Wildlife and Plant Habitat

This guidance is intended to clarify how the Wildlife and Plant Habitat Goal and Objectives of the Regional Policy Plan (RPP) are to be applied and interpreted in Cape Cod Commission Development of Regional Impact (DRI) project review. This technical bulletin presents specific methods by which a project can meet the goal and objectives.

Wildlife and Plant Habitat Goal: To protect, preserve, or restore wildlife and plant habitat to maintain the region's natural biodiversity.

- ***Objective WPH1** – Maintain existing plant and wildlife populations and biodiversity*
- ***Objective WPH 2** – Restore degraded habitats through use of native plant communities*
- ***Objective WPH 3** – Protect and preserve Rare Species habitat, Vernal Pools, 350-foot buffers to Vernal Pools*
- ***Objective WPH 4** – Manage Invasive Species*
- ***Objective WPH5** – Promote best management practices to protect wildlife and plant habitat from the adverse impacts of development*

The applicability and materiality of these goals and objectives to a project will be determined on a case-by-case basis considering a number of factors including the location, context (as defined by the Placetype of the project's location), scale, use, and other characteristics of a project.

THE ROLE OF CAPE COD PLACETYPES

The RPP incorporates a framework for regional land use policies and regulations based on local form and context as identified through categories of Placetypes found and desired on Cape Cod.

The Placetypes are determined in two ways: some are depicted on a map contained within the RPP Data Viewer located at www.capecodcommission.org/RPPDataViewer adopted by the Commission as part of the Technical Guidance for review of DRIs, which may be amended from time to time as land use patterns and regional land use priorities change, and the remainder are determined using the character descriptions set forth in Section 8 of the RPP.

The project context, as defined by the Placetype of the project's location, provides the lens through which the Commission will review the project under the RPP.

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INTRODUCTION

Cape Cod is located within the southern Massachusetts Pine Barrens eco-region. Pine barrens are a globally rare habitat comprised of a unique assemblage of plants and animals that thrive in the nutrient poor soils and variable climate found on Cape Cod. Pine Barrens are comprised of an open canopy of pitch pines and a dense understory of scrub oak and huckleberry. There are many natural communities associated with the Pine Barrens, which together populate the matrix of habitats that define the eco-region, including thickets, shrub barrens, heathlands and grasslands, and various pond and wetland habitats. Though the entire natural landscape on Cape Cod was altered following European settlement, there remain pockets of mature woodlands within the Pine Barrens matrix containing beech, hickory, red maple, and birch. These woodlands have supported, and continue to support native species and traditional uses, providing important habitat diversity and value to the region.

Many of the plant and animal species found on Cape Cod are rare or declining in number. Of the 453 species of plants and wildlife listed by the Massachusetts Natural Heritage and Endangered Species Program (NHESP) as endangered, threatened, or special concern, 148 occur on Cape Cod. Additional species are on a watch list and could become listed in the future based on further review. Threatened and endangered species that are also on the federal list of threatened and endangered species include the little brown bat, northern long-eared bat, North Atlantic right whale, Kemp's ridley sea turtle, red knot, piping plover, roseate tern, and sandplain gerardia.

These species depend on undisturbed and healthy habitats for their survival. The Cape's woodlands provide important upland wildlife and plant habitat. Poorly planned development can harm species by fragmenting large tracts of forest and severing wildlife corridors and other ecological connections. The Cape's wetlands, vernal pools, and ponds also provide vital habitat for a diversity of species. These areas can be damaged not only by adverse impacts such as pollution and disturbance but also by groundwater withdrawals that can reduce water levels needed to support aquatic and shoreline species.

Accurate information about the nature, location, and extent of sensitive resources can result in improved project site selection and site design. Applicants are encouraged to review available mapped information about sensitive resource areas and areas that are priorities for protection prior to selecting a development location. To identify these

areas, the RPP relies on several sources of mapped data based on existing natural resources and protected open space presently providing a network of wildlife habitats and corridors across the Cape. A compilation of many of these important resource areas is found in the Regional Policy Plan Data Viewer. In addition, several other resources, including the State's Wildlife Action Plan (SWAP), may provide guidance in selecting preferred locations for development. A list of mapped resources available for planning and regulatory review is available at the end of this technical bulletin.

Growth management approaches are needed to reduce the amount of land converted to development and to improve the design and performance of new development to ensure protection of valuable habitat. A renewed commitment to protect the most ecologically sensitive undeveloped lands through land acquisition and other permanent conservation measures is also warranted. Maintaining wildlife corridors and large patches of existing heterogeneous habitat types is a critical element toward maintaining the viability of wildlife habitat on Cape Cod. Restoration and better land stewardship are needed to improve areas that have already been developed.

HABITATS FOUND ON CAPE COD

According to the SWAP, Cape Cod is defined by many upland, wetland, and aquatic habitats, such as: coastal beaches and dunes, grasslands and heathlands, woodlands and barrens, maritime forests and shrublands, coastal plain pondshores, marshes and wet meadows, vernal pools, tidal wetlands, and marine nearshore and offshore, among others. The SWAP further subdivides habitats into distinct natural communities that are finer-scale groups of plants and animals that co-occur in distinct environmental settings. For example, the woodlands and barrens habitat includes the pitch pine-scrub oak and pitch pine-oak forest/woodland communities that typify the southern Massachusetts Pine Barrens eco-region.

