Standards for Rangeland Health and Guidelines for Grazing Administration
Implementation Project: Allotment Assessment
For
MT. TRUMBULL - 4826

I. INTRODUCTION

The Mt. Trumbull Assessment was conducted in accordance with directions set forth in the Washington Office Instruction Memorandum No. 98-91 and Arizona State Instruction Memorandum No. 99-012 for implementation of Standards for Rangeland Health and Guidelines for Grazing Administration (Standards and Guides).

The purpose of Standards and Guides is to insure the health of public rangelands. These standards help the Bureau of Land Management (BLM), rangeland users, and interested members of the public achieve a common understanding of acceptable resource conditions, and work together to implement that vision (see appendices for a copy of the Standards and Guidelines).

Arizona's Standards and Guides were developed by the BLM State Standards and Guides Team and the Arizona Resource Advisory Council (RAC), a state level council appointed by the Secretary of the Interior.

The Secretary of the Interior approved the Standards and Guides in April 1997. The Decision Record, signed by the BLM State Director (April 1997) provides for full implementation of the Standards and Guides in all Arizona Land Use Plans.

This assessment was conducted by an interdisciplinary assessment team (IAT) of resource specialists from:

- BLM.
- Natural Resource Conservation Service (NRCS).
- Arizona Game and Fish Department (AGFD).
- Mohave County Extension.

The IAT was assisted by the Rangeland Resource Team (RRT), a diverse group of local residents formed and appointed under the RAC charter (see appendices for a list of members on both teams). The RRT may provide informal advice to the BLM Field Manager regarding implementation of Standards and Guides, and "will have opportunities to raise any matter of concern with the resource advisory council and ... to provide information and options to the council for their consideration" as provided for by regulations at 43 CFR 1784.6-2(a)(2)(iv)(A).

The BLM/RAC Implementation Strategy for Arizona States that the RRT's primary role is to assist BLM managers in assuring the S&G's are consistently applied and technically sound. The IAT analyzed all available information in cooperation with the RRT. Based on field observations, team members determined whether rangeland conditions were meeting, progressing toward meeting, or not meeting the Standards for Rangeland Health.

The RRT, IAT, permittees and other interested parties were invited to attend an issue scoping meeting on {INSERT DATE}, and a field visit on {INSERT DATE}. In cases where standards were not being met, the group identified which resource uses needed to be addressed, and teams presented recommendations to improve resource conditions.

After consultation with interested persons, permittees, and the IAT, the Authorized Officer will select the appropriate actions. The selected management actions will be analyzed through the National Environmental Policy Act (NEPA) process and a proposed decision will be issued.

II. GRAZING USE

A. Total Grazing Privileges

Livestock Numbers	Season of Use	Percent Federal	Active AUMs
144 Cattle	12/01 to 11/30	87	1,506
5 Horses	12/01 to 11/30	87	52

(Note: an AUM, or Animal Unit Month, is a unit of measurement indicating how much forage is eaten by a cow/calf pair in one month.)

B. Season(s) of Use

144 cows from 12/01 to 11/30
5 horses from 12/01 to 11/30

C. Kind and Class of Livestock

Cow/Calf Operation

D. Percent Public Land

The Mt. Trumbull Allotment is 87 percent public land. Fees for AUMs on state ground are paid to the State of Arizona by the permittee.

III. ALLOTMENT PROFILE

A. Description

The Mt. Trumbull Allotment is located approximately 58 miles south of St. George, Utah. The allotment includes two separate areas located 9½ miles apart. The southern area is the Frog-Cane winter pasture located below Whitmore Point. The Frog-Cane pasture is within the Lake Mead National Recreation Area in T. 31 & 32 N., R. 9 & 10 W. The northern portion of the allotment includes all the summer and fall pastures. These pastures are located around the Mt. Trumbull town site and on top of the Hurricane Cliffs in T. 34, 35 and 36 N., R. 9 &10 W.

B. Acreage

State land is managed in accordance with the Allotment Management Plan (AMP).

Public Lands (BLM)	13,210 ac.
Lake Mead NRA	15,817 ac.
State	2,000 ac.
Private	2,240 ac.
Total	33,267 ac.

