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Chemical Properties of Soils and Streams in Natural and Disturbed Forest Ecosystems in the Ouachita Mountains

R. S. Beasley

University of Arkansas at Monticello


E. L. Miller

Oklahoma State University

E. R. Lawson

U.S. Forest Service

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CHEMICAL PROPERTIES OF SOILS AND STREAMS IN NATURAL AND DISTURBED FOREST ECOSYSTEMS IN THE OUACHITA MOUNTAINS

R.S. Beasley
Department of Forest Resources
Univ. of Arkansas at Monticello
Monticello, AR 71655

E.L. Miller
Department of Forestry
Oklahoma State University
Stillwater, OK 74078

E.R. Lawson
Forest Hydrology Laboratory
U.S. Forest Service
Oxford, MS 38655

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Arkansas Water Resources Research Center
University of Arkansas
Fayetteville, Arkansas 72701



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Arkansas Water Resources Research Center
University of Arkansas
112 Ozark Hall
Fayetteville, AR 72701

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ABSTRACT

CHEMICAL PROPERTIES OF SOILS AND STREAMS IN NATURAL AND DISTURBED FOREST ECOSYSTEMS IN THE OUACHITA MOUNTAINS

One year of pre-harvest and five years of post-harvest water chemistry data were collected and analyzed for NO₃-N, TKN, TP, OP, K and Ca on nine small watersheds in the Ouachita Mountains of central Arkansas. Gross exports of all nutrients except TKN were significantly increased by clearcutting followed by mechanical site preparation and broadcast burning of slash. Discharge-weighted nutrient concentrations were increased only for OP, K and Ca. The treatment effect was brief, lasting only one year. The first harvest of a selection system regime had no measurable effect on gross losses or concentrations of nutrients. Precipitation chemistry measurements from the region indicated that annual imports of all nutrients considered in this study generally exceed the gross losses measured. However, because of the possible threat to soil fertility by the leaching effects of acid deposition, foresters should be especially vigilant in their efforts to protect site productivity where soils are low in base cations.

R.S. Beasley, E.L. Miller and E.R. Lawson

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INTRODUCTION

Long-term studies to describe and explain patterns in nutrient inputs and movement through forest soils and surface waters are lacking for the Ouachita Mountain physiographic province. This geographic region is important for both timber production and recreational activities. Many of the forested watershed ecosystems of the region are subjected to varying degrees of disturbance as a result of forest management activities. The need to understand the complex nature of nutrient cycling within natural and disturbed forest ecosystems has become even more crucial for several reasons: 1) the adoption of intensive evenage management requiring shorter rotations (30-40 years), 2) greater nutrient export at harvest due to whole tree removal and improved utilization of logging residues, 3) smaller profit margins which preclude the widespread use of fertilizers to maintain site productivity, 4) a body of anthropogenic origin may increase rates of leaching of base-cations from the soil and release toxic ions into streams and 5) the growing importance of out limited high quality surface water supplies.

Significant losses of nutrients from a forest ecosystem, in excess of the capacity of soil weathering processes and atmospheric deposition to replenish them, would seriously impair the productivity potential of that ecosystem. Of equal importance are the effects of accelerated nutrient losses on water quality. Both long-and short-term flushes of nutrients into streams may impair water quality and affect aquatic ecosystems. For example, nitrate levels in streams

draining severely disturbed forest watersheds have in some instances exceeded public drinking water standards (Bormann et al., 1968; Pierce et al., 1972). The release of aluminum and hydrogen ions from acidified soils into streams and lakes has been shown to be toxic to aquatic organisms (Cronan et al., 1980; Driscoll et al., 1980). The potential effects of forest management and anthropogenic pollution on forest soils and surface water quality are greater in regions where soils and streams are poorly buffered, as in the Ouachita mountains of Arkansas and Oklahoma (Omernic and Powers, 1982). Because of the long-term nature of the potential problems, the value of the soil, water and forest resources, and the complexity of the ecosystems involved, we would be remiss in failing to evaluate the potential for problems or to document current levels of forest soil and water nutrients as a benchmark to determine future changes.

A. Purpose and Objectives

The purpose and objectives of this study are to provide an analysis of six years of stream and precipitation chemistry for nine forest watersheds in the Ouachita Mountains of central Arkansas as a basis for contrasting the effects of intensive evenage management and unevenage selection forest management of the export of selected ions. Background levels of soil and water nutrients measured on undisturbed forest watersheds will establish points of reference for evaluating future levels as they may be affected by atmospheric deposition.

B. Related Research or Activities

Much of the previous research has demonstrated the hazards of extrapolating results of nutrient cycling research from one region to another. Nutrient losses following perturbations are strongly dependent on geology, climate, depth of soils, initial nutrient levels and nature of disturbances. Bormann et al. (1968) cut and left in place all trees and woody vegetation on a 15.6 ha watershed on the Hubbard Brook Experimental Forest in New Hampshire and measured nutrients released to streamflow. Regrowth was eliminated for three years by spraying the watersheds with herbicides. Nitrate concentrations increased 41-fold over pretreatment level the first year and 56-fold the second year. Sulfate was the only measured ion that decreased after treatment. The experiment was not intended to evaluate normal forest practice; consequently, the results may not be applicable to situations where merchantable timber is removed and regeneration is promoted. Pierce et al. (1972) compared nutrient outflow from eight New Hampshire watersheds clearcut by conventional logging practices and eight adjacent undisturbed watersheds. Clearcutting increased most measured ions during the first and second years after cutting but not to the levels observed in the previous Hubbard Brook experiment. The authors concluded that clearcutting on shallow, infertile, podzolized soils with thin layers of unincorporated humus promotes nutrient losses for several years after logging. However, they observed that stream enrichment can be diluted downstream by flow from undisturbed areas. Aubertin and Patric (1974) reported nutrient losses after

clearcutting in West Virginia, but at much lower concentrations than those measured in New Hampshire. Nutrient losses measured after clearcutting and burning in Oregon (Fredriksen, 1971) were also much lower than those measured in New Hampshire, but ammonia levels exceeded the U.S. Public Health limits for drinking water for a period of 12 days. Johnson and Swank (1973) measured concentrations and flux of Ca, Mg, K and Na in a mature hardwood coppice stand and a 13-year-old eastern white pine stand at the Coweeta Hydrologic Laboratory in the southern Appalachians of North Carolina. The young pine and hardwood coppice forests showed a net gain in Ca and significantly lower losses of Mg, K and Na than the other ecosystems. The weed stand lost significantly more cations than the other ecosystems. However, the authors concluded that none of the ecosystems were losing substantial quantities of any cation. Schreiber et al. (1976) measured selected cations and anions in precipitation and storm runoff from undisturbed forested watersheds in northern Mississippi. Annual losses of $\text{NO}_3\text{-N}$ increased linearly with annual storm runoff, and all measured nutrient losses were a function of total runoff. However, all nutrients showed a net gain for the study period because of input from precipitation and dry fallout.

Other research has confirmed that gains of inorganic nitrogen via rainfall and deposition in southern forests often exceed losses of total nitrogen in streamflow by a factor of two or more (Henderson et al., 1978). Atmospheric contributions of sulfur often account for a large proportion of total sulfur available for plant use. One study

(Johnson et al., 1982) pointed out that actual sulfur deficiencies have been identified in forests which are far removed from pollution sources. Therefore, the beneficial nutritional aspects of acidic deposition cannot be ignored, especially where pollution is moderate and forest, grasslands or crops are not fertilized.

Regardless of the possible beneficial aspects of atmospheric deposition in moderate quantities on some sites, the long-term effects may be detrimental on sites with low buffering capacity such as shallow, naturally acidic soils on steep slopes or soils which have non-alkaline geologic substratas. Among the potentially harmful effects of acidic deposition are (1) the leaching of nutrients both from plant foliage and the soil by hydrogen, sulfate or nitrate ions (Lee and Webber, 1972); (2) alteration of beneficial microorganisms in the forest floor and upper soil horizons including damage to symbiotic nitrogen-fixing organisms (Francis, 1982); (3) acid-induced mobility and toxicity of aluminum (Al) in the soil solution leading to toxic levels of Al in streamflow and water bodies (Steiner et al., 1980; Ulrich et al., 1980; Johnson et al., 1981); and (4) increased susceptibility of trees and plants to environmental stresses, including drought (Johnson et al., 1981; Lee and Webber, 1982).

METHODS AND PROCEDURES

A. Study Area

The study was conducted on U.S. Forest Service and Weyerhaeuser Company lands in the Ouachita Mountains, 35 km north of Hot Springs, Arkansas (Figure 1). The study utilized nine watersheds selected

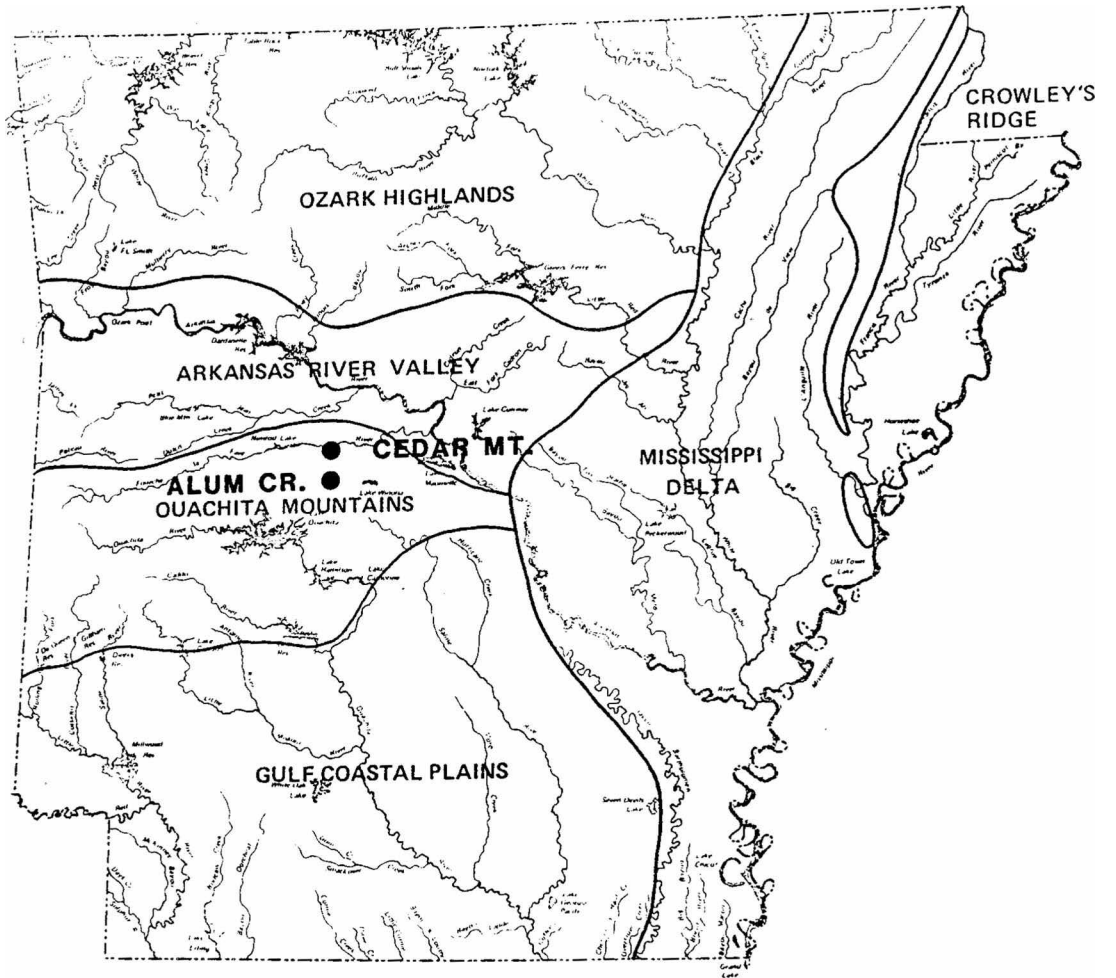


Figure 1. Map of the study areas and physiographic provinces of Arkansas.

from headwaters of first order basins. All the watersheds had natural and well defined divides and stream channels. Streams were generally ephemeral grading to intermittent at the watershed outlets.

Watershed sizes ranged from 4.18 to 5.91 ha. Slopes averaged about 15 percent, but steeper breaks of up to 30 percent were common. Six of the watersheds were grouped together and shared a single ridge which formed the upper berm of each. Three of these had west northwest aspects and the other three faced east southeast. The remaining three watersheds were located about 9.5 km due north and had north aspects.