Several areas on Cape Cod have been designated as significant for comprehensive resource protection interests. The Wildlife and Plant Habitat goal, objectives, and methods are structured to discourage, limit, or prohibit development in these significant habitat areas. Applicants should review the mapped boundaries (viewable through the RPP Data Viewer or elsewhere, as noted) of these areas when planning a development activity, and take appropriate steps to address the resource protection interests of each, if applicable:

- Natural Heritage and Endangered Species Program (NHESP) Rare and Endangered Species Habitat: NHESP is responsible for the conservation of hundreds of species in Massachusetts that are not hunted, trapped, fished or commercially harvested in the state, as well as the protection of the natural communities that make up their habitats. NHESP also administers the Massachusetts Endangered Species Act through the review of projects located in Priority Habitat of Rare Species, a mapped data layer available through MassMapper and the RPP Data Viewer.
- BioMap is a map and guide developed and maintained by MassWildlife for protecting and stewarding lands and waters that are most important for conserving biological diversity in Massachusetts. BioMap includes Core Habitats and Critical Natural Landscapes as well as Local and Regional Components. BioMap can be explored here: https://biomap-mass-eoeea.hub.arcgis.com/
- Key Sites are identified by the SWAP as the highest priority sites for biodiversity protection and habitat management. Key Sites have a concentration of co-occurring rare species, the best-quality occurrences of high-priority species or natural communities, and/or multiple, co-occurring, landscape-level resources, as identified by BioMap. Key Sites identified in the 2015 SWAP can be found in Chapter 4, starting on page 351. Key Sites are being updated with the 2025 SWAP.
- Important Bird Areas (IBA) are important sites for the conservation of bird species, identified by a set of internationally-accepted, standardized criteria. The sites are small enough to be conserved in their entirety, often form part of a protected-area network, and typically are different in character or habitat or ornithological importance from the surrounding area. Cape Cod hosts several IBAs. Mass Audubon maintains a list of IBAs in Massachusetts here: https://www.massaudubon.org/our-work/birds-wildlife/bird-conservation-research/massachusetts-important-bird-areas/iba-sites. The National Audubon Society also has information on IBAs and a map here: https://www.audubon.org/important-bird-areas
- Areas of Critical Environmental Concern (ACEC) are defined areas which contain concentrations of highly significant environmental resources and which have been formally designated by the state through a public nomination and review process. Following designation, state agencies, communities, and public and private organizations work to protect, preserve and restore the significant resources in these areas. Regulatory agencies are expected to apply stricter standards of review to development activities within ACECs. Cape Cod hosts eight ACECs from Wellfleet

to Bourne. Designation documentation on the eight ACECs is available on the state's ACEC Program Overview webpage ACEC Program Overview | Mass.gov.

- Districts of Critical Planning Concern (DCPC) are areas designated by ordinance by Barnstable County following review and recommendation by the Cape Cod Commission. DCPCs may be established for many purposes under the Cape Cod Commission Act, but many of those in place today were designated to protect natural resource interests.

STRESSORS TO HABITATS ON CAPE COD

Habitats on Cape Cod may be adversely impacted or threatened by numerous stressors, including residential and commercial development, agriculture and aquaculture, energy production and mining, transportation and service corridors, biological resource use, human intrusions and disturbance, natural system modifications, invasive and other problematic species, pollution, as well as other stressors that are beyond the control of the typical applicant (i.e., geological events, and severe weather – from a list adopted by the International Union for the Conservation of Nature, and incorporated into the SWAP). In addition, the increasingly severe effects of climate change exert stress on the region's biodiversity (see the Climate Change Technical Bulletin for actions that applicants can take to address this global issue and its more localized effects). In order to protect the remaining habitat areas on Cape Cod, development introducing or expanding these stressors is discouraged, and is not permitted in certain significant habitats such as vernal pools and their buffers, and rare species habitat. The SWAP, through BioMap, contains detailed information on the nature of the impacts these stressors may be expected to exert on each of the habitats on Cape Cod.

NATURAL RESOURCES INVENTORY

Applications for Developments of Regional Impact that propose to alter undeveloped areas are required to provide a Natural Resources Inventory (NRI) as detailed in the application materials. The NRI should identify the presence and location of wildlife and plant habitat, including wetlands and vernal pools, and serve as a guide for the layout of the development and any open space requirement (see Open Space Technical Bulletin).

DEFINITIONS

Invasive Species: Any species introduced to an area in which it would not naturally occur and whose introduction causes or is likely to cause significant harm to the environment, economy, or human health. Invasive species compete with native plants and wildlife for resources, disrupt beneficial relationships, spread disease, cause direct mortality, and can significantly alter ecosystem function.

Key Sites: As defined in the 2015 Massachusetts State Wildlife Action Plan (SWAP), Key Sites are identified as the highest priority sites for biodiversity protection and habitat management. Key Sites were identified based on meeting one or more of the following thresholds:

1. Sites with a concentration of co-occurring Rare Species listed under the Massachusetts Endangered Species Act,
2. Sites with the best-quality occurrences of high-priority species or natural communities (e.g., globally rare species),
3. Multiple, co-occurring, landscape-level resources, as identified by BioMap. Key Sites identified in the 2015 SWAP can be found in Chapter 4, starting on page 351.

