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REGIONAL FORESTER

STATE OF IDAHO

ROBERT E. SHYKIE  
GOVERNOR

Fish and Game Department

518 FRONT STREET BOISE, IDAHO

July 13, 1964

15240

COMMISSION  
GLENN STANGER IDAHO FALLS  
R. J. HOLMES TWIN FALLS  
ARLIE JOHNSON BOISE  
WILLIAM B. BURDON MOSCOW  
FRANK CULLEN COEUR D'ALENE

Action	John R. WOODWORTH DIRECTOR
A.R.F.	
Dr. Chief	<i>[Signature]</i>
D. & E.	<i>[Signature]</i>
1.	<i>[Signature]</i>
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Control	<i>[Signature]</i>
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2.	<i>[Signature]</i>
3.	<i>[Signature]</i>
Pathologist	<i>[Signature]</i>
Finance	
Staff	

Mr. Floyd Iverson  
Regional Forester  
Forest Service Building  
Ogden, Utah

Dear Floyd:

Attached is a signed copy of the study plan monitoring fish and wildlife habitat on Hughes Creek during the 1964 spruce budworm control project.

Sincerely,

IDAHO FISH AND GAME DEPARTMENT

*John R. Woodworth*  
John R. Woodworth  
Director

cc: Spruce Budworm

TM-INSECT & DISEASE

STUDY PLAN  
MONITORING FISH AND FISH HABITAT  
ON HUGHES CREEK

FISH & GAME  
DIRECTOR  
Jul 10 8 26 AM '64

1964 SPRUCE BUDWORM PROJECT  
DIVISION OF TIMBER MANAGEMENT  
REGION FOUR

Submitted by:

Approved by:

Donald R. Corley  
Don Corley  
Area Fisheries Biologist  
Idaho Fish & Game Department

Kenneth Walker 7-8-64  
Kenneth Walker  
In Charge  
Analytical Chemistry Investigations  
Agricultural Research Service  
Date

Recommended for Approval:

Robert L. Casebeer 7-1-64  
Robert L. Casebeer  
Project Monitor Coordinator  
U. S. Forest Service  
Date

John R. Woodworth 7-13-64  
John R. Woodworth  
Director  
Idaho Fish & Game Department  
Date

Clifford T. Solberg 7/1/64  
Clifford T. Solberg  
Project Leader  
U. S. Forest Service  
Date

Joel L. Frykman 7/19/64  
Joel L. Frykman  
Assistant Regional Forester  
Division of Timber Management  
U. S. Forest Service  
Date

David M. Gaufin 7/16/64  
David M. Gaufin  
Assistant Regional Forester  
Division of Wildlife Management  
U. S. Forest Service  
Date

Charles R. Whitt  
Charles R. Whitt  
Project Fisheries Biologist  
U. S. Forest Service  
Date

## I. Objective of Study

To evaluate the immediate effects on aquatic organisms of a DDT spray program where a 100 feet non-spray strip is left on each side of Hughes Creek and its tributaries. The next 400 feet from the stream is sprayed by a helicopter at a rate of one-half pound DDT per acre, and the rest of the infested area by fixed-wing aircraft at the rate of 1 pound DDT per acre.

## II. Assignment of Personnel

This study will be directed and supervised by the Idaho Fish & Game Department's Area Biologist who is directly responsible to the Department's Chief of Fisheries Management. Personnel to assist the Area Biologist will consist of four departmental fisheries biologists and one biological aid.

A Cooperative Agreement between the Forest Service and the Idaho Fish and Game Department provides that specific portions of the aquatic monitoring program are being assigned to the Department. Specifically, the Department will be directly responsible for planning and conducting the Hughes Creek monitoring program. Monitoring the remainder of the spray project is the responsibility of the Forest Service as provided in a separate study plan.

During spray operations, it is mutually agreed that as peak workload periods of aquatic monitoring shift from one phase to the other, there will need to be a corresponding shift in manpower and personnel from each agency to work on the other phase than the one for which their individual agency is responsible. It will be the responsibility of the Department's Area Fisheries Biologist and the Project Fisheries Biologist to coordinate exchange of personnel in field assignments. All personnel will remain administratively responsible to the agency by which they are employed but will be directed to follow instructions of the fisheries biologist in charge of the particular field job to which they may be assigned.

The Pesticide Chemicals Research Branch of the Agricultural Research Service in Yakima, Washington, will cooperate in this study program as consultant to the project design and operation and will analyze water and fish samples to determine pesticide residues.

## III. Timing

Timing of the aquatic monitoring program is dependent on spruce budworm development. However, prespray sampling will begin approximately one week before spraying starts and will terminate approximately October 15, 1964.