Physiographic uniformity within each block of three watersheds was good. The southern group of six watersheds will be referred to as the Alum Creek or block 1 and 2 watersheds, and the northern group of three as the Cedar Mountain or block 3 watersheds.

Bedded sandstones and shales of the Atoka, Stanley and Jackfork geologic formations comprise the parent materials of the soils on the watersheds. Soils on the Alum Creek watersheds are mapped as the Carnasaw-Townley-Pirum Association (Haley et al., 1979). These soils are fine-textured, well drained and developed over a residual shale subsoil. Normally, a sandstone rock pavement overlies a loamy A horizon about 15 cm thick. The B horizons are strongly developed, clayey and extend to shale bedrock at about 100 cm. On the Cedar Mountain watersheds, the Carnasaw-Pirum-Clebit Association predominates (Townsend and Williams, 1982). The lower watershed areas are occupied by Sherwood fine sandy loam on 3-8 percent slopes.

Soil chemical properties of the Carnasaw series, the predominant series on the Alum Creek Watersheds, were described by Apfelbeck (1987). Three composite samples per horizon were collected from three soil pits in each of the two areas--one representing a predominantly pine cover and the other mature hardwood cover. Samples from the A₁, E, B and B₂ horizons were analyzed for Ortho-P, K, Ca, % organic matter, cation exchange capacity (CEC) and pH. Soil analyses followed procedures suggested by NCASI (1983). Mean values for each soil property and cover type are presented in Table 1.

Table 1. Soil chemical properties for the Carnasaw silt loam series on the Alum Creek watersheds by cover type (meq/gm).

Soil Property	Hardwood Cover				Pine Cover			
	A ₁	E	B ₁	Horizon B ₂	A ₁	E	B ₁	B ₂
K	0.016	0.007	0.005	0.005	0.005	0.018	0.008	0.006
Ca	0.040	0.011	0.004	0.005	0.085	0.016	0.013	0.006
%OM	6.8	3.00	1.54	1.00	9.58	3.71	1.26	0.77
CEC	0.22	0.11	0.11	0.20	0.36	0.14	0.22	0.22
pH	3.5	3.75	3.82	3.83	3.32	3.78	3.84	3.87

B. Instruments and Sampling

Stormflow was measured in calibrated 0.9 m H-type flumes installed on each watershed. Digital time-stage recorders were used in combination with FW-1 type water level recorders. Concrete approach sections 2.45 m long above each flume provided control and included traps for bedload materials. Cutoff walls extended outward from the approach

section walls at ground level, usually about 3 m. Cutoff walls extended downward into clayey subsoils or to bedrock.

Water sampling equipment included an ISCO automated pump and Coshocton wheel at each flumesite. Pumping samplers had a 28 sample capacity and were activated by floats with mercury switches located in the flume approach sections. Once activated, pumps collected discrete samples on time sequence which varied with season to compensate for the flashiness of stormflow events. Sample collection was recorded automatically on the FW-1 charts via solenoid activated pens wired to the pumps. Pump intakes were located at fixed levels in the approach sections. Hand sampling of stormflow for a limited number of events was done to check the validity of pumped samples. A single aliquot sample was collected from each watershed during each storm by the Coshocton sampler. These samples were used primarily as backup for large events if pumps malfunctioned or for small events when pumps were not activated.

Precipitation was measured with weighing-bucket recording gages and standard weather bureau-type gages distributed over the study area. Variation in rainfall was minimal within blocks 1 and 2 and among block 3 watersheds. Precipitation as snow and ice is negligible in the study area.

C. Watershed Treatments

Two silvicultural treatments, clearcut and selection cut, were contrasted with a control (no treatment). The clearcut treatment was followed by intensive site preparation and planting of seedlings.

The selection cut treatment was preceded by injection of understory and nonmerchantable hardwood trees to open the stand for natural seeding. All treatments were operational in nature and scale.

On clearcut and selection cut areas, trees were felled and limbed with chainsaws. Rubber tired cable skidders dragged tree-length stems uphill to log decks which were located on ridgetops within watershed boundaries. There were no restrictions in cutting or skidding in the vicinity of stream channels other than prudent safe operation of equipment. Roads and road drainage were not located on any of the experimental watersheds. Trucks and log loading equipment operated on log decking areas.

A tractor-drawn drum chopper was used to crush the residual vegetation prior to burning the clearcut watersheds. Stream channels were not buffered from chopping or burning. No site preparation was conducted on the selection cut watersheds.

Clearcut watersheds were planted by hand at a 2 by 3 m spacing. Each planted watershed was divided into four blocks with loblolly and shortleaf seedlings planted in alternating blocks for future growth comparison. No special erosion control treatments were applied to clearcut or selection cut watersheds.

D. Chemical Analyses

Nitrate-nitrogen ($\text{NO}_3\text{-N}$) was analyzed using a nitrate specific ion electrode with an Orion Ion Analyzer. Total Kjeldahl nitrogen (TKN) was determined using a block digester to convert organic-N to NO_3 , then using the specific electrode to measure $\text{NO}_3\text{-N}$. Total

phosphorus (TP) was determined colorimetrically after filtering (0.45 micron filters). Cations were measured with a Perkin Elmer atomic absorption spectrophotometer.

Discrete samples collected throughout eight storm events during 1986-87 were analyzed for sulfate (SO_4), chloride (Cl), specific conductance and NO_3 using a Dionex 2000i ion-chromatograph. These samples were used to measure changes in each parameter on the rising and falling limbs of the hydrographs.

E. Experimental Design and Statistical Analyses

A randomized complete block design was used to test treatment effects. The nine watersheds were blocked according to location and aspect. Uniformity in soils, stream channel characteristics and vegetation was also accomplished with blocking. Treatments were assigned to watersheds randomly within blocks as follows:

<u>Block</u>	<u>Watershed No.</u>	<u>Treatment</u>	<u>Size (ha)</u>
1	10	Selection cut	5.74
	11	Control	4.93
	12	Clearcut	5.91
2	13	Control	4.74
	14	Selection cut	4.35
	15	Clearcut	5.11
3	16	Control	4.34
	17	Selection cut	4.15
	18	Clearcut	4.08

Analysis of variance was used to test for differences in each nutrient among treatments and among seasons and years. Duncan's multiple range tests were used to compare individual means.

Data were summarized and all analyses done by month, season and year. The term year in this paper refers to water year (WY), the period from October 1 through September 30.

Although all flow, including baseflow, from each watershed was measured, sampled and analyzed each year, this report includes samples collected only during storm events. Baseflow analyses will be incorporated as part of the ongoing study.

PRINCIPAL FINDINGS AND SIGNIFICANCE

A. Annual Precipitation and Stormflow

Precipitation and stormflow discharge are shown by years in Table 2. Precipitation ranged from a high of 166.8 cm in 1983 to a low of 101.0 cm in 1980. There was considerable variability in annual stormflow among watersheds within years and even greater variability among blocks. Block 3 at Cedar Mt. was consistently the lowest in stormflow due to the nature of the soils and geology.

B. Pretreatment Results

The pretreatment water year (WY) 1980, was unusually hot and dry, especially during the growing season. Consequently, the nutrient fluxes from the undisturbed watersheds were generally lower than those from the control watersheds during subsequent years. Nitrate-N was an exception to this pattern. The highest NO₃-N losses for the study period (1,224 - 1,500 g/ha) were measured in WY 1980 (Table 3). The pretreatment NO₃-N concentrations and gross losses were higher than those reported for other undisturbed forest watersheds in the South. Schrieber and Duffy (1976) reported concentrations of 0.08 mg/l and

Table 2. Annual precipitation and stormflow by watershed and treatment.

WATER YEAR	PRECIPITATION-cm			STORMFLOW - cm							
	ALUM CR.	CEDAR MT.		CLEARCUT			SELECTION		CONTROL		
			12	15	18	10	14	17	11	13	16
1980	101.0	94.9	23.0	11.9	7.3	19.8	17.5	10.4	21.7	18.6	3.5
1981	124.5	105.8	51.9	33.9	8.7	41.6	36.7	16.1	32.0	30.0	2.2
1982	112.7	116.2	45.7	26.6	9.9	33.9	28.0	15.0	26.5	22.5	5.7
1983	166.8	162.0	98.2	75.4	53.6	74.0	78.8	61.2	67.5	63.9	37.8
1984	154.6	146.3	72.7	54.1	26.4	58.8	54.1	36.4	46.1	44.2	17.3
1985	161.9	147.9	124.4	88.6	54.6	95.7	81.8	61.7	88.6	85.6	42.6

Table 3. Gross nutrient export by treatment and year (gm/ha).

	NO3			TKN		
WY	CC	SEL	CON	CC	SEL	CON

1980	1 226	1646	1498	0	0	0
1981	1037	232	84	2089	1223	873
1982	84	622	13	1839	1772	689
1983	183	229	78	2333	2818	2206
1984	197	211	171	725	704	651
1985	425	278	240	1564	1424	1437

	TP			OP		
WY	CC	SEL	CON	CC	SEL	CON

1980	37	126	58	0	0	0
1981	271	108	99	65	16	8
1982	1188	566	287	36	498	13
1983	211	138	104	213	196	77
1984	78	70	64	24	22	22
1985	207	200	197	34	30	20

	K			CA		
WY	CC	SEL	CON	CC	SEL	CON

1980	837	1269	1151	1203	2106	1728
1981	5417	2279	1078	5054	2152	1667
1982	3873	3310	1846	3239	2831	1699
1983	5594	4337	3511	4480	4952	3211
1984	2953	2649	2173	2891	2721	2279
1985	2760	2520	2376	2220	2088	2028

losses of 318 g/ha for five loblolly pine plantations in northern Mississippi. DeHaven et al. (1982) found an average of 0.34 mg/l of NO₃-N in storm discharge from their east Texas watersheds.

The objective, however, of collecting samples from all watersheds for a full year prior to silvicultural treatments was to evaluate the similarity of the watersheds so that any pretreatment differences could be properly accounted for in the posttreatment analysis. This objective was accomplished. No significant differences ($p=0.05$) were detected among watersheds or blocks during WY 1980 (Table 3).

C. Posttreatment Results

In steady state ecosystems, nutrient gains equal losses. Although cycling and flux patterns occur, depending primarily on stages of growth and seasons, nutrient concentrations in stream discharge remain relatively stable. However, when an ecosystem is disturbed, nutrient cycles are temporarily disrupted, and nutrients that normally would be absorbed by plant roots become susceptible to leaching. This occurred in our study. Clearcutting followed by mechanical site preparation and broadcast burning significantly increased gross nutrient losses in stormflows (Table 4). During the first posttreatment year (WY 1981) differences in mean annual gross nutrient export between the clearcut and control watersheds was 3,387 gm/ha for calcium. Import of calcium via precipitation is in the range of 3,000 - 4,000 gm/ha for western Arkansas (Wagner and Steele, 1982; Joe Nix and Kent Thornton-Personal communication). This indicates that only one year would be required for calcium lost via stormflow to be re-

placed naturally. Export of all nutrients considered in this report were affected with the exception of TKN. The only discharge-weighted nutrient concentrations increased during the study period were OP, K and Ca and those increases occurred only during the first posttreatment year. This suggests that a primary factor in the increase in nutrient export was the significant increase in storm discharge that accompanied clearcutting. However, the increases were shortlived, lasting only through WY 1981. No statistically significant treatment effects or block effects were evident in WY's 1982, 1984 or 1985. The selection harvest had no significant effect on either nutrient concentrations or losses.

In WY 1983, N03-N showed an unexplained increase on the selection watersheds in contrast to the clearcut watersheds. The differences were statistically significant. A possible explanation is perhaps related to the enhanced capacity of large mature trees to "comb" or filter pollutants from the air (Mayer and Ulrich, 1977; Johnson et al., 1982). WY 1983 was unique in that annual rainfall and stream discharge was unusually high (Miller et al., 1985). Nitrate is a highly mobile anion in the soil; therefore, any excess N03 accumulated from the previous drier years might have been available for leaching.

Table 4. Increases in nutrient export (gm/ha) caused by clearcutting during the first post-harvest year (WY 1981).

