1-1-1955

Forestry Kaimin, 1955

Montana State University (Missoula, Mont.). School of Forestry. Forestry Club

KAIMIN

J. D. Daniels

THE

FORESTRY CLUB

Of

MONTANA STATE UNIVERSITY

Presents Its

40th ANNUAL

FORESTRY KAIMIN

1955

MISSOULIAN

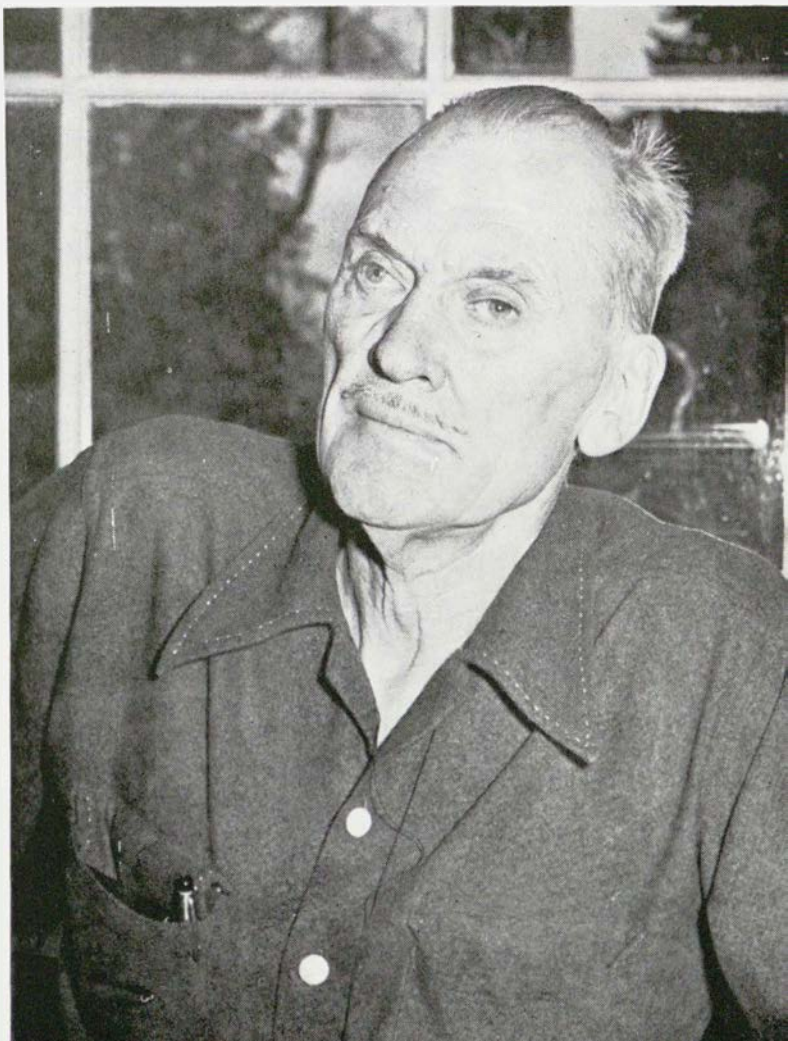
—Photo by Roscoe Haines, The Anaconda Co.

The following resolution was passed unanimously by the Board of Education at its meeting in Billings on April 18, 1955:

RESOLVED, that upon the occasion of his retirement from the faculty of Montana State University, the State Board of Education expresses its appreciation of the long and faithful services of Fay Goodcell Clark. When the veterans of the first World War entered the School of Forestry a need was felt for someone specially qualified to help meet the educational demands of this group. Fay Clark, then with the U. S. Forest Service was invited to join the staff of this University to help with the teaching. Thirty-three years of teaching and association with students have produced a record which demanded industry, independent thinking and practical understanding of the field of forestry by graduates of the School of Forestry. He will be long remembered as one who has given color and distinction to Forestry education at Montana State University. We are appreciative of his service to Montana and the University.

The students of the Forestry School take great pleasure in being able to dedicate the 1955 Forestry Kaimin to him.

DEDICATION



Foreward.....

Another year—another graduating class new Frosh, and another Forestry Kaimin. Perhaps a little later than usual this year, but problems always seem to mount up. The publication date was changed this year so as to include the entire school year—from Fall to Spring. Because of this, the Spring quarter activities of 1954 were lost in the shuffle.

A few of the high-lites: Jack Chamberlain received the annual alumni award for the year; both a Spring hike and dance were held; Senior rangemen and timbermen went on their respective trips, while the Forestry Club was ably represented at the A.W.F.C. Conclave in Oregon. We even "WON" a prize—"The Royal Order of the Rusty Pulaski." The Sophomore class attended numerous Saturday picnics, and even our softball team won a couple of games.

My thanks to all for being patient with us, and especially to our advertisers. Thanks also to Al Crozer for all his time and gas, to the other staff members for their time and energy, and to the ad chasers.

The work is done and mostly forgotten, but the Kaimin will be around to bring back stories, good times and memories.

Ye Olde Ed.

KAIMIN STAFF

Left to right—Joanne Golden, Feature Writer; Jean Campbell, Feature Writer; Dick Johnson, Editor; Jack Duke, Advertising; Allen Crozer, Business Manager; Pete Stofle, Advertising Manager; Mary Meagher, Feature Writer. Not pictured: Paul Bruns, Faculty Advisor; Glenn Freeman, Photo Editor.

Faculty . . . .

ROSS WILLIAMS

Dean of the Forestry School

Director of the Montana Forestry and Conservation Experiment Station

Professor of Forestry

B.S.F.—Montana State University—1921
M.F.—Yale University—1923
Survey of Forestry and Farm Forestry

FAY CLARK

Professor of Forestry

B.A.—University of Michigan—1912
M.S.F.—University of Michigan—1914
Mensuration and Valuation

PAUL BRUNS

Associate Professor of Forestry

B.A.—New York University—1937
M.F.—Yale University—1940
Forest Management, Silviculture and Regional Silviculture

MEL MORRIS

Professor of Forestry

B.S.—Colorado A. & M. College—1930
M.S.—1932
General Range Management, Conservation Economics, Big Game Management, Big Game and Wildlife Management and Regional Range.

CHARLES WATERS

Professor of Forestry and Botany

B.S. and B.L.—Berea College—1919
M.A.—Ohio State University—1921
Ph.D.—University of Michigan—1927
Dendrology, Wood Technology, Forest Pathology and Silvics.

JOHN KRIER

Assistant Professor of Forestry

B.S.—University of Idaho—1947
M.S.—1948
Ph.D.—Yale University—1951
Forest Utilization
Forest Policy
Sawmilling & Lumbering
Seasoning & Preservation
Mechanically Derived Wood Products

GENE COX

Associate Professor of Forestry

B.S., M.F., and Ph.D.—Duke University—1947, 1948, 1953
Soils, Silvicultural Methods, and Seeding and Planting

JAMES KLEMMEDSON

Instructor of Forestry

B.S.F.—University of California—1950
M.S.—Colorado A. & M. College—1953
Range Management, Range Forage Plants

JAMES FAUROT

Instructor of Forestry

B.S.F.—Montana State University—1949
Engineering, Logging, and Timber Mechanics

Faculty . . . .

BEN HUEY

Assistant Professor of Forestry

B.A. in Economics—Kansas University—1938

B.S.F.—Colorado A. & M.—1942

M.S.F.—Montana State University—1951

Forest Economics

LOUIS POWELL

Instructor of Forestry

B.S.F.—Oregon State College—1950

M.F.—Duke University—1951

Surveying, Aerial Photo Interpretation, Mapping

DON DRUMMOND

Instructor of Forestry

B.S.F.—Utah State Agricultural College

M.F.—Louisiana State University—1939

Forest Fire Control

MRS. HELEN ETTINGER

Librarian

DORA RATZBURG MARY ANN KOCAR

Secretaries

THE EFFECT OF DEER CONCENTRATIONS AND ARTIFICIAL FEEDING ON A WINTER RANGE IN WESTERN MONTANA

by LAWRENCE L. HELWIG and GENE L. KUHNS

INTRODUCTION

The movement of mule and white-tailed deer from summer to winter range is a normal characteristic of these game animals in western Montana. The winter range is generally limited in size and results in the concentration of game animals. In open winters the area is much larger than that when the winters are severe. Whatever causes an earlier, longer, and a more concentrated condition of animals on the winter range contributes to heavy or excessive use of winter feed and to abnormal use of a typical food materials. Good forage species lose vigor, coniferous reproduction is damaged and in some years heavy die-offs of animals take place.

Commonly build-ups in deer population, severe winters, or artificial feed are the principle contributing causes to excessive concentrations of game. Severe winters are natural and expected and would probably, with normal populations of game, present no special problem in game management. However, due to under-hunting of deer populations, and by unwise feeding of game, concentrations are of more frequent occurrence, more intensive, and aggrevate the effect of severe winters.

A situation of execessive concentration due to the above named causes and subsequent damage to forage and trees as well as heavy die-offs exists in the vicinity of Salmon Lake in the Blackfoot valley of western Montana. It is the purpose of this study to measure the effect of deer concentration, as a result of winter feeding, on the amount and condition of both forest reproduction and natural forage species.

Review of Literature

In a study of the effect of deer browsing on ponderosa pine and Douglas-fir reproduction in northwestern Montana, Adams (1949) found pondersoa pine showing more past use than Douglas-fir. He also found a higher mortality in ponderosa pine than he did in Douglas-fir.

