane Doe 6/1/08
Signature Date

Wildlife Team Meeting

January 1st , 2008
11:00 am
Admin. Office

Meeting called by: **Jane Doe** **Type of meeting:** **Preparation**

Attendees: IN: ALL STAFF - John, Sally, Sue, Bob, Jim, Neil, Erica, Ted, Sam, Jane, Marie, Kim, Rob, Dirk, Paul, Chris, Pete, Patrick, Mary, Greg, Melissa, Erin, Tim, Tom, Cindy, Bruce, James, Marty, Stan, Bryce, Erica, Calvin, Jeff, Kevin, Kyle, Terry, Kelly & Doug

Topic	Presenter	Time allotted
Monthly Budget Updates	Jane	10
Aquatic Habitat	Sam	10
Misc	Open	5

Wildlife Team Meeting

Feb 1st , 2008

9:00 am

Admin. Office

Meeting called by: **Jane Doe** **Type of meeting:** **Preparation**

Attendees: IN: John, Sally, Sue, Bob, Jim, Neil, Erica, Sam, Jane, Marie, Kim, Rob, Dirk, Greg, Melissa & Erin

Topic	Presenter	Time allotted
Monthly Budget Updates – Certification requirements	Jane & Marie	10
Aquatic Habitat	Sam	10
Audubon Society Members	Jimmy & Dawn	20

Wildlife Team Meeting

April 1 , 2009

11:00 am

Admin. Office

Meeting called by: **Jane Doe** **Type of meeting:** **Preparation**

Attendees: IN: ALL STAFF - John, Sally, Sue, Bob, Jim, Neil, Erica, Ted, Sam, Jane, Marie, Kim, Rob, Dirk, Paul, Chris, Pete, Patrick, Mary, Greg, Melissa, Erin, Tim, Tom, Cindy, Bruce, James & Marty

Topic	Presenter	Time allotted
Monthly Budget Updates	Jane	10
Aquatic Habitat	Sam	10
Portland High School Shop Teacher – conference call	Mr. Tompson	10

Wildlife Team Meeting

June 1, 2009

10:00 am

Admin. Office

Meeting called by: **Jane Doe** **Type of meeting:** **Preparation:**

Attendees: IN: John, Sally, Sue, Bob, Jim, Neil, Erica, Ted, Sam, Jane, Marie, Kim, Rob, Dirk, Paul, Chris, Pete, Patrick, Mary, Greg, Melissa, Tim, Tom, Cindy, Bruce, James, Marty, Stan, Erica, Calvin & Jeff.

Topic	Presenter	Time allotted
Certification – Wildlife Management Plan Updates	Marie	5
Aquatic Habitat	Sam	5
Misc.	Open	5

Wildlife Team Meeting

July 1, 2009

10:00 am

Admin. Office

Meeting called by: **Jane Doe** **Type of meeting:** **Preparation: Submit Documentation/Records**

Attendees: IN: ALL STAFF - John, Sally, Sue, Bob, Jim, Neil, Erica, Ted, Sam, Jane, Marie, Kim, Rob, Dirk, Paul, Chris, Pete, Patrick, Mary, Greg, Melissa, Erin, Tim, Tom, Cindy, Bruce, James, Marty, Stan, Bryce, Erica, Calvin, Jeff, Kevin, Kyle, Terry, Kelly & Doug

Topic	Presenter	Time allotted
Certification	Marie	15
Aquatic Habitat	Sam	10
Misc	Open	5

Additional Documentation Included in Package:

Photograph Journal on CD– includes Program flyers for site

Nesting Data submitted to www.nestwatch.org
Login Name --- SiteNameMonitoringLog
Password ---- JaneDoe1234

Online Project Journal for Wildlife Team can be found at:
www.pretendonlinejournal.com

Guest Sign-In Sheet Log