C. Objectives

Program guidance decisions as well as specific resource objectives for the Mt. Trumbull Allotment are found in the:

- Arizona Strip Resource Management Plan (RMP, 1992).
- Shivwits Resource Area RMP Implementation Plan (SRAIP).
- Mt. Trumbull Habitat Management Plan (HMP).
- Mt. Trumbull AMP.

1. Land Use Plan Objectives

a. Shivwits Resource Area Implementation Plan For The Arizona Strip Resource Management Plan

GZ17 - Allowable use on key forage species is 50 percent on allotments with rotational grazing systems.

OH01 - Implement the designation of off-highway vehicle use for the Shivwits Resource Area as follows:
Use of existing roads and trails: 1,031,341 acres.
Use of designated roads and trails: 278,921 acres.

Closed: 68,404 acres (excludes wilderness, which is off limits to vehicular travel).
Open for unlimited off-road travel: 0 acres (for further evaluation)

RR02 - Evaluate requests for additional recreation permits through the National Environmental Policy Act process and for their consistency with management goals and objectives and process on a case-by-case basis.

RR03 - Limit camping to 14 days at any one location unless otherwise authorized.

RR04 - Recreation management direction includes:
1. Accommodate current uses, protect cultural values, and complement wilderness management plans where appropriate.
2. Provide visitor information.
3. Use various methods to acquire visitor use data on an annual basis. Maintain a system of traffic counters, monitor results monthly and field-verify results annually.
4. Conduct compliance patrols (district ranger).
5. Consider visual impacts on all proposed actions and protect scenic values by using mitigation measures where feasible, including alternative locations, camouflage, vegetation or topographic screening and other measures.

RR05- Improve and increase the number of road signs and develop a sign inventory system.

RR06- Implement actions to restore and/or maintain natural conditions or appearance in all areas.

RR07- Maintain primary access roads, particularly Quail Hill Road, on a year round basis.

RR08- Manage the majority of the Resource Area for extensive recreation while maintaining its naturalness/remoteness. The exception to this is the Cedar Pockets campground.

RR09- Commercial recreation permits would be issued to the extent that their cumulative impacts are consistent with the overall objectives of this plan and in the public interest.

RR12- In Visual Resource Management Class 3 and 4 areas, provide settings for recreational opportunities associated with motorized vehicle use such as exploring back country roads, vehicle camping and picnicking. Other management decisions in these areas are:

1. Allow for some changes in Recreational Opportunity Spectrum classes from semi-primitive non-motorized to roaded-natural where necessary to meet recreational needs or other resource development. However, the goal is to maintain the desired recreational settings.
2. Provide recreational settings where restrictions on visitors are not noticeable, but blend with the natural setting.
3. Develop sign plans to provide road information for interpretation, public safety, and coordinate the plans with the Arizona Strip visitor map.
4. Regulate visitor use only if monitoring indicates a need for limiting or restricting use.

RR13- In Visual Resource Management Class 1 & 2 areas, ensure continued public use and enjoyment of a variety of recreation activities that are compatible with the protection and enhancement of natural and cultural values.

Other management decisions are:

1. Enhance opportunities for high quality, back country recreation experiences, and provide for a range of recreational activities, including camping, vehicle exploring, sightseeing, hiking, limited off-road travel, horseback riding, rock hounding, and hunting.
2. Provide recreation settings where visitor restrictions are subtle.
3. Ensure maintenance of desired resource and social settings.
4. Regulate visitor use only when monitoring indicated a trend toward unacceptable change to desired recreation settings brought about by such use.
5. Inventory and develop sign plans compatible with the objectives of the area, while maintaining the minimum number of signs necessary to provide public safety and information.

VR01: Assign Visual Resource Management Classes for the Resource Area as follows:

153,815 acres as Class I.
310,318 acres as Class II (Includes the primary travel corridors).
188,695 acres as Class III.
879,652 as Class IV.

VR-05: Activities which would cause adverse long-term impacts to the important visual resources in the following areas would be prohibited or mitigated to the extent practicable: Hurricane Rim, Upper and Lower Grand Wash Cliffs, Diamond Butte, Andrus and Parashant Canyons.

b. Vermilion Resource Area Implementation Plan

A small portion of this allotment, on its southern end, lies on the Mt. Trumbull Resource Conservation Area (roughly 20 percent).