Davenport (1939) shows in a controlled diet study in Michigan that from a nutritional standpoint it is entirely possible to carry deer on artificial diets where the natural winter food is insufficient. However, maintaining by artificial feeding a herd that is already so large that the increase cannot be harvested under present hunting regulations can readily be seen to be impractical.

Doman and Rasmussen (1944) in their study on supplemental winter feeding of mule deer in northern Utah, believe it impractical as a welfare program. They also consider it impractical from the standpoint of both cost and range management. Artificial feeding serves to concentrate deer in small areas year after year causing irreparable damage to native forage species, and eventually severely reducing the carrying capacity of the much needed winter range. Carhart (1943), along with other game technicians, believes winter feeding has limitations.

METHODS

Location of the Study: The study is located in the Clearwater drainage. Area I is located north of Placid Lake, and is on a south facing slope. Area II is located north of Owl Creek, and is also on a south facing slope. Area III is located west of the Shishler ranch adjacent to the Clearwater River. See Fig. 1.

Description of Vegetation: The vegetation on which the study was made is typically montane forest. The principle coniferous species are ponderosa pine (Pinus ponderosa), Douglas-fir (Pseudotsuga menziezii) rocky mountain juniper (Juniperus scopulorum), some lodgepole pine (Pinus contorta) and western larch (Larix occidentalis).

Deciduous shrubs found are chokecherry (Prunus demissa), serviceberry (Amelanchier alnifolia), rose (Rosa spp.), willow (Salix spp.), ceanothus (Ceanothus velutinus), kinnikinnik (Arctostaphylus uvi-ursi), and a few aspen (Populus tremuloides).

Sampling Procedure: In each study area three sample lines were run up the slope and radiated 20 degrees from a feeding center. The lines were located by means of a hand compass. Sampling plots, one-tenth acre in size, were established along the control lines at intervals of at least two chains. Plot centers were established by pacing and plot area determined by chaining.

Method of Plot Analysis: Both physical and vegetative characteristics were tabulated on special data sheets. The physical characters tabulated for each plot were aspect, position on slope and slope percent. The trees were enumerated by the following size classes: seedling, trees below 2 feet tall; sapling, 2 to 7 feet tall; pole, 7 feet tall to 6 inches dbh; and mature, over 6 inches dbh. Trees over seven feet high were measured for height of highline. Trees under seven feet and the deciduous browse were enumerated by degree of use classes. The classes consisted of six categories of use, no browsing, lightly browsed (1-25% of tree browsed), moderately browsed (26-50% of tree

(Continued on page 22)

Masters .....

The following men worked towards their Masters Degree during the 1954-1955 school year:

EDWARD C. BARKMAN—FOREST ENGINEERING

VOLLRAT (FRED) DEICHMAN—FOREST FIRE CONTROL

JOHN H. LOWELL—WILDLIFE MANAGEMENT

WESLEY MORRISON—FOREST FIRE CONTROL

HOWARD S. NELSON—RANGE INSECTS

ARTHUR L. ROE—FOREST MANAGEMENT

ANTHONY E. SQUILLACE—FOREST GENETICS

ROBERT STONE—FOREST MANAGEMENT

DAVIS A. WEISTANER—FOREST PATHOLOGY

PSALM OF A SAMPLE PLOT

by Elmer W. Shaw

My boss is head chainman; I shall not rest.

He maketh me to survey the deep forest; he leadeth me through the peat bogs: I am buried in mud.

He leadeth me in paths of wilderness in the name of research.

We stake out the plot centers: We tag trees by the thousand.

Yea, though I'm lost amid hemlocks and fir trees, I will fear no evil for thou art with me. Thy compass and jake staff they guide me.

Thou preparest a pathway before me through wet salmon berry, vine maple, and skunk cabbage.

I annointeth my skin with repellent, yet mosuitoes swarm o'er me.

Surely insects and statistics shall follow me all the days of my life, and sample plots haunt me forever!

(With humble apologies to all other psalmists, I remain a bug-bitten, rain-soaked, timber beast.)

Seniors . . . .

JACK CHAMBERLAIN

Jack is a timber management major from Spokane, Washington,. He attended Northern Idaho College of Education before coming here. Jack has been very active, serving as chairman of the 1952 Fall Dance, Ass't. Chairman of Gym Decorations, and Chairman and Advisor of the Tree Cutting for the Foresters' Ball. He has played touch football, softball, volleyball, intramural golf. He has been vice-president of the Druids and a member of the A.S.M.S.U. Budget and Finance Committee. Jack is also a member of the Baled Hay Chapter of Alpha Falpha. 1951 saw him working for Potlatch Forests, Inc. In 1952, '53 and '54, he worked for the Forest Service in Pierce, Idaho, as scaler and dispatcher.

CHARLES T. COSTON

Charles hails from Oak Ridge, Tennessee, and is another timber management major. He attended the University of Tennessee before coming here. In 1951, he worked as a lookout-smokchaser at Ninemile R.S. 1952 and 1953 he did cruising and timber marking on the Lolo National Forest. In 1954 he worked as a fire control aide at the Seeley Lake R.S.

J. RUSSELL DAHL

A timber management major, Russ comes to us from Hot Springs, Arkansas. He attended Arkansas Polytechnic College before coming here. Russ has been very active in the Forestry Club, serving as advisor for Tickets and Favors Committee of the Foresters' Ball. He was ad manager of the 1954 Forestry Kaimin. He is a proctor at South Hall and is a member of A.P.O., serving as vice-president for one quarter. In 1952, he worked at the Priest River Experiment Station on the Soil Infiltration Project. 1953 saw him working on the Nez Perce. In 1954, he worked at the Missoula Research Center.

FRANCIS E. DUNNING

Frank is a forest management major from Billings, Montana. He attended Eastern Monana College of Education before coming here. In 1952 and 1953, he worked for the Forest Service in Gardiner, Montana, at F.C.A. 1954, he worked as a timber management aide in Powell, Idaho.

RALPH A. EMERSON

A forest engineering major, Ralph comes all the way from Juneau, Alaska. He has been very active here, being a member of Druids, serving as president of Forestry Club, working on Gym Decorations for the Foresters' Ball, and ad-chaser for the Kaimin. He has also played intra-mural football for the club. 1947-48, he worked as a lookout-smokechaser on the Flathead National Forest. In 1949, he did timber marking on the Coeur d'Alene N.F. 1950 and 1953, he worked for Potlatch Forests, Inc. as a compassman. 1954, he worked as engineers helper on the Potlatch Forests, Inc.

NORMAN GARRICK

ROBERT S. GIBSON, JR.

Another forest management major, Bob comes to us from Butte, Montana. He is a member of the Forestry Club, has worked on the Foresters' Ball and has been Circulation Manager for the Kaimin. He is a member of Sigma Nu. In 1950, he worked for the Empire Millwork Corp. in Nykomish, Wash. In 1951, he worked on the Deerlodge N.F. 1952, he worked for the Poleline Construction Co. In 1953, he worked on the Lolo N.F. and in 1954, he worked on the Beaverhead N.F.

JOHN J. GILLIAM

John hails from Lincoln, Montana. He is a member of the S.A.F. and attended Metropolitan J.C. in March-May of 1951. He is a member of the Forestry Club and has worked on the Foresters' Ball. 1952 saw him working as a lookout and 1953 and 1954 saw him working as dispatcher in Lincoln.

Seniors . . . .

ROBERT GREENAN

Bob is from Chicago, Illinois and is a timber management major. Bob is another active member of the Forestry Club; he has been A.W.F.C. Veep, worked on the Foresters' Ball in connection with sound and lighting, publicity, gym decorations (chairman and advisor). He has been layout editor of the Kaimin. He is a member of the Druids and has played intra-mural football. Bob worked for the Kingston R.S. for two years; the Western Montana Sawmill in Missoula; and for the school forest for one year.

HAROLD E. HANSON

Another forest management major, Bud is from Longville, Minnesota. He attended S. Dak. State and Cornell University before coming here. He is a member of the Forestry Club, serving as Junior delegate to Executive Board; has worked on the Foresters' Ball; and has been Honor Council Chairman. He is a member of Druids. Harold has played I.M. bowling, softball, and basketball, serving as coach for the latter. 1952, 1953 and 1954 saw him working for the Forest Service in Forest Surveys.

JOHN L. HAUTZINGER

John is from Omaha, Nebraska and is a forest management major. He attended Omaha University in 1950-51. He is a member of the Forestry Club, has worked on the Foresters' Ball, and has been business manager for the Kaimin. He has been captain of the varsity rifle team, and is a member of the A.F.R.O.T.C. rifle team. 1952, he worked for the Forest Service as a smokejumper. 1953, he worked for the Forest Service as a scaler in Juneau, Alaska. 1954, he worked for the Forest Service in Lima, Montana as alternate ranger.

LARRY HELWIG

Larry is a wildlife management major from Waubay, So. Dakato where he attended Northern State Teachers College before coming here. He has been athletic manager for the Forestry Club, Chairman and advisor of the Foresters' Ball chow hall, and ass't. layout manager of the Kaimin. He has played I.M. softball, volleyball and basketball. He has had a Range Management Problem published in the Journal of Range Management. In 1953, he worked on the Medicine Lake National Wildlife Refuge and in 1954, he worked for the South Dakota Fish & Game Dept.

