

STUDY PLAN
MONITORING TERRESTRIAL WILDLIFE

1964 SPRUCE BUDWORM PROJECT
DIVISION OF TIMBER MANAGEMENT
REGION FOUR

PROJECT LOCATED ON THE
SALMON NATIONAL FOREST*

DIRECTOR _____

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ADMR _____ ADD _____

Submitted by:

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I. Objectives:

- A. Measure and analyze so far as possible the impacts and effects on terrestrial wildlife from the DDT aerial spray program.
- B. Measure and analyze so far as possible the impacts and effects on terrestrial wildlife from the testing program for using Cygon (Dimethoate).

II. Responsibility and Cooperation.

- A. The Monitor Coordinator is responsible to the Project Leader for organizing, planning, coordinating, conducting, and reporting on all phases of the monitoring program.
- B. The Project Game Biologist assigned to monitoring is the Monitor Coordinator's representative, and is directly responsible to him for planning, coordinating, conducting, and reporting the terrestrial wildlife monitoring program.
- C. The Idaho Fish & Game Department will participate in the terrestrial monitoring program within the guidelines of the cooperative agreement between the U. S. Forest Service and the State. The State Area Big Game Biologist will represent the State in coordinating the program with the Project Game Biologist. Job assignments are as set out in this study plan.
- D. The Bureau of Sport Fisheries and Wildlife will be represented by a Research Biologist from the Branch of Wildlife Research, Denver Wildlife Research Center. Branch personnel will act as consultants in various aspects of the terrestrial wildlife monitoring and will participate in jobs according to the schedule shown in this study plan, so far as they can finance and furnish manpower and laboratory assistance.
- E. Personnel from the Agricultural Research Service, Yakima, Washington, will (1) cooperate in a consulting capacity for sampling designs and procedures, (2) analyze residues in samples as scheduled in this plan, and (3) report findings to the Regional Forester, U. S. Forest Service, Ogden, Utah.
- F. Other wildlife agencies, schools or organizations will be invited to observe the spray program and the monitoring program. Copies of study plans and reports will be furnished those having a direct concern with the area and this project.

III. Terrestrial Wildlife and the DDT Spray Project.

A. Mule Deer

1. Pre-Spray

- a. Up to five adult males will be collected by rifle from the spray area within the Panther Creek drainage - Idaho Fish & Game Department.
- b. Adipose fat samples approximating five grams will be removed from each animal and placed in numbered glass vials supplied by the Agricultural Research Service - Forest Service and Idaho Fish & Game Department.
- c. Tissue samples from the liver, kidney, adrenal and thyroid glands will be removed and placed in individual plastic bags. A larger plastic bag numbered to correspond to the fat sample will be used for storage and shipping. - Forest Service, Fish & Wildlife Service, and Idaho Fish & Game.
- d. A rumen sample will be removed, strained through cheesecloth and placed in a double plastic bag. The bag will be numbered to correspond to the fat sample. - Forest Service, Fish & Wildlife Service, and Idaho Fish & Game.
- e. An attempt will be made to take adult deer by means of a "capture" gun. By biopsy a rump fat sample will be taken from each captured animal. The animal will then be conspicuously marked and released for possible future recovery.

2. Post-Spray.

- a. Approximately 30 to 45 days after spraying, up to ten adult males will be collected by rifle from spray areas in Panther Creek. - Idaho Fish & Game. Removal of sample material will be carried out as before. - Forest Service and Idaho Fish & Game.
- b. Following spray operations and prior to the general hunting season, an effort will be made to recover marked animals by means of a rifle. If marked animals will still be at large during the 1964 deer season, hunters in the area will be alerted to the importance of reporting kills of these animals. If a kill is reported, every effort will be made to obtain a rump fat sample.
- c. General Deer Season - 1964: Adipose fat samples will be removed from hunter kills from the Panther Creek drainage above Napias Creek. Efforts will be made to include fawn samples. - Idaho Fish & Game.
- d. General Deer Season - 1965: The same procedure will be followed as for the general season of 1964, except that efforts will be made to especially include fawns and yearlings in the sampling. - Idaho Fish & Game.

- e. General Deer Season - 1966: The same procedure will be followed making efforts to include samples from fawns, yearlings, and two and one-half year old animals. - Idaho Fish & Game.

3. Controls

During the 1964 general deer season, adipose fat samples will be taken from 15 to 20 adult mule deer taken from Boise and Elmore counties. - Idaho Fish & Game.

B. Elk

1. During the 1964 elk season adipose fat samples will be taken from up to ten elk killed within the spray project area. Locations of kills will be determined as closely as possible and recorded. - Idaho Fish & Game.
2. As controls, adipose fat samples will be taken from up to ten elk killed in the elk hunt in Boise and Elmore Counties. - Idaho Fish & Game.
3. The same method of handling and shipment will be followed as for deer taken in the 1964 deer hunting season.