Key Sites are being updated with the 2025 SWAP.

Rare Species: Plant and animal species listed as endangered, threatened, or special concern under the Massachusetts Endangered Species Act. These species are tracked in the NHESP database. These species are either at risk, or may become at risk, of extinction. Rarity in the state, population trend, and overall threat are the main criteria used to determine extinction risk. Rare Species in Massachusetts are threatened primarily due to habitat loss or degradation.

Significant Habitat Areas: Natural resources identified as important for protection and include Natural Heritage and Endangered Species Program BioMap areas, State Wildlife Action Plan Key Sites, Important Bird Areas, Areas of Critical Environmental Concern, and Districts of Critical Planning Concern where wetlands, wildlife, and plant habitat are identified as a concern.

"Take" is defined under the Massachusetts Endangered Species Act as the following:

In reference to animals, it means to harass, harm, pursue, hunt, shoot, hound, kill, trap, capture, collect, process, disrupt the nesting, breeding, feeding or migratory activity or attempt to engage in any such conduct, or to assist such conduct,

And in reference to plants, take means to collect, pick, kill, transplant, cut or process or attempt to engage or to assist in any such conduct. Disruption of nesting, breeding, feeding or migratory activity may result from, but is not limited to, the modification, degradation or destruction of habitat.

Vernal Pool: A vernal pool is a wildlife habitat that supports standing water for a period of time from spring into summer and which provides habitat for vernal pool species. For the purposes of DRI review, Vernal Pools include both those sites which have been certified by the NHESP, and those sites which have the characteristics that make them certifiable by the NHESP. Maps of certified Vernal Pools and potential Vernal Pools are available in the RPP Data Viewer.

Wetland: An inland area of 500 square feet or greater including wet meadows, marshes, swamps, bogs, and areas of flowing or standing water, such as rivers, streams, ponds, and lakes, or a coastal area including beaches, dunes, barrier beaches, coastal banks, intertidal areas, salt marshes, and land under the ocean. Wetlands may border water bodies or may be isolated. Wetlands are generally described in the Wetlands Protection Act and delineated in accordance with the boundary delineation methods set forth in the relevant sections of 310 CMR 10.00. All wetlands, regardless of whether bordering on other waterbodies or isolated, are protected under the RPP.

SUMMARY OF METHODS

GOAL | WILDLIFE AND PLANT HABITAT

To protect, preserve, or restore wildlife and plant habitat to maintain the region's natural biodiversity.

Objective WPH1 – Maintain existing plant and wildlife populations and biodiversity

METHODS

All DRIs must:

- Minimize clearing of vegetation and alteration of natural topography
- Minimize fragmentation of wildlife and plant habitat and maintain or establish greenways/wildlife corridors to protect edge species and species that inhabit the interior forest
- Maximize the protection of large, contiguous unfragmented areas, and cluster development away from the most sensitive areas of a site
- Protect standing specimen trees; if protecting standing specimen trees is not possible, appropriate mitigation must be provided

DRIs should, to the maximum extent feasible:

- Avoid constructing development, including fencing and curbing, that interferes with identified wildlife migration corridors
- Avoid development in Significant Habitat Areas

OBJECTIVE WPH1 AREAS OF EMPHASIS BY PLACETYPE

Natural Areas | New clearing is strongly discouraged
Rural Development Areas | New clearing is minimized, does not conflict with rural character, preserves habitat connections
Suburban Development Areas | New clearing is minimized, preserves habitat connections
Historic Areas | New clearing is minimized, does not conflict with character defining landscape

Maritime Areas, Community Activity Centers, Industrial Activity Centers, and Military and Transportation Areas | New clearing is minimized, preserves habitat connections

Objective WPH2 – Restore degraded habitats through use of native plant communities

METHODS

- Plant native vegetation as needed to enhance or restore wildlife habitat
- Restore altered or degraded habitat areas where ecologically appropriate (for example, sandplain grasslands, pine barrens, etc.)

Objective WPH3 – Protect and preserve Rare Species habitat, Vernal Pools, 350-foot buffers to Vernal Pools

METHODS

- Locate development outside of Rare Species habitat
- Where a project is located within mapped Rare Species habitat, demonstrate that impacts to Rare Species have been avoided or mitigated. Comments from the Natural Heritage and Endangered Species Program may be used to support demonstration that the project does not adversely impact Rare Species or their habitats.