TREATMENT	N03	TP	OP	K	Ca
Clearcut	1,037	271	65	5,417	5,054
Control	<u>84</u>	<u>99</u>	<u>8</u>	<u>1,078</u>	<u>1,667</u>
DIFF.	953	172	57	4,339	3,387

D. Seasonal Trends

Since no significant treatment or block effects were shown for WY's 1980 and 1982-85, the five years of data were combined to evaluate seasonal variations among and within the various chemical parameters. It is evident upon inspection of the tabular data (Appendix Table 3-4) that seasonal effects were significant, at least for the summer quarter which rarely produced measurable flow on the watersheds. It was our goal, however, to statistically test for differences among the winter, spring and fall quarters. Statistical analyses revealed significant seasonal trends. TKN and NO₃ export were highest in the fall, while losses of both forms of phosphorus were highest during the winter or spring.

E. WY 1987 Eight Storm Summary

Eight storms occurring in WY 1987 were selected for inclusion in the report to demonstrate the range of stormflow values for sulfate (SO₄), chloride (Cl), pH and specific conductivity as well as for parameters measured during past years (NO₃, Ca and K) (Table 5). Means are reported for each storm by watershed and treatment in Appendix Table 4.

Table 5. Summary of selected chemical parameters for eight storms in WY 1987. (All units mg/l except pH and Cond).

	CLEARCUT	SELECTION	CONTROL
SO ₄	7.367	8.187	8.514
CL	1.486	1.783	1.602
pH	6.307	6.280	6.210
COND	24.667	26.333	21.667
NO ₃	0.523	0.339	0.211
CA	1.601	1.629	1.439
K	0.987	0.739	0.539

Stormflow pH ranged from a mean of 6.2 on the controls to 6.3 on the selection and clearcut watersheds. The differences were not statistically significant. Mean pH for stormflow was virtually the same as that measured in southwest Arkansas streams (Joe Nix and Kent Thornton-Personal communication). Rainfall pH for the region averages between 4.5 and 4.6 (Nix and Thornton-Personal communication). It appears that the soils are currently buffering and/or neutralizing much of the incoming acidity, probably at the expense of soil cations. This aspect of the problem is currently being investigated on our study sites as part of a separate but closely related project.

A reasonable degree of consistency in the other chemical parameters among watershed and treatments was also observed (Table 5).

CONCLUSIONS

Clearcutting with intensive mechanical site preparation significantly increased the gross annual export of NO₃, TP, OP, Ca and K during the first year following the silvicultural operations in the Ouachita Mountains. Discharge weighted concentrations of OP, K and Ca were also significantly increased during the first year after harvest. However, the effects were only temporary. By the second posttreatment year nutrient losses had returned to control levels. The first harvest of a selection system regime had no effect on nutrient losses. Precipitation chemistry data for the region indicates that nutrient import via precipitation generally equals or exceeds export. Nutrient losses for all years were lowest during the summer, the period of lowest storm runoff. NO₃ and TKN losses were highest in the fall. TP and OP losses were usually highest during the winter or spring.

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APPENDICES

TABLE 1. NUTRIENT GROSS LOSSES BY TREATMENT AND WATERSHED(Gm/Ha).

NO3-N-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1980

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	196	0	107	0	0
NOV	306	188	0	320	964	0	337	294	0
DEC	754	866	227	1178	0	326	1006	706	191
JAN	0	0	0	0	0	0	0	0	0
FEB	0	0	0	0	162	0	0	0	0
MAR	395	108	0	226	259	0	293	294	0
APR	372	132	157	258	148	479	354	375	126
MAY	0	108	64	171	0	79	194	203	14
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	171	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	1827	1402	448	2324	1730	884	2291	1871	331
MEAN		1226			1646			1498	

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TKN-N-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1980

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	0	0	0	0	0
NOV	0	0	0	0	0	0	0	0	0
DEC	0	0	0	0	0	0	0	0	0
JAN	0	0	0	0	0	0	0	0	0
FEB	0	0	0	0	0	0	0	0	0
MAR	0	0	0	0	0	0	0	0	0
APR	0	0	0	0	0	0	0	0	0
MAY	0	0	0	0	0	0	0	0	0
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0
MEAN		0			0			0	

TABLE 1. CONTINUED.

TOTAL P-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1980

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	5	0	3	0	0
NOV	7	5	0	9	26	0	6	34	0
DEC	16	19	13	25	0	13	24	18	11
JAN	0	0	0	0	0	0	0	0	0
FEB	0	0	0	0	6	0	0	0	0
MAR	15	6	0	11	7	0	13	13	0
APR	14	4	8	9	9	238	21	9	4
MAY	0	3	2	8	0	3	8	11	1
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	8	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	51	38	23	70	53	254	75	85	16
MEAN		37			126			58	

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ORTHO P-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1980

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	0	0	0	0	0
NOV	0	0	0	0	0	0	0	0	0
DEC	0	0	0	0	0	0	0	0	0
JAN	0	0	0	0	0	0	0	0	0
FEB	0	0	0	0	0	0	0	0	0
MAR	0	0	0	0	0	0	0	0	0
APR	0	0	0	0	0	0	0	0	0
MAY	0	0	0	0	0	0	0	0	0
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0
MEAN		0			0			0	

TABLE 1. CONTINUED.

POTAS-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1980

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	113	0	83	0	0
NOV	194	138	0	167	620	0	194	150	0
DEC	407	541	232	439	0	312	610	576	191
JAN	0	0	0	0	0	0	0	0	0
FEB	0	0	0	0	123	0	0	0	0
MAR	306	129	0	197	125	0	253	260	0
APR	237	81	147	199	114	1059	486	204	112
MAY	0	58	39	139	0	62	157	162	16
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	139	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	1145	947	419	1280	1095	1433	1783	1352	318
MEAN		837			1269			1151	

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CALCIUM-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1980

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	126	0	117	0	0
NOV	423	92	0	167	851	0	377	254	0
DEC	556	433	310	501	0	450	846	693	153
JAN	0	0	0	0	0	0	0	0	0
FEB	0	0	0	0	229	0	0	0	0
MAR	625	171	0	304	191	0	450	531	0
APR	424	138	293	248	190	2530	682	348	173
MAY	0	86	59	212	0	107	268	271	21
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	212	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	2028	921	661	1645	1586	3087	2740	2097	346
MEAN		1203			2106			1728	

TABLE 1. NUTRIENT GROSS LOSSES BY TREATMENT AND WATERSHED(GM/HA).

NO3- MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1981

	CLEARCUT			SELECTIO			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	1	6	0	29	12	0	18	11	0
NOV	176	1	0	27	15	0	20	23	0
DEC	20	24	0	26	12	0	8	20	0
JAN	91	44	0	58	63	0	63	8	0
FEB	17	1	0	3	20	0	1	1	0
MAR	102	12	0	12	38	0	13	12	1
APR	125	5	0	6	5	0	1	1	0
MAY	474	72	1132	26	39	0	8	5	0
JUN	514	219	77	130	132	42	17	21	0
TOTAL	1520	383	1208	318	337	42	150	101	1
MEAN		1037			232			84	

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TKN-N- MONTHLY NUTRIENT SUMMARIES BY TREATMENT

WY 1981

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	0	0	0	0	0
NOV	0	13	0	0	3	0	0	0	0
DEC	355	176	0	225	176	0	113	111	0
JAN	144	59	0	73	65	0	55	22	0
FEB	289	138	0	158	111	0	128	151	1
MAR	239	85	0	71	85	0	42	40	4
APR	137	98	0	80	116	0	79	63	0
MAY	1176	437	336	323	524	0	263	242	27
JUN	1393	1170	23	870	709	82	614	661	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	3733	2177	0	1799	1788	82	1296	1290	33
MEAN		1970			1223			873	

TABLE 1. CONTINUED.

TOTAL P- MONTHLY NUTRIENT SUMMARIES BY TREATMENT

	WY1981 CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	1	1	0	1	2	0	0	1	0
NOV	28	1	2	1	1	0	0	1	0
DEC	136	19	0	15	12	0	6	7	0
JAN	28	12	0	7	6	0	5	2	0
FEB	49	20	0	42	11	0	43	11	1
MAR	57	14	0	10	15	0	5	8	1
APR	13	6	0	5	9	0	3	3	0
MAY	119	60	11	26	101	0	147	16	3
JUN	156	82	0	33	28	1	18	18	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	587	214	13	139	185	1	227	66	5
MEAN		271			108			99	

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ORTHO P- MONTHLY NUTRIENT SUMMARIES BY TREATMENT

	WY1981 CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	0	0	0	0	0
NOV	0	0	0	0	0	0	0	0	0
DEC	20	11	0	2	2	0	1	2	0
JAN	11	4	0	1	1	0	1	0	0
FEB	17	6	0	7	2	0	1	1	0
MAR	13	3	0	1	8	0	0	1	0
APR	2	2	0	1	1	0	0	0	0
MAY	24	16	8	7	8	0	6	6	1
JUN	33	24	0	4	4	0	3	4	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	121	66	8	22	24	0	12	13	1
MEAN		65			16			8	

TABLE 1. CONTINUED.

POTAS- MONTHLY NUTRIENT SUMMARIES BY TREATMENT

	WY 1981 CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	57	22	0	47	58	0	21	19	0
NOV	1980	45	0	20	24	0	11	13	0
DEC	801	1219	0	521	436	0	226	187	0
JAN	523	403	0	259	228	0	141	53	0
FEB	870	616	0	887	347	0	260	234	3
MAR	943	398	0	244	267	0	117	150	15
APR	396	232	0	117	102	0	67	44	0
MAY	1675	1459	1008	698	715	0	418	383	84
JUN	1643	1900	62	1073	696	99	455	333	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	8887	6294	1070	3865	2872	99	1716	1415	102
MEAN		5417			2279			1078	

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CALCIUM- MONTHLY NUTRIENT SUMMARIES BY TREATMENT

	WY 1981 CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	45	15	0	44	56	0	32	27	0
NOV	1575	11	0	31	29	0	26	32	0
DEC	725	642	0	239	205	0	17	153	0
JAN	383	181	0	159	135	0	145	53	0
FEB	740	278	0	1203	264	0	409	367	3
MAR	1282	262	0	363	280	0	225	309	24
APR	501	149	0	143	150	0	145	123	0
MAY	2534	985	1637	738	800	0	769	716	144
JUN	1993	1163	60	837	697	84	673	609	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEPT	0	0	0	0	0	0	0	0	0
TOTAL	9778	3688	1697	3757	2617	84	2441	2387	171
		5054			2152			1667	

TABLE 1. CONTINUED.

NO3-MONTHLY NUTRIENT SUMMARIES TREATMENT
WY1982

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	83	73	0	140	114	0	5	6	0
NOV	0	0	0	0	0	0	0	0	0
DEC	0	0	0	0	0	0	0	0	0
JAN	9	9	3	34	13	7	4	5	0
FEB	2	0	0	0	3	0	1	0	0
MAR	8	6	4	4	1479	8	3	2	2
APR	19	24	4	16	27	6	5	4	1
MAY	0	0	0	0	0	0	0	0	0
JUN	3	4	1	5	4	1	1	0	0
JUL	0	0	0	1	0	0	0	0	0
AUG	0	1	0	2	1	0	1	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	124	116	12	203	1642	22	20	18	2
MEAN		84			622			13	

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TKN-N-MONTHLY NUTRIENT SUMMARIES TREATMENT
WY 1982

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	307	322	0	252	167	0	45	85	0
NOV	0	0	0	0	0	0	0	0	0
DEC	0	0	0	0	0	0	0	0	0
JAN	582	455	538	388	446	191	321	303	32
FEB	33	0	0	0	44	0	50	0	0
MAR	229	138	478	100	1605	144	121	105	83
APR	1331	504	169	690	787	83	342	369	74
MAY	5	0	0	0	0	0	0	0	0
JUN	159	88	10	104	124	33	58	34	3
JUL	8	5	62	24	3	9	4	0	0
AUG	47	48	0	92	31	0	26	10	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	2700	1560	1256	1649	3207	459	967	906	193
MEAN		1839			1772			689	

TABLE 1. CONTINUED.

