

**THE DRAGONFLIES AND DAMSELFLIES
OF THE COVE POINT LNG SITE
CALVERT COUNTY, MARYLAND**

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Introduction

The Cove Point Liquid Natural Gas Site (Cove Point Site) consists of 900 acres of undeveloped property in Calvert County, Maryland. The property is owned by the Cove Point LNG Limited Partnership and approximately 600 acres are subject to a conservation easement that was granted to the Maryland Environmental Trust and The Nature Conservancy to oversee.

The Cove Point Site borders the western shore of the Chesapeake Bay, just south of Calvert Cliffs. A wide variety of pristine and managed aquatic water habitats occur at the Site including marshes, ponds, streams, and seeps.

A survey was conducted for the dragonflies and damselflies of the Cove Point Site during 1998 and 1999 under a Cove Point Natural Heritage Trust Research Contract. Field data were collected on June 5, July 7, July 29, August 22, September 11, September 30, October 14 and December 2 in 1998. In 1999 field data were collected on January 3, March 31, April 23, April 30, May 21, June 6, July 8, September 3, and October 7. The survey was based mostly on adult odonates, but limited cast skins and larvae were also sampled. The species, date and habitat (along with any note-worthy behavior or life-history observations) were recorded for 10,916 individual dragonflies and damselflies over the course of the survey.

Fifty-three (53) species of dragonflies and damselflies were recorded at the Cove Point Site during the 1988-1999 season. Twenty-four (24) species were first records for Calvert County. One species, *Gomphus rogersi*, is ranked as S1 in Maryland. Two other species *Cordulegaster bilineata* and *Somatochlora filosa* have tentative ranks of S2, while six species *Archilestes grandis*, *Amphiagrion saucium*, *Anax longipes*, *Gomphaeschna furcillata*, *Celithemis fasciata*, and *Libellula axilena* have tentative ranks of S3.

I would like to thank Ruth Mathes and the other members of the Science Advisory Group, and the biologists who were concurrently conducting surveys at Cove Point (especially Brent Steury, Arnold Norden, and Barry Knisley) for their support and knowledge of Cove Point. I would also like to thank Kim Hahn of the head office, and the always helpful Security Guards for helping make my Cove Point visits enjoyable and safe.

Dragonflies and Damselflies of Cove Point LNG Site

Key :

(*) = new species record for Calvert County

(**) = rare or unusual -- should be protected and monitored

(v) = voucher specimen taken and/or photographed

(S1, S2, S3, S4, S5) = estimated Maryland State Conservation Rank

DAMSELFLIES

Calopterygidae (Broad-winged Damsels)

1. *Calopteryx maculata* -- Ebony Jewelwing -- (S5) -- This conspicuous species is common at Cove Point along wooded streams. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 23-Apr-99, 6-Jun-99 and 8-Jul-99. Larvae were collected from a small stream cutting across the gasline right-of-way on 23-Apr-99. Ebony Jewelwings were often seen mating and ovipositing at Cove Point. This species is widespread and common in Maryland. Its larval habitat is forested streams and rivers.

Lestidae (Spreadwings)

2. *Archilestes grandis* -- Great Spreadwing -- (*) (S3) -- This species is rare at Cove Point with only two records of adult males seen at the entry streams of the Settling Pond on 11-Sep-98 and 30-Sep-98. Since the wooded vegetation was removed from the Settling Pond late in 1999, the future success of this species near the Settling Pond has been diminished. Although not found elsewhere during the survey, it is likely that this large damselfly also occurs along wood streams elsewhere at Cove Point. The Great Spreadwing is a fall-flying species that is widespread in Maryland but uncommon. It is the largest damselfly in North America. Its larval habitat is wooded streams.

3. *Lestes disjunctus australis* -- Common Spreadwing -- (*) (v) (S4) -- This spreadwing is fairly common in the spring and fall (but difficult to find during mid-summer) along the Settling Ponds and Lake Levy at Cove Point. Adults were observed at Cove Point on 11-Sep-98, 30-Sep-98, and 23-Apr-99. Common Spreadwings were often seen mating and ovipositing at Cove Point. This species is the most common and widespread Lestes in Maryland. Its larval habitat is ponds and lake edges with emergent vegetation.

4. *Lestes rectangularis* -- Slender Spreadwing -- (v) (S4S5) -- A single adult male was observed at Cove Point at the base of the dam at Lake Levy on 29-Jul-98. This is a widespread and common species in Maryland and probably occurs at Cove Point in greater numbers than the single record would indicate. Its larval habitat is ponds and lake edges with emergent vegetation.

Coenagrionidae (Pond Damsels)

5. *Amphiagrion saucium* -- Eastern Red Damsel -- (*) (v) (S3) -- This damselfly is rare and very local in sunny grassy seeps at Cove Point. Adults were observed on 21-May-99 and 6-Jun-99 along the grassy seeps bordering the streams that cut across the gasoline right-of-way. This is a widespread species in Maryland but limited to very localized populations. The larval habitat is sunlit grassy seeps.
6. *Argia fumipennis violacea* -- Variable Dancer -- (*) (S4S5) -- A single adult male was observed at Cove Point on 11-Sep-98 at the small parking lot at the Jay Walk. This species is very widespread and common in Maryland and the reason that it is not more abundant at Cove Point is not known. The larval habitat is almost any still or slow moving water.
7. *Enallagma aspersum* -- Azure Bluet -- (*) (v) (S3S4) -- This is a common species at the Settling Pond. Isolated adults can also be found at Lake Levy and Osborn Pond. Adults were observed at Cove Point on 29-Jul-98, 22-Aug-98, 11-Sep-98 and 8-Jul-99. The females of this species at the Settling Pond (22-Aug-98) were observed inserting eggs into Stonewort (*Chara fragilis*) completely submerged and decoupled from the guarding male who stayed on the surface. The species is widespread and common in Maryland. The larval habitat is ponds, usually with no or few fish.
8. *Enallagma basidens* -- Double-striped Bluet -- (*) (S4) -- Adults were observed at Cove Point on 5-Jun-98 at the Settling Pond (two males) and another lone male on Osborn Pond on 11-Sep-98. This species is widespread but uncommon in Maryland. Its larval habitat is ponds.
9. *Enallagma civile* -- Familiar Bluet -- (v) (S5) -- This is the most abundant species of odonate at Cove Point where it can be found in nearly all aquatic habitats from early spring into early winter. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 14-Oct-98, 2-Dec-98, 23-Apr-99, 21-May-99, 6-Jun-99, 8-Jul-99, 3-Sep-99 and 7-Oct-99. The Familiar Bluet was often seen mating and ovipositing at Cove point. Emergence of adults from Lake Levy continued to occur throughout the year well into October. This species is very common and widespread in Maryland. Its larval habitats are fresh and slightly brackish ponds, marshes and lakes.
10. *Enallagma signatum* -- Orange Bluet -- (*) (v) (S4) -- At Cove Point this species is common (ponds/marsh) to abundant (Lake Levy) but often inconspicuous. Adults were observed at Cove Point on 11-Sep-98, 14-Oct-98 and 3-Sep-99. Orange Bluets were often seen mating and ovipositing at Cove Point. The Orange Bluet is a widespread and common species in Maryland. Its larval habitats are marshes, ponds and lakes.
11. *Ischnura hastata* -- Citrine Forktail -- (v) (S4S5) -- An uncommon and very inconspicuous damselfly at Cove Point found in sunlit grassy seepages such as the edges of ponds, marshes and streams. Adults were observed at Cove Point on 7-Jul-98, 30-Sep-98 and 6-Jun-99. This is a widespread and common species in Maryland. Its larval habitat is sunlit seepages with dense

short grass/rush/sedge emergent vegetation. This is the smallest odonate species found at Cove Point.