For projects adjacent to a Vernal Pool:

- Locate development outside of certified or certifiable Vernal Pools
- Provide a 350-foot undisturbed buffer to Vernal Pools

Objective WPH4 – Manage Invasive Species

METHODS

- Where Invasive Species have been identified on a project site, provide an Invasive Species management plan that helps to prevent the spread of Invasive Species on the site
- Use best management practices during construction to avoid introduction of Invasive Species

Objective WPH5 – Promote best management practices to protect wildlife and plant habitat from the adverse impacts of development

METHODS

All DRIs must:

- Limit the extent of site alteration and disturbance to the minimum areas needed for the project
- Use erosion control barriers during construction to prevent gullying
- Use fencing to protect plants and wildlife from harm during construction

All DRIs should, to the maximum extent feasible:

- Avoid use of pesticides (including herbicides, fungicides, insecticides, and rodenticides)
- Respect time of year restrictions to avoid or minimize impacts to wildlife from construction activities
- Incorporate bird-friendly practices into building design to reduce the threat of bird collisions with glass
- Ensure lighting is dark-sky compliant to minimize impacts to nocturnal and migratory species
- Educate contractors about the potential presence of wildlife

DETAILED DISCUSSION OF METHODS FOR MEETING OBJECTIVE WPH1

Objective WPH1 *– Maintain existing plant and wildlife populations and biodiversity.*

ALL DRIS MUST:

Minimize clearing of vegetation and alteration of natural topography

Applicants must design development in a way that minimizes new land clearing, clearcutting, and alteration of topography to minimize impacts to wildlife and plant habitat. Minimizing impacts includes designing the project to minimize the total cleared and disturbed area on a site, clustering buildings, locating infrastructure under, on, or adjacent to buildings and paved areas, and utilizing existing disturbed areas. Reuse of existing buildings, parking, and other infrastructure is strongly encouraged. Locating structured parking under buildings or in a multi-level garage is encouraged.

Minimize fragmentation of wildlife and plant habitat and maintain or establish greenways/wildlife corridors to protect edge species and species that inhabit the interior forest

Projects must be designed to minimize fragmentation of wildlife and plant habitat. Development on parcels that may provide connections to a larger habitat network should be laid out to protect large unfragmented areas, and make connections to undeveloped areas offsite. Where appropriate, greenways and wildlife corridors of sufficient width to benefit edge species and those that inhabit the interior forest should be provided. Wildlife should be provided with opportunities for passage under or across roads and safely through developments where such opportunities will maintain the integrity of wildlife corridors. Where development is proposed adjacent to Rare Species habitat or Significant Habitat Areas, the Commission may require designation of a limit of work (for structures, driveways, lawns, etc.), where appropriate, to limit removal of vegetation. Fencing should not be constructed so as to interfere with identified wildlife migration corridors. See references below for additional guidance on site and subdivision design layout.

Maximize the protection of large, contiguous unfragmented areas, and cluster development away from the most sensitive areas of a site

Development sites may include or be adjacent to off-site resources that are highly sensitive to the impacts of development. Applicants must cluster development activity away from these sensitive resources such as Wetlands and their buffers, Rare Species habitat, Vernal Pools and their buffers, Potential Public Water Supply Areas, specimen trees, etc. (which are also addressed in WPH2, WET1, and WR1 objectives), and should strive to cluster development away from Significant Habitat Areas, with the objective of preserving large, contiguous unfragmented areas of intact woodlands or other existing naturally vegetated plant communities. Clustering of development is an objective that also meets Community Design interests (see Objective CD2), and will aid in reducing mitigation requirements.

Protect standing specimen trees; if protecting standing specimen trees is not possible, appropriate mitigation must be provided

The preservation of the tree canopy and planting of replacement trees if necessary helps to conserve habitat as well as the character and aesthetics of the region, and helps mitigate the impacts of climate change (see Climate Change Technical Bulletin). The number and species of specimen trees on a project site should be identified in the Natural Resources Inventory (NRI – see application requirements). Defining a specimen tree on Cape Cod will vary depending on the species of tree, but typically softwoods greater than 18″ diameter-breast-height (dbh) and hardwoods greater than 12″ dbh are considered specimens. Protecting specimen trees means not disturbing an area equivalent to 10 feet greater than the canopy perimeter, at a minimum, and ideally protecting a larger area around them, including trees which provide buffering to the specimen tree from storms.

Applicants should protect standing specimen trees to the extent feasible, especially native species. Where specimen tree removal cannot be avoided, removed trees should be replaced on- or off-site according to the following: for each inch of dbh of the specimen tree(s) removed, no less than one-half inch of caliper of new tree(s) shall be replanted with each new tree having a minimum caliper of two inches, or, where feasible, large (greater than 3″ dbh) same-species trees should be moved from areas to be cleared to areas to be protected. Any tree transplantation should be done in consultation with a certified arborist.

Specimen tree mitigation may also be achieved through the permanent protection of specimen trees through the provision of off-site open space mitigation (see Open Space Technical Bulletin). If the Town has an established tree fund or tree planting program, a contribution to the fund or program may be considered as part of specimen tree mitigation.

DRIS SHOULD, TO THE MAXIMUM EXTENT FEASIBLE:

Avoid constructing development, including fencing and curbing, that interferes with identified wildlife migration corridors.

Fencing and curbing should not be constructed so as to interfere with wildlife migration corridors identified through a NRI. Fencing design, material, and installation should allow for safe passage for wildlife through developments. Minimize use of curb and gutter and provide breaks to allow for small animal passage. Other site design considerations such as building configurations and site drives and parking should reflect consideration for preservation of daily or seasonal wildlife movement, as may be indicated by the NRI. See references below for additional guidance on site and subdivision design layout.