JOHN D. HOLDEN

John hails from Van Nuys, California. He is a forest management major and he attended Los Angeles Valley J.C. and Oregon State College before coming here. John has been active in the Forstry Club, serving as delegate to A.W.F.C., senior delegate to Executive Board, editor of the Montana Foresters' Book, and a member of the bar committee of the Foresters' Ball. In 1950, he worked on the Kaniksu N.F. in B.R.C. 1951 and 1952, he worked on the Angeles N.F. as F.C.A. and Tank Truck Operator. 1953, saw him working for the Coos Bay Lumber Co. 1954, he worked for the Missoula Research Center, Forest Management Division.

RALPH T. JASZKOWSKI

Ralph is from Missoula, Montana and is a timber management major. He attended the University of Illinois before coming here. Ralph is the winner of the 1954 Silas Thompson Award. He is a member of the Druids and is very active in the Forestry Club; he has been sophomore delegate to Executive board, chairman and advisor for the doorway and bar committees of the Foresters' Ball. He has also worked on Kaimin photography and Spring Hike committee, Conservation committee, and A.W.F.C. Conclave in 1954. Ralph has played I.M. football and softball. In 1951, he worked on the Kaniksu N.F.; 1952 was also spent on the Kaniksu N.F. In 1954, he worked on the Lolo N.F.

ALLEN F. KELLEY, JR.

Another timber management major, Al hails from Greenfield, Massachusetts. Al has served as chairman of the Home Ec.-Forester Dance; worked on the check room and gym decorations committees of the Foresters' Ball; and layout manager for the 1954 Kaimin. He is also a member of the Druids, Phi Kappa Phi, and Kappa Tau. Athletically, Al has played I.M. swimming, track, and volleyball. He is also a member of Royaleers, Independents, and the Ski Club. In 1952, he worked as a lookout in Condon, Montana and in 1953 and 1954, he worked as a smokejumper.

GENE L. KUHNS

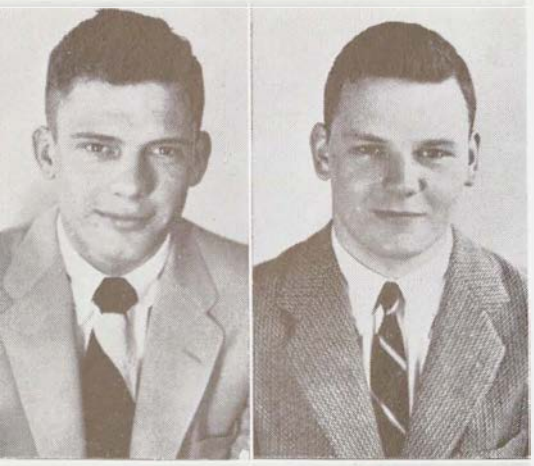
Gene is from Milwaukee, Wisconsin and is a wildlife management major. He attended the University of Wisconsin. He is vice-president of A.W.F.C., chairman of the Spring Dance, and chairman of the Music Committee of the Foresters' Ball. Gene is a member of the M Club and has been in varsity swimming, has played I.M. swimming, basketball, football, softball, and volleyball. In 1951 and 1952 he worked on the St. Joe N.F. in B.R.C. In 1954, he worked for the Inland Empire Research Center, Pole Blight Project.








Seniors . . . .



DAVID H. LARKIN

David is a forest engineering major from Buffalo, Wyoming. He is a member of the Forestry Club and has worked on the Foresters' Ball. He has played I.M. basketball. In 1948, he was a lookout in Buffalo, Wyoming. 1949, he was a recreation guard in Tensleep, Wyoming. In 1950, he worked as mill hand in Buffalo, Wyo. 1951 saw him as a smokejumper. In 1954, he worked in Cheyenne, Wyoming.

HOWARD R. MOORE

"Bob" hails from Trenton, New Jersey, and attended Trenton J.C. before coming here. He has served as athletic director for the Forestry Club and ass't chairman of the Foresters' Ball Special Effects Committee. Bob is a member of the M Club and the varsity swimimng team. He is also a member of I.M. swimming. 1952 and 1953 saw him working in Mercer County, New Jersey in Mosquito Control work. In 1954, he worked for the State of New Jersey on a state timber purchase survey.

WILLIAM R. OVERDORFF

Another forest engineering major, Bill is from Grand Island, Nebraska. He has been secretary of the Forestry Club, chairman and advisor of the Wood Butchers, and photo editor of the Kaimin. He is also a member of the Druids. In 1951, he worked for the National Park Service. 1952, he worked for the Forest Service in Kingston, Idaho. In 1953, he worked for the J. Neils Lumber Co. 1954, he worked for the Forest Service in Juneau, Alaska.

ROBERT POULSON

THEODORE I. RIEGER

Ted is a range management major from Plevna, Montana. Ted is a member of the Forestry Club, serving as bull cook, and on the athletic board. He was chairman and advisor of the Dining Hall committee for the Foresters' Ball. He was also photo editor for the Forestry Kaimin. Ted has played I.M. basketball, softball, football, and volleyball. He is a talented member of the Royaleers, belongs to the Methodist-Wesley Foundation, and S.C.A. In 1951-52, he worked on the Parachute project in Missoula. 1953 saw him working at the experiment station in Alder, Montana. 1954, he worked for the Inland Empire Research Center in Spokane.

ROBERT L. ROGERS

"Bob" comes to us from Sacramento, California, where he attended Sacramento J.C. before coming here. He is a member of Theta Chi. Bob has played I.M. football, basketball, tennis, and baseball. Bob worked for the Haven Saw & Tool Co. in Sacremento. He worked at Lake Tahoe in 1951. In 1952, worked for the Sacramento Mfg. Co. In 1953 and 1954, he worked for the Fomo & Morgan Lumber Co. and the Winton Lumber Co., respectively.

CHARLES E. ROUSE

Charles is from Lakeview, Oregon and is a forest engineering and management major. He attended Oregon State College before coming here. "Chuck" is a member of the Forestry Club and has helped on the Foresters' Ball. He is a member of the Independents and Royaleers. 1951, saw him working on the Fremont N.F. and in 1952, worked on the Ochoco N.F. 1953, he worked on the Lolo N.F., and in 1954, he worked for the Bureau of Land Management in Roseburg, Oregon.

JAMES R. SCHOENBAUM

Jim is another range management major and hails from Missoula. He is a member of the Forestry Club and worked on the Foresters' Ball. Also, he was a member of the former Rodeo Club. 1950 and 1951, he worked on the Shoshone N.F. 1952, he worked on the Beaverhead N.F., and at present, works for the White Pine Sash Co.

Seniors ....

ADRIAN D. SWENSON

Adrian is a timber management major from Superior, Wisconsin. He attended Superior State College before coming here. He is a member of the Forestry Club and has worked on the Foresters' Ball. He is a member of Iota Delta Chi, A.F.R.O.T.C. rifle team, and is the social chairman for the Newman Club. In 1952, 1953 and 1954, he worked at the Coram R.S. on the Flathead N.F.

ZANE G. SMITH

Zane is a timber management major from Missoula. He attended the University of New Mexico before coming here. He is a member of the Forestry Club and has worked on the Foresters' Ball; serving also as editor of the Kaimin. He was president of South Hall, and is a member of S.C.A. In 1952, he worked for the Forest Service in Overgard, Arizona. In 1953 and 1954, he worked for the Forest Service in Wallace, Idaho.

KENNEDY A. WANNER

Ken hails from Jamestown, North Dakota and has attended Jamestown College and North Dakota State College. Ken is majoring in utilization and engineering. He is a member of the Forestry Club and has worked on the Foresters' Ball. He is also a member of the Society of American Foresters. In 1949, he worked for the Soil Conservation Service. 1950, he worked for the Forest Service in St. Regis, Montana and in 1952, he worked there again. 1953, he worked for the Great Plains Experiment Station at Madison, North Dakota. In 1954, he worked for Koski Radio & T.V.

DON V. WILLIAMS

Don is a forest management major from Hamilton, Montana. Don is a member of the Forestry Club and was on the Executive Board. He was Chief Push for the 1955 Foresters' Ball. He is also a member of the Hellgate Ski Club and the Druids. Don played I.M. softball, volleyball, and was ski team captain. 1944-45 and 1949-50, he worked on the Moose Creek District, Bitterroot N.F. and in 1951-52, 1953 and 1954, he worked on the Sula District, Bitterroot N.F.

DAVID OWEN

Dave is a range management major and comes from Madison, Wisconsin. He attended the University of Wisconsin in 1949-50. Dave is a member of the Forestry Club and has been treasurer for the group. He has worked on the Foresters' Ball and has done numerous cartoons, posters, and covers for the Foresters. Dave has been secretary of the Druids and is also a member of Alpha Falpha. Dave served for four years as a string changer on the yo-yo team. 1950 saw him working in B.R.C. on the Cabinet N.F. 1951-54, he worked for the Forest Service in Aerial Fire Control.

Ralph Emerson and Mary Meagher preside at Club Meeting—
Shape-up you bums!

Coffee break—I think it's coffee.

Kelsey coughs up.

Intramural loot.

