

# An Introduction to The Principles of Habitat Management



There are four key components to wildlife habitat: Space, Food, Cover, and Water. This guide is designed to be an introduction to these components. Additionally, it touches upon invasive species management which should be a component of all management plans. If this guide prompts any additional questions please reach out to Maine Department of Inland Fisheries and Wildlife – [Beginning with Habitat staff](#).

## Space

- How many acres do you have?
- What is the surrounding land use (commercial, residential, agriculture, forestry) and acreage?

## Food

- What food sources do you have for wildlife?
  - Hard mast
    - Acorns, beech nuts, etc.
  - Soft mast
    - Berries and fruits
  - Herbaceous materials
    - Grasses, sedges, etc.
    - Wetland and aquatic plants
  - Pollen sources
  - Prey sources
    - Insects/invertebrates
    - Small mammals Aquatic invertebrates (clams, mussels, ect)

## Cover

- What habitat types do you have and how much of each?
  - Upland forest
    - Hardwood
    - Softwood
    - Mix
  - Regenerating forests
  - Open fields
  - Wetland
    - Forested
    - Scrub/Shrub
    - Emergent
  - Streams

## Water

- What do you have for water sources?
  - Lakes and ponds
  - Rivers and streams
    - Perennial – streams that flow all year round during a typical year
    - Intermittent – streams that flows during certain portions of the year and is influenced by groundwater
    - Ephemeral – streams that typically only flows during spring melt off and after precipitation events
  - Temporary water sources
    - Vernal pools
    - Stormwater features
  - Anthropogenic water features such as farm and irrigation ponds, retention basins, stormwater filtration areas, etc.
- Connectivity
  - Is there anything interrupting the flow of water on your property?
    - Barriers such as dams
    - Malfunctioning culverts (undersized, perched, clogged)

## Invasive species

- What are invasive species?
- Are there invasive species present?
  - What species?
  - What level of infestation?

# Space



Understanding your space, and the space around you, is important when developing your management goals. The amount of space a species needs to feed, shelter, reproduce, and move, varies from species to species. When developing your management goals, it is important to understand the size of the space you have and the home range requirements of the species you are managing for. Home range is defined as the area that a species moves within to meet its needs. It will be difficult to manage for a desired species if you do not have the minimum space required. Recruiting your neighbors is an option to help increase space. If your space is limited, then consider learning what species may utilize a home range that is the size of your space and adopt appropriate principals. Information is available at the [Beginning with Habitat](#) website.

## What can you do?

- Determine the amount of space you have available to manage
- Consider partnering with neighbors to increase the space being managed
- Determine the special needs of the species you desire
- Determine what species' home range size fits within your manageable space
- Use the [Beginning with Habitat](#) website to learn about desired species
- Use the [Online Map Database](#) to determine the amount of undeveloped space available
- Refer to the home range tables in Appendix A

# Food



Food is a key component of providing wildlife habitat. Encouraging the production of diverse food options is a critical part of managing for better wildlife habitat. By encouraging the growth of native and varied food sources, you can help meet the nutrient needs of wildlife throughout the seasons. Nuts, seeds, fruits, and berries are referred to as “mast” and are important and nutrient rich sources of wildlife food. Mast can be broken down to “hard mast”, acorns and nuts and seeds, and “soft mast” such as berries and fruits. Herbaceous plants such as, grasses, sedges, rushes, aquatic plants, and wildflowers, provide food for mammals, birds, and pollinators. Insects, small mammals, and fish are also important food sources.

## Hard Mast

- Acorns
- Beechnuts
- Beaked Hazelnuts
- Seeds

## Soft Mast

- Apples
- Raspberries
- Blueberries
- Strawberries
- Winterberries
- Viburnums berries

## Herbaceous browse

- Grasses, Sedges, and rushes
- Agricultural crops

## Pollen Sources

- Wildflowers (Goldenrods, Asters, ect)
- Clover

## Other Food Sources

- Insects
- Small mammals
- Aquatic foods
  - Amphibian eggs
  - Tadpoles
  - Fish
  - Mussels/clams
  - Wetland plants (cattails, skunk cabbage, rushes, grasses, and sedges)

