Karner Blue Butterfly Fact Sheet

Karner Blue Butterfly
Lycaeides melissa samuelis

New York Status: **Endangered**

Federal Status: **Endangered**

Description

The Karner blue is a small butterfly with a wing span of approximately one inch. In the male, the upper surface of all four wings is a deep violet-blue fringed with white. In the female, the upper surface is a dusky brownish blue with orange spots on the edge of the hindwing. The lower surface is a pale silver with white-ringed black spots and rows of bright orange and blue markings near the edge of the hindwings. The protective coloration of the larva, which reaches half an inch in length before changing into a pupa, perfectly matches the green leaves of the vegetation. The larva is covered with very fine hairs.

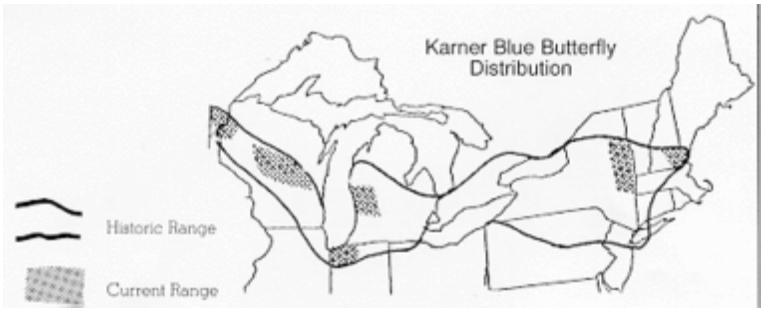
Life History

Like all butterflies, the Karner blue has four stages in its life cycle - the egg, the larva (caterpillar), the pupa (chrysalis), and the adult (butterfly). There are two generations per year. The first generation adults appear in late May to mid-June. Females lay eggs on the underside of a leaf or stem of the food plant, blue lupine (*Lupinus perrennis*). These eggs hatch in seven to eight days. Forty to fifty percent of the eggs survive to the adult stage. The resulting second brood adults, emerging in mid-July to early August, lay their eggs singly in dried lupine seed pods or near the ground on the stems. Eggs of the second brood overwinter, to hatch the next May. Karner blue adults are nectar-feeders, aiding in the pollination of a variety of wildflowers. The larvae, however, are highly specialized, feeding exclusively on the wild blue lupine leaves. Without blue lupine, the Karner blue would not survive.

Distribution and Habitat

The Karner blue is found in scattered localities from Minnesota to New Hampshire. In New York, the butterfly is found in certain parts of the Hudson Valley sand belt which extends from the Albany Pine Bush north to the Glens Falls area.

Within its range, this species is restricted to dry sandy areas with open woods and clearings supporting wild blue lupine. This type of habitat is usually associated with pitch pine/scrub oak or oak savannah communities that are maintained by fire at an early stage of plant succession.



Status

The Karner blue is experiencing a decline primarily due to human activities such as agriculture, urbanization and fire suppression. The sandy habitat essential to the blue lupine, and therefore the Karner blue, occurs mostly along river valleys and outwash plains. Because of the location and topography of such areas, they have been heavily favored as settlement sites. Extinctions of entire populations of the Karner blue have occurred around large urban centers such as Chicago and New York City. Other populations, such as those in the Albany Pine Bush, have been reduced both by habitat destruction from urbanization and by loss of lupine through natural succession resulting from fire suppression. The most intact populations remain in Saratoga County.

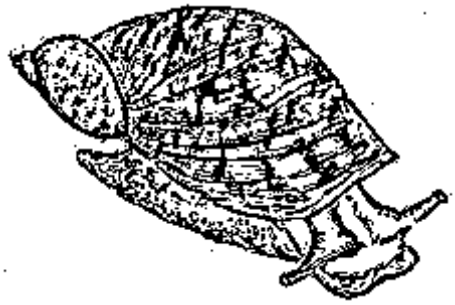
Management and Research Needs

Research is being conducted to develop methods of enhancing or creating habitat suitable for the Karner blue butterfly, in particular, the establishment and propagation of wild blue lupine. Methods used to establish or restore appropriate habitat conditions for blue lupine and the Karner blue include mowing and controlled burning. Protecting habitat from development is also important in preserving this species. Several of the largest populations of the Karner blue in New York are currently protected and managed by the Department of Environmental Conservation under cooperative agreements with landowners.