EXECUTIVE BOARD

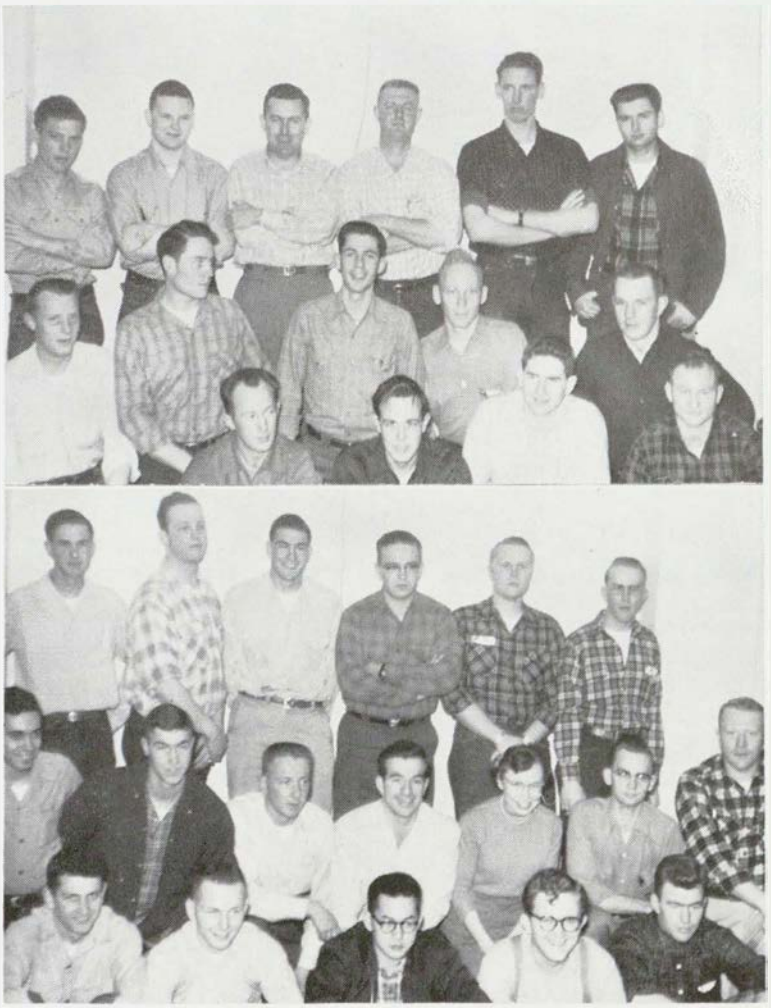
Sitting left to right—Moore, Meagher, Emerson, Patterson, Holden.
Standing—Johnson, Crozer.

FORESTRY WIVES CLUB

Forestry

Seniors...

Back row—Larkin, Moore, Chamberlain, Williams, Kelley, Rouse.
Middle row—Hanson, Rieger, Emerson, Olson, Owen.
Front row—Helwig, Holden, Greenan, Meuchels.



Juniors...

Back row—Sandman, Johnson, Royce, Hayes, Patterson, Venable
Middle row—Freeman, Poole, Phelps, Johnson, Campbell, Smith, Crozer
Front row—Ortengren, Heinz, Choong, Stofle, Ryan

Club

Sophomores...

Back row—Egerman, Baker, Daniels, Uphill, Neufelder, Schmitt.
Middle row—Cardwell, Bond, Loscar, Grandy, Wineholt.
Front row—Leveque, Kovalicky, Meagher, Davis.

Freshmen...

Back row—Knapp, Johnston, Jehrnigan, Nelson, Emerson
Middle row—Comstock, Dale, Steucker, France.
Front row—Stoleson, Kalkouski, Bohl.

Fall

Jim McLean pulled off a successful Fall Smoker.

Charge of the Light Brigade!

Smokey on Parade.

The Footballers tried but lost out in the championship game to Jumbolaya.

Our swimming team came home with the bacon for the second consecutive year.

Quarter

Arne looks lost,
Paul tells all . . .
Take away Rundle's can opener and he'd be lost.

but "my DAD says," and Lou agrees.
Check the China.
How'd that ear taste, Dick?

Silas Thompson Award

DICK JOHNSON received the Silas R. Thompson, Jr. Scholarship award for the year, presented for a combination of scholarship and activity in Forestry Club affairs.

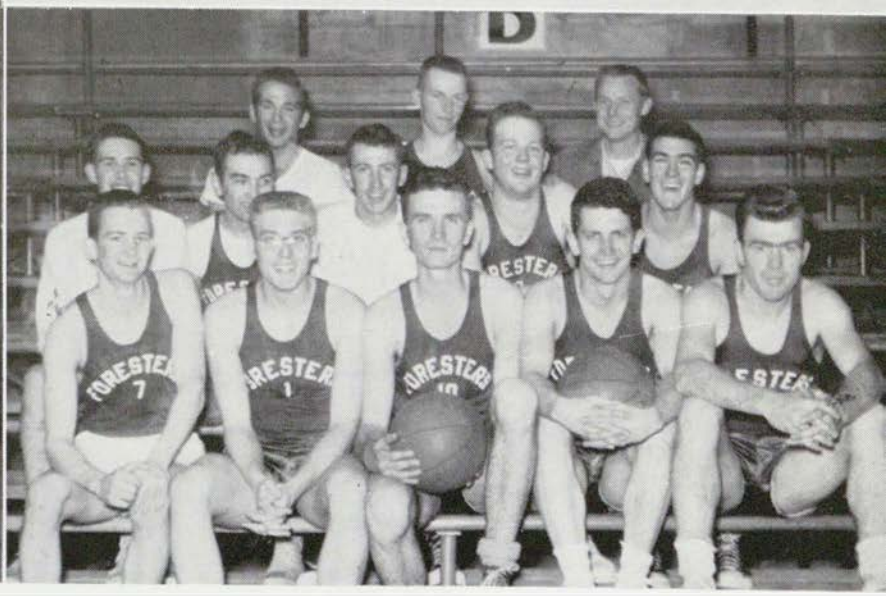
Alumni Award

The annual Alumni Award of $25.00 was given to **RALPH RUNDLE** for being the outstanding Junior in Forestry.

MONTANA DRUIDS

Front row—Prof. Krier, Overdorff, Greenan, Dahl, Emerson, Chamberlain, Ryan, Meuchels.
Back row—Inst. Powell, Dean Williams, Prof. Waters, Inst. Drummond, Williams, Royce, Johnson, Venable, Morrisson, Johnson, Kelley, Smith, Prof. Bruns, Prof. Clark, Hanson.

Winter Quarter



The Home-Ec. Dance livened up one of the meetings.

Rundle lays in '2' as Foresters whip Lawyers in a double overtime.

Ski team sweeps intramural skiing for the second year in a row.

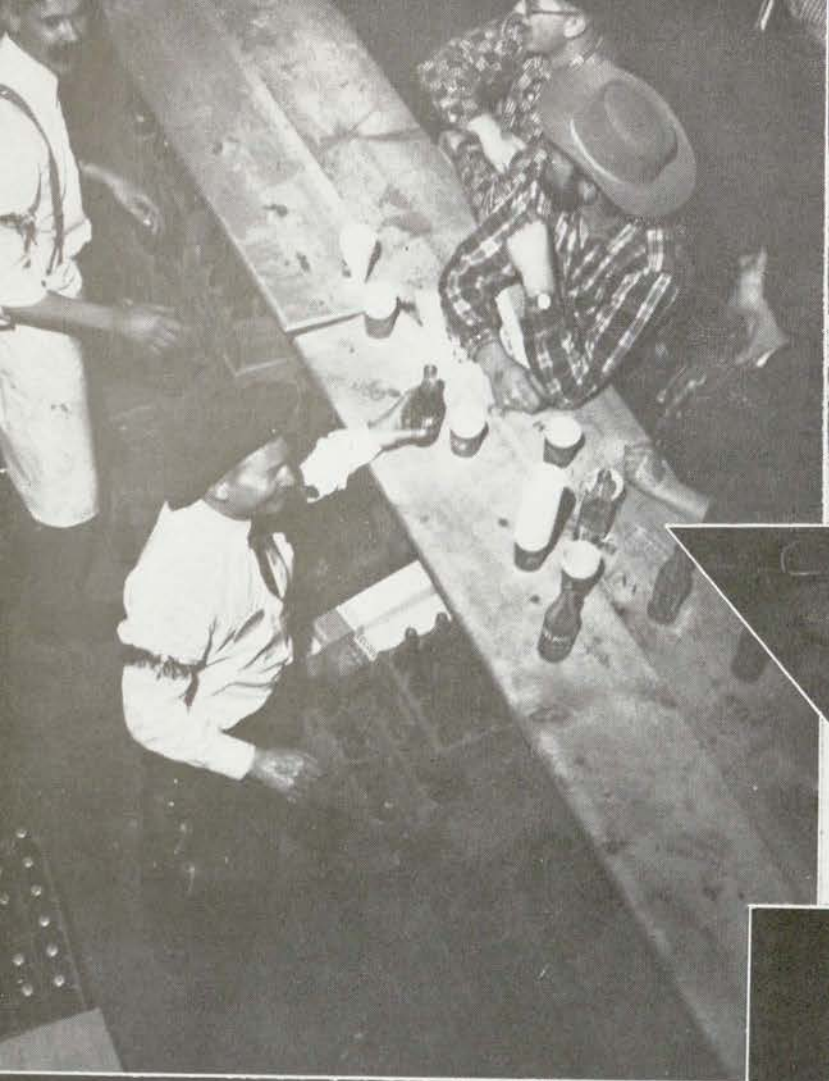
Basketball team looks happy before the game.