TOTAL P-MONTHLY NUTRIENT SUMMARIES TREATMENT

WY 1982

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	55	26	0	16	17	0	3	43	0
NOV	0	0	0	0	0	0	0	0	0
DEC	0	0	0	0	0	0	0	0	0
JAN	69	41	313	28	33	16	17	223	3
FEB	4	0	0	0	3	0	3	0	0
MAR	25	15	242	8	1430	11	9	80	5
APR	88	61	2547	40	52	7	27	405	6
MAY	1	0	0	0	0	0	0	0	0
JUN	23	10	24	8	15	4	3	31	0
JUL	1	1	13	2	0	1	0	0	0
AUG	4	3	0	3	1	0	1	3	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	269	157	3139	105	1553	40	63	785	14
MEAN		1188			566			287	

ORTHO P-MONTHLY NUTRIENT SUMMARIES TREATMENT

WY 1982

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	6	2	0	1	0	0	0	1	0
NOV	0	0	0	0	0	0	0	0	0
DEC	0	0	0	0	0	0	0	0	0
JAN	15	8	12	8	7	8	5	5	1
FEB	2	0	0	0	1	0	1	0	0
MAR	7	4	3	4	1421	4	6	3	4
APR	18	10	3	8	12	2	4	5	1
MAY	0	0	0	0	0	0	0	0	0
JUN	10	5	1	6	7	3	2	1	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	1	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	58	30	20	27	1449	17	18	17	6
MEAN		36			498			13	

TABLE 1. CONTINUED.

POTAS-MONTHLY NUTRIENT SUMMARIES TREATMENT

WY 1982

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	1323	966	0	767	591	0	157	267	0
NOV	0	0	0	0	0	0	0	0	0
DEC	0	0	0	0	0	0	0	0	0
JAN	2275	1158	1095	1710	1466	1157	1712	1437	245
FEB	381	0	0	0	168	0	207	0	0
MAR	746	338	602	184	1603	476	364	238	163
APR	979	889	307	478	619	217	305	273	68
MAY	8	0	0	0	0	0	0	0	0
JUN	215	119	43	136	120	81	26	27	4
JUL	27	5	24	36	3	11	6	0	0
AUG	79	42	0	77	28	0	34	7	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	6033	3516	2071	3389	4598	1942	2811	2248	480
MEAN		3873			3310			1846	

CALCIUM-MONTHLY NUTRIENT SUMMARIES TREATMENT

WY1982

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	1242	880	0	704	562	0	149	256	0
NOV	0	0	0	0	0	0	0	0	0
DEC	0	0	0	0	0	0	0	0	0
JAN	2263	1125	1077	1653	1418	1123	1709	1393	238
FEB	381	0	0	0	167	0	188	0	0
MAR	598	267	398	100	1403	426	324	221	107
APR	570	387	244	143	310	142	159	157	47
MAY	7	0	0	0	0	0	0	0	0
JUN	108	25	20	47	145	36	8	16	3
JUL	22	4	19	27	2	8	5	0	0
AUG	54	22	0	56	23	0	22	7	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	5246	2711	1759	2730	4029	1735	2563	2049	395
MEAN		3239			2831			1669	

TABLE 1. CONTINUED.

NO3-MONTHLY NUTRIENT SUMMARIES BY TREATMENT

WY 1983

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	3	1	0	2	3	0	0	0	0
NOV	17	22	0	29	55	16	4	8	0
DEC	41	187	71	55	145	41	37	28	29
JAN	12	26	3	0	46	22	3	4	0
FEB	9	0	2	31	38	0	0	1	0
MAR	9	29	9	20	46	0	2	2	3
APR	25	9	7	11	9	7	8	33	4
MAY	34	21	4	21	26	18	20	20	20
JUN	0	1	0	0	18	0	3	1	0
JUL	2	2	1	7	18	3	0	1	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	152	299	98	177	403	108	78	99	57
MEAN		183			229			78	

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TKN-MONTHLY SUMMARIES BY TREATMENT

WY 1983

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	27	4	0	8	8	0	3	4	0
NOV	387	324	0	340	271	66	167	127	4
DEC	1855	1438	454	1624	2842	1552	2140	1198	1365
JAN	117	47	8	1	76	26	54	44	4
FEB	53	0	0	91	38	0	0	24	0
MAR	80	81	2	66	100	0	15	19	1
APR	437	151	67	166	171	93	38	568	22
MAY	687	656	40	242	390	196	343	353	93
JUN	0	12	2	0	18	0	13	4	0
JUL	15	18	37	29	18	19	9	2	2
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	3656	2731	611	2567	3933	1952	2782	2344	1493
MEAN		2333			2817			2206	

TABLE 1. CONTINUED.

TOTAL P-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
 WY 1983

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	3	0	0	1	1	0	0	0	0
NOV	64	4	0	35	33	0	20	17	0
DEC	120	105	76	44	93	95	53	30	82
JAN	16	17	3	0	10	6	9	7	1
FEB	10	0	1	7	4	0	0	2	0
MAR	22	13	3	15	8	0	4	4	1
APR	19	7	8	7	3	0	2	3	2
MAY	66	58	7	11	24	6	30	36	2
JUN	0	1	0	0	2	0	1	1	0
JUL	3	2	2	6	2	3	1	1	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	324	208	101	124	180	110	121	102	89
MEAN		211			138			104	

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ORTHO P-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
 WY 1983

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	1	0	0	0	0	0	0	0	0
NOV	24	12	0	13	9	3	7	7	0
DEC	67	56	38	30	45	44	36	20	35
JAN	10	13	1	0	4	2	4	3	0
FEB	3	0	0	3	2	0	0	1	0
MAR	7	6	1	4	10	0	8	2	1
APR	344	25	4	57	120	152	30	45	6
MAY	13	6	2	19	55	7	4	19	3
JUN	0	0	0	0	1	0	0	0	0
JUL	1	1	1	0	1	1	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	471	119	48	128	248	210	90	97	45
MEAN		213			195			77	

TABLE 1. CONTINUED.

POTAS-MONTHLY NUTRIENT SUMMARIES BY TREATMENT

WY 1983

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	71	10	0	12	12	0	7	6	0
NOV	1182	882	0	808	730	270	523	467	12
DEC	2884	3350	2005	2104	3260	2636	2016	2771	1800
JAN	472	242	54	3	393	166	265	236	44
FEB	286	0	34	347	215	0	0	157	0
MAR	256	398	156	309	362	0	308	179	117
APR	727	477	287	338	260	297	139	251	76
MAY	1140	1343	219	605	746	704	368	377	305
JUN	0	33	7	0	50	0	22	28	0
JUL	85	74	112	54	50	123	22	28	9
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	7103	6809	2873	4582	6080	4196	3671	4500	2363
MEAN		5595			4953			3511	

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CALCIUM-MONTHLY SUMMARIES BY TREATMENT

WY 1983

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	62	9	0	10	10	0	7	4	0
NOV	1076	607	0	703	681	267	449	362	11
DEC	2571	3217	2227	1815	3555	2515	1802	2302	1950
JAN	447	242	65	4	403	164	279	248	43
FEB	270	0	34	286	222	0	0	159	0
MAR	280	388	150	296	398	0	265	188	99
APR	350	110	115	171	147	168	104	157	37
MAY	464	516	93	335	396	333	358	494	251
JUN	0	11	3	0	27	0	16	12	0
JUL	46	24	61	30	27	46	18	15	3
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	5566	5123	2748	3650	5866	3492	3297	3942	2394
MEAN		4479			4336			3211	

TABLE 1. CONTINUED.

NO3-MONTHLY NUTRIENT SUMMARIES BY TREATMENT

WY 1984

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	0	0	0	0	0
NOV	0	0	0	0	0	0	0	0	0
DEC	66	36	28	48	40	28	28	40	10
JAN	0	0	0	0	0	0	0	0	0
FEB	0	0	0	0	0	0	0	0	0
MAR	76	52	8	84	30	52	77	47	20
APR	37	29	0	37	30	0	34	26	0
MAY	138	88	32	108	101	74	136	69	25
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	318	204	69	276	202	154	275	181	56
MEAN		197			211			171	

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TKN-N-MONTHLY NUTRIENT SUMMARIES BY TREATMENT

WY 1984

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	0	0	0	0	0
NOV	0	0	0	0	0	0	0	0	0
DEC	294	140	180	316	216	249	347	263	73
JAN	0	0	0	0	0	0	0	0	0
FEB	217	289	109	250	272	130	231	164	111
MAR	211	55	6	131	16	49	178	47	13
APR	58	40	0	57	26	0	54	33	1
MAY	273	251	51	216	64	120	280	122	34
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	1054	774	346	970	594	548	1090	630	233
MEAN		725			704			651	

TABLE 1. CONTINUED.

TOTAL P-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1984

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	0	0	0	0	0
NOV	0	0	0	0	0	0	0	0	0
DEC	25	8	11	19	12	8	25	19	4
JAN	0	0	0	0	0	0	0	0	0
FEB	36	35	18	30	26	18	30	24	12
MAR	30	21	6	27	15	17	25	18	8
APR	7	5	0	4	3	0	6	3	0
MAY	19	9	3	17	6	7	9	8	3
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	117	78	38	97	63	50	95	71	26
MEAN		78			70			64	

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ORTHO P-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1984

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	0	0	0	0	0
NOV	0	0	0	0	0	0	0	0	0
DEC	11	6	6	10	7	5	9	7	2
JAN	0	0	0	0	0	0	0	0	0
FEB	10	11	5	10	9	5	7	8	5
MAR	4	3	1	4	2	3	2	14	1
APR	2	1	0	2	1	0	2	1	0
MAY	6	3	1	3	4	3	4	3	1
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	34	24	13	29	22	16	24	34	9
MEAN		24			22			22	

TABLE 1. CONTINUED.

POTAS-MONTHLY NUTRIENT SUMMARIES BY TREATMENT

WY 1984

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	0	0	0	0	0
NOV	0	0	0	0	0	0	0	0	0
DEC	971	525	608	639	483	403	424	409	107
JAN	0	0	0	0	0	0	0	0	0
FEB	1028	891	443	771	806	718	833	791	476
MAR	855	527	232	701	435	480	690	567	221
APR	284	151	0	118	175	0	183	168	3
MAY	1391	683	268	746	813	659	713	679	257
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	4530	2777	1551	2975	2713	2260	2843	2614	1063
MEAN		2953			2649			2173	

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CALCIUM-MONTHLY NUTRIENT SUMMARIES BY TREATMENT

WY 1984

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0	0	0	0	0	0	0	0	0
NOV	0	0	0	0	0	0	0	0	0
DEC	905	410	597	700	537	375	649	507	139
JAN	0	0	0	0	0	0	0	0	0
FEB	977	898	464	842	764	750	758	733	479
MAR	915	539	209	723	391	555	711	610	229
APR	288	150	0	125	175	0	199	153	3
MAY	1379	641	301	765	802	657	719	689	258
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	4465	2637	1572	3156	2669	2337	3036	2692	1109
MEAN		2891			2721			2279	

TABLE 1. CONTINUED.

NO3-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1985

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	130	239	205	103	64	154	139	112	0
NOV	56	148	10	80	59	68	72	27	36
DEC	8	3	1	19	1	9	9	0	4
JAN	0	0	0	0	0	0	0	0	0
FEB	89	64	30	63	19	44	58	50	24
MAR	203	13	19	58	44	18	90	11	25
APR	8	35	16	7	24	2	15	44	2
MAY	0	0	0	0	0	0	0	0	0
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	493	502	281	330	211	295	382	244	91
MEAN		426			278			239	

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TKN-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1985

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	139	62	75	106	65	59	58	89	76
NOV	1723	862	49	1407	669	325	1685	269	90
DEC	25	7	6	83	4	31	72	1	17
JAN	0	0	0	0	0	0	0	0	0
FEB	354	322	118	439	104	136	551	220	90
MAR	171	101	66	147	136	103	173	180	54
APR	322	212	80	188	137	131	351	277	61
MAY	0	0	0	0	0	0	0	0	0
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	2734	1565	393	2370	1115	786	2889	1036	387
MEAN		1564			1424			1437	

TABLE 1. CONTINUED.

TOTAL P-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1985

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	11	10	13	11	12	10	17	10	9
NOV	50	55	2	31	29	19	27	12	16
DEC	1	1	0	6	0	1	4	0	1
JAN	0	0	0	0	0	0	0	0	0
FEB	35	63	19	19	11	9	55	21	9
MAR	25	9	13	10	8	102	59	12	37
APR	197	89	27	69	220	31	189	78	33
MAY	0	0	0	0	0	0	0	0	0
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	319	226	75	147	280	173	352	135	104
MEAN		207			200			197	

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ORTHO P-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
WY 1985

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	1	2	1	1	1	2	1	1	1
NOV	4	7	0	4	3	6	2	1	4
DEC	0	0	0	1	0	1	1	0	1
JAN	0	0	0	0	0	0	0	0	0
FEB	3	4	2	6	1	3	6	6	2
MAR	7	3	2	4	4	2	4	4	2
APR	40	17	6	20	1	27	17	1	3
MAY	0	0	0	0	0	0	0	0	0
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	56	34	11	37	11	41	31	13	15
MEAN		34			30			20	

TABLE 1. CONTINUED.