A recovery strategy for the Karner Blue is being developed by a cooperative working group of DEC, NY'S Office of Parks, Recreation and Historic Preservation, The Nature Conservancy, and the Albany Pine Bush Commission. The efforts of this partnership, involvement of local towns and counties, and the cooperation of private landowners offer the greatest hope for the recovery of this unique species in New York.

Chittenango Ovate Amber Snail Fact Sheet

Chittenango Ovate Amber Snail
Novisuccinea chittenangoensis



New York Status: **Endangered**

Federal Status: **Threatened**

Description

The Chittenango ovate amber snail has a translucent shell with 3 1/2 whorls on an elongated spire. Maximum size is about .9 inch (23 mm). The shell is glossy, off-white to pale or pinkish yellow and is marked with growth wrinkles and lines. The soft body of the snail is a pale, translucent yellow. The outer covering of the soft parts, called the mantle, is pale yellowish-olive and is often marked with black streaks and blotches. A prominent dark blotch can be found on the upper side of the foot.

Life History

This species is a terrestrial snail with a life span of about two and a half years. It is hermaphroditic (individuals having both male and female reproductive organs) and mates from April until June. Four to fifteen transparent, jelly-like eggs are laid about a month after mating. The young snails hatch in 2-3 weeks, measuring .04 inch (1 mm).

Chittenango snails apparently feed on microscopic algae and other species of microflora that grow on the rocks and vegetation which occur in the spray zone of the waterfall around which they live. They ingest a lot of calcium carbonate for shell development. Adapted to relatively constant environmental and climatic conditions, including a clean water supply, the snail is intolerant of sudden changes.

Distribution and Habitat

The Chittenango snail appears to have evolved during the Pleistocene epoch. Similar snails occurred in isolated pockets from Tennessee to Ontario and as far west as Iowa and Minnesota. Although fossil shells similar in appearance to the Chittenango snail have been found at other sites, live specimens can be found at only one location in the entire world: a 100 foot high waterfall in central New York. The waterfall lies within Chittenango State Park which is administered by the New York State Office of Parks, Recreation and Historic Preservation.

The preferred habitat is the vegetated slopes adjacent to the waterfall, with their moderate climate and high humidity. Chittenango snails are found among patches of touch-me-nots, mosses and liverworts.

Status

The Chittenango ovate amber snail was described as being "abundant" when it was first discovered at Chittenango Falls in Madison County in 1905. The total population was estimated at less than 500 individuals in 1982, however, and had declined to fewer than 25 by 1990.

The Chittenango snail is listed as Endangered because of its extremely limited range and apparently declining numbers since discovery. Its existence at only one site makes it extremely vulnerable to a catastrophic event which could destroy the entire population. Factors thought to adversely affect the snail include water pollution, inadvertent habitat disturbance by humans, environmental sensitivity, and the introduction of a closely related pest species. Most of the Chittenango Creek watershed is used for agriculture, with fertilizers, herbicides and pesticides entering the drainage. In the winter months, road salt causes high salinity. Although water quality appears to be generally high, the effects of short-term pulses of polluted runoff from these agents may be deleterious to the population.

In 1984, a closely related snail, similar to *Succinea putris* of Europe, was found at Chittenango Falls. Probably introduced to the falls by accident, this snail is apparently out-competing the Chittenango snail. Recent censusing of the snails indicates the pest species outnumbers the Chittenango ovate amber snail by at least 50 to 1.