## What can you do?

- [Encourage the production of hard mast species](#)
  - Promote hard mast production by selectively harvesting trees around your mast producers
    - This increases sunlight on your desired trees and decreases competition
  - Retain hard mast trees in all age classes
  - Plant additional hard mast sources
- Encourage the growth of soft mast species
  - [Plant or maintain native fruit bearing trees](#)
  - [If present, prune and release apple trees](#)
  - If utilizing ornamental and fruit bearing plants/trees, ensure they are not an invasive species
  - [Plant fruit bearing species](#)
- Encourage the growth of herbaceous plants
  - Have a diverse array of native plant species
  - Delay mowing to allow herbaceous plants to go to seed
  - [Provide a diverse array of native pollen sources](#)
    - Where possible, allow pollen-bearing plants to grow until the end of the season. This allows them to go to seed and provide additional food
  - [Create or maintain openings within your woods](#)
    - These opening allow for increase herbaceous growth which helps increase insect activity. This allows more forage opportunities for insect eating birds.
  - If clover is present, allow it to grow to provide food and pollen
- Create habitat that encourages insect production and small mammal habitat
  - [Herbaceous openings](#)
  - [Downed wood and brush piles](#)
    - Leaving full length trees, and debris, of a variety of diameters is beneficial
  - [Standing dead trees](#)
  - Retain leaf litter

- Delay mowing
- Aquatic foods
  - Ensure that erosion is not filling in water sources and decreasing water quality and utilize proper [best management practices](#) around water sources
  - [Proper stream crossing](#)
  - To optimize productivity for wildlife, consider establishing a vegetative buffer around water sources
    - Contact your local code enforcement officer for guidance on activities within the [shoreland zone](#)
- Install and maintain bird feeders
  - [Be sure to follow proper guidance to avoid wildlife conflict](#)

# Cover



It is beneficial to maintain a forest with a diverse age structure. Wildlife will often use different parts of a forest throughout their life cycle. For example, wood frogs need vernal pools for breeding and egg laying but actually spend 98% of their lives in surrounding forested wetlands and upland forests. By providing a diverse age structure, you can provide a number habitat for a diverse array of species.

## Overstory

- Forest canopy, 30+ feet tall
- Provides perching opportunities
- Provided nesting opportunities
- Hard mast (such as acorns and beechnuts) is produced in the overstory
- Maintaining an overstory is important for wildlife and for providing “seed trees” for the future
- Standing dead trees provide cover, food, and nesting locations

## Midstory

- 6-30 feet tall
- Provides nesting opportunity for a variety of species
- Contributes to the production of hard mast, soft mast, and other forage opportunities
- Provides trees for the next generation of overstory trees
- Standing dead trees provide cover, food, and nesting locations

## Understory

- 0-6 feet tall
- Consists of shrubs and small trees and saplings
- Provides nesting habitat for a variety of species
- Downed wood (also known as coarse woody material) provides perching, hiding, and drumming locations for birds
- Provides cover for small mammals and amphibians
- Brush piles, natural and artificial, provide cover habitat for insects and cover for birds and small mammals
- Leaf litter and forest debris provide cover and forage opportunities for small mammals and amphibians

## What you can do?

- Maintain diverse age structure through harvesting and planting
- [Retain as many standing dead trees as possible in the upper story and mid story \(unless there is a safety concern\)](#) Maintain downed wood (tree length) and coarse woody debris (branches and sticks) and consider creating more downed wood
- Allow forest debris like twigs, sticks, and leaf litter to persist
  - If leaf litter must be removed, delay it until the spring (May) and after many song birds have migrated through
  - By retaining leaf litter, you are creating increased forage opportunities for small insects who reside in the leaves
- [Create brush piles for wildlife cover and insect production](#)
- Delay mowing in fields
  - When possible delay mowing in large fields until the late summer to taller grassland habitat
- Provide bird, bat, and pollinator boxes to increase nesting and roosting opportunities



# Water



Water is essential for all wildlife. Wildlife rely on water for hydration, thermoregulation, hygiene, food sources, habitat, and travel. Water occurs on the landscape in a variety of forms including, but not limited to, lakes, ponds, rivers, streams, and vernal pools. Protecting your water resources and using best management practices around them is an essential component of your management.