12. *Ischnura posita* -- Fragile Forktail -- (v)(S5) -- A common, widespread, but very inconspicuous damselfly at Cove Point. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 23-Apr-99, 21-May-99 and 6-Jun-99. The Fragile Forktail was often seen ovipositing along with *I. ramburii* and *I. verticalis* on the floating mats of *Potamogeton pectinatus* at Lake Levy. This species is probably the most abundant and widespread odonate species in Maryland but is not as abundant at Cove Point as *I. ramburii*, *I. verticalis*, *Enallagma signatum*, and *Enallagma civile*. Its larval habitat is non-flowing fresh water.

13. *Ischnura ramburii* -- Rambur's Forktail -- (v)(S4) -- This and *Enallagma civile* are the dominant damselflies of Cove Point Marsh. However, the adults of *I. ramburii* are often found in good numbers at other locations especially Lake Levy and Osborn Pond. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 14-Oct-98, 23-Apr-99, 21-May-99, 6-Jun-99, 8-Jul-99, 3-Sep-99 and 7-Oct-99. Rambur's Forktail were often seen mating and ovipositing at Cove Point. In Maryland this species is restricted to brackish water habitats and is rarely seen off of the Coastal Plain. Even at Cove Point this species is generally replaced by *I. verticalis* when moving from brackish to completely fresh water ponds and marsh-like habitats. In Maryland the larval habitat is slightly brackish water marshes and ponds.

14. *Ischnura verticalis* -- Eastern Forktail -- (v)(S5) -- This is a common to abundant damselfly at Cove Point along the marshy edges of Lake Levy, Osborn Pond and the Settling Pond. However, the adults often show up at other locations as well. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 23-Apr-99, 21-May-99, 6-Jun-99, 8-Jul-99 and 3-Sep-99. It was often observed ovipositing at Cove Point. This is a widespread and common to abundant species in Maryland. Its larval habitat is fresh non-flowing water with emergent vegetation.

DRAGONFLIES

Aeshnidae (Darners)

15. *Aeshna umbrosa* -- Shadow Darner -- (*) (v)(S4) -- This is a rare fall-flying dragonfly at Cove Point. Adults were observed at Cove Point on 14-Oct-98 and 2-Dec-98. This species is widespread and common in Maryland. Its larval habitat is small streams.

16. *Anax junius* -- Common Green Darner -- (v)(S5) -- This is the most abundant large species of dragonfly at Cove Point. Both a migratory population and a resident population co-exist at Cove Point. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 14-Oct-98, 23-Apr-99, 6-Jun-99, 8-Jul-99, 3-Sep-99 and 7-Oct-99. Common Green Darners were often seen mating and ovipositing at Cove Point. Cast skins were

collected from Lake Levy on 7-Jun-98 and the Settling pond on 22-Aug-98 and 11-Sep-98. The Common Green Darner is a widespread and common throughout Maryland. Its larval habitat is still or slow moving water.

17. *Anax longipes* -- Comet Darner -- (*) (S3) -- This is a rare but spectacular species of dragonfly at Cove Point. Single lone males were observed at Cove Point on 5-Jun-98 and 7-Jul-98 and two males observed on 8-Jul-99, all seen flying low over Lake Levy. Although no cast skins were found it is likely that Lake Levy holds a small resident population of Comet Darners. This is a widespread but uncommon dragonfly in Maryland. This species is listed from a number of Maryland's neighboring states as of conservation importance. Its larval habitat is ponds and small lakes. It is likely that this species exists only as an extended metapopulation.

18. *Boyeria vinosa* -- Fawn Darner -- (*) (S4S5) -- A single adult was observed at Cove Point flying along the edge of the Settling Pond on 3-Sep-99. This is a widespread and often common fall flying dragonfly in Maryland. Its larval habitat is streams and rivers.

19. *Epiaeschna heros* -- Swamp Darner -- (v) (S5) -- This is an uncommon forest loving dragonfly at Cove Point. Adults were observed at Cove Point on 21-May-99, 6-Jun-99 and 8-Jul-99 mostly along the gasoline right-of-way. This is a widespread and common dragonfly in Maryland. Its larval habitat is swamps. It is the largest dragonfly in Maryland.

20. *Gomphaeschna furcillata* -- Harlequin Darner -- (S3) -- A single adult male was observed at Cove Point on 23-Apr-99 flying along the gasoline right-of-way. This is a widespread but uncommon spring-flying dragonfly in Maryland. Its larval habitat is swamps and bogs.

Gomphidae (Clubtails)

21. *Gomphus lividus* -- Ashy Clubtail -- (*) (S5) -- Three adult males were observed at Cove Point along the gasoline right-of-way on 23-Apr-99. This is the most widespread and common clubtail in Maryland. Its larval habitat is streams and rivers.

22. *Gomphus rogersi* -- Sable Clubtail -- (*) (**) (v) (S1) -- A small resident population was found in a single stream cutting across the gasoline right-of-way. At the stream the larvae utilize the unshaded, sandy-bottom where there is little or no silt present (*Cordulegaster bilineata* larvae replace *G. rogersi* when silt starts to cover the sandy bottom). The larvae would remain buried just below the sand with only the tip of the abdomen exposed to the surface which looked like a dark spot against the light colored sand bottom. The only organism that was found in the sampling nets which were of the right size and numbers to be prey for the Clubtail were larval Northern Two-lined Salamanders. The dragonfly's larval habitat only extended for approximately 4 meters of stream and the stream was approximately 1/3 meter wide.

One *G. rogersi* larva was collected on 31-Mar-99 and seven more on 23-Apr-99 from approximately 1/5 of the total habitat (the other 4/5 of the habitat was left untouched). This would indicate a total population (before my removal of 8 larvae) of 40 individuals. The seven larvae collected on April 23 were reared to determine identification. All seven of the larvae

emerged between May 12 and May 18 in the laboratory. No adults were ever seen at the site which attests to the difficulty in surveying for Clubtails.

Although only approximately 32 individuals were estimated to emerge from this stream in 1999 this still makes it the largest population of this species currently known from the Coastal Plain in Maryland and is only 1 of 3 existing known populations in Maryland. Because of the very restricted suitable habitat at Cove Point for *G. rogersi* and due to the small size of the population, it is questionable whether this species will be self-sustaining over the long run at Cove Point.