Management and Research Needs

The New York State Department of Environmental Conservation took a lead role in initiating and completing a recovery plan for this species. In March 1983, the U. S. Fish and Wildlife Service gave final approval to the Chittenango Ovate Amber Snail Recovery Plan. This plan provides a detailed outline of activities essential to the protection and perpetuation of a self-sustaining colony.

Recovery of this species in part requires strict protection of its habitat and a reduction of contaminants entering the creek. The Chittenango State Park receives more than 100,000 visitors annually. Park managers direct visitors away from the critical habitat area and the immediate area of the falls is relatively inaccessible. Despite these safeguards, some

trampling and overturned rocks have been observed. Any disturbance can severely affect reproductive success.

Ensuring this unique species continued existence and hopefully augmenting its population requires a captive colony of snails. Efforts to establish a captive colony of Chittenango snails began in 1992. A collection of four adult snails produced approximately 40 hatchlings. As expected, initial results indicate that Chittenango snails do not reproduce or grow as quickly as the pest species of snail, but they are at least encouraging in that the species can be maintained and produced in captivity.

Additional detailed studies on the ecology and life history of the Chittenango ovate amber snail are needed.

Dwarf Wedge Mussel Fact Sheet

Dwarf Wedge Mussel
Alasmidonta heterodon

New York Status: **Endangered**

Federal Status: Endangered

Description

The dwarf wedge mussel is a small freshwater mussel that rarely exceeds 1.5 inches (38 mm) in length. It is brown or yellowish-brown in color. Adult mussels are filter-feeders, feeding on algae and other small suspended particles. They spend most of their time buried almost completely in the bottom of streams and rivers.

Life History

The dwarf wedge mussel is sexually dimorphic, with separate sexes, unlike some mussels which are hermaphroditic, with individuals having both male and female reproductive organs. Even so, the dimorphism is very subtle; routine determination of sex in dwarf wedge mussels is at best difficult. Male dwarf wedge mussels release sperm into the water column during the mid-summer or fall. Females collect the sperm while siphoning water for food; the eggs are then fertilized and kept within the female until they are released the following spring. By then, each egg has developed into a parasitic larvae called a glochidium. After release from the female, the glochidium attaches itself to a fish with the aid of a small hook-like appendage. Mussel glochidia are generally species-specific and will only live if they find the correct host. With dwarf wedge mussels, the right hosts are small bottom-dwelling fish,

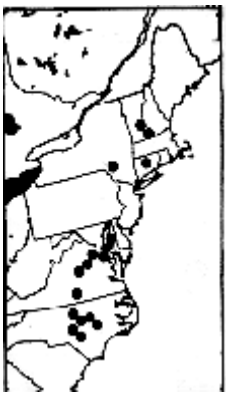
the tessellated darter (*Etheostoma olmstedi*) and the mottled sculpin (*Cottus bairdi*). It appears that the glochidium receives little nutrition from the fish, but uses it only as a means of dispersal. After several weeks, the glochidium detaches itself from the unharmed fish and drops to the river bottom. It is then a juvenile mussel.

1. *Eggs, carried in the female's gills, are fertilized as sperm-laden water passes through.*
2. *The "glochidia" attach to a host fish where they develop for a time.*
3. *Juvenile mussels detach and sink to the bottom where they continue to develop.*

Dwarf Wedge Mussel Life Cycle

Many mussels have lifespans that range upwards of 20, 30 or even 100 years. The dwarf wedge mussel is considerably different in this regard, though, as it appears to only live about 10 years. Adults must therefore be constantly replaced to maintain a viable population.

Distribution and Habitat



The dwarf wedge mussel is found at 17 sites in seven Atlantic Coast drainages. These are located in New Hampshire, Vermont, Connecticut, New York, Maryland, Virginia and North Carolina.

Typical habitat for this mussel includes running waters of all sizes, from small brooks to large rivers. Bottom substrates include silt, sand and gravel, which may be distributed in relatively small patches behind larger cobbles and boulders. The river velocity is usually slow to moderate. Dwarf wedge mussels appear to select or are at least tolerant of relatively low levels of calcium in the water.