## Water Sources

- Lakes & Ponds
- Rivers & Streams
- Bays and Oceans
- Coastal Wetlands and Salt Marshes
- Freshwater Wetlands
- [Vernal pools](#)
  - [Conserving Maine's Vernal Pools](#)

## What can you do?

- Determine what water resources you have on site
  - Utilize [Beginning with Habitat maps](#) to assist you
  - Explore the Beginning with Habitat [Conservation Library](#)
- Make sure that artificial sources aren't blocking or filling your water resources
  - [Contact Beginning with Habitat staff](#) if this is the case
  - Examples may include:
    - Undersized culverts
    - Perched culverts (culverts elevated about the level of the stream)
    - Clogged culverts
- Maintain a healthy vegetated buffer around water resources
  - This contributes to shoreline stabilization, erosion control, and food sources

- Riparian habitat is generally defined as a 250ft wide strip around great ponds (>10 acres), rivers, coastlines and wetlands 10 acres or greater and a 75 foot buffer around streams.
- Working with a forester, biologist, or other resource professional can help you design a management plan that reduces impact to these buffers

# Invasive Species



An invasive species is a non-native species (including seeds, eggs, spores, or other propagules) whose introduction causes or is likely to cause economic harm, environmental harm, or harm to human health. The term "invasive" is used for the most aggressive non-native species. These species grow and reproduce rapidly, and can spread with or without human help, causing major disturbance to the areas where they are present. Invasive species often outcompete and kill of native species that are far more valuable to wildlife.

## Invasive plants

- [Invasive plant list](#)

## Invasive pests

- [Invasive pest list](#)

## What can you do?

- Review guidance resources prepared by the [Maine Natural Areas Program](#)
- Evaluate your property and identify the [invasive species](#) on site
- Remove invasive species and plant non-invasive alternatives
  - Utilize approved practices for invasive removal
  - If inundation is too large to handle independently consider hiring a professional

- [Licensed companies offering services for control of invasive terrestrial plants](#)
  - [Non-herbicide or herbicide-plus invasive plant control businesses](#)
- Contact your [district forester](#) to discuss invasive pest/insects

# Appendix A

## Habitat Block Size Requirements for Wildlife in Maine: UNDEVELOPED

RACCOON	WOODCHUCK	KESTREL
HARE	DEER	RED-TAIL HAWK
COYOTE	MUSKRAT	HORNED OWL
SMALL RODENT	MOOSE	RAVEN
PORCUPINE	RED FOX	BARRED OWL
BOBCAT	SONGBIRDS	OSPREY
COTTONTAIL	SHARP-SHINNED HAWK	TURKEY VULTURE
BEAVER	BALD EAGLE	TURKEY
BLACK BEAR	SKUNK	MOST REPTILES
SQUIRREL	COOPER'S HAWK	GARTER SNAKE
WEASEL	HARRIER	RING-NECK SNAKE
MINK	BROAD-WINGED HAWK	MOST AMPHIBIANS
FISHER	GOSHAWK	WOOD FROG

## Habitat Block Size Requirements for Wildlife in Maine: 100–499 Acres

RACCOON	WOODCHUCK	KESTREL
HARE	DEER	<del>RED-TAIL HAWK</del>
<del>COYOTE</del>	MUSKRAT	HORNED OWL
SMALL RODENT	<del>MOOSE</del>	<del>RAVEN</del>
PORCUPINE	RED FOX	BARRED OWL
<del>BOBCAT</del>	SONGBIRDS	OSPREY
COTTONTAIL	SHARP-SHINNED HAWK	TURKEY VULTURE
BEAVER	<del>BALD EAGLE</del>	TURKEY
<del>BLACK BEAR</del>	SKUNK	MOST REPTILES
SQUIRREL	COOPER'S HAWK	GARTER SNAKE
WEASEL	HARRIER	RING-NECK SNAKE
MINK	BROAD-WINGED HAWK	MOST AMPHIBIANS
<del>FISHER</del>	<del>GOSHAWK</del>	WOOD FROG

## Habitat Block Size Requirements for Wildlife in Maine: 1-19 Acres

RACCOON

HARE

COYOTE

SMALL RODENT

PORCUPINE

BOBCAT

COTTONTAIL

BEAVER

BLACK BEAR

SQUIRREL

WEASEL

MINK

FISHER

WOODCHUCK

DEER

MUSKRAT

MOOSE

RED FOX

SONGBIRDS

SHARP-SHINNED HAWK

BALD EAGLE

SKUNK

COOPER'S HAWK

HARRIER

BROAD-WINGED HAWK

GOSHAWK

KESTREL

RED-TAIL HAWK

HORNED OWL

RAVEN

BARRED OWL

OSPREY

TURKEY VULTURE

TURKEY

MOST REPTILES

GARTER SNAKE

RING-NECK SNAKE

MOST AMPHIBIANS

WOOD FROG