23. *Hagenius brevistylus* -- Dragonhunter -- (*) (v) (S4) -- A single cast skin was collected at a woodland stream by Brent Steury on 2-Jul-98. This species is widespread but uncommon in Maryland. In Maryland, the Dragonhunter is second only to the Swamp Darner in size. Its larval habitat is streams and rivers.

Cordulegastridae (Spiketails)

24. *Cordulegaster bilineata* -- Brown Spiketail -- (*) (**) (v) (S2) -- Larvae were collected on 31-Mar-99 and 23-Apr-99 from a small stream cutting across the gasoline right-of-way. The larvae seems to prefer the sunlit section of the stream where a thin layer of silt covered an otherwise sandy bottom. Larvae were in three distinct sizes indicating a three year larval development. A single adult male was observed along the gasoline right-of-way on 6-Jun-99. This species was separated from *Cordulegaster diastatops* (which occurs in Western Maryland) in 1983 and disagreement still exists whether this was justified. This is an uncommon to rare spring-flying dragonfly previously recorded from Maryland only from Baltimore, Howard, Anne Arundel, and Prince Georges counties. Its larval habitat is streams.

25. *Cordulegaster maculata* -- Twin-spotted Spiketail -- (v) (S4) -- A single adult male was observed at Cove Point along the gasoline right-of-way on 23-Apr-99. This spring flying species is uncommon but widespread in Maryland. Its larval habitat is streams.

Macromiidae (Cruisers)

26. *Didymops transversa* -- Stream Cruiser -- (*) (v) (S4S5) -- Adults were observed at Cove Point on 23-Apr-99 hunting along forested paths. This is a spring-flying species which is common and widespread in Maryland. Its larval habitat is streams and rivers.

Corduliidae (Emeralds)

27. *Epiptera cynosura* -- Common Baskettail -- (*) (v) (S5) -- Adults were observed at Cove Point on 23-Apr-99, 30-Apr-99, 21-May-99 and 6-Jun-99. The majority of them were found hawking over the gasoline right-of-way. Mating in flight was observed over the gasoline right-of-way on 21-May-99. This spring-flying species is abundant and widespread in Maryland. Its larval habitat is ponds and very slow moving streams.

28. *Somatochlora filosa* -- Fine-lined Emerald -- (**) (v) (S2) -- An uncommon dragonfly most often seen along the western edge of Cove Point Marsh. Adults were observed at Cove Point on

30-Sep-98 and 3-Sep-99. This species is only rarely encountered in Maryland and even then as lone individuals. However, at Cove Point a number of individuals were seen together and interacting over the Jay Walk on 3-Sep-99. As far as I am aware Cove Point has the highest concentration of this species in Maryland. Its larval habitat is not known. However, based on the behavior of the adults at Cove Point the most likely larval habitat is the seeps and/or small boggy pools along the western edge of Cove Point Marsh. This species was first recorded from Calvert County at the Flag Ponds.

29. *Somatochlora tenebrosa* -- Clamp-tipped Emerald -- (v)(S3S4) -- At Cove Point this species was occasionally found hunting along forested borders at Cove Point during summer and early fall. Adults were observed at Cove Point on 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98 and 8-Jul-99. A female was seen ovipositing in the small stream just north of the Jay Walk. This is a widespread, but uncommon dragonfly in Maryland. Its larval habitat is forested streams.

Libellulidae (Skimmers)

30. *Brachymesia gravida* -- Four-spotted Pennant -- (v)(S3S4) -- This is a common species at Cove Point Marsh and Lake Levy. Scattered adults can be found throughout Cove Point during the height of the season. This species is not found far from brackish water in Maryland but does seem to be doing well in Lake Levy where it was often seen mating and ovipositing. Adults were observed at Cove Point on 7-Jul-98, 29-Jul-98, 22-Aug-98, 8-Jul-99 and 3-Sep-99. In Maryland this species is common in the brackish water marshes surrounding the Chesapeake Bay, but is not found off of the Coastal Plain.

31. *Celithemis elisa* -- Calico Pennant -- (*) (v)(S5) -- This species is common at the ponds and Lake Levy during the summer months. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 21-May-99, 6-Jun-99 and 8-Jul-99. This species was often seen ovipositing. Observed a Calico Pennant being captured and eaten by an Eastern Pondhawk on 29-July-98. This species is widespread and common in Maryland. Its larval habitat is ponds and marshes.

32. *Celithemis eponina* -- Halloween Pennant -- (*) (v)(S4S5) -- This species is common to abundant at the ponds and Lake Levy, it can also be found at Cove Point Marsh in fewer numbers. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 8-Jul-99 and 3-Sep-99. This species was often observed mating and oviposition at Cove Point. Observed a large fish take a Halloween Pennant at Lake Levy on 22-Aug-98. Also observed an Eastern Pond Hawk capture and eat a Halloween Pennant. This species is widespread and common in Maryland. Its larval habitat is healthy marshes or the marshy edges around ponds and lakes.

33. *Celithemis fasciata* -- Banded Pennant -- (*) (S3) -- This species is uncommon at Cove Point and seen only in 1998 at Lake Levy and Osborn Pond. Adults were observed at Cove Point on 5-Jun-98 and 7-Jul-98. This species is restricted to the eastern portion of the Piedmont and western shore in Maryland where it is uncommon. Its larval habitat is marshes or the marshy edges around ponds and lakes.

34. *Erythemis simplicicollis* -- Eastern Pondhawk -- (v)(S5) -- An abundant dragonfly found throughout Cove Point. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 21-May-99, 6-Jun-99, 8-Jul-99 and 3-Sep-99. Cast skins were collected from Osborn Pond on 7-Jul-98. The Eastern Pond Hawk was often seen mating and ovipositing at Cove Point. This species is abundant and widespread in Maryland. Its larval habitat is nearly any still or slow flowing water.

The Eastern Pondhawk hunts by staying on the ground and flying up to capture prey in the air. An interesting behavioral observation was noticed between the Eastern Pondhawk and one of its prey animals the tiger beetle *Cicindela hirticollis*, on the beach at Cove Point. The dragonfly would only take the tiger beetle when it was in flight which would occasionally happen when I disturbed the beetles while walking on the beach. If the beetle managed to land before being captured, the dragonfly would land next to it, often just a couple of inches away. I got the impression (but it does need to be further observed or tested) that the tiger beetle was behaviorally programmed to run and not fly away from the dragonfly -- thus avoiding capture. When I approached the tiger beetles they appeared to more readily take to the air than they did when a dragonfly was next to them. As a side note -- I have watched the Eastern Pondhawk hunt *Cicindela dorsalis* at Flag Ponds in the early 1990s but did not see any captured (only attempts). However, the Flag Ponds rangers informed me that they had seen them being taken. One thing that is for sure, is that at the beach at Cove Point, during the heat of the day, the Eastern Pondhawks are an active predator of tiger beetles.