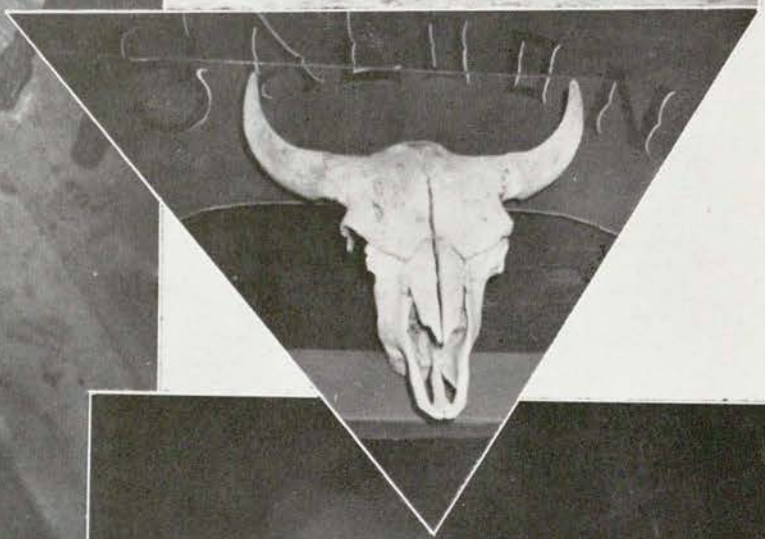
Foresters Ball

After umpteen years in the men's gym, the Foresters Ball was moved into the new field house. Don Williams had himself a real chore, but as usual, the ball ended up a big success.

Wes and Mrs. took the costume prizes—Fay thinks he should have won. Seitz applies final touch to the doorway.

Bartenders were drunk as usual—on Root beer of course, and the Ball wouldn't be complete without the Honky-Tonk "pianer." Don Stagg beat out a mean tune. Beards were all over the place, but at judgment time, Kels presented first prize, an electric razor donated by the Schick Co., to Bob Stanley.





THE EFFECT OF DEER CONCENTRATIONS AND ARTIFICIAL FEEDING

(Continued from page 7)

browsed), heavily browsed (51-75% of tree browsed) and very heavily browsed (75% or more of tree used). Trees dead from browsing and other causes of death were also recorded.

Results

Data from each location are presented in Tables I and II. The amount of damage to each species in each size class is given in number and percentage for each condition class.

By examination of the tables there appears to be no evident mortality in the seedling size class of any of the species. There was little mortality in the sapling stage for most species except Douglas-fir. The mortality for this species and age class was 36% on study area III. As the tree reached pole size, however, the mortality was again of no significance.

Preference by deer for certain coniferous species was evident. Ninety-two percent of the

TABLE I. Analysis of Degree of Use and Mortality of Conifer by Size Classes.

Condition and Size Classes	SPECIES AND AREAS*								
	PONDEROSA PINE			DOUGLAS FIR			JUNIPER		
	Area I	Area II	Area III	Area I	Area II	Area III	Area I	Area II	Area III
None Browsed	%	%	%	%	%	%	%	%	%
seedling	52	30	57	46	66	49	0	30	56
sapling	11	18	42	28	17	10	0	1	0
pole	77	19	17	43	3	1.5	0	0	0
Browsed Light to Moderate									
seedling	32	53	36	42	17	12	0	51	53
sapling	44	53	33	52	43	7	0	4	0
pole	17	56	36	45	22	11	100	1	0
Browsed Heavy to Very Heavy									
seedling	16	17	7	12	17	39	0	18	11
sapling	23	29	19	16	39	44	0	92	100
pole	6	25	47	12	75	86	0	99	0
Dead from Browsing									
seedling	0	0	0	0	0	0	0	0	0
sapling	11	0	3	1	.5	36	0	1	0
pole	0	0	0	0	0	0	0	0	100
Dead from Other Causes									
seedling	0	0	0	0	0	0	0	1	0
sapling	11	0	3	3	.5	3	0	2	0
pole	0	0	0	0	0	1.5	0	0	0
TOTAL	No.	No.	No.	No.	No.	No.	No.	No.	No.
seedling	31	69	28	106	98	99	0	141	9
sapling	9	51	33	92	134	245	0	132	3
pole	35	36	58	118	146	320	1	355	1

*Area I has had no or very little artificial feeding of hay to the deer.
Area II has had intermittent artificial feeding of hay to the deer.
Area III has had consistent artificial feeding of hay to the deer.

TABLE 3. Use and damage by deer to deciduous browse species found on all locations.

Location	SERVICEBERRY								CHOKECHERRY								WILLOW							
	No Use		Light to Heavy		Heavy to Very Heavy		Dead From Use		No Use		Light to Heavy		Heavy to Very Heavy		Dead From Use		No Use		Light to Heavy		Heavy to Very Heavy		Dead From Use	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
I	1	7	2	13	11	73	1	7	0	0	3	2	148	82	28	16	0	0	1	3	29	85	4	12
II	0	0	4	7	46	79	8	14	0	0	4	6	42	61	23	33	0	0	0	0	0	0	0	0
III	0	0	14	11	92	76	15	13	0	0	0	0	5	100	0	0	0	0	0	0	1	100	0	0

(Continued on page 29)

Spring Quarter

Conclave group looks happy in the rain at Frontier Town. Daniels, Hollowell, "Boss-Man" Patterson, Kovalicky, Grandy, Rundle, "Pi Phi" Behan, Phelps, Gallup. Taking photo was Crozer. A quick switch in the obstacle race. Gallup splits hairs.

That's no Aquamaid—that's "you name it I've got it" Stofle.

They didnt grow—no green thumb here.

"Cellar dwellers" with mascot.
Well, you can't win 'em all.

Probably the first gal Stoleson's ever kissed.

Spring

SENIOR MANAGEMENT TRIP

Front row—Deichman, Holden, Dahl, Hanson, Smith, Williams, Jaszkowski, Poulson, Dunning.

Back row—Hautzinger, Swenson, Gilliam, Larken, Estey.

Password for the day was confusion, as Kelley checks to see it that blonde is still there.

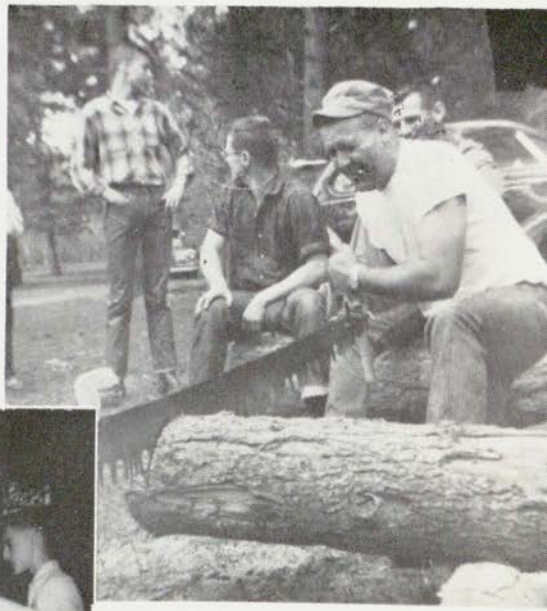
Quarter

"Chancellor" Royce really makes out, as Dal dances off the page.

This picture was taken "B. P."

Guess who will flunk the next test, or, see you next year, Lou.

At Washington School, Ryan demonstrates aerial photo equipment during Conservation Week.



"Charlie" Egerman works at normal speed.

Forestry School Roster

— A —

Abbott, Donald E.—Frosh.....Misoula, Mont.
Addor, Eugene E.—Jr.....Missoula, Mont.
Anderson, Gerald D.—Soph.....Eleva, Wis.
Anderson, R. J.—Frosh.....Palisades, Idaho
Andrews, Lee—Frosh. .....Philadelphia, Pa.
Austin, LeRoy—Frosh.....Gilby, N. Dak.

— B —

Backlin, Harvey L.—Soph.....Corvallis, Mont.
Bailey, Edward D.—Frosh.....Hamberg, Pa.
Baker, Bill—Soph.....Renton, Wash.
Barkman, Ed—Grad..... Missoula, Mont.
Beckman, Glen—Soph.....Gallatin Gateway, Mont.
Bednorz, Joseph C., Jr.—Frosh. ....Sioux Falls, S. Dak.
Behan, Richard W.—Soph...Indianapolis, Ind.
Belcher, Fitzroy A.—Jr.....Missoula, Mont.
Bergland, Robert J.—Soph...Great Falls, Mont.
Betts, Marion—Frosh. .....Silverton, Idaho
Blake, Cliff—Soph. .....Missoula, Mont.
Boe, Deen E.—Frosh.....Hays, Mont.
Boll, Louis A.—Jr. .....Winona, Minn.
Bond, Douglas C.—Soph.....Missoula, Mont.
Bremicker, Gilbert T., Jr.—Jr.....Berwyn, Ill.
Brause, Jack F.—Frosh.....Polson, Mont.
Bryant, Don—Soph.....Missoula, Mont.
Burk, Donald W.—Frosh....Sioux Falls, S. D.
Burns, Robert—Frosh.....Valparaiso, Ind.