POTAS-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
 WY 1985

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	813	758	641	684	666	766	862	568	493
NOV	824	778	34	782	577	489	751	360	436
DEC	80	21	13	223	10	93	161	3	47
JAN	0	0	0	0	0	0	0	0	0
FEB	879	764	295	805	228	337	846	701	247
MAR	475	454	201	347	335	289	360	446	195
APR	497	488	265	263	353	276	228	284	147
MAY	0	0	0	0	0	0	0	0	0
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	3566	3263	1448	3105	2169	2249	3208	2362	1565
MEAN		2759			2508			2378	

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CALCIUM-MONTHLY NUTRIENT SUMMARIES BY TREATMENT
 WY 1985

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	332	185	214	183	252	249	266	247	173
NOV	813	699	43	724	550	573	688	260	433
DEC	87	19	15	268	11	100	188	7	48
JAN	0	0	0	0	0	0	0	0	0
FEB	1078	772	374	868	257	433	981	724	256
MAR	466	397	193	315	351	277	379	405	191
APR	352	374	243	328	236	295	341	327	163
MAY	0	0	0	0	0	0	0	0	0
JUN	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0
TOTAL	3128	2447	1082	2685	1658	1926	2842	1969	1262
MEAN		2219			2090			2025	

TABLE 2. NUTRIENT CONCENTRATIONS BY TREATMENT, WATERSHED AND YEAR (mg/l).
 NO3-N
 WY 1980

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.175	0.000	1.424	0.000	0.000
NOV	1.592	1.628	0.000	1.904	7.695	0.000	1.645	1.683	0.000
DEC	1.583	1.603	0.880	1.877	0.000	0.946	1.474	1.389	1.001
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.000	0.000	0.000	0.000	0.145	0.000	0.000	0.000	0.000
MAR	0.776	0.638	0.000	0.808	1.190	0.000	0.736	0.722	0.000
APR	0.741	0.699	0.762	0.692	0.496	0.840	0.925	0.830	0.885
MAY	0.000	0.827	0.969	0.752	0.000	0.899	0.741	0.747	0.913
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.153	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.862			1.004			1.003	

TKN	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MAR	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
APR	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MAY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.000			0.000			0.000	

TABLE 2. CONTINUED. TOTAL P
WY 1980

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.004	0.000	0.044	0.000	0.000
NOV	0.035	0.039	0.000	0.053	0.206	0.000	0.027	0.193	0.000
DEC	0.033	0.035	0.052	0.039	0.000	0.039	0.035	0.035	0.059
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000
MAR	0.029	0.033	0.000	0.036	0.031	0.000	0.031	0.033	0.000
APR	0.027	0.024	0.038	0.024	0.030	0.419	0.056	0.020	0.031
MAY	0.000	0.026	0.034	0.034	0.000	0.025	0.030	0.041	0.070
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.029			0.103			0.042	

ORTHO P
WY 1980

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MAR	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
APR	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MAY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.000			0.000			0.000	

TABLE 2. CONTINUED. POTASSIUM
WY 1980

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.101	0.000	1.098	0.000	0.000
NOV	1.015	1.199	0.000	0.995	4.948	0.000	0.945	0.861	0.000
DEC	0.856	1.002	0.897	0.698	0.000	0.903	0.894	1.133	1.001
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.000	0.000	0.000	0.000	0.110	0.000	0.000	0.000	0.000
MAR	0.602	0.765	0.000	0.704	0.572	0.000	0.637	0.639	0.000
APR	0.471	0.427	0.713	0.533	0.384	1.859	1.268	0.452	0.783
MAY	0.000	0.443	0.595	0.609	0.000	0.709	0.600	0.595	0.984
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.124	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.623			0.883			0.819	

CALCIUM
WY 1980

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.112	0.000	1.542	0.000	0.000
NOV	2.199	0.800	0.000	0.995	6.791	0.000	1.836	1.452	0.000
DEC	1.167	0.801	1.197	0.798	0.000	1.306	1.241	1.363	0.801
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.000	0.000	0.000	0.000	0.204	0.000	0.000	0.000	0.000
MAR	1.231	1.017	0.000	1.085	0.876	0.000	1.133	1.306	0.000
APR	0.843	0.735	1.420	0.665	0.639	4.442	1.783	0.770	1.206
MAY	0.000	0.656	0.901	0.929	0.000	1.203	1.029	0.999	1.335
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.189	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.854			1.568			1.126	

TABLE 2. CONTINUED NO3-N
WY 1981

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.023	0.365	0.000	0.943	0.279	0.000	0.688	0.431	0.000
NOV	1.019	0.039	0.000	0.863	0.542	0.000	0.856	0.770	0.000
DEC	0.079	0.120	0.000	0.068	0.045	0.000	0.038	0.105	0.000
JAN	0.366	0.294	0.000	0.253	0.310	0.000	0.297	0.094	0.000
FEB	0.031	0.004	0.000	0.008	0.054	0.000	0.002	0.002	0.000
MAR	0.175	0.042	0.000	0.030	0.109	0.000	0.030	0.029	0.025
APR	0.305	0.026	0.000	0.026	0.028	0.000	0.008	0.010	0.000
MAY	0.400	0.089	3.318	0.028	0.045	0.000	0.011	0.007	0.003
JUN	0.354	0.191	1.276	0.114	0.151	0.344	0.022	0.032	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		1.150			0.179			0.032	

TKN

WY 1981

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000
NOV	0.000	0.574	0.000	0.000	0.094	0.000	0.000	0.000	0.000
DEC	1.381	0.898	0.000	0.596	0.643	0.000	0.509	0.589	0.000
JAN	0.583	0.397	0.000	0.314	0.321	0.000	0.263	0.254	0.000
FEB	0.546	0.460	0.000	0.401	0.307	0.000	0.263	0.337	0.485
MAR	0.408	0.304	0.000	0.170	0.244	0.000	0.095	0.101	0.157
APR	0.337	0.567	0.000	0.359	0.597	0.000	0.489	0.472	0.000
MAY	0.991	0.540	0.984	0.355	0.598	0.000	0.364	0.362	0.212
JUN	0.958	1.017	0.373	0.762	0.810	0.670	0.794	1.020	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.765			0.559			0.427	

TABLE 2. CONTINUED. TOTAL P
WY 1981

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.051	0.034	0.000	0.039	0.039	0.000	0.013	0.022	0.000
NOV	0.164	0.029	0.002	0.032	0.029	0.000	0.024	0.023	0.000
DEC	0.529	0.094	0.000	0.040	0.042	0.000	0.029	0.039	0.000
JAN	0.113	0.081	0.000	0.030	0.032	0.000	0.023	0.019	0.000
FEB	0.092	0.067	0.000	0.105	0.030	0.000	0.089	0.024	0.269
MAR	0.097	0.051	0.000	0.025	0.043	0.000	0.011	0.021	0.025
APR	0.032	0.034	0.000	0.022	0.047	0.000	0.018	0.022	0.000
MAY	0.100	0.074	0.032	0.028	0.115	0.000	0.203	0.024	0.026
JUN	0.107	0.072	0.006	0.029	0.032	0.007	0.023	0.027	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.077			0.035			0.044	

ORTHO P
WY 1981

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.078	0.054	0.000	0.006	0.006	0.000	0.006	0.009	0.000
JAN	0.045	0.028	0.000	0.003	0.004	0.000	0.003	0.004	0.000
FEB	0.032	0.021	0.000	0.017	0.006	0.000	0.003	0.003	0.054
MAR	0.023	0.010	0.000	0.003	0.022	0.000	0.001	0.001	0.000
APR	0.005	0.009	0.000	0.003	0.003	0.000	0.003	0.003	0.000
MAY	0.020	0.020	0.025	0.008	0.009	0.000	0.008	0.008	0.005
JUN	0.023	0.021	0.006	0.003	0.004	0.005	0.004	0.006	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.095			0.007			0.005	

TABLE 2. CONTINUED. POTASSIUM
WY 1981

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	1.995	1.339	0.000	1.503	1.329	0.000	0.801	0.735	0.000
NOV	11.467	1.919	0.000	0.637	0.866	0.000	0.494	0.426	0.000
DEC	3.119	6.211	0.000	1.378	1.595	0.000	1.019	0.993	0.000
JAN	2.111	2.699	0.000	1.118	1.122	0.000	0.668	0.601	0.000
FEB	1.646	2.058	0.000	2.247	0.957	0.000	0.532	0.522	1.508
MAR	1.614	1.425	0.000	0.588	0.763	0.000	0.263	0.381	0.558
APR	0.970	1.336	0.000	0.524	0.524	0.000	0.410	0.330	0.000
MAY	1.412	1.804	2.954	0.768	0.817	0.000	0.578	0.572	0.652
JUN	1.130	1.652	1.031	0.940	0.796	0.809	0.589	0.514	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		2.260			0.970			0.586	

CALCIUM
WY 1981

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	1.557	0.926	0.000	1.413	1.295	0.000	1.176	1.043	0.000
NOV	9.124	0.477	0.000	0.987	1.051	0.000	1.144	1.075	0.000
DEC	2.822	3.272	0.000	0.632	0.752	0.000	0.076	0.810	0.000
JAN	1.544	1.215	0.000	0.689	0.665	0.000	0.689	0.601	0.000
FEB	1.401	0.929	0.000	3.047	0.728	0.000	0.837	0.820	1.616
MAR	2.194	0.939	0.000	0.875	0.802	0.000	0.505	0.787	0.898
APR	1.227	0.858	0.000	0.643	0.772	0.000	0.897	0.925	0.000
MAY	2.136	1.218	4.800	0.811	0.914	0.000	1.064	1.068	1.116
JUN	1.371	1.011	0.996	0.733	0.797	0.681	0.870	0.939	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		7.460			0.893			0.954	

TABLE 2. CONTINUED NO3-N
WY 1982

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.134	0.149	0.000	0.346	0.372	0.000	0.055	0.047	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JAN	0.006	0.014	0.007	0.033	0.016	0.012	0.005	0.007	0.000
FEB	0.008	0.000	0.000	0.000	0.026	0.000	0.006	0.000	0.000
MAR	0.011	0.019	0.011	0.015	3.609	0.016	0.006	0.003	0.004
APR	0.021	0.036	0.020	0.024	0.031	0.022	0.006	0.008	0.008
MAY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.008	0.021	0.020	0.023	0.020	0.009	0.016	0.000	0.000
JUL	0.000	0.000	0.000	0.027	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.020	0.000	0.010	0.038	0.000	0.051	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.031			0.050			0.007	

TKN

WY 1982

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.496	0.657	0.000	0.623	0.544	0.000	0.552	0.582	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JAN	0.413	0.696	1.177	0.372	0.531	0.353	0.328	0.355	0.274
FEB	0.111	0.000	0.000	0.000	0.339	0.000	0.267	0.000	0.000
MAR	0.332	0.456	1.190	0.324	3.918	0.285	0.229	0.291	0.298
APR	1.462	0.771	0.754	1.052	0.910	0.326	0.489	0.647	0.519
MAY	0.773	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.555	0.559	0.158	0.422	0.548	0.261	0.815	0.545	0.471
JUL	0.397	0.843	3.156	0.572	1.081	0.811	0.717	0.000	0.000
AUG	0.665	0.859	0.000	0.819	1.060	0.000	1.183	1.258	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.936			0.653			0.354	

TABLE 2. CONTINUED. TOTAL P
WY 1982

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.089	0.055	0.000	0.039	0.055	0.000	0.028	0.295	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JAN	0.049	0.063	0.684	0.027	0.039	0.031	0.018	0.260	0.028
FEB	0.015	0.000	0.000	0.000	0.026	0.000	0.012	0.000	0.000
MAR	0.036	0.052	0.602	0.025	3.491	0.022	0.017	0.220	0.016
APR	0.096	0.092	11.324	0.062	0.061	0.026	0.038	0.710	0.039
MAY	0.193	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.082	0.064	0.414	0.032	0.065	0.036	0.047	0.475	0.000
JUL	0.057	0.169	0.689	0.055	0.000	0.101	0.000	0.000	0.000
AUG	0.048	0.060	0.000	0.030	0.038	0.000	0.051	0.419	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.091			0.046			0.027	