35. *Erythrodiplax berenice* -- Seaside Dragonlet -- (v)(S4) -- An uncommon species of dragonfly at Cove Point. Adults were observed at Cove Point on 7-Jul-98, 29-Jul-98 and 11-Sep-98. The larvae of this species is restricted to the eastern edge (closest to the bay) of Cove Point Marsh. The Seaside Dragonlet is the most salt tolerant of any North American dragonfly species and it can be expected that the number of individuals encountered at Cove Point Marsh will be proportional to the influx of bay waters into the marsh. Two of the three female forms of the Seaside Dragonlet occur at Cove Point Marsh. They are the male-like form and the Spot-wing form. In Maryland, this species is restricted to the brackish water marshes of the Chesapeake Bay where it can be very abundant.

36. *Libellula axilena* -- Bar-winged Skimmer -- (*) (S3) -- A single adult male was observed at Cove Point along the gasoline right-of-way on 8-Jul-99. This species is widespread but uncommon in Maryland. Its larval habitat is temporary pools and the shallow edges of ponds.

37. *Libellula cyanea* -- Spangled Skimmer -- (v)(S5) -- A common and widespread species at Cove Point. Adults were observed at Cove Point on 5-Jun-98, 21-May-99, 6-Jun-99 and 8-Jul-99. This species is widespread and abundant in Maryland. Its larval habitat is ponds and lakes.

38. *Libellula deplanata* -- Blue Corporal -- (*) (v)(S4S5) -- An abundant early-spring pond species at Cove Point. Adults were observed at Cove Point on 23-Apr-99 and 21-May-99. Cast skins were collected from the edge of Lake Levy on 23-Apr-99. This species is abundant on the Coastal Plain and rare elsewhere in Maryland. Larval habitat is ponds and edges of lakes.

39. *Libellula incesta* -- Slaty Skimmer -- (v)(S5) -- A common to abundant species at Cove Point most often seen at Cove Point Marsh, Lake Levy and the ponds. Adults were observed at Cove Point on 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 6-Jun-99, 8-Jul-99 and 3-Sep-99. The Slaty Skimmer was often seen mating and ovipositing at Cove Point. This species is widespread and common in Maryland. Its larval habitat is permanent sunlit ponds and lakes. At Cove Point, as elsewhere, this species is replaced by *Libellula vibrans* in shady pond habitats.

40. *Libellula luctuosa* -- Widow Skimmer -- (v)(S5) -- A beautiful common to abundant pond dragonfly at Cove Point. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 6-Jun-99, 8-Jul-99 and 3-Sep-99. Photographed near Lake Levy on 6-Jun-99 a large jumping spider (*Phidippus* sp.) eating a teneral Widow Skimmer which it was able to capture and kill. The Widow Skimmer is widespread and common in Maryland. Its larval habitat is ponds and lake edges.

41. *Libellula lydia* -- Common Whitetail -- (v)(S5) -- A common pond dragonfly at Cove Point. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 23-Apr-99, 21-May-99, 6-Jun-99, 8-Jul-99 and 3-Sep-99. The Common Whitetail were often seen mating and ovipositing at Cove Point. A widespread and common to abundant dragonfly in Maryland. Its larval habitat is ponds, ditches, and other (often degraded) still water habitats.

42. *Libellula needhami* -- Needham's Skimmer -- (v)(S4S5) -- An abundant, large, orange-red dragonfly found throughout Cove Point. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 14-Oct-98, 21-May-99, 6-Jun-99, 8-Jul-99 and 3-Sep-99. Needham's Skimmer was often seen mating and ovipositing at Cove Point. Cast skins were collected at Lake Levy on 6-Jun-99. This is probably the most conspicuous summer dragonfly of Cove Point Marsh and Lake Levy. In Maryland this species is somewhat restricted to the eastern half where it does its best, against other species of dragonflies, in slightly brackish still-water habitats. It is very abundant in the semi-freshwater coastal marshes around the Chesapeake Bay and is the dominant summer species of dragonfly at Cove Point.

43. *Libellula pulchella* -- Twelve-spotted Skimmer -- (*) (S4S5) -- A single adult male (probably a stray) was observed at Cove Point over the Settling Pond on 11-Sep-98. This species is widespread and common in Maryland. Its rarity at Cove Point is probably due to the absence of its larval habitat which is temporary sunlit ponds.

44. *Libellula semifasciata* -- Painted Skimmer -- (*) (v)(S4S5) -- An uncommon species at Cove Point. Adults were observed at Cove Point on 5-Jun-98, 11-Sep-98 and 6-Jun-99 in open fields and along the gasoline right-of-way. This species is widespread and common in Maryland. Its larval habitat is grassy seeps.

45. *Libellula vibrans* -- Great Blue Skimmer -- (S4S5) -- An uncommon large dragonfly found long the shaded sections of Lake Levy and the ponds. Adults were observed at Cove Point on 5-Jun-98, 22-Aug-98 and 11-Sep-98. This species replaces the much more abundant *L. incesta* in

the deep shaded edges of the ponds at Cove Point. This species is widespread and common in Maryland. Its larval habitat is forest ponds.

46. *Pachydiplax longipennis* -- Blue Dasher -- (v)(S5) -- An abundant dragonfly of Cove Point Marsh, and the ponds/lake at Cove Point. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 14-Oct-98, 6-Jun-99, 8-Jul-99 and 3-Sep-99. The Blue Dasher were often seen mating and ovipositing at Cove Point. Cast skins were collected from Lake Levy on 5-Jun-98. This species is the most abundant summer dragonfly in Maryland. Its larval can be found in almost any still or slow-moving body of water.

47. *Pantala flavescens* -- Wandering Glider -- (S5) -- A common dragonfly of Lake Levy and the ponds at Cove Point. Adults were observed at Cove Point on 29-Jul-98, 22-Aug-98, 11-Sep-98, 6-Jun-99 and 8-Jul-99. This species is widespread and common in Maryland. It is a migrant species which comes north in the spring/summer, lays eggs which develop during the season and emerge in the fall to migrate south. The Wandering Glider does not overwinter in Maryland. The adults are most often encountered hawking over open fields. This species is widespread and common in Maryland. Its larval habitat is shallow or temporary ponds.

48. *Pantala hymenaea* -- Spot-winged Glider -- (v)(S5) -- A common dragonfly of Lake Levy and the ponds at Cove Point. Adults were observed at Cove Point on 29-Jul-98, 22-Aug-98, 21-May-99, 6-Jun-99 and 8-Jul-99. The Spot-winged Glider is a migrant species which comes north in the spring/summer, lays eggs which develop during the season and emerge in the fall to migrate south. The Spot-winged Glider is more abundant than its close relative the Wandering Glider at Cove Point. The Spot-winged Glider does not overwinter in Maryland. The adults are most often encountered hawking over open fields. This species is widespread and common in Maryland. Its larval habitat is shallow or temporary ponds.

49. *Perithemis tenera* -- Eastern Amberwing -- (v)(S5) -- An abundant tiny dragonfly of Cove Point Marsh and the ponds/lake at Cove Point. Adults were observed at Cove Point on 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 6-Jun-99, 8-Jul-99 and 3-Sep-99. Cast skins of this species were seen in mass on top of floating mats of Sago pondweed (*Potamogeton pectinatus*) at Lake Levy on 8-Jul-99. I observed an Eastern Pond Hawk capture and eat a male Eastern Amberwing at Lake Levy on 3-Sep-99. This Eastern Amberwing is widespread and common in Maryland. This species oviposites on floating algae, vegetation, or other floating objects in open marshes, ponds and lakes.