— C —

Campbell, Myra J.—Jr.....Missoula, Mont.
Carmean, Ed B.—Frosh.....Lyndhurst, N. J.
Chamberlin, Jack L.—Sr.....Missoula, Mont.
Choong, Elvin—Jr. .....Djakoota, Indonesia
Christman, Peter Dale—Jr.....Butte, Mont.
Clark, M. D.—Soph.....Missoula, Mont.
Comstock, Don—Frosh.....Lincoln, Ill.
Craven, Daniel—Frosh.....Glendale, Calif.
Crawford, Allen—Frosh.....Lombard, Ill.
Crozer, E. Allen—Jr.....Trenton, N. J.
Coston, Charles T.—Sr.....Oak Ridge, Tenn.

— D —

Dahl, J. Russell—Sr.....Hot Springs, Ark.
Dale, Robert T.—Soph...San Luis Obispo, Cal.
Daley, Edward M.—Soph.....Claymont, Del.
Daniels, Dan—Jr.....Helmville, Mont.
Daniels, Jess D.—Soph.....Houston, Texas
Daniels, Terry L.—Frosh.....Palmeton, Pa.
Davis, John T.—Frosh.....Missoula, Mont.
Davis, John—Soph.....Missoula, Mont.
Dawson, Charles D.—Jr.....Kodiak, Alaska
Day, Allen—Frosh.....Overland Park, Kan.
DeBruine, Gordon—Soph.....West Allis, Wis.
Deichmann, V.—Grad. .....Kablen, Germany
Dillingham, Richard—Frosh...Valparaiso, Ind.
Duft, Joseph F.—Soph.....Morris, Minn.
Duhamel, Eugene—Jr.....East Providence, R. I.
Duke, John—Frosh.....Helena, Mont.
Dunkelberger, William—Frosh. .... Olympia, Wash.
Drysuis, Ken—Soph. .....Dixon, Mont.

— E —

Eakland, James—Sr.....Missoula, Mont.
Egan, Louis—Frosh. .....Missoula, Mont.
Egerman, Kenneth J.—Soph..... .....Big Timber, Mont.
Emerson, James C.—Frosh.....Juneau, Alaska
Emerson, Ralph A.—Sr.....Juneau, Alaska
Erickson, Hal—Frosh.....Sioux Falls, S. Dak.
Estey, William R.—Sr. .....Missoula, Mont.
Evans, Warren L.—Frosh.....Oroville, Calif.

— F —

Fahey, William—Frosh..... .....Green Forks, N. Dak.
Fisher, Donald—Soph.....Evansville, Ind.
Flohr, Don L.—Sr. .....Hamilton, Mont.
Ford, Bob—Soph. .....Lincoln, Nebr.
Foster, John R.—Frosh.....Springfield, Ohio
Fouts, William—Frosh.....Livingston, Mont.
France, Nevil—Frosh. .....Randolph, N. Y.
Frazer, Thomas—Soph.....Billings, Mont.
Freeman, Glen—Jr. .....Dillon, Mont.

— G —

Galea, John—Soph. .....Missoula, Mont.
Gallup, R. D.—Soph.....Fayette, Ohio
Garrick, Norman—Sr.....Missoula, Mont.
Gibson, Richard L.—Soph.....Blue Island, Ill.
Gibson, Robert—Sr.....Butte, Mont.
Gilliam, John J.—Sr. .....Lincoln, Mont.
Gjernes, Ellef—Soph.....Oklee, Minn.
Golden, Joanne L.—Jr.....Oregon, Wis.
Gorsh, Joe—Frosh.....Butte, Mont.
Grandy, George—Soph.....San Carlos, Calif.
Graves, Delbert—Soph.....Polson, Mont.
Gray, Robert—Soph. ..... Gallatin Gateway, Mont.
Green, Jackson—Frosh..... ..... Thompson Falls, Mont.
Greenan, Bob—Sr. .....Missoula, Mont.
Guardipee, Francis X., Jr.—Frosh..... ..... Browning, Mont.
Gustafson, Robert D.—Frosh...Missoula, Mont.

— H —

Hankins, William—Jr.....Billings, Mont.
Hanson, Harold E.—Sr.....Missoula, Mont.
Harryman, William—Soph.....Billings, Mont.
Hautzinger, John—Sr. .....Omaha, Nebr.
Hayes, Harlan L.—Jr. .....Missoula, Mont.
Heckerman, A. L.—Soph.....Missoula, Mont.
Heinz, Paul R.—Jr. .....Shawano, Wis.
Heidlebaugh, Rex—Frosh.....Col. Grove, Ohio
Helwig, L. L.—Sr. .....Waubay, S. Dak.
Hendzel, L.—Frosh. .....Pulaski, Wis.
Hoffman, Harry—Frosh.....Fort Atkinson, Wis.
Hoffman, John—Soph. ....Rapid City, S. Dak.
Hoffmeister, William—Soph., ... Cincinnati, Ohio

Holden, John D.—Sr.....Missoula, Mont.
Hollewell, Art—Soph.....Drummond, Mont.
Holzweiss, Henry—Frosh. .....
.....East Williston, N. Y.
Humes, Hubert R.—Soph.....Missoula, Mont.

—J—

Jaszkowski, Ralph—Sr.....Missoula, Mont.
Jehrnigan, Frank—Frosh.....Corvallis, Mont.
Johnson, Dallard—Jr. .....Milwaukee, Wis.
Johnson, John—Soph.....Missoula, Mont.
Johnson, L. E.—Jr.....Ozone Park, N. Y.
Johnson, Richard F.—Jr. .....Chicago, Ill.
Johnson, Robert M.—Frosh.....Middlebury, Vt.
Johnson, Robert W.—Frosh. Harlowton, Mont.
Johnston, Dempsey T.—Frosh. .....
.....Columbia Falls, Mont.
Jones, A. H.—Frosh. .....Missoula, Mont.
Jukkla, Art—Soph. .....Lead, S. Dak.
Jackson, James—Jr. .....Missoula, Mont.

—K—

Kabica, Richard—Frosh.....Chicago, Ill.
Kalkoshe, Gene—Frosh.....Neenah, Wis.
Kawin, William F.—Soph.....Missoula, Mont.
Kelley, Allen F., Jr.—Sr.....Greenfield, Mass.
Kirschten, Frank—Sr.....Baker, Mont.
Knapp, George—Frosh.....Elmira, N. Y.
Knudson, Gary—Frosh.....Highwood, Mont.
Kovalicky, Tom—Soph.....Clifton, N. J.
Kom, Harvey—Jr. .....Missoula, Mont.
Kull, Glen C.—Jr.....Missoula, Mont.
Kytonen, Everett—Sr. .....Missoula, Mont.

—L—

Laber, Alfred—Soph.....Newport, N. H.
Lambert, W. H.—Frosh.....Leavenworth, Kan.
Lambe, Michael—Frosh. .....Bethesda, Md.
Larkin, David—Sr. .....Hardin, Mont.
Larson, C. L.—Jr. .....Grand Forks, N. Dak.
Laux, James—Soph. .....Milwaukee, Wis.
Lawin, Thomas D.—Jr. .....Eau Claire, Wis.
Laws, Louis—Frosh. .....Pilot Rock, Ore.
Leat, Merlin—Sr. .....Winner, S. Dak.
Lee, Oliver—Soph. .....Osburn, Idaho
Legner, Francis—Frosh.....Philadelphia, Pa.
Lix, Robert—Frosh. .....Los Angeles, Calif.
Lorang, Carrol—Frosh.....Lead, S. Dak.
Loscar, Donald—Soph. .....Mesa, Arizona
Lowell, John—Grad.....Sioux Falls, S. Dak.

—Mc—

McBride, Jon—Frosh.....Springfield, Mo.
McCullough, William G.—Frosh.....
..... Missoula, Mont.
McDonald, William B.—Frosh. .....
.....Hill City, S. Dak.
McGee, Troy—Frosh. .....Missoula, Mont.
McGregor, D. W.—Frosh.....Sheridan, Mont.
McLean, J. D.—Jr. .....Missoula, Mont.

—M—

Mading, Wallace—Jr. .....Springfield, Mo.
Mann, William A.—Sr.....Winnetka, Ill.
Martin, Dave—Frosh. .....Pasco, Wash.
Mathison, Robert D.—Frosh. Chaseburg, Wis.
Meagher, Mary—Soph.....Spokane, Wash.
Meuchel, Joe—Sr. .....Hamilton, Mont.
Mistrick, Alfred—Frosh. ....Watersmert, Mich.
Moore, H. Robert—Sr. .....Trenton, N. J.
Morris, Alan A.—Soph.....Missoula, Mont.
Morris, Tom—Soph.....Valparaiso, Ind.
Morrison, Gary G.—Frosh. .....
..... Colorado Springs, Colo.
Morrissey, Donald T.—Soph.....
..... Wilkes-Barre, Pa.
Murphy, William C.—Frosh...Missoula, Mont.
Murray, Roger S.—Soph.....Helena, Mont.
MacPherson, Cole—Soph.....Missoula, Mont.

—N—

Nelson, Donald W., Jr.—Frosh.....
..... Livingston, Mont.
Nelson, Gerhart H.—Grad...Miles City, Mont.
Nelson, Howard S.—Grad.....Missoula, Mont.
Neufelder, Carl—Soph.....Butte, Mont.
Nyquest, Charles—Soph.....Boulder, Mont.