Avoid development in Significant Habitat Areas

Development within Significant Habitat Areas is strongly discouraged. These areas may serve the community better as protected open space and should be considered for that purpose. Where development is proposed within BioMap areas as defined by NHESP, Key Sites for Species of Greatest Conservation Need as identified in the SWAP, Important Bird Areas, Areas of Critical Environmental Concern, or Districts of Critical Planning Concern, the applicant must submit with its application a narrative describing how the project has been designed to avoid or minimize impacts to the natural resource interests identified.

DETAILED DISCUSSION OF METHODS FOR MEETING OBJECTIVE WPH2

Objective WPH2 *– Restore degraded habitats through use of native plant communities*

Plant native vegetation as needed to enhance or restore wildlife habitat

To enhance or restore wildlife habitats, landscape plans must include plants that are characteristic of the region (see the Cape Cod Commission plant list). Use a variety of plant materials that are predominantly native species, suitable to the site, and characteristic of their natural associations. In general, no less than 90% of the total landscaped and/or restored area should be comprised of native species. The Applicant must provide justification for any proposed plants that are not on the Commission's plant list. Incorporate pollinator species and other species that provide nesting, food, and cover for wildlife. Provide diversity in plant material selection and select species that minimize use of irrigation, pesticides, and fertilizer. Minimize lawn area and provide alternatives to turfgrass lawn including native grasses, sedges, groundcovers, and forbs to reduce mowing and fertilizer application. Where lawn is necessary, favor fescues, other drought tolerant species, and low growing wildflowers. Soil tests are recommended to help inform planting plans. Further information about recommended plant species can be found on the Cape Cod Commission website.

Restore altered or degraded habitat areas where ecologically appropriate (for example, sandplain grasslands, pine barrens, etc.)

Opportunities to restore native habitat communities such as sandplain grasslands and pine barrens that are found within the southern Massachusetts pine barrens eco-region are encouraged. Restoration projects or development projects, including "undevelopment," with a habitat restoration component should provide in their application a plan detailing the nature of the restoration, including grading changes, a description of native species to be planted (including types, sizes, quantities), discussion of approach to ensure establishment (irrigation and/or invasive species management), and a narrative discussing the purpose and objectives of the restoration, and monitoring as needed.

DETAILED DISCUSSION OF METHODS FOR MEETING OBJECTIVE WPH3

Objective WPH3 *– Protect and preserve Rare Species habitat, Vernal Pools, 350-foot buffers to Vernal Pools*

Locate development outside of Rare Species habitat

Where a proponent cannot avoid siting development within mapped state or federal Rare Species habitat areas, the proponent must submit the development proposal to the Massachusetts Natural Heritage and Endangered Species Program for review and comment. Development that adversely affects habitat of local populations of rare wildlife and plants is not permitted. However, development in mapped Priority Habitat for Rare Species may be allowed if the NHESP provides written comment that the work will not adversely affect Rare Species (including through the development of a NHESP approved conservation and management permit, or that NHESP determines that the project will not result in a Take).

Where a project is located within mapped Rare Species habitat, demonstrate that impacts to Rare Species have been avoided or mitigated

Comments from the Natural Heritage and Endangered Species Program may be used to demonstrate that the project does not adversely impact Rare Species or their habitats. Development which NHESP determines may result in a Take of state listed species may be permitted where the proponent can demonstrate that such development will not adversely affect Rare Species habitat. An applicant may be able to address a determination of Take or likely Take through redesign of the project, utilizing best management practices during construction, timing of construction activities, or occasionally through mitigation, including a conservation and management permit. Only through a determination by NHESP will mitigation be allowed to address impacts to Rare Species. In those cases, a wildlife and plant habitat management plan may be required as a condition of approval when development or redevelopment is permitted in Rare Species habitat areas.

PROJECTS ADJACENT TO OR THAT CONTAIN A VERNAL POOL WITHIN THE SITE MUST:

Locate development outside of certified or certifiable Vernal Pools

Vernal Pools are ephemeral pools of water that typically appear in the spring with winter snowmelt and spring rains, and often (but not always) disappear by summer's end. Only those Vernal Pools meeting the state Wetlands Protection Act definition of "wetlands" are protected under that Act, but all Vernal Pools are recognized as a significant habitat and are protected under the RPP. Studies have demonstrated that Vernal Pool species, which spend most of their yearly lifecycles in upland vegetated buffers outside of the pool, may migrate up to 1,000 feet to breed in the temporary pools. NRIs should identify Vernal Pools that may be present on a site according to the criteria established by the NHESP (see reference below and details in NRI). Vernal Pools and their 350-foot buffer should be delineated on a site plan included in application materials.

Provide a 350-foot undisturbed buffer to Vernal Pools

If a Vernal Pool, including pools that meet the criteria for certification, is located on or adjacent to a project site, development must be located outside of a 350-foot undisturbed buffer around these resources in order to protect both the pool habitat as well as the important migration corridors and upland habitat around them.

The Commission may permit alterations to Vernal Pool buffers where:

- Development currently exists,
- There is no feasible alternative to alteration,
- Proposed additional alterations either reduce impacts to or improve the function of the Vernal Pool buffer,
- The applicant can show that the project will provide a public benefit, and
- The impacts from the alteration are minimized and mitigated.