Status

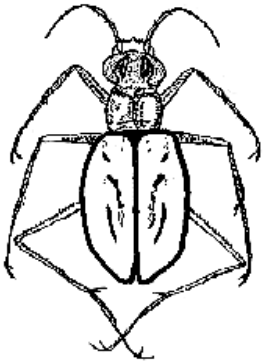
This mussel was once found at 70 locations in 15 major Atlantic Coast drainages. Its numbers have declined drastically; most populations that remain number in the 100's. The two exceptions are the lower Neversink River in Orange County, where there appears to be at least ten thousand if not tens of thousands of dwarf wedge mussels, and the Tar River in North Carolina.

Water pollution, including sediments and chemicals from agriculture and other development projects such as golf courses, have been implicated in the mussel's decline. Also, impoundments and channelization may have eliminated the mussel from former habitat.

Management and Research Needs

Studies by the Institute of Ecosystem Studies at Millbrook, New York and the Nature Conservancy are presently underway to better understand the habitat requirements of the dwarf wedge mussel. It is still largely unknown what determines the location of mussel beds on the river bottom. More detailed population surveys in the Neversink River will be done to determine the age structure, distribution and size of the New York population. Research will focus on potential threats to the mussels such as the effects of dams and agricultural practices.

Northeastern Beach Tiger Beetle Fact Sheet



Northeastern Beach Tiger Beetle
Cicindela dorsalis dorsalis

New York Status: **Extirpated**
Federal Status: **Threatened**

Description

The northeastern beach tiger beetle has been described as a handsome, sand-colored insect. The white to light tan wing covers on the insect's back are often marked with fine dark lines. The head and thorax (chest area) are bronze-green. Overall length varies from 1/2 to 3/5 inch (13-15.5 mm). True to their name, they grasp prey with long, sickle-like mandibles (mouthparts) in an aggressive, "tiger-like" manner. Larvae are also predatory and similarly equipped.

Life History

Northeastern beach tiger beetles have a full, two-year life cycle. Adults emerge in late June, reach peak abundance by mid-July, and decline through early September. They feed, mate and bask at the water's edge on warm, sunny days. Some adults are also active on warm, calm evenings. High body heat is necessary for maximum predatory activity. Foraging occurs in the damp sand of the intertidal zone; prey species include lice, fleas, and flies. Adults also regularly scavenge dead crabs and fish.

Mating and egg-laying occur from late-June through August. Females deposit their eggs in the sand after mating, higher up the beach in the dunes. Eggs hatch and larvae appear in late July and August. Larvae experience three developmental stages or "instars." Most larvae reach the second instar by September and a few reach the third instar well into November, when larvae are still active.

Most overwinter as second instars. Next year, these same individuals overwinter again, this time as third instars. Overwintering occurs high up the beach; storms and wave activity are thus avoided. Both second and third instars emerge from winter inactivity in mid-March. Third instar larvae emerge, pupate in the bottom of their burrows, and re-emerge as winged adults in June, two full years after the eggs were laid.

Larvae live in vertical burrows located in the upper intertidal to high drift zone, where prey is most abundant. Larvae forage from their burrows, preying on passing insects. Their primary food sources are beach fleas, lice, flies and ants. Larvae are regularly covered during high tide; sand moisture is important. Larvae lack a hard shell and are subject to desiccation. They avoid hot, dry conditions. During the summer months they are inactive, going through a period of aestivation. With each successive stage of development, larvae grow in size and burrow deeper, going from 4 to 6-7 to 9-14 inches into the sand.

Populations of tiger beetles normally experience very high larval mortality and dramatic year-to-year, two to three fold fluctuations in abundance, sometimes resulting in local extinction. Weather factors such as flood tides, hurricanes, erosion and winter storms, mortality due to predators and parasites, and recreational beach use all contribute to the population declines. Natural enemies of adults include robber flies (Asilidae), birds and spiders. Larvae are preyed upon by parasitic, wingless wasps (Methocha), which lay their eggs on the tiger beetle larvae. The larval wasps develop by eating the larval tiger beetles.