ORTHO P

WY 1982

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.009	0.005	0.000	0.000	0.000	0.000	0.000	0.008	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JAN	0.010	0.012	0.027	0.008	0.008	0.017	0.005	0.005	0.009
FEB	0.008	0.000	0.000	0.000	0.009	0.000	0.006	0.000	0.000
MAR	0.010	0.011	0.008	0.011	3.470	0.007	0.011	0.009	0.012
APR	0.020	0.015	0.010	0.012	0.014	0.009	0.005	0.010	0.008
MAY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.035	0.029	0.020	0.023	0.030	0.018	0.031	0.018	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.140	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.016			0.012			0.009	

TABLE 2. CONTINUED. POTASSIUM
WY 1982

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	2.139	1.974	0.000	1.895	1.927	0.000	1.932	1.847	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JAN	1.616	1.772	2.396	1.639	1.745	2.147	1.752	1.678	2.060
FEB	1.301	0.000	0.000	0.000	1.304	0.000	1.098	0.000	0.000
MAR	1.084	1.116	1.496	0.600	3.913	0.946	0.686	0.655	0.583
APR	1.075	1.358	1.367	0.728	0.715	0.853	0.436	0.480	0.480
MAY	1.353	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.750	0.760	0.749	0.549	0.533	0.647	0.360	0.422	0.628
JUL	1.362	0.843	1.205	0.872	1.081	1.014	0.897	0.000	0.000
AUG	1.125	0.759	0.000	0.689	0.946	0.000	1.594	0.839	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		1.450			1.150			1.010	

TABLE 2. CONTINUED. CALCIUM
WY 1982

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	2.007	1.798	0.000	1.737	1.828	0.000	1.835	1.777	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JAN	1.607	1.722	2.357	1.585	1.688	2.082	1.749	1.627	2.013
FEB	1.301	0.000	0.000	0.000	1.295	0.000	0.997	0.000	0.000
MAR	0.870	0.882	0.989	0.324	3.426	0.846	0.612	0.609	0.382
APR	0.626	0.591	1.088	0.217	0.359	0.554	0.227	0.275	0.330
MAY	1.160	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.379	0.165	0.355	0.190	0.642	0.297	0.110	0.246	0.471
JUL	1.135	0.674	0.976	0.654	0.720	0.710	0.897	0.000	0.000
AUG	0.760	0.400	0.000	0.499	0.757	0.000	1.028	0.839	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		1.220			1.110			0.830	

TABLE 2. CONTINUED NO3-N
WY 1983

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.068	0.117	0.000	0.161	0.251	0.000	0.000	0.000	0.000
NOV	0.013	0.025	0.000	0.036	0.074	0.051	0.009	0.017	0.000
DEC	0.014	0.051	0.032	0.020	0.038	0.015	0.016	0.010	0.015
JAN	0.025	0.062	0.046	0.000	0.116	0.124	0.010	0.016	0.000
FEB	0.027	0.000	0.065	0.099	0.164	0.000	0.000	0.006	0.000
MAR	0.017	0.063	0.054	0.052	0.107	0.000	0.005	0.007	0.031
APR	0.023	0.014	0.023	0.020	0.013	0.020	0.016	0.059	0.023
MAY	0.023	0.016	0.007	0.019	0.020	0.023	0.018	0.020	0.040
JUN	0.000	0.032	0.000	0.000	0.252	0.000	0.104	0.040	0.000
JUL	0.022	0.016	0.009	0.077	0.126	0.027	0.000	0.032	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.038			0.041			0.022	

TKN

WY 1983

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.544	0.468	0.000	0.564	0.585	0.000	0.525	0.907	0.000
NOV	0.310	0.356	0.000	0.420	0.363	0.213	0.334	0.267	0.302
DEC	0.623	0.390	0.204	0.580	0.740	0.558	0.908	0.418	0.708
JAN	0.235	0.113	0.107	0.005	0.192	0.142	0.167	0.161	0.096
FEB	0.161	0.000	0.000	0.286	0.164	0.000	0.000	0.132	0.000
MAR	0.154	0.175	0.013	0.169	0.233	0.000	0.032	0.061	0.010
APR	0.405	0.233	0.233	0.289	0.255	0.275	0.076	1.026	0.117
MAY	0.470	0.502	0.061	0.215	0.301	0.248	0.302	0.346	0.183
JUN	0.000	0.352	0.363	0.000	0.252	0.000	0.417	0.161	0.000
JUL	0.143	0.125	0.312	0.332	0.126	0.155	0.215	0.064	0.258
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.414			0.457			0.514	

TABLE 2. CONTINUED. TOTAL P
WY 1983

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.068	0.000	0.000	0.081	0.084	0.000	0.000	0.000	0.000
NOV	0.051	0.005	0.000	0.043	0.044	0.000	0.040	0.035	0.000
DEC	0.040	0.029	0.034	0.016	0.024	0.034	0.022	0.011	0.042
JAN	0.032	0.040	0.046	0.000	0.025	0.031	0.028	0.025	0.024
FEB	0.031	0.000	0.032	0.021	0.019	0.000	0.000	0.013	0.000
MAR	0.043	0.029	0.020	0.037	0.018	0.000	0.010	0.014	0.010
APR	0.018	0.010	0.027	0.012	0.005	0.000	0.004	0.006	0.012
MAY	0.045	0.045	0.010	0.010	0.018	0.007	0.027	0.035	0.004
JUN	0.000	0.032	0.000	0.000	0.032	0.000	0.035	0.040	0.000
JUL	0.033	0.016	0.019	0.064	0.016	0.027	0.027	0.032	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.037			0.027			0.026	

ORTHO P
WY 1983

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0.019	0.014	0.000	0.017	0.012	0.011	0.013	0.014	0.000
DEC	0.023	0.015	0.017	0.011	0.012	0.016	0.015	0.007	0.018
JAN	0.020	0.032	0.015	0.000	0.011	0.012	0.014	0.012	0.000
FEB	0.010	0.000	0.000	0.011	0.010	0.000	0.000	0.006	0.000
MAR	0.013	0.012	0.007	0.011	0.024	0.000	0.017	0.007	0.010
APR	0.319	0.038	0.016	0.100	0.178	0.451	0.060	0.081	0.029
MAY	0.009	0.004	0.003	0.017	0.042	0.009	0.004	0.019	0.007
JUN	0.000	0.000	0.000	0.000	0.016	0.000	0.000	0.000	0.000
JUL	0.011	0.008	0.009	0.000	0.008	0.009	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.032			0.033			0.019	

TABLE 2. CONTINUED. POTASSIUM
WY 1983

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	1.427	1.052	0.000	0.887	0.919	0.000	1.049	1.134	0.000
NOV	0.948	0.970	0.000	0.998	0.977	0.872	1.046	0.985	0.831
DEC	0.968	0.909	0.901	0.751	0.849	0.947	0.856	0.966	0.933
JAN	0.952	0.582	0.733	0.016	0.989	0.915	0.823	0.870	0.937
FEB	0.875	0.000	0.973	1.094	0.923	0.000	0.000	0.879	0.000
MAR	0.495	0.863	0.930	0.791	0.847	0.000	0.674	0.571	1.068
APR	0.674	0.735	0.994	0.590	0.386	0.879	0.276	0.453	0.398
MAY	0.780	1.029	0.331	0.536	0.576	0.891	0.324	0.369	0.600
JUN	0.000	0.927	1.090	0.000	0.710	0.000	0.694	1.004	0.000
JUL	0.839	0.514	0.944	0.613	0.356	1.004	0.537	0.795	1.033
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.900			0.873			0.793	

CALCIUM
WY 1983

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	1.246	0.935	0.000	0.726	0.752	0.000	1.049	0.907	0.000
NOV	0.863	0.668	0.000	0.868	0.913	0.861	0.899	0.763	0.755
DEC	0.863	0.872	1.000	0.648	0.926	0.904	0.765	0.802	1.011
JAN	0.903	0.582	0.886	0.022	1.015	0.903	0.868	0.911	0.913
FEB	0.827	0.000	0.973	0.900	0.952	0.000	0.000	0.891	0.000
MAR	0.542	0.841	0.896	0.757	0.931	0.000	0.579	0.599	0.904
APR	0.324	0.169	0.400	0.299	0.218	0.498	0.207	0.283	0.193
MAY	0.317	0.395	0.141	0.297	0.306	0.421	0.315	0.484	0.494
JUN	0.000	0.320	0.545	0.000	0.379	0.000	0.486	0.442	0.000
JUL	0.452	0.164	0.510	0.345	0.190	0.374	0.430	0.414	0.387
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.790			0.731			0.713	

TABLE 2. CONTINUED NO3-N
WY 1984

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.048	0.030	0.049	0.040	0.035	0.065	0.029	0.043	0.060
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MAR	0.061	0.056	0.023	0.073	0.033	0.062	0.072	0.053	0.041
APR	0.060	0.076	0.000	0.084	0.074	0.000	0.077	0.092	0.000
MAY	0.092	0.101	0.088	0.112	0.097	0.096	0.149	0.085	0.079
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.036			0.042			0.044	

TKN

WY 1984

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.214	0.116	0.316	0.268	0.187	0.573	0.356	0.284	0.430
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.198	0.312	0.199	0.269	0.320	1.565	0.247	0.194	0.196
MAR	0.168	0.059	0.017	0.113	0.017	0.058	0.166	0.053	0.027
APR	0.095	0.109	0.000	0.127	0.063	0.000	0.126	0.117	0.183
MAY	0.182	0.289	0.136	0.222	0.062	0.156	0.309	0.151	0.104
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.140			0.142			0.171	

TABLE 2. CONTINUED. TOTAL P
WY 1984

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.018	0.007	0.020	0.016	0.011	0.018	0.025	0.021	0.020
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.034	0.039	0.033	0.033	0.030	0.216	0.032	0.028	0.022
MAR	0.024	0.023	0.020	0.023	0.016	0.021	0.024	0.020	0.016
APR	0.011	0.012	0.000	0.010	0.008	0.000	0.013	0.012	0.000
MAY	0.013	0.010	0.009	0.017	0.006	0.009	0.010	0.010	0.007
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.015			0.014			0.017	

ORTHO P
WY 1984

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.008	0.005	0.010	0.009	0.006	0.010	0.009	0.008	0.013
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.009	0.012	0.008	0.011	0.011	0.067	0.007	0.009	0.008
MAR	0.004	0.004	0.003	0.003	0.002	0.004	0.002	0.015	0.002
APR	0.004	0.003	0.000	0.005	0.003	0.000	0.005	0.004	0.000
MAY	0.004	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.003
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.005			0.004			0.006	

TABLE 2. CONTINUED. POTASSIUM
WY 1984

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.709	0.435	1.065	0.543	0.417	0.930	0.436	0.441	0.629
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.934	0.961	0.809	0.830	0.948	8.633	0.891	0.933	0.839
MAR	0.680	0.563	0.686	0.606	0.469	0.562	0.646	0.644	0.444
APR	0.464	0.410	0.000	0.268	0.433	0.000	0.418	0.603	0.366
MAY	0.928	0.787	0.721	0.766	0.785	0.860	0.785	0.842	0.790
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.575			0.543			0.607	

TABLE 2. CONTINUED. CALCIUM
WY 1984

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.661	0.339	1.046	0.595	0.464	0.863	0.667	0.546	0.821
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.889	0.968	0.848	0.906	0.899	9.025	0.812	0.864	0.847
MAR	0.729	0.576	0.620	0.625	0.422	0.650	0.665	0.692	0.460
APR	0.470	0.407	0.000	0.283	0.430	0.000	0.456	0.551	0.549
MAY	0.919	0.739	0.812	0.784	0.775	0.857	0.792	0.855	0.794
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.565			0.557			0.636	

TABLE 2. CONTINUED NO3-N
WY 1985

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.032	0.081	0.104	0.041	0.055	0.076	0.041	0.035	0.000
NOV	0.040	0.117	0.033	0.058	0.067	0.076	0.058	0.048	0.057
DEC	0.006	0.008	0.007	0.020	0.003	0.024	0.009	0.000	0.024
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.076	0.075	0.070	0.072	0.071	0.090	0.055	0.072	0.061
MAR	0.138	0.014	0.032	0.054	0.053	0.032	0.072	0.013	0.055
APR	0.008	0.052	0.044	0.010	0.037	0.006	0.019	0.061	0.009
MAY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.049			0.036			0.029	