## IV. Methods

### A. Selection of Test Stations

A total of five test stations will be located on Hughes Creek and its tributaries. The location of each station is shown on the attached map.

Two control stations will be used for this study. The location of these stations are to be determined later. These controls will be the same as used by the Forest Service as control stations.

#### B. Aquatic Insect Drift Sampling.

Insect drift sampling will be conducted at each test station. However, only limited sampling will be done at the control stations. Each prespray sample will consist of a 15 minute sampling period at hourly intervals. Prior to spraying, sampling with aluminum screen and surber drift nets will be done for one 24 hour period (includes night time sampling), to measure the normal pre-spray number of insects drifting in the stream. Twenty four hour sampling is expected to give an indication of aquatic insect population densities.

On spray days at each test station, one 15 minute drift sample will be taken each hour starting one hour before spray time and continuing for 8 hours. These samples will be taken with aluminum screen drift nets, the mesh measurement of which are 144 openings per square inch. In addition, a series of corresponding samples will be taken at test stations T-1 and T-5 with fine meshed surber drift nets, to determine the number of very small insects drifting in the stream.

Insects collected in drift nets will be put in vials, labeled for identification, and preserved in alcohol. Taxinomic tabulations will be completed by approximately August 31, 1964.

#### C. Bottom Sampling of Insects

Bottom insects will be sampled at test stations T-1, T-2, and T-5 and at the control stations one week prior to spray, two weeks after spraying, one month after spraying, and three months after spraying. A total of twenty square feet will be sampled at each of the above stations on each sampling date. Bottom sampling apparatus will consist of a circular frame with a sampling area of two square feet. Insects collected from bottom samples will be placed in bottles containing alcohol and labeled. A quantitative taxonomical analysis of bottom samples will be made. Identification work will be done by Idaho Fish and Game Department and Forest Service personnel.

#### D. Live Box Tests

At each test and control station three live boxes will be placed in the stream. Approximately three days before spraying begins, 120 steelhead fry, 120 hatchery-reared rainbow fingerlings, and approximately 75 Chinook salmon fingerlings will be placed in separate live boxes at each station. The day before spraying is to commence, all but 100 steelhead and rainbow, and 50 chinook salmon will be removed from each box.

Fish will be kept in live boxes approximately one week after spraying is completed and mortality, if it occurs, will be noted each day.

Control stations will be located in two streams well outside of the spray area. These stations will be the same as those used for the general monitoring program. Separate sets of live box tests will be used for each phase of the project.

Test fish will be obtained as follows:

1. Chinook salmon will be collected from traps on the North Fork of the Salmon River, the Lemhi River, the Salmon River, the Pahsimeroi River, and the East Fork Salmon River. In addition and if necessary, Salmon fingerlings will be obtained by electric shockers from the Lemhi River.
2. Steelhead trout fry will be trapped from an artificial spawning channel located on the Lemhi River.
3. Rainbow trout will be transported from the Mackay Fish Hatchery.

Live boxes will be placed in slow moving water when possible. Test fish will be protected from swim fatigue by boarding solid one or more sides of each box. Portions of the bottom of each box may also be boarded solid for additional protection.

#### E. Analysis of Fish for DDT

Twenty fish of each species from the various lots of test and control fish will be sacked in plastic bags, labeled, and frozen prior to the time spraying begins. All fish, if any, which die during the spray and post-spray periods, will be removed from the live boxes. These fish will also be sacked in plastic bags, labeled and frozen. Similarly, 20 surviving fish from each test control live box will be preserved by freezing at the end of the testing period.

Lots of fish to be analyzed for DDT will be determined after data on fish mortality, if any, has been examined.

#### F. Water Sample Analyses

One pint (16 oz.) water samples will be collected every 15 minutes from 0400 to 1200 each day spraying occurs. Samples will be collected from each of two test stations. No samples will be collected from the control stations. Samples will be collected in 16 oz. screw-cap tins. They will be shipped to the following laboratory for analysis: Analytical Investigations, Pesticide Chemicals Research Branch, Agricultural Research Service, 3706 Nob Hill Boulevard, Yakima, Washington, 98902, c/o Kenneth Walker.

For analyses the entire sample will be used, including a solvent rinse of the can after pouring out the water. Findings will be reported in parts per billion of DDT and its metabolites and of any other identifiable pesticide residue.

Identification numbers will be scratched on the sides of each can, as well as on each lid. Other pertinent data will be recorded on appropriate field forms.

#### G. Spray Card Analyses

The spray distribution pattern will be analyzed by placing oil-sensitive cards in various locations. The approximate location of eight spray card transects is shown on the attached map. Spray cards will be spaced one chain apart extending 20 chains up the slope from each stream bank. However, the first chain distance from the stream bank will have cards distributed approximately ten feet apart. Spray cards will be replaced each day that spraying occurs within the Hughes Creek drainage.