—O—

O'Hara, Melvin—Frosh.....Waterville, Ohio
Ortengren, Richard—Jr.....Missoula, Mont.
Overdorff, William R.—Sr.....
.....Grand Island, Nebr.
Owen, Dave—Sr. .....Missoula, Mont.

—P—

Palmer, Ronald J.—Soph.....Sandpoint, Idaho
Pasicznyk, Walter—Jr.....Missoula, Mont.
Patten, Richard—Soph.....Missoula, Mont.
Patterson, Tom—Jr.....Minocqua, Wis.
Paul, Glen—Soph.....Edmonton, Alberta
Peacock, Marius G.—Frosh...Missoula, Mont.
Pennington, A. M.—Soph.....McLean, Va.
Periman, R. A.—Frosh.....Drummond, Mont.
Pfaffinger, Darwin—Frosh.....Hampshire, Ill.
Pfefferkorn, Bernard—Frosh.....Brooklyn, N. Y.
Phelps, John R.—Jr. .....Winnetka, Ill.
Pinter, John—Soph.....Whitefish Bay, Wis.
Poole, Robert B.—Jr.....Missoula, Mont.
Poulson, William L.—Sr. .....Missoula, Mont.

—R—

Rabone, Howard—Frosh.....Leonardo, N. J.
Ramberg, Richard G.—Frosh.....Huson, Mont.
Rannow, Ted—Frosh. .....Athens, Ohio
Rhodes, Charles—Frosh.....Bluffton, Ind.
Rice, William—Frosh.....Pampa, Texas
Rider, John W.—Frosh.....El Paso, Texas
Rieger, Ted—Sr. .....Plevna, Mont.
Roe, Arthur L.—Grad.....Missoula, Mont.
Roeller, C. Ray—Soph.....Sidney, Ohio
Rogers, Robert—Sr. .....Sacramento, Calif.
Rounds, John—Jr. .....LaFayette, Calif.
Rouse, Charles E.—Jr.....Lakeview, Ore.
Royce, Arnold—Jr. .....Belfry, Mont.
Roylance, John F.—Fr. .....Columbus, Mont.
Rubel, R. F.—Soph. .....Polson, Mont.
Rubins, C. Thomas—Frosh.....Kenton, Ohio
Rundle, Ralph—Jr. .....Chicago, Ill.
Rundle, Ronald J.—Soph. .....Chicago, Ill.
Ryan, Patrick P.—Jr. .....Trenton, N. J.
Ryan, Jack R.—Frosh. .....Missoula, Mont.

— S —

Salmonson, Earl—Jr. ..... Missoula, Mont.
Sammons, James B.—Frosh. ..... Utica, Mont.
Sandman, Richard J.—Jr. .. Rapid City, S. Dak.
Sandvig, Frank—Jr. ..... Missoula, Mont.
Sartz, Calvert—Soph. ..... Beach, N. Dak.
Saxton, Leroy F.—Frosh. ..... Ovando, Mont.
Saylor, Rolland—Frosh. ..... Manilla, Iowa
Schirm, John—Frosh. ..... San Marino, Calif.
Schlueter, Henry L.—Frosh. .... Missoula, Mont.
Schmidt, Eugene P.—Frosh. ..... Ronkonkoma, N. J.
Schmitt, Whitney—Soph. ..... Teaneck, N. J.
Schoenbaum, James R.—Sr. .. Missoula, Mont.
Schroedel, Dan—Frosh. ..... Pampa, Texas
Searight, Duane R.—Frosh. .... Missoula, Mont.
Sedlacek, Barney (T. G.)—Jr. ..... New York, N. Y.
Seitz, Gary—Jr. ..... Roundup, Mont.
Simpson, B.—Soph. ..... Calgary, Alberta
Sladish, Paul E.—Soph. ..... Ithaca, N. Y.
Smith, Lewis K.—Jr. ..... Helena, Mont.
Smith, Vane H.—Frosh. ..... Charlevoix, Mich.
Smith, Zane G.—Sr. ..... Missoula, Mont.
Sorensen, Frank—Frosh. ..... Ashland, Nebr.
Squillace, Anthony E.—Grad. ..... Missoula, Mont.
Squire, Robert S.—Soph. ..... Bayonne, N. J.
Stark, Eugene G.—Soph. ..... Missoula, Mont.
Steuche, E. W.—Frosh. ..... Missoula, Mont.
Stevenson, Donald—Soph. ..... East Glacier Park, Mont.
Stofle, Peter C.—Jr. ..... Honolulu, Hawaii
Stone, Robert N.—Grad. ..... West Olive, Mich.
Sundstrum, Charles—Frosh. Philadelphia, Pa.
Swart, Kenneth—Soph. ..... Riley, Kan.
Swensen, Adrian—Sr. ..... Superior, Wis.
Symes, Robert G.—Soph. ..... Oakland, Calif.

— T —

Taliaferro, William—Sr. ..... Bartsville, Okla.
Thayer, Alan—Jr. ..... Riverside, R. I.
Thorsen, Charles—Soph. ..... Oak Park, Ill.
Tyler, D. K.—Jr. ..... Missoula, Mont.

— U —

Unger, Tom M.—Frosh. ..... Fergus Fals, Minn.
Uphill, Tom—Frosh. ..... Fernie, B. C.

— V —

Visminas, Casimir—Frosh. .... Missoula, Mont.
V.A.V. Dugm, Hidde—Frosh. ..... The Hague, The Netherlands
Venable, Richard M.—Jr. ..... Miles City, Mont.

— W —

Wakefield, Sam B.—Soph. .... Missoula, Mont.
Wanner, K. A.—Sr. ..... Missoula, Mont.
Weeden, Dean J.—Soph. ..... St. Regis, Mont.
Weingart, Paul—Soph. ..... Missoula, Mont.
Weistaner, Dave—Grad. ..... Missoula, Mont.
Walch, David G.—Frosh. ..... Missoula, Mont.
Wendell, John R.—Jr. ..... Milwaukee, Wis.
Westover, Hal M.—Soph. ..... Pierre, S. Dak.
Wetzsteon, Gary—Grad. ..... Missoula, Mont.
Wiant, Richard B.—Frosh. .... Anaconda, Mont.
Wilozynski, Karol—Frosh. ..... Hillside, N. J.
Williams, Don V.—Sr. ..... Hamilton, Mont.
Wilson, H. J.—Jr. ..... Missoula, Mont.
Wineholt, Ellwood—Frosh. ..... Brunswick, Md.
Wolfe, J. Franklin—Soph. ..... Sylacanga, Ala.
Wolfrum, Fred—Soph. ..... Wauwatosa, Wis.
Wordal, John E.—Soph. ..... Missoula, Mont.
Wreisner, Dale T.—Frosh. ..... Dassel, Minn.

— Y —

Young, Ronald—Soph. ..... Moiese, Mont.

Fig. 2

Prunus demissa in a typical browsed condition. Picture was taken in early winter, so all the new growth very likely will be taken before the coming spring.

Fig. 3

Amelanchier alnifolia attracts great attention as is evidenced by the number of deer tracks. Heavy browsing like this produces a brooming effect upon the deciduous browse.

(Continued from page 22)

Juniper saplings were in the heavy to very heavy use class, and leads all other species in degree of use where it is present on the sample plots. Also, 99% of the poles were in the heavy to very heavy use class. There appears to be a shift in preference between size classes of Douglas-fir and ponderosa pine from location to location.

The relative use of coniferous browse by areas was apparently associated with amount of feeding as well as snow conditions, as has been previously indicated. Area I has had no or very little feeding of hay and moderate snow. Area II has had some hay feeding and light snow. Area III has had the longest period of feeding.

Table I, Area I suggests that the least use was incurred by coniferous browse on this area. It is noted that there was 11% mortality to ponderosa pine saplings, but there were so few

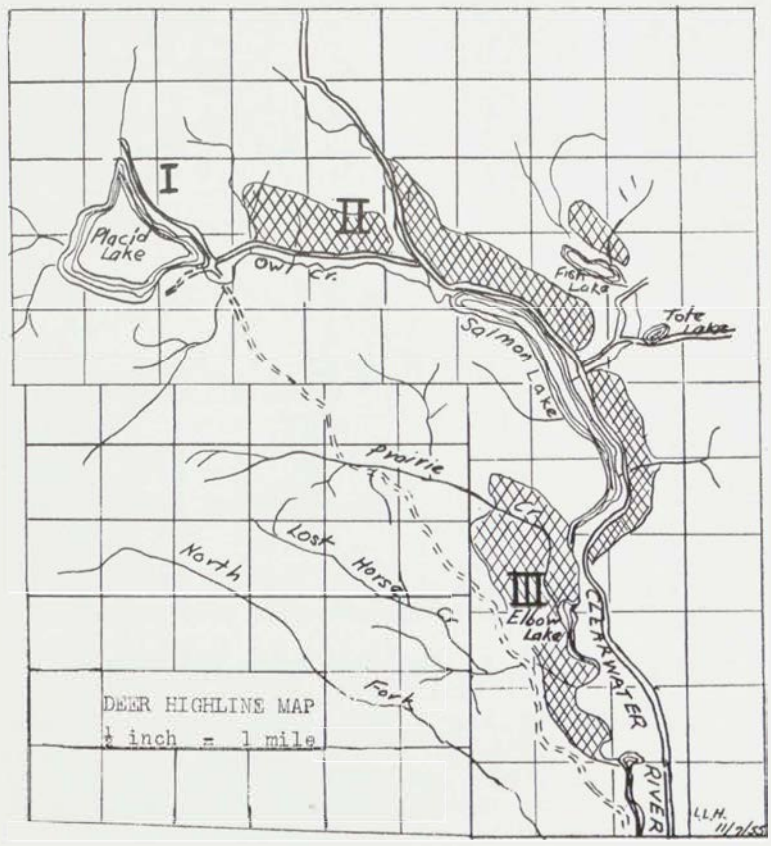


FIG. 1. Map of Clearwater drainage showing the extent of highlining (cross-hatched area) by deer and location of study areas I, II and III.