Distribution and Habitat

Early records indicate that the northeastern beach tiger beetle occurred in "great swarms in July" along coastal beaches from Martha's Vineyard south to New Jersey and on both sides of Chesapeake Bay in Virginia and Maryland. It was very common on Rhode Island and Long Island beaches. Today, it is extirpated from the northern Atlantic Coast with the exception of a tiny population of fewer than 40 adults on Martha's Vineyard, Massachusetts. This is the only known population north of Maryland.

Over 50 sites occur in the Chesapeake Bay area; half of these have over 100 adults with 16 having over 500. Ideal habitat for the adult beetles and their larvae are wide, undisturbed, dynamic, fine sand beaches. The most important consideration, though, is limited use and disturbance by vehicles and humans.

Status

The northeastern beach tiger beetle is currently extirpated from New York State. During the last 20 years, the beaches on Long Island have been subject to increasing vehicular traffic. Surf fishermen, commercial seiners, and beach recreationists in general use 4-wheel-drive trucks and other off-road vehicles on the beaches, especially in the intertidal zone. Foot traffic can be heavy. The impacts on larvae can be considerable, compacting burrows and crushing individuals. The fact that the tiger beetle is in the larval stage for two years increases the significance of these disturbances.

Although there are many populations in the Chesapeake Bay area, most are threatened by activity associated with human population increases. Developmental pressure, with concurrent beach alteration, beach stabilization structures, and recreational activities, have greatly altered the beetle's habitat along the Atlantic Coast. The continual disturbance or disruption of occupied habitats has eliminated many populations. A series of nearby or contiguous populations is probably necessary to naturally re-establish populations that have been locally depleted or extirpated. The decrease in habitat availability and a reduced number of populations make it difficult for beetles to recover from population declines. Long-term survival of this species is probably dependent upon its ability to disperse for considerable distances to colonize transient or well separated habitats, something which is perhaps unlikely without outside help. While mark-recapture study results have shown the beetles capable of traveling 5-12 miles from their original capture site, it might not be enough to reach the nearest suitable habitat.

The natural balance between the beetles and their primary predators has also been altered by habitat degradation and other factors. In some cases, these natural enemies may now pose a significant threat to the beetles.

The northeastern beach tiger beetle is listed as endangered by Maryland and Massachusetts. Threatened status has been proposed by Virginia.

Management and Research Needs

Detailed knowledge of certain aspects of distribution, annual and seasonal abundance, and ecology have only recently been gained, and much remains to be learned. Controlling access to beach areas and limiting foot traffic and off-road vehicle use are being considered and/or implemented at known locations of the northeastern beach tiger beetle. There are also a few remote islands in New England and New York (Gardiners Island) that need to be searched and checked or re-checked for the presence or absence of additional populations.

The objective of recovery efforts is to restore this threatened species to a secure status within its historical range. This could be accomplished by translocating beetles. Reestablishment methodology needs to be developed and survivorship maximized. Research is needed to determine whether the population on Martha's Vineyard is the same subspecies as those in the Chesapeake Bay area, the likely source of beetles for translocating. Most potential translocation sites are not currently suitable due to beach traffic, etc. This will need to be addressed prior to translocation. Also, existing sites in the Chesapeake Bay area need to be protected. Access must be controlled; barriers, like fencing, must be erected and areas patrolled. Habitat management will also be necessary. Phragmites control measures have been implemented in some instances. Further study is also needed to determine the effects of oil spills and other pollutants on beetle larvae. Another issue relates to beach nourishment (adding sand to a beach) programs, which could potentially destroy larvae directly, while benefiting the beetle in the long run.