50. *Sympetrum vicinum* -- Yellow-legged Meadowhawk -- (v)(S5) -- An abundant late-fall early-winter red dragonfly at Cove Point. Adults were observed at Cove Point on 14-Oct-98 and 2-Dec-98 in large numbers over the ponds and Lake Levy. Yellow-legged Meadowhawks were often seen mating and ovipositing at Cove Point well into December. Many more females than males were observed at Cove Point. The reason for this is not known but is not characteristic of this species which normally occurs in a 50/50 sex ratio. This species is the most abundant late fall dragonfly in Maryland. Its larval habitat is ponds and edges of lakes.

51. *Tramea carolina* -- Carolina Saddlebags -- (v)(S4S5) -- A common aerial dragonfly of open

areas and the ponds and lake at Cove Point. Adults were observed at Cove Point on 5-Jun-98, 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 21-May-99, 6-Jun-99, 8-Jul-99 and 3-Sep-99. Cast skins were collected from Lake Levy on 5-Jun-98 and 7-Jul-98. The Carolina Saddlebags were often seen mating and ovipositing at Cove Point. This species is widespread and common in Maryland. It is a migrant species which comes north in the spring, lays eggs which develop during the season and emerge in the fall to migrate south. The Carolina Saddlebags does not overwinter in Maryland. The adults are most often encountered hawking over open fields. This species is widespread and common in Maryland. Its larval habitat is shallow ponds.

52. *Tramea lacerata* -- Black Saddlebags -- (v)(S5) -- An abundant aerial dragonfly of open areas and the ponds and lake at Cove Point. Adults were observed at Cove Point on 7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 21-May-99, 6-Jun-99, 8-Jul-99 and 3-Sep-99. The Black Saddlebags were often seen mating and ovipositing at Cove Point. This species is much more common than *T. carolina* at Cove Point. Mass emergence of adults at Lake Levy was observed on 11-Sep-98. This species is widespread and common in Maryland. It is a migrant species which comes north in the spring, lays eggs which develop during the season and emerge in the fall to migrate south. The Black Saddlebags does not overwinter in Maryland. The adults are most often encountered hawking over open fields. This species is widespread and common in Maryland. Its larval habitat is shallow or temporary ponds.

53. *Tramea onusta* -- Red-mantled Saddlebags -- (*) (SA) -- A single adult male was observed at the Settling Pond at Cove Point on 29-Jul-98 where it provided good views through binoculars but stayed out of reach of the net. This species has been recorded from Maryland only 5 times (including the 1998 Cove Point record and the more recent 1999 find in Howard County). This species is a southern species which occurs in our area only as isolated strays.

Monthly Summaries of the Species Composition of the Dragonflies and Damselflies at the Cove Point LNG Site

The 1998-1999 survey at Cove Point recorded 10,916 data points on individual odonates as to species, date and habitat. The data collecting technique, used in creating the monthly summaries, used the minimum number of individual adults of each species seen at any given location. This means that when a species was present in small or moderate numbers the data is reasonably exact, however those species which occur in large numbers are likely under represented in the data points. The following percentages represent the total number of individual adults of a particular species compared to the total number of all individual adult dragonflies and damselflies seen during that month. No data was collected for the month of November.

APRIL (Based on 380 data points representing 13 species)

66%	<i>Libellula deplanata</i>	ponds, lake
11%	<i>Enallagma civile</i>	ponds, lake, marsh
9%	<i>Anax junius</i>	ponds, lake, marsh
6%	<i>Ischnura verticalis</i>	ponds, lake
8%	9 other species	

MAY (Based on 121 data points representing 16 species)

16%	<i>Ischnura ramburii</i>	ponds, lake, marsh
16%	<i>Pantala hymenaea</i>	ponds, lake, marsh, open areas
11%	<i>Erythemis simplicicollis</i>	ponds, lake, marsh
10%	<i>Libellula deplanata</i>	ponds, lake
10%	<i>Epithea cynosura</i>	ponds, lake, slow moving streams
7%	<i>Tramea lacerata</i>	ponds, lake, marsh, open areas
7%	<i>Libellula lydia</i>	ponds, lake, marsh
7%	<i>Enallagma civile</i>	ponds, lake, marsh
16%	8 other species	

JUNE (Based on 1064 data points representing 29 species)

21%	<i>Ischnura ramburii</i>	ponds, lake, marsh
19%	<i>Libellula needhami</i>	ponds, lake, marsh
17%	<i>Erythemis simplicicollis</i>	ponds, lake, marsh
16%	<i>Libellula lydia</i>	ponds, lake, marsh
12%	<i>Enallagma civile</i>	ponds, lake, marsh
15%	24 other species	

JULY (Based on 5376 data points representing 33 species)

22%	<i>Enallagma civile</i>	ponds, lake, marsh
20%	<i>Erythemis simplicicollis</i>	ponds, lake, marsh

13%	<i>Celithemis eponina</i>	ponds, lake, marsh
10%	<i>Libellula needhami</i>	ponds, lake, marsh
9%	<i>Brachymesia gravida</i>	ponds, lake, marsh
6%	<i>Libellula luctuosa</i>	ponds, lake, marsh
5%	<i>Tamea lacerata</i>	ponds, lake, marsh, open areas
5%	<i>Libellula incesta</i>	ponds, lake, marsh
4%	<i>Pachydiplax longipennis</i>	ponds, lake, marsh
6%	24 other species	

AUGUST (Based on 867 data points representing 21 species)

23%	<i>Erythemis simplicicollis</i>	ponds, lake, marsh
23%	<i>Pachydiplax longipennis</i>	ponds, lake, marsh
12%	<i>Celithemis eponina</i>	ponds, lake, marsh
12%	<i>Libellula incesta</i>	ponds, lake, marsh
12%	<i>Libellula needhami</i>	ponds, lake, marsh
3%	<i>Enallagma civile</i>	ponds, lake, marsh
3%	<i>Perithemis tenera</i>	ponds, lake, marsh
3%	<i>Ischnura verticalis</i>	ponds, lake
9%	13 other species	

SEPTEMBER (Based on 1758 data points representing 31 species)

34%	<i>Enallagma civile</i>	ponds, lake, marsh
15%	<i>Perithemis tenera</i>	ponds, lake, marsh
9%	<i>Enallagma signatum</i>	ponds, lake, marsh
9%	<i>Tamea lacerata</i>	ponds, lake, marsh
8%	<i>Libellula needhami</i>	ponds, lake, marsh
6%	<i>Ischnura ramburii</i>	ponds, lake, marsh
5%	<i>Libellula incesta</i>	ponds, lake, marsh
5%	<i>Pachydiplax longipennis</i>	ponds, lake, marsh
9%	23 other species	

OCTOBER (Based on 1645 data points representing 9 species)

94%	<i>Enallagma civile</i>	ponds, lake, marsh
4%	<i>Sympetrum vicinum</i>	ponds, lake
2%	7 other species	

DECEMBER (Based on 206 data points representing 3 species)

97%	<i>Sympetrum vicinum</i>	ponds, lake
2%	<i>Enallagma civile</i>	ponds, lake, marsh
1%	<i>Aeshna umbrosa</i>	streams

Butterflies of Cove Point LNG Site

Listed below are the 47 species of butterflies that I observed at Cove Point during the 1998-1999 seasons. It is important to note that I recorded the butterflies that I saw and had time to identify.

