

copies were extremely good. Richard Duppa was not a botanist or illustrator by profession, but was the High Sheriff of Randor. He lived from 1770 to 1831. Credit Mrs. Beck with finding the origin of the print you illustrated."

SHORT NOTES

CONSERVATION ACTION FOR CARNIVOROUS PLANTS

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Carnivorous plants often find themselves in the same position as cacti and orchids: they are too bizarre and beautiful for their own good. Merciless harvesters, such as those vividly described by Don Schnell in the September 1975 CPN, are removing populations of species that have already reached a low ebb in their passive battle for survival.

What a contrast such collecting is, compared to the beneficial work being done by the staff of the North Carolina Botanical Garden at Chapel Hill. There, Venus flytraps and pitcher plants are grown from seed and displayed in order to educate the public and show that many native plants can be propagated relatively easily, and should never be removed from their natural habitat unless imminently endangered by human activities. A discussion of their work has been presented by J. K. Moore and C. R. Bell, American Horticulturist 55:23-29 (Winter 1974).

In the Endangered Species Act of 1973 (Public Law 93-205), the Congress of the United States authorized and directed the Smithsonian Institution to review species of plants which are now or may become endangered or threatened and to review methods of adequately conserving such species. The result of this directive is a Report on Endangered and Threatened Plant Species of the United States, published by the Government Printing Office early this year. In it, the following carnivorous plants are listed as endangered or threatened on a national basis: Darlingtonia californica, Dionaea muscipula, Pinguicula ionantha, P. planifolia, Sarracenia oreophila, S. psittacina and S. rubra. David Lane has categorized them in the September 1975 CPN.

On July 1, 1975, the U. S. Department of the Interior published in the Federal Register a Notice of Review of the status of all plants listed in the Smithsonian Report. The Interior Department has thus obliged itself to the lengthy and time-consuming process of gathering and evaluating data in order to help in deciding whether or not to officially list the plants as endangered or threatened.

Their decisions will be based on such important criteria as the exact locality of the native populations, the acreage covered by them, the number of individual plants at each locality, and whether the populations have been increasing, are stable, or are decreasing at each locality. They also will need to know the nature of the threats to the species, whether it be land-clearing, drainage changes, or over-collection for sale, and specific examples of these threats.

Conservation-oriented readers of the CPN can be of great assistance by sending in any such data at their disposal to the Office of Endangered Species, U. S. Fish and Wildlife Service, Department of the Interior, Washington, D. C. 20240.

Once a species had been officially listed, the judgment will have the force of the Endangered Species Act of 1973 behind it. It will then be against the law to deliver, receive, carry, transport or ship in interstate or foreign commerce any such species without a permit issued by the Secretary of the Interior, and the Secretary is empowered under the Act to acquire land on which endangered species occur. Only through such a course of action will rapacious commercial collectors be deterred from wrecking the populations of carnivorous plants and their habitats.

FIELD NOTES ON CEPHALOTUS FOLLICULARIS IN WESTERN AUSTRALIA

by Larry DeBuhr

Cephalotus is an extremely interesting carnivorous plant that grows exclusively in the southwestern corner of Western Australia. It ranges along the south coast from Augusta to just east of Albany. Cephalotus is placed in its own plant family, the Cephalotaceae, and there is only one species known, Cephalotus follicularis.

There is apparently some confusion about the discovery of Cephalotus. The plant was first described by the French botanist Labillardiere in 1804. Labillardiere traveled to Western Australia aboard the ships La Recherche and L'Esperance in 1792. They had intended to land at King George Sound, now the site of Albany, but were carried farther east to the point now called Esperance. Esperance is about 250 miles east of the nearest known Cephalotus bog.

Although the source remains unknown, Labillardiere indicated in his description of Cephalotus that someone had given him the material which had been collected near King George Sound. (See Nelson, The collectors and type locations of some of Labillardiere's "Terra Van-Lewin" [Western Australia] specimens, Taxon 24 (2/3): 319-336, May, 1975.)

The southwestern corner of Western Australia is characterized by a Mediterranean type climate similar to that of California. The winters are cool and moist with the majority of rainfall occurring during the months of May to August. The summers are hot and dry, and a summer drought occurs between November and March or April. However, along the south coast where Cephalotus grows, more rain falls over a longer period of time than in the rest of southwestern Australia. This area usually receives a yearly average of 60 or more inches of rain. Temperatures are mild throughout the year and are seldom below 32° F. during the winter and very rarely above 100° F. during the summer.

Cephalotus grows in bogs that have dense, compact peat soil. This soil is formed by the accumulation of partially decomposed vegetation material. The soils in southwestern Australia are commonly leached; that is, when it rains, minerals are carried out of the upper layers of soil and accumulate in lower levels. The amount of leaching increases with increased rainfall, and soil acidity increases with leaching. When the average yearly rainfall reaches or exceeds 60 inches, the soil becomes heavily leached and peaty in nature.

Cephalotus bogs occur in low, depressed areas or along stream beds, and are often completely inundated with water during the winter and rainy season. The soil is extremely absorbent and acts as a gigantic reservoir. The bogs never completely dry out, although they may not have standing water all of the year. The soil is very acidic, and decomposition of vegetative material is slow.

Cephalotus has a thick fleshy rhizome which produces one or more rosettes of leaves each season. There are two types of leaves, several small spatulate leaves are formed first and are followed by the production of a number of pitcher leaves. The plants grow as low clumps since a single rhizome may form several rosettes or may branch with each branch forming a rosette. For more detailed descriptions of the structure of the leaves, see Erickson (Plants of Prey of Australia, 1968) and Lloyd (Carnivorous Plants, 1942).

In 1974 I had the opportunity to observe Cephalotus in its natural habitat. I saw the species growing in several peat bogs near Albany on the south coast. The first bog that I saw had been burnt the previous year, and dead, charred stems of shrubby plants stuck up from the peaty soil. The majority of these plants were sprouting from the base. A few Cephalotus plants were found growing in small clumps, apparently having survived the fire by means of the underground rhizomes. Growing with Cephalotus were Utricularia simplex and U. menziesii.

The next bog I visited was in a depression partially filled with water. There were several zones of vegetation around the bog. On the slopes leading to the bog was a low, dense, scrubby vegetation characteristic of the area. Immediately around the bog in a moist zone, but not within the bog, was an extremely dense stand of tall shrubs, small trees, and lots of reeds. This vegetation was only 5 to 10 feet thick but took several minutes to push through. The bog itself was much easier to move in. The vegetation was more open and composed of shrubs about 3 to 4 feet tall and had clumps of reeds and sedges scattered throughout. Standing water was present between raised tussocks of soil and vegetation. Portions of the bog vibrated when walked upon, giving the impressions of a quacking bog. Cephalotus plants were growing hidden from view in clumps at the base of the sedges, rushes, and shrubs. Growing with Cephalotus in this bog was Utricularia volubile, a bladderwort that has a viny stem with large blue flowers at the top.

Other carnivorous plants that grow in similar bogs, often with Cephalotus, include Drosera hamiltonii and D. myriantha.

Cephalotus flowers in December and January, and since I left Australia in November, I did not have the opportunity to see the flowers of Cephalotus. The flowering time of Cephalotus is during the warmest and driest period of the year, a time when most plants have finished flowering. However, the excessive moisture of the bog enables the species to flower later in the year. It is my understanding that the majority of the plants do not flower each year. The mechanism inducing flowering in Cephalotus needs investigation, and may be nothing more than age or size of the plants. As with almost all carnivorous plants, a great deal of information on their natural history is yet to be learned, and this can only be done with extensive field research.