American Burying Beetle Fact Sheet

American Burying Beetle
Nicrophorus americanus

New York Status: **Extirpated**

Federal Status: **Endangered**

Description

The American burying beetle, also known as the "giant carrion beetle," is the largest member of its genus in North America. Most adults are 1.2 inches (30 mm) in length, though they vary from 1.0-1.4 inches (25-35mm). This beetle can be easily identified by its distinctive orange-red on shiny black coloration. One colored mark covers the frons, an upper frontal head plate, and a similarly colored plate exists just behind the head. Both contrast sharply with the black body color. Wings are black with two pairs of scalloped red spots and the tips on the antennae are orange. The sexes can be distinguished by a distinctively shaped orange-red facial mark below the frons. Males have a large rectangular mark, while females have a smaller triangular mark.

Burying beetles often carry swarms of orange-colored mites on their body. They help keep beetles and carcasses clean of microbes and fly eggs.

Life History

American burying beetles are active from late April through September. Adults are nocturnal, active when temperatures exceed 15C (60F). Most reproductive activity and carcass burial occur in June and July. Reproduction depends on the availability of carrion. American burying beetles select carcasses larger than other burying beetles. The carcasses of larger species (i.e. pheasant chicks) are used as a food source during the breeding season. Optimum weights are between 100 and 200 grams. Carcass weight is critical to successful reproduction; larger (>100 g) is better. Birds and mammals are used equally and are the preferred carrion. A positive correlation exists between carcass weight and number of larvae produced.

Males find carcasses at night, soon after it is dark. They then emit pheromones (sex attractants) to attract females. Males and females compete amongst themselves for a carcass, with size generally determining who claims the prize. Carcasses are buried on the spot or rolled into a ball, carried elsewhere (up to 1 m), then buried, usually before dawn. Carcasses weigh up to 200 times a beetle's own weight. The beetles move a carcass by lying on their backs and balancing the carcass above them, then walking their legs to move the load forward as if on a conveyor belt.

A brood chamber is constructed adjacent to the carcass while it is being buried. About two days after burying the carcass, the female lays her eggs in an escape tunnel leading off the brood chamber. One parent, usually the female, stays with the eggs. Larvae hatch in approximately four days and are cared for and fed by the adult. This level of parental care is quite rare for a non-social insect. Development of larvae is usually completed in 6-12 days, at which time the brood disperses to pupate in the soil nearby. They emerge as adults 48-60 days later in July and August, then disperse with their parents. The young, now adults, reproduce the following June or July. They overwinter, probably singly, in the soil. The parents die off after reproduction or during the subsequent winter.

American burying beetles are scavengers, attracted to decaying vegetation and carrion. Adults feed on a wide range of species as carrion. They also consume live insects.

Distribution and Habitat

Although this species historically ranged from southern Maine to South Dakota and south to Texas and Florida (temperate eastern North America), and was widely distributed within its range, the American burying beetle is currently known to exist in only two locations. One population is on Block Island, Rhode Island. The other is a recently discovered population in eastern Oklahoma. Habitats occupied on Block Island include maritime shrub thickets and grazed fields (coastal moraine grasslands). Oklahoma sites are representative of the forest/pasture ecotone and open pastures in a ridge and valley area of that state.

Oak-hickory and bottomland forests and grasslands predominate. Well-drained soils and a well developed detritus layer are characteristic of all sites. Open agricultural land is frequently utilized. It is unlikely that vegetational structure and soil type were historically limiting, in a general sense, considering the species' wide geographic range. While soils suitable for carcass burial are essential, it is probably carrion availability that is more important. Vegetation and soil do influence the potential prey base available to the beetles, though. Historically, American burying beetles depended upon large aggregations of 100-200 gram carcasses; ring-necked pheasant chicks were ideally suited. Today on Block Island, large 100-200 gram carcasses are used from six bird species, including pheasants and woodcock. Twice as abundant, small carcasses (<100 g) are also utilized.

