

INTERNAL REPORT 110
INVERTEBRATE TERRESTRIAL CONSUMER INVENTORY
IN CASCADE DOUGLAS-FIR - WESTERN HEMLOCK FORESTS

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ABSTRACT

Insects represent the most diverse and abundant group of consumers known. The overall objective of this study was to obtain relative density estimates of the dominant taxa and identify their primary functions in order to assist consumer modelling efforts.

PROCEDURES

Insect collection data has been obtained with various collecting devices. These include rotary-net traps, pit-fall traps, suction traps, sticky-screen collision traps, and beating foliage. All of these devices randomly sample walking or flying insects. In addition, sticky-traps baited with synthetic chemicals were used in an attempt to selectively trap phytophagous Lepidoptera.

The various collecting and trapping techniques were systematically applied on a weekly or continual basis under various stand conditions. Representative sampling areas include old growth (450 years old, watershed 2), intermediate aged (High 15, about 120-years-old), young growth (about 25 years old), and clear-cut areas. The baited sticky-traps were also placed at higher elevations (to 1380 m on Carpenter Mountain), including true fir type locations.

RESULTS

Approximately 500 different species of insects were captured in the various collecting devices in 1972. Some of these are represented by only one specimen, whereas others were collected in the hundreds on a single day. Diversity indices for different stand types (old-growth, intermediate, young-growth, clear cuts) are being calculated from these data. Different

feeding types (phytophagous, saprophagous, etc.) will be categorized according to relative densities and biomass. A reference collection, comprising representatives of all the different species, is being established.

Sticky-traps, baited with synthetic chemicals, were successful in trapping several species of Lepidoptera including one of the major western forest defoliators, the western spruce budworm, Choristoneura occidentalis (Free.). The western spruce budworm was attracted by the chemical, trans-11-tetradecenal which is known to be the primary component of its sex pheromone. Spruce budworms were captured at elevations ranging from 900-1380 m with greater numbers caught at the higher elevations. The highest catches were associated with mixed species stands containing true firs and Douglas-fir or true fir and mountain hemlock at elevations of 1049-1380 m. As many as 11 adult male budworms were captured in a single trap, but this does not indicate a high density of the insect in the area. Pheromone traps are very effective for detecting low density populations, and associated studies indicate that trapping responses of this magnitude (0-11 males per trap) are indicative of a population level that would be very difficult to detect by another sampling device, such as beating foliage. It would also be very difficult to observe feeding damage as caused by such a population.

Three additional unknown species of Lepidoptera were captured in sufficient numbers by sticky-traps baited with synthetics so that it can be positively stated that they were attracted by the chemical. All of the attracted adults were males which is very good evidence the chemicals were acting as sex pheromones. Two of these species are of the family Noctuidae and are rather large in size. Efforts are being taken to identify them to the species level.

Additional sampling will be necessary in 1973, particularly in the spring months, before the inventory will be completed.