However, I did not try and locate all potential butterfly habitats at Cove Point, nor did I time my visits to Cove Point to coincide with butterfly abundance and diversity. In addition, I did not attempt to identify every butterfly encountered, therefore skippers and small gossamer wings are likely under represented in the list below.

The Cove Point site provides an excellent assortment of butterfly habitats. Richard (Dick) Smith, a Maryland Butterfly specialist, accompanied me to Cove Point on June 6, 1999, to look over the various habitats from a “butterflies” perspective. Dick shares my views that Cove Point should be surveyed for rare butterflies. He mentioned that Cove Point especially has the potential to harbor the Dion Skipper, a Maryland listed species.

Papilionidae

- | | | |
|------------------------------|----------------------------|---|
| 1. Eastern Tiger Swallowtail | <i>Papilio glaucus</i> | 29-Jul-98, 22-Aug-98,
11-Sep-98, 23-Apr-99,
30-Apr-99, 21-May-99,
6-Jun-99, 3-Sep-99 |
| 2. Spicebush Swallowtail | <i>Papilio troilus</i> | 2-Aug-98, 21-May-99,
3-Sep-99 |
| 3. Zebra Swallowtail | <i>Eurytides marcellus</i> | 7-Jul-98 |

Pieridae

- | | | |
|----------------------|-------------------------|---|
| 4. Cabbage Butterfly | <i>Pieris rapae</i> | 11-Sep-98, 30-Sep-98,
14-Oct-98, 2-Dec-98,
31-Mar-99, 30-Apr-99,
6-Jun-99, 3-Sep-99 |
| 5. Clouded Sulphur | <i>Colias philodice</i> | 22-Aug-98, 11-Sep-98,
14-Oct-98, 2-Dec-98,
31-Mar-99, 30-Apr-99 |
| 6. Orange Sulphur | <i>Colias eurytheme</i> | 5-Jun-98, 14-Oct-98,
31-Mar-99, 23-Apr-99,
30-Apr-99, 21-May-99,
6-Jun-99, 3-Sep-99, |

		7-Oct-99
7. Cloudless Sulphur	<i>Phoebis sennae</i>	29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 14-Oct-98, 2-Dec-98, 21-May-99, 3-Sep-99
8. Little Yellow	<i>Eurema lisa</i>	22-Aug-98
9. Great Southern White*	<i>Ascia monuste</i>	21-May-99
Lycaenidae		
10. Henry's Elfin	<i>Callophrys henrici</i>	30-Apr-99
11. Brown Elfin	<i>Callophrys augustinus</i>	23-Apr-99
12. Eastern Pine Elfin	<i>Callophrys niphon</i>	23-Apr-99, 21-May-99
13. Red-banded Hairstreak	<i>Calycopis cerops</i>	21-May-99, 6-Jun-99, 3-Sep-99
14. White M Hairstreak	<i>Parrhasius m-album</i>	11-Sep-98
15. Gray Hairstreak	<i>Strymon melinus</i>	11-Sep-98, 14-Oct-98, 23-Apr-99, 6-Jun-99, 3-Sep-99, 7-Oct-99
16. Spring Azure	<i>Celastrina ladon</i>	31-Mar-99, 30-Apr-99, 6-Jun-99
17. Summer Azure	<i>Celastrina neglecta</i>	22-Aug-98
18. Eastern Tailed Blue	<i>Everes comyntas</i>	22-Aug-98, 11-Sep-98, 30-Sep-98, 14-Oct-98, 23-Apr-99, 30-Apr-99, 21-May-99, 6-Jun-99, 3-Sep-99, 7-Oct-99
Nymphalidae		
19. Great Spangled Fritillary	<i>Speyeria cybele</i>	5-Jun-98, 22-Aug-98, 8-Jul-99
20. Variegated Fritillary	<i>Euptoieta claudia</i>	11-Sep-98, 2-Dec-98, 3-Sep-99

21. Pearl Crescent	<i>Phyciodes tharos</i>	29-Jul-98, 11-Sep-98, 30-Sep-98, 14-Oct-98, 23-Apr-99, 30-Apr-99, 21-May-99, 3-Sep-99
22. Question Mark	<i>Polygonia interrogationis</i>	14-Oct-98, 2-Dec-98, 31-Mar-99
23. Eastern Comma	<i>Polygonia comma</i>	14-Oct-98, 2-Dec-98
24. Mourning Cloak	<i>Nymphalis antiopa</i>	11-Sep-98, 14-Oct-98, 31-Mar-99
25. American Painted Lady	<i>Vanessa cardui</i>	5-Jun-98, 22-Aug-98, 14-Oct-98, 23-Apr-99, 30-Apr-99, 21-May-99, 6-Jun-99
26. Red Admiral	<i>Vanessa atalanta</i>	7-Jul-98, 14-Oct-98, 23-Apr-99
27. Common Buckeye	<i>Junonia coenia</i>	29-Jul-98, 22-Aug-98, 11-Sep-98, 14-Oct-98, 2-Dec-98, 6-Jun-99, 8-Jul-99, 3-Sep-99, 7-Oct-99
28. Red-spotted Purple	<i>Limenitis arthemis astyanax</i>	22-Aug-98, 30-Sep-98
29. Monarch	<i>Danaus plexippus</i>	5-Jun-98, 7-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 14-Oct-98, 3-Sep-99
30. Little Wood Satyr	<i>Megisto cymela</i>	7-Jul-98, 8-Jul-99
31. Common Wood Nymph	<i>Cercyonis pegala</i>	7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 8-Jul-99, 3-Sep-99
Hesperiidae - Pyrginae		
32. Silver-spotted Skipper	<i>Epargyreus clarus</i>	29-Jul-98, 22-Aug-98, 11-Sep-98, 21-May-99, 6-Jun-99, 8-Jul-99

33. Northern Cloudywing	<i>Thorybes pylades</i>	11-Sep-98
34. Juvenal's Duskywing	<i>Erynnis juvenalis</i>	23-Apr-99, 30-Apr-99
35. Horace's Duskywing	<i>Erynnis horatius</i>	22-Aug-98
36. Sleepy Duskywing	<i>Erynnis icelus</i>	31-Mar-99
37. Wild Indigo Duskywing	<i>Erynnis baptisiae</i>	30-Sep-98
38. Common Checkered Skipper	<i>Pyrgus communis</i>	14-Oct-98
Hesperiidae - Hesperinae		
39. Least Skipper	<i>Ancyloxypha numitor</i>	7-Jul-98, 22-Aug-98, 11-Sep-98, 30-Sep-98, 14-Oct-98, 21-May-99, 6-Jun-99, 8-Jul-99, 3-Sep-99
40. Fiery Skipper	<i>Hylephila phyleus</i>	11-Sep-98
41. Sachem	<i>Atalopedes campestris</i>	22-Aug-98, 11-Sep-98, 21-May-99, 6-Jun-99
42. Southern Broken Dash**	<i>Wallengrenia otho</i>	29-Jul-98
43. Zabulon Skipper	<i>Poanes zabulon</i>	22-Aug-98, 21-May-99
44. Broad-winged Skipper	<i>Poanes viator</i>	7-Jul-98, 29-Jul-98, 22-Aug-98, 11-Sep-98, 3-Sep-99
45. Hobomok Skipper***	<i>Poanes hobomok</i>	21-May-99
46. Little Glassywing	<i>Pompeius verna</i>	6-Jun-99
47. Dun Skipper	<i>Euphyes vestris</i>	3-Sep-99