DETAILED DISCUSSION OF METHODS FOR MEETING OBJECTIVE WPH4

Objective WPH4 *– Manage Invasive Species*

Where Invasive Species have been identified on a project site, provide an Invasive Species management plan that helps to prevent the spread of Invasive Species on the site

Development on sites where a NRI identifies the presence of invasive plant species must provide and implement a management and restoration plan detailing the management, and where possible the eradication, of the Invasive Species present, and the proposed revegetation of the site with native species. Where significant or sensitive wildlife or plant habitat is threatened, the Invasive Species management plan should strive to eradicate or reduce the threat to those sensitive species. A current listing of invasive plant species can be found on the web at https://www.mass.gov/info-details/massachusetts-prohibited-plant-list. Additional information on invasive plants in Massachusetts can be found on the Massachusetts Invasive Plant Advisory Group's webpage here: www.massnrc.org/mipag/invasive.htm.

Use best management practices during construction to avoid introduction of Invasive Species

Development activities should also take steps to avoid introducing Invasive Species to a development site during construction through use of best management practices, such as educating contractors regarding Invasive Species, using weed-free construction and landscaping materials, properly handling and disposing of soils, seeds, and plants from infested areas, washing construction vehicles and equipment off site prior to initiating work on the project site and inspecting and/or washing vehicles and equipment periodically during construction.

DETAILED DISCUSSION OF METHODS FOR MEETING OBJECTIVE WPH5

Objective WPH5 *– Promote best management practices to protect wildlife and plant habitat from the adverse impacts of development*

ALL DRIS MUST:

Limit the extent of site alterations and disturbance to the minimum areas needed for the project

In general, development projects on Cape Cod are strongly encouraged to retain as much of the natural vegetation as possible. As discussed elsewhere (above, and in the Community Design technical guidance), development should be clustered on a site to use land as efficiently as possible, minimize impervious surfaces and minimize impacts to native vegetation and habitats. Clearcutting should be avoided and construction fencing and/or limits of work employed to limit disturbance to existing trees, shrubs, and groundcovers. Setting limits of work will typically reduce restoration and other mitigation costs, and help retain native forested and other vegetative covers to protect the services these natural materials provide in filtering nutrients and stormwater, improving air quality, and providing shade and wildlife habitat. Limits of work established in a property deed can ensure that impacts from development are not expanded and that these natural services are protected over the long term. The Commission may require the use of limits of work where sensitive habitats or resources are present.

Use erosion control barriers during construction to prevent gullying

Erosion control barriers should be used in areas with slopes, areas proximate to Wetlands, or anywhere other sensitive resources are present to ensure that the impacts from construction are managed within the construction site. In longer-term construction projects where unvegetated soils may be present through several seasons, seeding and/or erosion control blankets should be employed to manage loss of soils off-site and prevent gullying. Import and export of soils should be avoided, and a soils management plan should be developed to ensure appropriate management of soils during construction. Erosion controls should be inspected regularly and after storm events to ensure proper function and repairs are made, as needed.

Use fencing to protect plants and wildlife from harm during construction

Construction activities can pose direct threats to wildlife. Where turtles or other slow moving or sensitive wildlife species may be present (such as Vernal Pool species or amphibians), construction fencing should be employed to redirect wildlife away from the construction site.

ALL DRIS SHOULD, TO THE MAXIMUM EXTENT FEASIBLE:

Avoid use of pesticides

After construction and throughout the life of the project, the use of pesticides should be avoided (including herbicides, fungicides, insecticides, and rodenticides) as these may have adverse impacts on non-target wildlife.

Respect time of year restrictions to avoid or minimize impacts to wildlife from construction activities

Time of year restrictions help protect wildlife from the adverse impacts of construction. For example, it is best practice to avoid tree and other vegetation removal during the spring/summer breeding bird season, or clearing activities that could impact amphibian or reptile migration. Applicants should comply with time of year restrictions on the project site or provide a rationale for why compliance is infeasible.

Incorporate bird-friendly practices into building design to reduce the threat of bird collisions with glass

Incorporating bird-friendly practices into building design helps reduce collision threats to birds. If large glass areas are proposed, applicants should incorporate muntins (grilles) or other features to limit bird collisions. Other bird-friendly practices include using low-reflectivity glass or glass fritting or frosting, avoiding the use of mirrored surfaces, using exterior window screens, and avoiding glass-enclosed walkways. Additional bird-friendly design ideas can be found here: https://abcbirds.org/wp-content/uploads/2015/05/Bird-friendly-Building-Guide_2015.pdf

Ensure lighting is dark-sky compliant to minimize impacts to nocturnal and migratory species

Outdoor lighting should be avoided as much as possible. Where outdoor lighting is proposed, following responsible outdoor lighting principles minimizes disruption to

nocturnal and migratory species. More information is available through Dark Sky International: https://darksky.org/what-we-do/advancing-responsible-outdoor-lighting/.

Educate contractors about the potential presence of wildlife

Contractors should be educated about the potential presence of wildlife species on the construction site and what to do if wildlife is encountered. A note on the construction drawings may suffice to address this interest. Contact information for the town's animal control office and local wildlife rehabilitation facilities should be provided to contractors.