C. Mountain Goats.

1. Adipose fat samples will be taken from hunter kills during the 1964 Horse Creek control hunt. - Idaho Fish & Game.
2. For control purposes, adipose fat samples will be taken from up to ten animals taken during the 1964 Pahsimeroi hunt. Idaho Fish & Game.
3. The same method of handling and shipment will be followed as for deer taken in the 1964 hunting season.

D. Mountain Sheep.

1. Adipose fat samples will be taken from hunter kills taken within the spray project area during the 1964 open hunt.
2. The same method of handling and shipment will be followed as for deer in the 1964 hunting season.

E. Song Birds

1. Sampling for residue analyses.

a. Pre-Spray.

- (1) Five robins will be collected by shotgun from spray areas. - Forest Service
- (2) The beak, feet, and skin will be removed from each bird and discarded. The crop and stomach will be removed and bagged as a separate sample. The carcass will be bagged and both portions identified as from the same bird.

b. Post-Spray.

Five robins will be collected from the spray area at 15-day intervals with a maximum of four post-spray sampling periods. Handling will be carried out in the same manner as with the pre-spray samples. - Forest Service.

2. Census.

The purpose of this portion of the study is to determine if this particular census technique has merit for evaluating the effects of spray projects on bird populations or movements. It may serve as a partial indication of a limited population dynamics as a result of spray treatment. It will not serve as inventory of population dynamics of this spray project. This study will be done by the Project Game Biologist with possible assistance from Dr. Keith Dixon, Ornithologist, Utah State University, and the Research Biologist, Bureau of Sport Fisheries and Wildlife.

- a. Two 40 acre square study plots will be established within the spray area in Panther Creek. Location will be identified on aerial photos. Environmental descriptions will be written for each plot. Efforts will be made to locate the plots in the following types:
 - (1) Douglas-fir with closed or nearly closed canopy.
 - (2) Browse field or mixed browse and open Douglas-fir canopy which will most likely be sprayed.
- b. Census strips will be marked by string lines in such a way that the entire study plot will be censused.
- c. Two or three days prior to spraying a sunrise census will be made of all birds found within each study plot.

- d. Two or three days following spraying the plots will again be censused.
- e. Any dead birds found within these plots, or anywhere within the project, will be preserved for residue analyses.

F. Vegetation.

The purpose of this sampling will be to determine the persistence of DDT residues on forage species. The project plans provide for protection of meadows wherever practical. The sampling described here will not be an inventory of distribution of spray on range forage.

1. Pre-Spray: Fifteen sampling sites for each of five selected forage species will be selected on areas where one pound DDT per acre is anticipated to be applied. Each site will be assigned a number and plotted on an aerial mosaic. To facilitate ready field recognition all sites will be flagged or painted. Selected forage species will be tagged or marked at each site. Collections will be made of each of five selected forage species at each site and each bagged separately and put in cold storage. - Forest Service, Idaho Fish & Game, and Fish & Wildlife Service.
2. Spraying: Five oil sensitive cards will be placed out on each sample site just before the sites are to be sprayed. Within 24 hours after spraying the cards will be picked up and evaluated for the amounts of spray hitting the cards. Averages will be computed for the cards at each site. The highest ten sites for each species will be selected for further sampling. (The highest 10 must average over .1 pound DDT per acre on the ground. Otherwise only those sites having .1 pound per acre will be selected for further sampling.) Pre-spray vegetation samples collected from sites not chosen for further sampling will then be discarded. Forest Service.
3. Post-Spray Sampling: Samples will be taken for each of the five marked species from sites selected for further study at periods from immediately following spraying and at 30-day intervals for a total of four post-spray collection periods. Each individual species from all sampling sites will be put together as a single sample for each period of collection. All samples will be properly labeled and frozen. - Forest Service.
4. For control the same five species will be selected on sites well away from the spray project. Samples will be taken of each species at each time samples are taken from within the spray area. Each species will be kept separate for analyses. - Forest Service.