TKN

WY 1985

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.034	0.021	0.038	0.042	0.056	0.030	0.017	0.027	0.515
NOV	1.237	0.682	0.161	1.029	0.760	0.361	1.370	0.477	0.143
DEC	0.018	0.016	0.035	0.085	0.011	0.085	0.069	0.001	0.089
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.304	0.377	0.273	0.505	0.387	0.279	0.523	0.312	0.233
MAR	0.117	0.103	0.112	0.136	0.163	0.183	0.139	0.204	0.121
APR	0.327	0.315	0.225	0.268	0.216	0.356	0.465	0.386	0.238
MAY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.156			0.170			0.163	

TABLE 2. CONTINUED. TOTAL P
WY 1985

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.003	0.003	0.007	0.004	0.011	0.005	0.005	0.003	0.061
NOV	0.036	0.043	0.007	0.023	0.033	0.021	0.022	0.022	0.025
DEC	0.001	0.003	0.000	0.006	0.000	0.003	0.004	0.000	0.006
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.030	0.074	0.044	0.022	0.042	0.018	0.052	0.030	0.023
MAR	0.017	0.009	0.023	0.009	0.009	0.181	0.048	0.014	0.083
APR	0.200	0.132	0.076	0.099	0.346	0.085	0.251	0.110	0.128
MAY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.022			0.026			0.025	

ORTHO P
WY 1985

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.000	0.001	0.001	0.000	0.001	0.001	0.000	0.000	0.008
NOV	0.003	0.005	0.000	0.003	0.004	0.006	0.002	0.002	0.007
DEC	0.000	0.000	0.000	0.001	0.000	0.003	0.001	0.000	0.006
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.003	0.005	0.005	0.006	0.004	0.007	0.005	0.008	0.006
MAR	0.005	0.003	0.004	0.004	0.005	0.004	0.004	0.005	0.005
APR	0.041	0.025	0.016	0.029	0.002	0.073	0.022	0.002	0.013
MAY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.003			0.006			0.006	

TABLE 2. CONTINUED. POTASSIUM
WY 1985

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.197	0.257	0.326	0.271	0.572	0.380	0.254	0.175	3.334
NOV	0.591	0.616	0.110	0.572	0.656	0.543	0.611	0.639	0.695
DEC	0.059	0.052	0.085	0.229	0.024	0.253	0.156	0.004	0.250
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.755	0.895	0.683	0.926	0.846	0.694	0.802	0.996	0.640
MAR	0.324	0.462	0.340	0.322	0.403	0.513	0.289	0.504	0.439
APR	0.505	0.725	0.746	0.375	0.557	0.749	0.302	0.396	0.577
MAY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.547			0.516			0.712	

CALCIUM
WY 1985

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
OCT	0.080	0.063	0.109	0.072	0.217	0.124	0.078	0.076	1.167
NOV	0.583	0.554	0.139	0.530	0.625	0.637	0.560	0.461	0.689
DEC	0.065	0.047	0.092	0.275	0.027	0.271	0.182	0.009	0.256
JAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.926	0.904	0.867	0.998	0.954	0.890	0.930	1.030	0.663
MAR	0.318	0.404	0.327	0.292	0.422	0.491	0.305	0.457	0.428
APR	0.358	0.557	0.686	0.468	0.373	0.801	0.452	0.457	0.638
MAY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW TMT MEAN		0.431			0.431			0.597	

Appendix Table 3. Seasonal nutrient export summaries by year, treatment and watershed (gm/ha).

WY 1980- NO3-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	1060	1054	228	1497	1160	326	1450	1000	191
WINTER	395	108	0	226	421	0	293	294	0
SPRING	372	241	221	429	148	558	548	577	141
SUMMER	0	0	0	171	0	0	0	0	0

WY 1981 NO3-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	209	57	0	74	121	0	77	21	1
WINTER	1114	296	1208	162	177	42	26	27	1
SPRING	0	0	0	0	0	0	0	0	0
SUMMER	197	30	0	82	39	0	47	54	0

Appendix Table 3. Continued

WY 1982 NO3-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	83	73	0	140	114	0	4	7	0
WINTER	19	15	8	39	1495	15	9	7	1
SPRING	21	27	6	21	31	7	6	4	1
SUMMER	0	1	0	2	1	0	1	0	0

WY 1983 NO3-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	62	211	71	86	203	57	41	36	29
WINTER	30	55	15	52	130	22	6	8	3
SPRING	58	31	11	33	53	25	31	54	25
SUMMER	2	2	1	7	18	3	0	1	0

Appendix Table 3. Continued

WY 1984 NO3-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	66	36	28	47	40	28	28	40	10
WINTER	76	53	8	84	30	53	77	47	20
SPRING	175	115	33	146	131	74	169	94	26
SUMMER	0	0	0	0	0	0	0	0	0

WY 1985 NO3-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	194	390	216	202	124	231	220	139	40
WINTER	291	77	49	121	63	62	148	62	48
SPRING	8	35	16	7	24	2	15	44	2
SUMMER	0	0	0	0	0	0	0	0	0

Appendix Table 3. Continued

WY 1980 TKN-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0	0	0	0	0	0	0	0	0
WINTER	0	0	0	0	0	0	0	0	0
SPRING	0	0	0	0	0	0	0	0	0
SUMMER	0	0	0	0	0	0	0	0	0

WY 1981 TKN-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	672	282	0	301	261	0	226	213	5
WINTER	2707	1705	358	1273	1349	82	956	966	28
SPRING	0	0	0	0	0	0	0	0	0
SUMMER	355	190	0	225	178	0	113	111	0

Appendix Table 3. Continued

WY 1982 TKN-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	307	322	0	252	167	0	45	84	0
WINTER	843	593	1017	488	2095	334	492	409	115
SPRING	1494	592	178	795	910	115	400	403	77
SUMMER	55	54	62	115	35	9	30	10	0

WY 1983 TKN-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	2268	1766	454	1971	3121	1618	2310	1329	1370
WINTER	249	128	10	158	214	26	68	86	6
SPRING	1124	819	110	408	579	289	395	926	115
SUMMER	15	18	37	29	18	19	9	2	2

Appendix Table 3. Continued

WY 1984 TKN-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	294	140	180	316	216	249	346	263	73
WINTER	428	344	114	381	288	179	408	212	124
SPRING	332	291	50	272	90	120	335	155	35
SUMMER	0	0	0	0	0	0	0	0	0

WY 1985 TKN-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	1886	930	130	1596	739	416	1815	359	183
WINTER	526	423	184	586	240	239	724	400	143
SPRING	322	212	80	188	137	131	351	277	61
SUMMER	0	0	0	0	0	0	0	0	0

Appendix Table 3. Continued

WY 1980 TOTAL-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	22	24	13	34	30	13	33	52	11
WINTER	15	6	0	10	12	0	12	13	0
SPRING	13	8	10	17	9	241	29	20	6
SUMMER	0	0	0	8	0	0	0	0	0

WY 1981 TOTAL-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	134	46	0	59	32	0	53	21	1
WINTER	287	148	11	63	138	1	167	37	4
SPRING	0	0	0	0	0	0	0	0	0
SUMMER	166	20	2	17	14	0	7	9	0

Appendix Table 3. Continued

WY 1982 TOTAL-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	55	27	0	16	17	0	2	43	0
WINTER	99	57	555	36	1466	28	29	303	8
SPRING	112	71	2567	48	67	11	30	435	6
SUMMER	4	4	13	6	1	1	1	3	0

WY 1983 TOTAL-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	187	110	76	80	127	95	73	47	82
WINTER	48	30	8	21	22	6	13	13	2
SPRING	85	66	15	18	29	6	34	40	4
SUMMER	3	2	2	6	2	3	1	1	0

Appendix Table 3. Continued

WY 1984 TOTAL-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	25	8	11	19	12	8	25	19	3
WINTER	67	57	25	57	40	36	56	41	20
SPRING	26	13	3	21	10	7	15	11	2
SUMMER	0	0	0	0	0	0	0	0	0

WY 1985 TOTAL-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	63	66	16	48	41	30	48	22	26
WINTER	59	72	33	29	19	111	114	34	46
SPRING	197	89	27	69	220	31	189	78	33
SUMMER	0	0	0	0	0	0	0	0	0

Appendix Table 3. Continued

WY 1980 ORTHO-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0	0	0	0	0	0	0	0	0
WINTER	0	0	0	0	0	0	0	0	0
SPRING	0	0	0	0	0	0	0	0	0
SUMMER	0	0	0	0	0	0	0	0	0

WY 1981 ORTHO-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	41	13	0	9	11	0	2	2	0
WINTER	59	42	9	11	12	1	9	10	1
SPRING	0	0	0	0	0	0	0	0	0
SUMMER	20	11	0	2	2	0	1	2	0

Appendix Table 3. Continued

WY 1982 ORTHO-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	6	2	0	0	0	0	0	1	0
WINTER	24	11	16	11	1429	12	11	8	4
SPRING	28	15	3	13	19	4	6	7	1
SUMMER	0	0	0	0	0	0	0	1	0

WY 1983 ORTHO-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	92	68	38	44	54	47	43	27	35
WINTER	20	19	2	8	17	2	12	7	1
SPRING	358	30	7	76	176	159	35	64	9
SUMMER	1	1	1	0	1	1	0	0	0

Appendix Table 3. Continued

WY1984 ORTHO-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	11	6	6	10	7	4	9	8	2
WINTER	15	15	6	13	11	9	9	21	6
SPRING	8	3	1	6	4	2	6	4	1
SUMMER	0	0	0	0	0	0	0	0	0

WY 1985 ORTHO-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	6	9	1	7	4	9	4	2	7
WINTER	10	8	4	10	6	6	10	10	4
SPRING	40	17	6	20	1	27	17	1	3
SUMMER	0	0	0	0	0	0	0	0	0

Appendix Table 3. Continued

WY 1980 POTASSIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	603	679	232	605	733	312	887	726	191
WINTER	306	129	0	197	248	0	253	260	0
SPRING	236	139	186	337	114	1122	642	365	128
SUMMER	0	0	0	139	0	0	0	0	0

WY 1981 POTASSIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	2336	1417	0	1389	841	0	518	436	18
WINTER	3714	3591	1070	1888	1513	99	940	761	84
SPRING	0	0	0	0	0	0	0	0	0
SUMMER	2838	1286	0	588	517	0	259	218	0

Appendix Table 3. Continued

WY 1982 POTASSIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	1324	966	0	768	592	0	157	267	0
WINTER	3403	1495	1697	1895	3237	1634	2283	1674	407
SPRING	1201	1008	350	613	739	298	331	300	73
SUMMER	106	48	24	113	31	11	40	7	0

WY 1983 POTASSIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	4137	4242	2005	2924	4002	2906	2546	3244	1812
WINTER	1013	640	243	660	971	166	573	573	160
SPRING	1867	1853	512	944	1057	1001	529	656	381
SUMMER	85	74	112	54	50	123	22	28	9

Appendix Table 3. Continued

WY 1984 POTASSIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	971	525	609	639	483	403	424	409	106
WINTER	1883	1418	675	1472	1241	1197	1523	1358	696
SPRING	1676	834	268	865	989	659	896	847	259
SUMMER	0	0	0	0	0	0	0	0	0

WY 1985 POTASSIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	1716	1557	688	1689	1253	1347	1774	931	976
WINTER	1354	1218	495	1152	563	627	1206	1147	442
SPRING	497	488	265	263	353	276	228	284	147
SUMMER	0	0	0	0	0	0	0	0	0

Appendix Table 3. Continued

WY 1980 CALCIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	978	525	309	668	976	451	1339	946	152
WINTER	625	171	0	304	419	0	451	531	0
SPRING	424	225	352	460	191	2637	952	619	194
SUMMER	0	0	0	212	0	0	0	0	0

WY 1981 CALCIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	2405	722	0	1725	679	0	779	729	28
WINTER	5028	2297	1697	1717	1647	83	1587	1447	144
SPRING	0	0	0	0	0	0	0	0	0
SUMMER	2344	669	0	314	290	0	75	211	0

Appendix Table 3. Continued

WY 1982 CALCIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	1242	880	0	704	562	0	149	257	0
WINTER	3242	1392	1475	1753	2988	1549	2221	1614	345
SPRING	685	412	265	189	455	178	167	173	50
SUMMER	76	27	19	83	25	8	28	7	0

WY 1983 CALCIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	3709	3833	2227	2527	4247	2782	2258	2669	1961
WINTER	998	630	249	586	1023	164	544	595	141
SPRING	814	637	212	507	569	501	477	664	288
SUMMER	46	24	61	30	27	46	18	15	3

Appendix Table 3. Continued

WY 1984 CALCIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	906	409	597	701	537	374	649	507	139
WINTER	1893	1437	674	1565	1156	1305	1469	1343	708
SPRING	1667	791	301	890	977	657	918	843	261
SUMMER	0	0	0	0	0	0	0	0	0

WY 1985 CALCIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	1232	903	271	1175	814	921	1142	513	653
WINTER	1544	1169	567	1182	607	709	1360	1129	446
SPRING	352	374	243	328	236	295	341	327	163
SUMMER	0	0	0	0	0	0	0	0	0

Appendix Table 4. Seasonal nutrient concentration summaries by year, treatment and watershed (mg/l).