GENERAL APPLICATION REQUIREMENTS

Applicants should provide the following materials to address consistency with the Wildlife and Plant Habitat Goal and Objectives:

- Prepare a Natural Resources Inventory (NRI) (see guidance below)
- Where a project is located within mapped Rare Species habitat, provide documentation indicating review by the Massachusetts Natural Heritage and Endangered Species Program.
- Where a NRI indicates the presence of Invasive Species, provide an Invasive Species management plan (see guidance below).

Natural Resources Inventory

Once a site has been selected, applicants for DRI review must prepare a Natural Resources Inventory (NRI) to evaluate the site in more detail. NRIs should be prepared by a wildlife or plant biologist, and contents should include:

SOILS

- Describe soils underlying the development site. Where the USDA Natural Resource Conservation Service's Web Soil Survey for Barnstable County or the Prime Farmland Soils in MassMapper indicates the presence of Prime Farmland Soils (Prime Farmland, Farmland of Statewide Importance, or Farmland of Unique Importance), the development site should be surveyed and mapped based on results of field testing.

VEGETATION

- Describe the major upland vegetational communities located on the site, include canopy/trees, shrub layer, low ground cover, herbaceous vegetation. Note approximate depth of leaf litter, and size and height of mature trees. Note species and locations of specimen trees. If several different zones of vegetation or natural/vegetational communities are present on the site, note the location of these areas on a site plan (suggested scale: 1"=40').
- Identify and delineate Wetlands, waterbodies, banks, dunes, flats, and floodplain areas located on the site. Describe the major vegetational communities located in these areas as above. Note whether Wetland delineations have been verified by the town conservation commission.

- Note the relative abundance or scarcity of vegetational community(ies) identified on the site in areas immediately surrounding the development site. In particular, note nearby areas of similar unfragmented habitat. Identify vegetational communities that are unique to the development site.
- Identify and delineate the presence of any state-listed Invasive Species.

WILDLIFE

- Identify wildlife species and evidence of wildlife observed in each vegetational community. Search for amphibians and reptiles under rocks and fallen logs. Identification/observations may include sightings of animal species, identification of species from calls/sounds, tracks, scat, burrows, browse marks, nests, feathers, bone fragments, etc. At least two field visits for the purpose of wildlife identification should be made. Such field visits should occur within one hour of sunrise and within one hour of sunset during good weather. If possible, field visits should occur during peak migration seasons (spring and/or fall) and should attempt to identify nocturnal species (e.g., bats).
- Identify presence of wildlife migration areas and corridors, denning, nesting and breeding areas, and deer yards and travel corridors.
- Note presence of snags, cavities, and significant dead vegetation that may serve as nesting or roosting sites for birds, bats, or other wildlife species.
- Note presence of fish, amphibians and other species associated with Wetlands and waterbodies located on the site.

VERNAL POOLS

- Note presence of kettle hole depressions and other areas that may function as Vernal Pools (regardless of association with other Wetland area or state certification). If such areas exist, note presence/evidence of Vernal Pool species. Refer to the state Vernal Pool certification guidelines for identification of Vernal Pools. When possible, Vernal Pool surveys should be conducted during April, May and June.

NATURAL RESOURCE INVENTORY NARRATIVE

The results of the inventory should be provided in a report format and on plans, as appropriate, and should include a discussion of the short and long-term impacts to existing habitats and natural communities that will result from the development activity.

The narrative should discuss how the project's design has minimized impacts to the habitats present, including habitat fragmentation. If impacts to Wetlands or their buffers are proposed, discuss how proposed conditions will compare to existing conditions relative to changes in Wetland functions, hydrology, and habitat. The narrative should also include a description of any proposed mitigation measures that are specifically intended to reduce the impact of the proposed project upon plant and wildlife habitat and/or populations. Include any measures designed to enhance existing plant and wildlife habitat that would provide an overall benefit to the area. Include details on best management practices to be employed during construction to avoid gullying and other effects of erosion, and to avoid the introduction of Invasive Species (see Detailed Methods for Meeting Objectives WPH4 and WPH5). Where appropriate, describe any revegetation and restoration that is planned after development and associated monitoring. Revegetation should emphasize plant species indigenous to Cape Cod.

In addition to the maps referenced (above/below) several resources may be useful in preparing the NRI. These may include:

- RPP Data Viewer
- Mapping of Rare Species habitat and Vernal Pools by the Natural Heritage and Endangered Species Program (NHESP),
- BioMap Core Habitat, Critical Natural Landscape, and Local and Regional Components by NHESP
- NHESP Natural Communities
- Massachusetts State Wildlife Action Plan (SWAP), 2025
- USDA Natural Resource Conservation Service (Barnstable County Soil Survey), MassMapper Prime Farmland Soils mapping
- Aerial photography
- DEP Wetlands layer
- FEMA and Massachusetts Coast Flood Risk Model flood zones
- Areas of Critical Environmental Concern (ACEC), maps and designation narrative
- Districts of Critical Planning Concern (DCPC), maps and designation narrative
- Coastal Zone Management Shoreline Change maps
- Important Bird Area maps

Invasive Species Inventory and Management Plan

Projects proposing to alter undeveloped areas should provide an inventory of Invasive Species on the proposed site. These inventories should include the percent cover of each species and should delineate each species on a site map. Invasive plants should be identified by genus and species names. Where identified state-listed Rare Species are present on a project site, a detailed narrative discussing potential threats to the species from the more aggressive and/or successful Invasive Species should be provided. This narrative should also address potential problems associated with managing Invasive Species in proximity to Rare Species or in ecologically sensitive areas.