G. Preservation and Shipment of Samples

1. The Agricultural Research Service will furnish the project with containers for fat and tissue samples. Containers and instructions for samples to be taken from the hunts in Boise and Elmore counties will be forwarded to Dick Norell, Idaho Fish & Game Department Biologist, Boise, Idaho. Plastic bags will be furnished by the Forest Service for rumen and vegetation samples. All tagging materials will be furnished by the Forest Service.
2. Adipose fat samples taken from deer during the pre-spray and post-spray collection periods will be sent to Agricultural Research Service in Yakima, Washington for analyses immediately following collection of the full complement (up to 15 samples) of animals. This material will be analyzed at the earliest possible date. The Agricultural Research Service will send a report of their findings to the Regional Forester, U. S. Forest Service, Ogden, Utah, as soon as analyses are completed and a copy to the Director, Idaho Fish and Game Department, Boise, Idaho. The contents of this analyses report will be considered administratively confidential. Information about these results will not be released as public information unless and until agreed upon jointly by the Forest Service and Idaho Fish and Game Department.
3. All collections made through the 1964 hunting season will be held in a cold storage locker in Salmon rented by the Forest Service for that purpose, except that those fat samples taken from the hunt in Boise and Elmore counties will be shipped by the Idaho Fish & Game Department directly to the Agricultural Research Service. Following each major collection period in 1964 in the Salmon area, the Forest Service will ship samples to the respective laboratories for residue analyses.
4. Robin samples will be shipped as two component parts--carcass, and crop with the stomach. Analysis will be made of DDT residues in each of these two component parts.
5. All fat and robin samples will go to:

Analytical Investigations
Pesticide Chemicals Research Branch
Agricultural Research Service
3706 Nob Hill Boulevard
Yakima, Washington 98902
c/o Mr. Kenneth C. Walker

All vegetation, including rumen, samples will go to:

Bureau of Sport Fisheries & Wildlife
Building 45, Denver Federal Center
Denver, Colorado 80225
c/o Mr. Richard E. Pillmore

Disposition of deer taken as pre-spray sampling will be by the Idaho Fish & Game Department. Disposition of post-spray samples will be worked out at a later date.

IV. Cygon Test Area.

- A. Treatment area will be in the South Fork of Iron Creek about 30 miles south of Salmon, Idaho.
- B. A memorandum has been sent out by the Project Leader to all project personnel indicating that anyone working in this test area should be watchful for active bird nests. If any are found, locations are to be marked and reported to the Monitor Coordinator.
- C. Personnel of the Forest Service and Bureau of Sport Fisheries and Wildlife will make a search of the area just preceding spray application for active bird nests.
- D. The Research Biologist of the Bureau of Sport Fisheries and Wildlife will continue followup study of active nests found. A check of hatch and survival will be made.
- E. These same personnel will investigate the possibilities of establishing bird census routes through both the treatment area and the control area. If this proves feasible, routes will be established and described. Sunrise counts will be made within three days prior to spraying and again within three days following spraying. All birds along the route will be identified, if possible, and recorded. This will not constitute a thorough population dynamics investigation of the areas but may serve as an indication of trends.
- F. If any birds are found that are just freshly dead, either from the active nests or in connection with the census routes, they will be analysed for cholinesterase levels by the Research Biologist of the Fish & Wildlife Service.

V. Reporting.

- A. The close of the 1964 big game hunting season will be considered the close of this project monitoring field period. Collections made in 1965 and 1966 will be as programmed between the Idaho Fish & Game Department and the Agricultural Research Service. A copy of analyses results for animals taken from within the project area after 1964 should be furnished the Regional Forester, Forest Service, Ogden, Utah.

- B. The Agricultural Research Service will furnish the Regional Forester, U. S. Forest Service, Ogden, Utah, with a report of findings of the sample analyses. The Forest Service will furnish copies to the Director, Idaho Fish & Game Department, Boise, Idaho, the Area Big Game Biologist, Idaho Fish & Game Department, Salmon, Idaho and to the Director, Fish & Wildlife Research Center, Denver, Colorado.
- C. The Denver Wildlife Research Center will furnish the Regional Forester, U. S. Forest Service, Ogden, Utah, with a report covering sample analyses and findings of the Cygon test. The Forest Service will furnish copies to the Director, Idaho Fish & Game Department, Boise, Idaho, the Area Big Game Biologist, Idaho Fish & Game Department, Salmon, Idaho, and the Agricultural Research Service, Yakima, Washington.
- D. At the end of his assignment to this project the Project Game Biologist will furnish a report of his field accomplishments to the Monitor Coordinator.
- E. A completion report of all monitoring activities will be made by the Monitor Coordinator to the Project Leader by November 15, 1964. This report will include an analysis of the terrestrial wildlife monitoring. Copies of the approved report will be supplied to all cooperating agencies by the Regional Forester.
- F. The following report will be used as an additional source of big game pre-spray control data: "Report of the Determination of DDT, DDE, and TDE Insecticide Residues in the Adipose Tissue of Antelope, Bear, Deer, Elk, Goat, and Moose in the State of Idaho", by Agricultural Research Service in cooperation with the Idaho Fish and Game Department, August, 1963.