WY 1980- NO3-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.25	0.51	0.58	0.48	0.17	0.58	0.56	0.53	0.60
WINTER	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00
SPRING	1.06	1.08	0.29	1.26	2.62	0.32	1.51	1.02	0.33
SUMMER	0.26	0.21	0.00	0.27	0.45	0.00	0.25	0.24	0.00

WY 1981 NO3-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.35	0.10	1.53	0.06	0.07	0.11	0.01	0.02	0.00
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.37	0.17	0.00	0.62	0.29	0.00	0.53	0.44	0.00
SUMMER	0.19	0.11	0.00	0.10	0.16	0.00	0.11	0.04	0.01

Appendix Table 4. Continued

WY 1982 NO3-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.01	0.02	0.01	0.02	0.02	0.01	0.01	0.00	0.00
WINTER	0.00	0.01	0.00	0.01	0.01	0.00	0.02	0.00	0.00
SPRING	0.04	0.05	0.00	0.12	0.12	0.00	0.02	0.02	0.00
SUMMER	0.01	0.01	0.01	0.02	1.22	0.01	0.01	0.00	0.00

WY 1983 NO3-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.02	0.02	0.01	0.01	0.10	0.01	0.05	0.04	0.02
WINTER	0.01	0.01	0.00	0.03	0.04	0.01	0.00	0.01	0.00
SPRING	0.03	0.06	0.01	0.07	0.12	0.02	0.01	0.01	0.01
SUMMER	0.02	0.04	0.05	0.05	0.13	0.04	0.01	0.01	0.01

Appendix Table 4. Continued

WY 1984 NO3-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.05	0.06	0.03	0.07	0.06	0.03	0.08	0.06	0.03
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.02	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02
SUMMER	0.02	0.02	0.01	0.02	0.01	0.02	0.02	0.02	0.01

WY 1985 NO3-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.00	0.02	0.01	0.00	0.01	0.00	0.01	0.02	0.00
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.03	0.07	0.05	0.04	0.04	0.06	0.04	0.03	0.03
SUMMER	0.07	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.04

Appendix Table 4. Continued

WY 1980 TKN-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUMMER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

WY 1981 TKN-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.76	0.71	0.45	0.49	0.67	0.22	0.55	0.62	0.07
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.46	0.49	0.00	0.20	0.25	0.00	0.17	0.20	0.00
SUMMER	0.51	0.39	0.00	0.30	0.29	0.00	0.21	0.23	0.21

Appendix Table 4. Continued

WY 1982 TKN-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.93	0.44	0.30	0.49	0.49	0.20	0.43	0.40	0.33
WINTER	0.35	0.57	1.05	0.46	0.71	0.27	0.63	0.42	0.00
SPRING	0.17	0.22	0.00	0.21	0.18	0.00	0.18	0.19	0.00
SUMMER	0.29	0.38	0.79	0.23	1.60	0.21	0.27	0.22	0.19

WY 1983 TKN-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.29	0.36	0.22	0.17	0.27	0.17	0.26	0.51	0.10
WINTER	0.05	0.04	0.10	0.11	0.04	0.05	0.07	0.02	0.09
SPRING	0.49	0.40	0.07	0.52	0.56	0.26	0.59	0.53	0.34
SUMMER	0.18	0.10	0.04	0.15	0.20	0.05	0.07	0.12	0.04

Appendix Table 4. Continued

WY 1984 TKN-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.09	0.13	0.05	0.12	0.04	0.05	0.14	0.09	0.10
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.07	0.04	0.11	0.09	0.06	0.19	0.12	0.09	0.14
SUMMER	0.12	0.12	0.07	0.13	0.11	0.54	0.14	0.08	0.07

WY 1985 TKN-N

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.11	0.11	0.07	0.09	0.07	0.12	0.16	0.13	0.08
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.43	0.24	0.08	0.39	0.28	0.16	0.49	0.17	0.25
SUMMER	0.14	0.16	0.13	0.21	0.18	0.15	0.22	0.17	0.12

Appendix Table 4. Continued

WY 1980 TOTAL-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.01	0.02	0.02	0.02	0.01	0.15	0.03	0.02	0.03
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.02	0.02	0.02	0.03	0.07	0.01	0.04	0.08	0.02
SUMMER	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00

WY 1981 TOTAL-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.08	0.06	0.01	0.03	0.06	0.00	0.08	0.02	0.01
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.25	0.05	0.00	0.04	0.04	0.00	0.02	0.03	0.00
SUMMER	0.10	0.07	0.00	0.05	0.03	0.00	0.04	0.02	0.10

Appendix Table 4. Continued

WY 1982 TOTAL-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.12	0.05	3.91	0.03	0.04	0.02	0.03	0.39	0.01
WINTER	0.03	0.08	0.23	0.03	0.01	0.03	0.02	0.14	0.00
SPRING	0.03	0.02	0.00	0.01	0.02	0.00	0.01	0.10	0.00
SUMMER	0.03	0.04	0.43	0.02	1.19	0.02	0.02	0.16	0.01

WY 1983 TOTAL-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.02	0.03	0.01	0.01	0.02	0.00	0.02	0.03	0.01
WINTER	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.00
SPRING	0.05	0.01	0.01	0.05	0.05	0.01	0.02	0.02	0.01
SUMMER	0.04	0.02	0.03	0.02	0.02	0.01	0.01	0.02	0.01

Appendix Table 4. Continued

WY 1984 TOTAL-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.01	0.01	0.00	0.01	0.00	0.00	0.01	0.01	0.00
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01
SUMMER	0.02	0.02	0.02	0.02	0.02	0.08	0.02	0.02	0.01

WY 1985 TOTAL-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.07	0.04	0.03	0.03	0.12	0.03	0.08	0.04	0.04
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.01	0.02	0.00	0.01	0.01	0.01	0.01	0.01	0.03
SUMMER	0.02	0.03	0.02	0.01	0.02	0.07	0.03	0.01	0.04

Appendix Table 4. Continued

WY 1980 ORTHO-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUMMER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

WY 1981 ORTHO-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.02	0.02	0.01	0.00	0.01	0.00	0.00	0.01	0.00
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUMMER	0.03	0.02	0.00	0.01	0.01	0.00	0.00	0.00	0.02

Appendix Table 4. Continued

WY 1982 ORTHO-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
SPRING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUMMER	0.01	0.01	0.01	0.01	1.16	0.01	0.01	0.00	0.01

WY 1983 ORTHO-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.11	0.01	0.01	0.04	0.08	0.15	0.02	0.03	0.01
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
SUMMER	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00

Appendix Table 4. Continued

WY1984 ORTHO-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUMMER	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.01	0.00

WY 1985 ORTHO-P

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.01	0.01	0.01	0.01	0.00	0.02	0.01	0.00	0.00
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
SUMMER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix Table 4. Continued

WY 1980 POTASSIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.16	0.29	0.44	0.38	0.13	0.86	0.62	0.35	0.59
WINTER	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00
SPRING	0.62	0.73	0.30	0.56	1.68	0.30	0.98	0.66	0.33
SUMMER	0.20	0.25	0.00	0.23	0.23	0.00	0.21	0.21	0.00

WY 1981 POTASSIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	1.17	1.60	1.33	0.74	0.71	0.27	0.53	0.47	0.22
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	5.53	3.16	0.00	1.17	1.26	0.00	0.77	0.72	0.00
SUMMER	1.79	2.06	0.00	1.32	0.95	0.00	0.49	0.50	0.69

Appendix Table 4. Continued

WY 1982 POTASSIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	1.06	0.71	0.71	0.43	0.42	0.50	0.27	0.30	0.37
WINTER	0.83	0.53	0.40	0.52	0.68	0.34	0.83	0.28	0.00
SPRING	0.71	0.66	0.00	0.63	0.64	0.00	0.64	0.62	0.00
SUMMER	1.33	0.96	1.30	0.75	2.32	1.03	1.18	0.78	0.88

WY 1983 POTASSIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.48	0.90	0.80	0.38	0.56	0.59	0.43	0.61	0.33
WINTER	0.28	0.17	0.31	0.20	0.12	0.33	0.18	0.27	0.34
SPRING	1.11	0.98	0.30	0.88	0.91	0.61	0.98	1.03	0.59
SUMMER	0.77	0.48	0.88	0.63	0.92	0.31	0.50	0.77	0.67

Appendix Table 4. Continued

WY 1984 POTASSIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.46	0.40	0.24	0.34	0.41	0.29	0.40	0.48	0.39
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.24	0.14	0.36	0.18	0.14	0.31	0.15	0.15	0.21
SUMMER	0.54	0.51	0.50	0.48	0.47	3.07	0.51	0.53	0.43

WY 1985 POTASSIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.17	0.24	0.25	0.12	0.19	0.25	0.10	0.13	0.19
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.28	0.31	0.17	0.36	0.42	0.39	0.34	0.27	1.43
SUMMER	0.36	0.45	0.34	0.42	0.42	0.40	0.36	0.50	0.36

Appendix Table 4. Continued

WY 1980 CALCIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.28	0.46	0.77	0.53	0.21	1.88	0.94	0.59	0.85
WINTER	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00
SPRING	1.12	0.53	0.40	0.60	2.30	0.44	1.54	0.94	0.27
SUMMER	0.41	0.34	0.00	0.36	0.36	0.00	0.38	0.44	0.00

WY 1981 CALCIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	1.58	1.03	1.93	0.73	0.83	0.23	0.94	0.98	0.37
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	4.50	1.56	0.00	1.01	1.03	0.00	0.80	0.98	0.00
SUMMER	1.71	1.03	0.00	1.54	0.73	0.00	0.68	0.74	0.84

Appendix Table 4. Continued

WY 1982 CALCIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.72	0.25	0.48	0.14	0.33	0.28	0.11	0.17	0.27
WINTER	0.63	0.36	0.33	0.38	0.49	0.24	0.64	0.28	0.00
SPRING	0.67	0.60	0.00	0.58	0.61	0.00	0.61	0.59	0.00
SUMMER	1.26	0.87	1.12	0.64	2.14	0.98	1.12	0.75	0.80

WY 1983 CALCIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.21	0.29	0.36	0.20	0.30	0.31	0.34	0.40	0.23
WINTER	0.15	0.05	0.17	0.11	0.06	0.12	0.14	0.14	0.13
SPRING	0.99	0.83	0.33	0.75	0.86	0.59	0.90	0.82	0.59
SUMMER	0.76	0.47	0.92	0.56	0.97	0.30	0.48	0.80	0.61

Appendix Table 4. Continued

WY 1984 CALCIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.46	0.38	0.27	0.36	0.40	0.29	0.42	0.47	0.45
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.22	0.11	0.35	0.20	0.15	0.29	0.22	0.18	0.27
SUMMER	0.54	0.51	0.49	0.51	0.44	3.23	0.49	0.52	0.44

WY 1985 CALCIUM

	CLEARCUT			SELECTION			CONTROL		
	12	15	18	10	14	17	11	13	16
FALL	0.12	0.19	0.23	0.16	0.12	0.27	0.15	0.15	0.21
WINTER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPRING	0.24	0.22	0.11	0.29	0.29	0.34	0.27	0.18	0.70
SUMMER	0.41	0.44	0.40	0.43	0.46	0.46	0.41	0.50	0.36