POTENTIAL IMPACT OF INVASIVE PLANT SPECIES

The management plan should describe:

- how the invasive plants could be expected to spread if left unmanaged in an undeveloped area and the impacts (if any) to the surrounding plant and wildlife community.
- how the invasive plants could be expected to spread if left unmanaged after the proposed development was constructed.
- alternative management options for the invasive plants on site. These options should include examples of mechanical, chemical, and biological control with a full explanation of any potential adverse effects from control measures.

DEVELOPMENT OF A PREFERRED MANAGEMENT PLAN

A preferred management plan should use a strategy that best manages the Invasive Species on site with the minimum adverse impacts from control measures. Wherever possible, the goal of the management plan should be to eradicate the species from the site. Mechanical control, such as cutting or pulling, generally has the least adverse impacts, however, it is not effective on some deciduous woody plant species. Chemical control methods should be avoided, except in situations where chemical management would reduce adverse impacts on the environment. When chemical control is the only viable option, modest applications to cut stems or frill cuts are recommended. Foliar spraying is strongly discouraged because of the negative impact to non-target plant and animal species. Biological control, or use of living organisms as a control agent, has

been proven effective on some species. However, only well tested, scientifically documented biological control agents should be considered. The goal of biological control strategies should not be to eradicate the species, because if the target species is eradicated, the biological control agent often moves to a non-target species. Where plant removal is proposed, an alternative planting plan, using plants native to the region, should be provided (also see WPH2).

Staff is available to consult with applicants to determine the best management plan for Invasive Species. A variety of information which may assist in developing management plans is available on-line. Suggested websites include:

- https://massnrc.org/mipag/publications.htm
- https://www.massaudubon.org/nature-wildlife/invasive-plants-in-massachusetts
- The Massachusetts Invasive Plant List may be found at: https://www.mass.gov/service-details/invasive-plants

REFERENCES

See also the Wetlands, Open Space, and Community Design Technical Bulletins

REGIONAL POLICY PLAN DATA VIEWER

https://www.capecodcommission.org/RPPDataViewer

VERNAL POOL INFORMATION

The Natural Heritage and Endangered Species Program certifies vernal pools and has established criteria for their certification. Information may be found here: https://www.mass.gov/service-details/vernal-pool-certification

RARE SPECIES

Information on Rare Species, including current list of state listed species, forms requesting state review and comment, and other pertinent resources may be found at the Natural Heritage and Endangered Species Program website https://www.mass.gov/orgs/masswildlifes-natural-heritage-endangered-species-program

BIOMAP

MassWildlife maintains BioMap, a guide for protecting and stewarding lands and waters that are most important for conserving biological diversity in Massachusetts. BioMap includes Core Habitats and Critical Natural Landscapes as well as Local and Regional Components. BioMap can be explored here: https://biomap-mass-eoeea.hub.arcgis.com/

STATE WILDLIFE ACTION PLAN

The 2025 draft update to the Massachusetts State Wildlife Action Plan (SWAP) can be found at this link: https://www.mass.gov/service-details/state-wildlife-action-plan-swap

BIODIVERSITY CONSERVATION GOALS FOR THE COMMONWEALTH

The 2025 Biodiversity Conservation Goals for the Commonwealth were developed by the Massachusetts Department of Fish & Game in response to Massachusetts Executive Order No. 618 (Biodiversity Conservation in Massachusetts) and can be found here: https://www.mass.gov/info-details/biodiversity-goals-for-massachusetts

SITE AND SUBDIVISION DESIGN

See the Community Design Technical Bulletin.

Rural by Design, or Conservation Subdivision Design, both by Randall Arendt, provide detailed guidance about layout of new development in greenfield sites, designed to minimize impacts to habitat and views of significant landscapes.

HEALTHY SOILS ACTION PLAN

The Massachusetts Executive Office of Energy and Environmental Affairs developed the Healthy Soils Action Plan to protect, restore, and better steward soils across the Commonwealth: https://www.mass.gov/doc/healthy-soils-action-plan-2023/download. A companion to the plan, the MA Healthy Soils Guide is a collection of resources offering strategies and best practices for protecting soil health (https://masshealthysoils.org/guide/).

BIRD-FRIENDLY DESIGN GUIDELINES

The American Bird Conservancy developed a Bird-Friendly Building Design Guide that provides an overview of the threats glass poses to birds and solutions.

RESPONSIBLE OUTDOOR LIGHTING

DarkSky International's five principles for responsible outdoor lighting can be found here: https://darksky.org/resources/guides-and-how-tos/lighting-principles/

CAPE COD FRESHWATER POND BUFFER GUIDANCE

This comprehensive document is designed to help homeowners and municipalities preserve and protect ponds through responsible landscape management: https://capecodcommission.org/our-work/cape-cod-freshwater-pond-buffer-guidance