RR17: Institute visitor limits, regulation, or restriction in the resource area only when monitoring of resource and social conditions indicate a trend toward unacceptable change to desired recreation settings brought about by such use.

RR19: Designate the Mt. Trumbull area as a Resource Conservation Area and a Special Recreation Management Area with recreation as one of the primary management programs emphasized.

RR20: Provide recreation settings in the Mt. Trumbull Resource Conservation Area that range from Roaded Natural to Primitive. Recreation opportunities associated with motorized vehicle use such as exploring back country roads, vehicle camping, sightseeing, and picnicking are balanced with opportunities associated with non-motorized use such as primitive camping, backpacking, hiking, horseback riding, mountain bike riding, and hunting.

The range of settings is briefly described below from less to more primitive:

- *Physical setting – ranges from areas that are generally natural where resource uses and modifications are evident, to essentially unmodified environments.*

- *Social setting – ranges from areas where concentration of users is low to moderate and there may be moderate evidence of the sights and sounds of others, to areas where concentration of users is very low and evidence of others is minimal.*

- *Management setting – ranges from areas where control and restrictions offer a sense of security, some rustic facilities may be provided, and conventional motorized use is allowed, to areas that are almost free of controls and restrictions, no facilities are provided, and motorized use is not allowed.*

RR21: Promote, through various means, conservation of natural and human resource values in the Mt. Trumbull Resource Conservation Area, for the purposes of education, scientific study, and recreational opportunities.

RR22: Write a coordinated, multi-resource activity plan for the Mt. Trumbull Resource Conservation Area, which will satisfy the requirements for a Recreation Area Management Plan.

RR25: As visitor use increases in the Mt. Trumbull Resource Conservation Area, consider low-intensity development of facilities to better manage user impacts.

RR27: Manage the Mt Trumbull Resource Conservation Area as a Visual Resource Management Class II area; changes to the land form, vegetation, or structures should be subtle and not attract attention.

VR01: Assign Visual Resource Management classes for the resource area as follows:

111,262 acres as Class I
460,217 acres as Class II
333,648 acres as Class III
664,483 acres as Class IV

VR02: Management of primary access roads will be guided by Visual Resource Management Class II objectives. Changes to the land form, vegetation, or structures along the roads in the foreground or middle ground should be subtle and not attract attention. (These roads, with accompanying numbers, may include, but are not limited to the following): Clayhole/Nixon (5), Trumbull (109), Tuweap (115), Craig Ranch (263), Black Point (1014), Temple Trail (1001), Antelope Trail (1015), State Highway, 89A, State Highway 389, Buffalo Ranch (1049), Two-Mile (1065), Ryan (FS 422), Winter Road (1025), Gunsight (1048), Hack Canyon, Cane Beds (237), Big Warren (1068), Navajo Trail (30), Robinson (1058), June Tank (1057), Findlay Tank (1010), Sandridge (1055), Pine Tree Pockets (1017).

c. Mt Trumbull Resource Conservation Area Plan

Objective 4: Manage the spectrum of recreational settings in the Resource Conservation Area so that selected indicators of resource and social conditions are within or below the following ranges described in Table 1.

Table 1.

Resource Conditions	Natural Setting	Backcountry Setting	Primitive Setting
a. Visitor[1] impacts at five monitoring locations.[2]	Not to exceed 1 highly impacted and 4≤ moderately impacted campsites.	Not to exceed 3 moderately impacted and two ≤ minimally impacted campsites	Not to exceed 1 moderately impacted and 4 ≤ impacted campsites.
B. Impacts from other uses as evaluated at key observation points.[3]	Not to exceed an overall low visual contrast rating.		Not to exceed an overall low visual contrast rating. Impacts in wilderness must not be noticeable.
Social Conditions			
c. Annual increase in traffic counts tallied.	No more than 5 percent at Toroweap junction and Hurricane Rim sites.	No more than 2 percent at Mt. Logan Road and Death Valley Lake Road sites.	No more than 1 percent at Mt. Trumbull Trail and Mt. Logan Trail sites.
D. Average # of encounters[4] with other groups/day.	No more than 20 during peak visitor use periods.[5]	No more than 10 during peak visitor use periods.	No more than 6 during peak use periods.