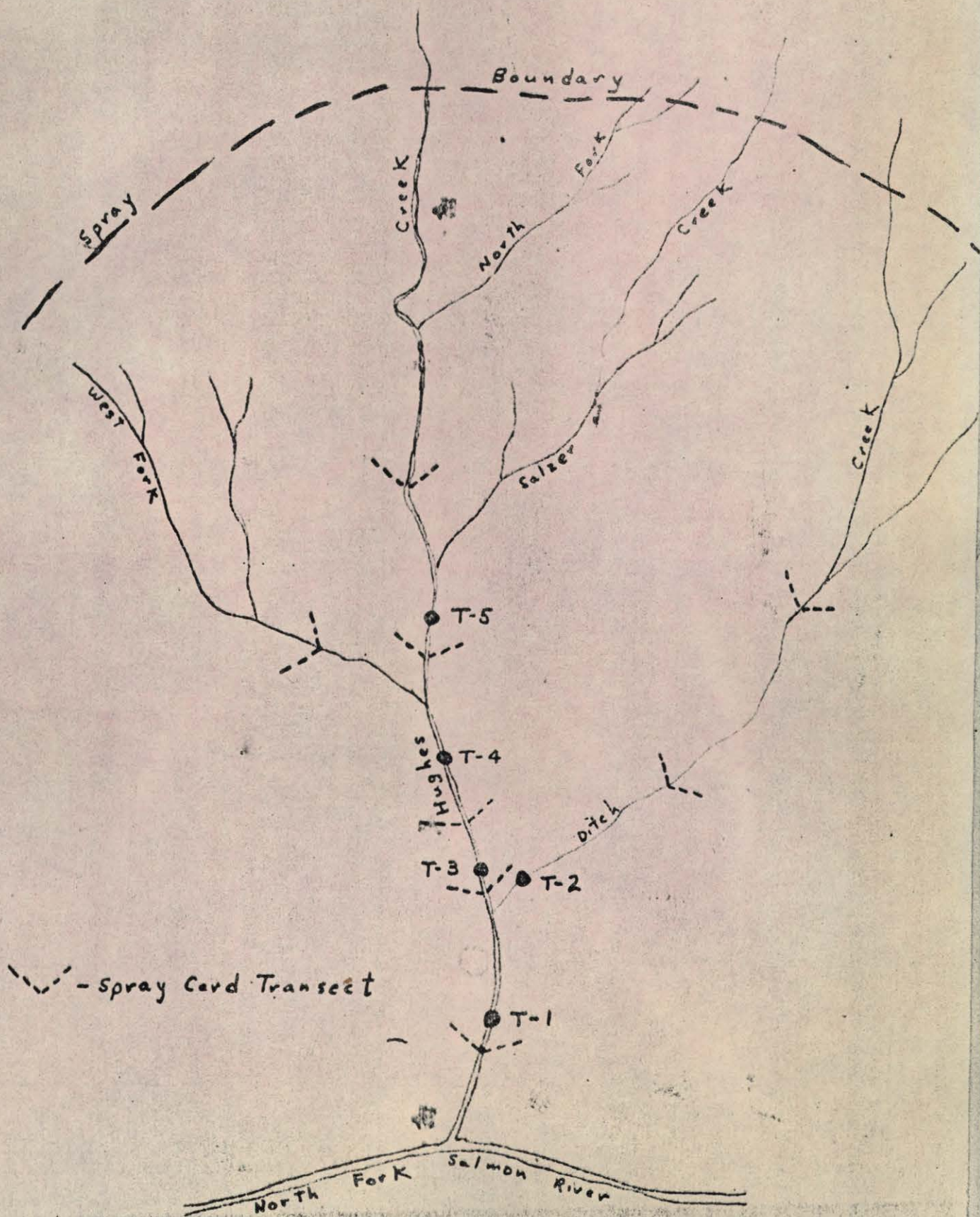
The distribution and collection of transect cards will be done by Forest Service personnel.

Additional spray cards will be placed immediately adjacent to the stream banks on Hughes Creek and its tributaries by Fish and Game Department personnel.

#### V. Reports

The Idaho Fish and Game Department is responsible for reporting this phase of the monitoring project. A preliminary report of findings to date will be submitted to the Forest Service through the Monitor Coordinator, target date for this report will be November 1, 1964. A final report will be due within 90 days after completion of field work. Any field data related to this study that is requested by Forest Service shall be forwarded to the Regional Forester, Ogden, Utah. Copies of these same data may be retained by the Department for their files.

Hughes Creek Area



- Spray Card Transect

North Fork Salmon River