* = A male Great Southern White was seen at the gasline right-of-way west of the main plant complex. It landed for a few minutes on a wild rose flower before moving west at a good rate. I got good views of the butterfly with the binoculars (when on the rose flower) but was not able to net it. Dick Smith says that this species has only been seen in Maryland a couple of times. It is a stray from the southern United States.

** = A Southern Broken Dash was netted and released near the eastern end of Lake Levy near the edge of the forest. This was my first record of this butterfly from Maryland. Dick Smith told me that these are uncommon in Maryland, but that my finding at Cove Point was not totally unexpected.

*** = A male Hobomok Skipper was netted and released on a forested path near the gasline right-of-way going west from the main natural gas complex. Dick Smith says that although this species is reasonably common at some locations in Maryland it was not expected from Cove Point which is just outside (southeast) of its normal range.

Birds of Cove Point LNG Site

Cove Point is known for its excellent birding. Although, I made no attempt to survey Cove Point for birds they were impossible to ignore. The only exception, when I did concentrate on the birds, was on January 3, 1999, when I accompanied Tom Harden on the Christmas Bird Count at Cove Point. The following list contains the 129 species of birds that I observed at Cove Point during the 1998-1999 seasons. The dates given correspond to an entry in my field notes, usually indicating the first time I saw the species, at Cove Point. Additional dates indicate additional field notes.

Horned Grebe (3-Jan-99)	Northern Gannet (3-Jan-99)(31-Mar-99)
Double-crested Cormorant (3-Jan-99)(+ others)	Great Cormorant (3-Jan-99)
Great Blue Heron (3-Jan-99)(3-Sep-99)	Black-crowned Night-Heron (8-Jul-99)
Green Heron (2-Jan-99)	Great Egret (29-Jul-98)(6-Jun-99)
Tundra Swan (2-Dec-98)(3-Jan-99)	Mute Swan (3-Jan-99)(6-Jun-99)(3-Sep-99)
Canada Goose (2-Dec-98)(31-Mar-99)(+others)	Wood Duck (2-Dec-98)
Surf Scoter (3-Jan-99)	American Black Duck (2-Dec-98)(3-Jan-99)
Mallard (3-Jan-99)(31-Mar-99)	Gadwall (3-Jan-99)(31-Mar-99)
American Wigeon (3-Jan-99)(31-Mar-99)	Ring-necked Duck (14-Oct-98)(2-Dec-98)
Lesser Scaup (2-Dec-98)	Oldsquaw (3-Jan-99)
Common Goldeneye (3-Jan-99)	Bufflehead (2-Dec-98)(3-Jan-99)
Hooded Merganser (3-Jan-99)	Red-breasted Merganser (3-Jan-99)(31-Mar-99)
Ruddy Duck (14-Oct-98)(2-Dec-98)	Black Vulture (3-Jan-99)(31-Mar-99)(7-Oct-99)
Turkey Vulture (3-Jan-99)(31-Mar-99)	Osprey (7-Jul-98)(22-Aug-98)(+ others)
Bald Eagle (5-Jun-98)(7-Jul-98)(+ others)	Northern Harrier (2-Dec-98)
Sharp-shinned Hawk (3-Jan-99)	Red-shouldered Hawk (3-Jan-99)(23-Apr-99)
Red-tailed Hawk (3-Jan-99)(31-Mar-99)	American Kestrel (31-Mar-99)
Virginia Rail (3-Jan-99)	American Coot (2-Dec-98)
Killdeer (3-Jan-99)(31-Mar-99)	Greater Yellowlegs (22-Aug-98)
Spotted Sandpiper (21-May-99)	Sanderling (22-Aug-98)(3-Jan-99)
Semipalmated Sandpiper (22-Aug-98)	Western Sandpiper (22-Aug-98)
Least Sandpiper (22-Aug-98)	Short-billed Dowitcher (22-Aug-98)
Laughing Gull (22-Aug-98)	Bonaparte's Gull (3-Jan-99)
Ring-billed Gull (3-Jan-99)	Herring Gull (3-Jan-99)(31-Mar-99)
Great Black-backed Gull (3-Jan-99)	Caspian Tern (3-Sep-99)
Common Tern (3-Sep-99)	Forester's Tern (3-Sep-99)
Least Tern (29-Jul-98)	Rock Dove (8-Jul-99)
Mourning Dove (3-Jan-99)(31-Mar-99)	Yellow-billed Cuckoo (21-May-99)
Great Horned Owl (23-Apr-99)	Chimney Swift (21-May-99)
Ruby-throated Hummingbird (22-Aug-98)	Belted Kingfisher (3-Jan-99)(31-Mar-99)
Red-bellied Woodpecker (3-Jan-99)	Downy Woodpecker (3-Jan-99)(31-Mar-99)