Table 1 Footnotes:

1. Visitors are people who are in the area primarily for a recreational purpose, such as hunting or sightseeing.
2. Frequency of monitoring campsites for each setting if once every three years. Impact ratings will be based on monitoring worksheets developed for the RCA, taking into account such factors as number of campfire rings, litter, vegetative damage, camp size, etc.
3. BLM Visual Resource Management contrast rating worksheets, using specific key observation points, will be used as projects are proposed. Key observation points are generally selected by determining where the most people might be in site of the project. Contrast rating will assume that the initial construction phase of any project may not met visual objectives, but that given a reasonable specified time and rehabilitation/mitigation measures, the desired degree of contrast will be met.
4. An "encounter is" is any visual or auditory contact with another person or group of persons not part of the observer's group while at a designated monitoring site.
5. "Peak visitor use periods" are the weekend days associated with: Memorial Day, July 4th, July 24th, Labor Day, and the opening of the general season deer hunt.

Objective 5: Enhance visitor experience opportunities with information, interpretation, services, and facilities in order for the visitors to make appropriate choices about participation in recreation activities within the RCA using guidelines described in Table 2.

Table 2.

Management Guidelines	Natural Setting	Backcountry Setting	Primitive Setting
a. Overall management conditions.	Focus on maintaining recreation settings that frequently provide for use confidence and convenience.	Focus on maintaining recreations settings that occasionally provide for user confidence and convenience.	Focus on maintaining recreation settings that rarely provide for user confidence and convenience.
b. Visitor contact with management personnel.	Frequent	Frequent to occasional	Occasional to rare
c. Type, level, and location of visitor information.	Formal, moderate, on-site/off-site	Informal, occasional, off-site	Informal, rare, off-site
d. Signing	Frequent to occasional, generally permanent	Occasional	Rare, temporary
e. Typical road standard	Improved gravel or dirt, frequent maintenance	Dirt, occasionally maintained	Dirt or none, rarely maintained
f. Degree of user facilities development	Moderate to low	Very low to none	None

d. Mt. Trumbull Habitat Management Plan (HMP) Objectives for Wildlife

HMP II.B.1. *To increase the carrying capacity of the habitat from the present 2,000 deer year-long to 4,000 deer year-long by improving the habitat.*

HMP II.B.3a. *Above 6,000 feet, increase forb densities from a trace to five percent and grasses from five percent to 15 percent.*

HMP II.B.3b. *Below 6,000 feet, increase the density of cliffrose, bitterbrush and ceanothus from ten percent to 20 percent.*

HMP II.B.6. *Increase the mule deer production and fawn survival rate from the present five year average of 30 fawns per hundred does to a five year average of 75 fawns per hundred does by 1996.*

3. Specific Resource Objectives

a. Mt. Trumbull Allotment Management Plan (1975) being evaluated in this process

- *Increase ground cover of perennial grasses in pastures #1 Rim, #2 North Stockade, #3 South Stockade and #7 Boys from the present average of 8.96 to 15 percent.*
- *Increase the ground cover of perennial grasses in pastures #4 Side of Mountain, #5 Whitmore and #8 One-Sixty from the present average of 7.35 to 13 percent.*
- *Reduce the forage utilization around waters (within ½ mile) in the Frog and Cane pasture from the present 60-70 percent to 50-60 percent.*
- *Provide a minimum of 274 Animal Unit Months (AUMs) of mule deer forage on a sustained yield basis.*
- *To maintain essential ground cover for watershed protection, utilization will not exceed 60 percent on pastures that are grazed each year on a deferred rotation.*
- *Proposed developments on the allotment will be coordinated with recreation interests to protect aesthetic values and enhance recreational experiences.*

b. Desired Plant Community Objectives developed during this process

Desired Plant Community (DPC) key areas #1 & #3 (Limestone Hills 13-17")

Maintain ecological condition in Mid or Late Seral through 2025 by:

- *Maintaining the tree/shrub composition between 10-50 percent through 2025*
- *Maintaining the grass composition between 35-65 percent through 2025*
- *Maintaining the forb composition between 5-10 percent through 2025*

DPC key area #5 (Loamy Upland/Shallow Loamy 10-14")

Maintain ecological condition in Late Seral through 2025 by:

- *Maintaining the tree/shrub composition between 15-35 percent through 2025*
- *Maintaining the grass composition between 60-75 percent through 2025*
- *Maintaining the forb composition between 0-10 percent through 2025*