Status

In addition to the known populations in Rhode Island and Oklahoma, American burying beetles were collected in Ontario, Kentucky, Arkansas, Missouri and Nebraska as late as 1970. If the species still exists in these areas, it is very localized.

The decline of American burying beetles has been underway for almost a century. Populations were largely gone by the 1920's. The prevailing theory for the decline involves habitat loss and fragmentation, which led to a greatly reduced carrion food-base. With habitat fragmentation, high population densities of many indigenous species were no longer possible. Species composition possibly changed. Changing land use patterns resulted in increased acreage of agricultural land; species composition in these habitats also changed. Mice were more plentiful, but at 25 grams were too small for the beetles. Passenger pigeons and prairie chickens disappeared. Turkey, waterfowl and shorebird populations declined. Prey species were generally less plentiful. Widespread cutting of forests increased edge habitat, which led to more predators and scavengers such as foxes, raccoons, opossums, skunks and crows. All competed with the beetles for carrion. The optimum-sized, carrion food-base was reduced throughout the beetle's range. The beetle disappeared.

Other theories for the decline exist. DDT was unlikely responsible, for the decline had occurred 25 years before DDT was used. A species specific disease is unlikely, though not impossible. Populations of other carrion beetle species have remained largely intact. American burying beetles appear to have broad habitat tolerances, so direct habitat loss was unlikely responsible initially. Once populations of burying beetles become isolated, though, habitat loss can become an important factor. Movements between habitats occurs less frequently. Genetic variation suffers. Interspecific competition at the genus level also comes into play once a species is geographically isolated.

Management and Research Needs

Much has been done to understand the life history of the American burying beetle and promote its recovery. A recovery plan was prepared by the U. S. Fish and Wildlife Service. The plight of the American burying beetle was publicized. Factors responsible for the decline were investigated. Information was solicited on all collection records. Studies of reproductive ecology and population status were conducted. Surveys of historical collection localities were carried out. Captive breeding populations were established. Captive-raised

beetles were reintroduced to a historic site at Penikese Island, Massachusetts. The population there is being monitored and added to as necessary.

The primary goal of ongoing recovery strategies is to protect the two known populations. Breeding populations will be maintained and additional reintroductions carried out. Further studies on ecological relationships, interspecific competition, and historical land use will be conducted. Searches for additional populations will be carried out. An information and education program will be implemented.

Praying and Chinese Mantises

Praying mantis - Mantis religiosa
Photo: Susan L. Shafer

Did You Know?

- They are fearsome predators, eating insects, spiders, frogs, lizards, and even small birds!
- The female will typically bite off the male's head during or after mating.
- They are the only insects that can turn their heads 180 degrees, which helps them spot prey. Their excellent eyesight allows them to detect movement up to 60 feet away.
- Because they blend in well within their environment, resembling a leaf or a stem, they can sit and wait to ambush their prey, and strike at a remarkable speed of about one-twentieth of a second.
- The Praying Mantis and Chinese Mantis were introduced to North America in the late 1800s to help rid crops and gardens of pests.

What to watch for:

Size:

3 to 4 inches in length

Chinese mantis -Tenodera sinensis
(Photo: Ronald Gizzi II)

Appearance:

Mantises are well camouflaged, adapting colors that help them blend in with the plants they live near. Typically they are green or brown. As adults they have wings with spiny front legs that are used for grasping prey. Their egg cases are straw-colored and look like a piece of shredded wheat breakfast cereal about the size of a child's thumb. The egg cases overwinter and in the spring a nymph hatches that resembles a small adult lacking wings.

Where to watch:

Mantis egg case

Look carefully at plant stems or leaves on tall plants, flowers, shrubs, or grasses in meadows or gardens. One must have a keen eye to spot this well camouflaged creature. Egg cases can be spotted throughout the winter by looking closely at plant stems or the underside of leaves that remain on trees and shrubs. They can also be found attached to stems of tall grasses and weeds, especially in overgrown fields.

When to watch:

Best time is during the spring and summer in the daytime.