Hairy Woodpecker (3-Jan-99)(31-Mar-99) **Northern Flicker** (3-Jan-99)(31-Mar-99)
Pileated Woodpecker (3-Jan-99)(31-Mar-99) **Eastern Wood-Pewee** (21-May-99)
Acadian Flycatcher (21-May-99) **Eastern Phoebe** (3-Jan-99)(31-Mar-99)
Great Crested Flycatcher (8-Jul-99) **Eastern Kingbird** (8-Jul-99)
Purple Martin (6-Jun-99) **Tree Swallow** (6-Jun-99)
Northern Rough-winged Swallow (6-Jun-99) **Barn Swallow** (6-Jun-99)
Blue Jay (3-Jan-99)(31-Mar-99) **American Crow** (3-Jan-99)(31-Mar-99)
Fish Crow (21-May-99) **Carolina Chickadee** (3-Jan-99)(31-Mar-99)
Tufted Titmouse (3-Jan-99)(31-Mar-99) **Brown Creeper** (3-Jan-99)
Carolina Wren (3-Jan-99) **Golden-crowned Kinglet** (3-Jan-99)(31-Mar-99)
Ruby-crowned Kinglet (14-Oct-98) **Blue-gray Gnatcatcher** (6-Jun-99)
Eastern Bluebird (3-Jan-99)(31-Mar-99) **Wood Thrush** (21-May-99)
American Robin (3-Jan-99)(31-Mar-99) **Gray Catbird** (21-May-99)
Northern Mockingbird (3-Jan-99) **Brown Thrasher** (6-Jun-99)
Cedar Waxwing (3-Jan-99)(8-Jul-99) **European Starling** (3-Jan-99)(31-Mar-99)
White-eyed Vireo (21-May-99) **Red-eyed Vireo** (21-May-99)
Northern Parula (21-May-99) **Yellow Warbler** (21-May-99)
Magnolia Warbler (21-May-99) **Yellow-rumped Warbler** (3-Jan-99)(31-Mar-99)
Yellow-throated Warbler (30-Apr-99) **Pine Warbler** (21-May-99)
Palm Warbler (7-Oct-99) **Bay-breasted Warbler** (21-May-99)
Blackpoll Warbler (21-May-99) **Black-and-white Warbler** (23-Apr-99)
American Redstart (6-Jun-99) **Ovenbird** (23-Apr-99)
Common Yellowthroat (21-May-99) **Hooded Warbler** (6-Jun-99)
Summer Tanager (21-May-99)(8-Jul-99) **Scarlet Tanager** (21-May-99)
Northern Cardinal (3-Jan-99)(31-Mar-99) **Indigo Bunting** (6-Jun-99)
Eastern Towhee (3-Jan-99) **American Tree Sparrow** (3-Jan-99)
Chipping Sparrow (21-May-99) **Field Sparrow** (3-Jan-99)
Savannah Sparrow (14-Oct-98) **Song Sparrow** (3-Jan-99)(31-Mar-99)
White-throated Sparrow (3-Jan-99)(+others) **Swamp Sparrow** (3-Jan-99)
Seaside Sparrow (29-Jul-98) **Dark-eyed Junco** (3-Jan-99)(31-Mar-99)
Red-winged Blackbird (21-May-99)(7-Oct-99) **Eastern Meadowlark** (31-Mar-99)
Common Grackle (21-May-99) **Brown-headed Cowbird** (3-Jan-99)
House Finch (3-Jan-99)(31-Mar-99) **American Goldfinch** (3-Jan-99)(31-Mar-99)
House Sparrow (3-Jan-99)

Amphibians and Reptiles of Cove Point LNG Site

The following 26 species of reptiles and amphibians were observed at the Cove Point LNG Site during the 1998-1999 seasons. I made no attempt to survey Cove Point for reptiles and amphibians, but I did record what I found. Therefore it is likely that the list provided below only samples the diversity of the reptiles and amphibians that are present at Cove Point.

Salamanders

1. Northern Two-lined Salamander -- *Eurycea bislineata* -- larvae common in stream at the *Gomphus rogersi* site
2. Spotted Salamander -- *Ambystoma maculatum* -- adult found under log in the upland forest -- photographed.

Frogs

1. Cricket Frog -- *Acris crepitans* -- often heard and seen
2. Green Tree Frog -- *Hyla cinerea* -- one seen 31-Mar-99 -- not heard
3. Gray Tree Frog -- *Hyla versicolor/chrysohelix* -- occasionally heard in upland areas
4. Spring Peeper -- *Pseudacris crucifer* -- very often heard and seen
5. Chorus Frog -- *Pseudacris triseriata* -- often heard
6. Southern Leopard Frog -- *Rana utricularia* -- very often heard and seen
7. Greenfrog -- *Rana clamitans melanota* -- often heard and seen
8. Pickerel Frog -- *Rana palustris* -- occasionally heard and seen at Cove Point Marsh
9. Bull Frog -- *Rana catesbeiana* -- often heard and seen
10. Fowler's Toad -- *Bufo woodhousii fowleri* -- occasionally heard and seen

Lizards

1. Fence Lizard -- *Sceloporus undulatus* -- surprisingly common in upland clearings
2. Five-lined Skink -- *Eumeces fasciatus* -- few seen
3. Six-lined Racerunner -- *Cnemidophorus sexlineatus sexlineatus* -- one seen at beach.

Snakes

1. Rough Green Snake -- *Opheodrys aestivus* -- one seen 14-Oct-98 -- photographed
2. Blackracer -- *Coluber constrictor* -- found empty eggs on beach -- 2-Dec-98
3. Black Rat Snake -- *Elaphe obsoleta* -- often seen -- photographed
4. Northern Watersnake -- *Nerodea sipedon* -- very common -- watched two males compete for a single female resulting in mating on 6-Jun-99
5. Copperhead -- *Agkistrodon contortrix* -- often seen, Cove Point specimens are large and healthy

Turtles

1. Eastern Mud Turtle -- *Kinosternon subrubrum* -- common -- observed two together, one closely following the other, moving upstream in the small stream parallel and north of the Jay Walk entrance road on 5-Jun-98.
2. Snapping Turtle -- *Chelydra serpentina* -- common
3. Red-bellied Turtle -- *Pseudemys rubriventris* -- few seen in Lake Levy and Osburn pond -- large size
4. Eastern Painted Turtle -- *Chrysemys picta* -- common
5. Northern Diamondback Terrapin -- *Malaclemys terrapin terrapin* -- one seen in small pond in Cove Point Marsh -- 3-Sep-1999
6. Eastern Box Turtle -- *Terrapene carolina carolina* -- one seen -- old individual -- near settling pond -- 3-Sept-99

Mammals of Cove Point LNG Site

The following mammals were seen, or foot prints found, at Cove Point during the 1998-1999 seasons:

Virginia Opossum	<i>Didelphis virginiana</i>	
Big Brown Bat	<i>Eptesicus fuscus</i>	(Smaller bats also seen -- species?)
Beaver	<i>Castor canadensis</i>	
Nutria	<i>Myocastor coypus</i>	(Only record was a single dead individual 3-Sep-99)
Meadow Vole	<i>Microtus pennsylvanicus</i>	
Muskrat	<i>Ondatra zibethicus</i>	
White-footed Mouse	<i>Peromyscus sp. probably leucopus</i>	
Gray Squirrel	<i>Sciurus carolinensis</i>	
Red Fox	<i>Vulpes vulpes</i>	
Mink	<i>Mustela vison</i>	(based on foot prints only)
Raccoon	<i>Procyon lotor</i>	
White-tail Deer	<i>Odocoileus virginianus</i>	

Tiger Beetles of Cove Point LNG Site

The following tiger beetles were seen at Cove Point during the 1998-1999 seasons. I never saw *Cicindela dorsalis* on the beach, although it was present in small numbers according to Barry Knisley (at least in 1998). The information on the *Cicindela puritana* (I believe the first record for this federally listed species at Cove Point) has already been provided to Barry Knisley.

<i>Cicindela hirticollis</i>	(7-Jul-98)(22-Aug-98)(11-Sep-98)(31-Mar-99)
<i>Cicindela punctulata</i>	(7-Jul-98)(8-Jul-99)
<i>Cicindela puritana</i>	(7-Jul-98)
<i>Cicindela repanda</i>	(29-Jul-98)(22-Aug-98)(11-Sep-98)(31-Mar-99)(21-May-99)
<i>Cicindela sexglutata</i>	(29-Jul-98)(23-Apr-99)(30-Apr-99)

Also see the notes of *Erythemis simplicicollis* on page 8 for tiger beetle/dragonfly interaction.