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Fig. 4

A browse line on conifers is prominent throughout the winter range. Note the browsing on some of the younger conifers in the background.

Fig. 5

The height of the browse line is well above the deer's head. Increased snow depth and a desperate attempt to find enough food aid in producing this condition.

of these trees present that the figure is considered insignificant. The date for Area II shown in Table I indicates that severe use was inflicted on coniferous browse, highlining was prevalent, but as of this date little mortality has occurred on these species in this area. The greatest use and mortality occurred on Area III as indicated by the data. In the sapling size class of Douglas-fir only 10% of the trees escaped use and 36% were dead as a result of over-browsing.

Table II shows a summary of the possible damage done to the deciduous browse species. Only the three main browse species found in the study were tabulated. Mortality was greatest for both serviceberry and chokeberry on Area I. Willow was found only on Area II and 12% of the bushes examined were dead.

On Area II the main use was found on chokecherry with heavy damage and mortality resulting. The serviceberry found on this area was also used severely, but did not suffer much mortality.

On Area I a different situation exists. Serviceberry was used the heaviest on this area, however, chokecherry suffered the highest mortality.

Area III contained the most serviceberry. The use and possible damage to this species was also the greatest. Except for one plant, all of the deciduous browse species found on all the plots showed evident signs of use.

Fig. 6

Douglas fir foliage taken during late winter will produce this effect. Increased snow depth helps protect the lower portion of the tree.

Fig. 7

Ponderosa pine practically striped of its foliage. The sapling stage is the critical stage since it is exposed to the deer during most of the season.

Discussion

Although a preliminary survey was made to get as similar areas as possible within the study location, physical and vegetative differences were present as well as the differences in artificial feeding.

Data compiled from this study indicates that there is very little mortality in the seedling stage of any of the major tree species found on the study areas. Seedlings are the first tree size to be covered by snow in winter and the last to be exposed by melting snow in the spring. It is felt that protection by snow is an outstanding factor in high survival of seedlings. The record on seedling survival does not consider any seedlings that are pulled out of the soil by the deer. It is recognized that this possibility may exist.

Sapling trees on the study location received the most use and possible damage, and consequently sustained the highest mortality. The 2 to 7 foot high saplings were the trees most exposed during the winter and readily accessible to the feeding deer. High mortality resulted in areas where deer concentrated. It is evident that once a tree is over this size class its leader and many of the growing tips are out of reach of the deer and hence it will survive as indicated by the lack of mortality in the pole size tree.

When using the amount of crown taken by deer as a criterion of preference, juniper was found to be the most palatable of the coniferous browse. Although the use on juniper was high the mortality to the species was low, indicating that juniper may be more resistant to browsing than the other coniferous species studied.

The order of preference between the Douglas-fir and ponderosa pine is different in the seedling stage from the order in the sapling stage. In the seedling stage ponderosa pine is preferred over Douglas-fir, and in the sapling stage Douglas-fir is preferred over ponderosa pine. Any attempt to explain the different order of preference would require further study.

Breaking the data down by areas it is seen that on Area II, considerable use occurred on both the deciduous and coniferous browse species. However, little mortality occurred on this area. This is thought to be due to the type of growth found on the area. The canopy is open allowing a maximum of light and a minimum of competition to take place. Trees that would normally succumb to low light intensities and heavy grazing in other locations, survived on this area.

Area I, where no feeding occurred and snow-fall was moderate, sustained the least use to coniferous species. The deciduous species on the area did suffer from heavy use and showed a high incidence of mortality. This would imply that the concentration of deer is such that they are not forced to eat coniferous browse, but concentrate their feeding on the more palatable and nutritious deciduous browse species.

Area III had the longest period of feeding and also the densest vegetative cover. Mortality to saplings was high on this area. This was thought to be caused by several factors. Among these were the density of growth and the over-browsing by the deer. The death seemed to be caused by a combination of browsing and shading. If there were adequate light and the competition decreased, it is thought that these trees might have survived the heavy grazing use. Deciduous browse found on this area was in very poor condition with 75% of the browse found in the very heavy use class.

The results of the study would indicate that the degree of use on the coniferous browse species is proportional to the factors that encourage white-tailed deer concentration on a winter range. These factors may be snow depth, vegetative composition, slope, aspect or conditions created by artificial factors such as winter feeding of the deer.

Summary

Extensive use of coniferous browse by deer on their winter range was studied by a line plot method. This study took place on a typical montane forest of western Montana in the Clearwater drainage.

Three areas were studied for comparison. While they differed somewhat in their physical characteristics, they were essentially different due to the amount of winter feeding sustained. Area I, north of Placid Lake, had little or no feeding history. Area II, north of Owl Creek road, had hay supplied along the road at the lower end of the line sample plot. Area III, west of the Shishler ranch and adjacent to the Clearwater River, had had a long period of hay and grain feeding.

The extent of heavy conifer use is indicated on the general map of the area. Some 4000 acres of forest growth has received heavy use by deer so that the high-line on the conifers can be readily observed.

Results indicate that pole size trees escape excessive damage due to their size, and seedlings are protected by the snow covering during the winter. The sapling sized tree receives excessive use. The areas having a longer period of artificial feeding show a heavier use and higher mortality than did areas of no feeding or of lighter artificial feeding.

The results also would indicate that the amount of use by deer on a winter range tends to be proportional to the factors that contribute to the concentration of these deer. This includes artificial feeding, vegetative composition, snow depth, and exposure, with slope having a less important but possible effect.

Acknowledgment

The authors are grateful to Professor Melvin S. Morris of the Forestry School, Montana State University, for his assistance and interest in the problem studied.

Paul Bunyan

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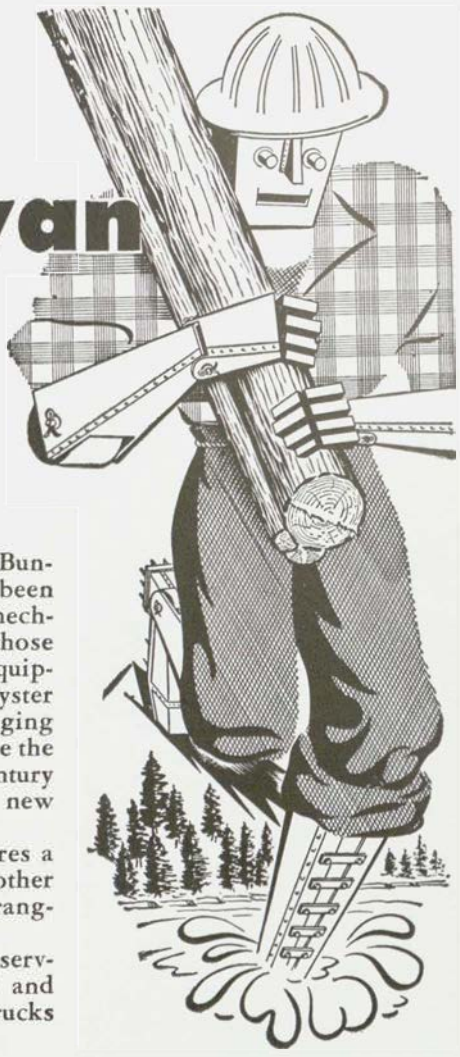

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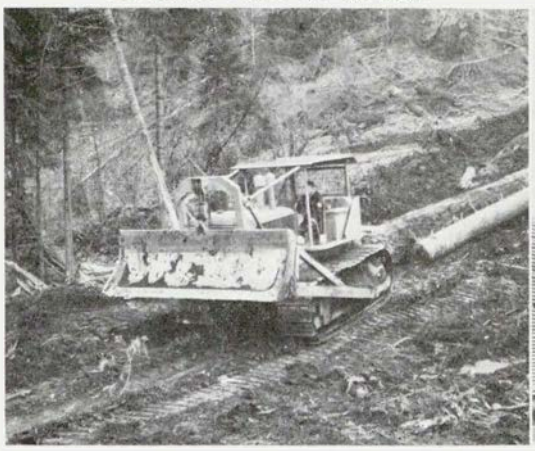

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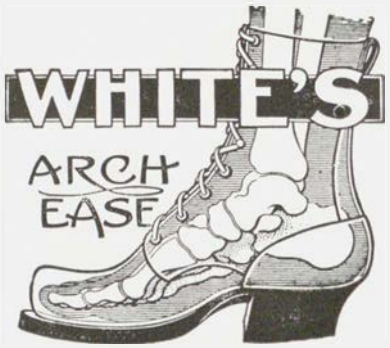

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