and animals have become extinct than the total lost for the entire North American continent. However, most of the species still remain, and many of them can be saved with scientific understanding of the interactions between the plants and animals and their changing environments, especially those environments which are influenced by man. The whole of the rich Hawaiian flora and fauna evolved from about 700 immigrant ancestral species, under conditions of extreme isolation, in the course of a few million years. What happened might be called an evolutionary explosion, and Hawaii constitutes an unsurpassed natural laboratory for the study of evolutionary and ecological phenomena. Because of the rapidity with which native species and communities are disappearing, it is urgent that an intensive study of the Hawaiian biota be carried out while there is still time.

The planners of this program have selected key species of plants and animals and have established priorities within their selections so that the extent of destruction in the near future may be assessed by considering (a) rarity, or narrow geographical extent, and (b) narrowness of ecological specialization. In addition, multidisciplinary studies will determine (1) the extent that the group of organisms, the community, or the ecosystem have special biological interest and significance; (2) the interrelationships of the taxon, community, or ecosystem; (3) any evidence of unusual biological adaptations of the taxon, community, or ecosystem. The native ecosystems, including rainforest, dry forest, bogs, and sand dunes will be studied.

Funding: First year support required: $400,000
Five year support required: $2,000,000

Program Director: Warren H. Wagner, Jr., Department of Botany, University of Michigan.

5. Phenology Program

Objective: To conduct detailed studies on plant and animal species, both aquatic and terrestrial at a number of sites within the United States in order to prepare phenological maps, obtain clues to the physiologic limitations that determine climatic limits of species, explain the biological basis for phenological timing, test the hypothesis that such studies will aid in understanding evolutionary mechanisms, and contribute to understanding the role of phenologic phenomena in the structure and productivity of ecosystems.

Program: Results of this program will more explicitly describe the seasonal development of organisms and from these