DPC key area #7 (Shallow Loamy calcarious 10-14")

Maintain ecological condition in Late Seral through 2025 by:

- *Maintaining the tree/shrub composition between 15-25 percent through 2025*

- *Maintaining the grass composition between 60-80 percent through 2025*
- *Maintaining the forb composition between 5-10 percent through 2025*

DPC key area #9 (Clay Loam Upland gravelly 13-17")

Maintain ecological condition in Late Seral through 2025 by:
- *Maintaining the tree/shrub composition between 12-65 percent through 2025*
- *Maintaining the grass composition between 27-75 percent through 2025*
- *Maintaining the forb composition between 2-10 percent through 2025*

DPC key area #10 (Shallow Loamy 10-14")

Maintain ecological condition in PNC through 2025 by:
- *Maintaining the tree/shrub composition between 20-30 percent through 2025*
- *Maintaining the grass composition between 60-75 percent through 2025*
- *Maintaining the forb composition between 1-5 percent through 2025*

DPC key area #11 (Loamy Upland 10-14")

Maintain ecological condition in PNC through 2025 by:
- *Maintaining the tree/shrub composition between 10-35 percent through 2025*
- *Maintaining the grass composition between 55-75 percent through 2025*
- *Maintaining the forb composition between 2-10 percent through 2025*

D. Key Species

Plant Category	**Common Name**	**Scientific Name**
Cool Season Grasses	Indian ricegrass	oryzopsis hymenoides
	needle and thread	stipa comata
	squirrel tail	sitanion hystrix
	wheatgrass	agropyron spp.
Warm Season Grasses	sand dropseed	sporobolus cryptandrus
	galleta grass	hilaria jamesii
	blue grama	bouteloua gracilis
Browse	cliffrose	cowania mexicana
	fourwing saltbrush	Atriplex canescens

E. Grazing System Description

The current grazing is operated under a deferred-rotation system. There are ten pastures within the allotment boundaries. The pastures are split into summer-fall pastures (Rim, No. Stockade, So. Stockade and Boys), spring-winter pastures (Side of Mountain, 160, and Whitmore Point) and the winter pasture (Frog and Cane). Each set of pastures is operated under a deferred-rotation schedule. When forage and water conditions permit, the summer-fall pastures are operated under a rest-rotation schedule, which allows total rest of one of the summer pastures. The Frog and Cane pasture is divided into two units (east and west) and is used to defer a portion of the allotment during the spring growing season. In addition to these pastures, there is a private and state section pasture which are used in the rotation. These pastures are generally used in the spring and fall during transition.

F. Other Uses

1. Special Status Species

a. Federally Listed Threatened or Endangered Species: There is no suitable habitat for any listed threatened or endangered species on this allotment. However, bald eagle (*Haliaeetus leucocephalus*), California condor (*Gymnogyps californianus*), and peregrine falcon (*Falco peregrinus alatum*) may occasionally fly over the area. There are no riparian areas that would provide foraging habitat for peregrine falcon, bald eagle, or southwestern willow flycatchers (*Empidonax traillii extimus*). An experimental non-essential population (as defined under section 10J of the Endangered Species Act) of California condors was established on the Vermilion Cliffs in 1996. These birds may eventually forage on carrion within the allotment but have not yet been observed doing so.

b. BLM Sensitive and State Species of Concern: Ferruginous hawks (*Buteo regalis*) are known to forage over grassland habitat similar to that found on the allotment, though specific sightings have not been recorded for the area. Black-crowned Night Heron (*Nysticorax nycticorax hoactli*) and snowy egrets (*Egretta thula brewsteri*) have occasionally been observed using stock tanks in the Mt. Trumbull area, but none have been recorded on the Mt. Trumbull Allotment. A variety of sensitive bat species have been captured on this and neighboring allotments including Townsend's big-eared (*Corynorhinus townsendii*), spotted bats (*Euderma maculatum*), small-footed myotis (*Myotis ciliolabrum*), fringed myotis (*Myotis thysanodes*), and big free-tailed bats (*Nyctinomops macrotis*).

2. **Other Wildlife Species**

The ponderosa pine forests in the Mt. Trumbull and Mt. Logan areas provide summer habitat for a small herd of mule deer (*Odocoileus hemionus*). The northern portion of the allotment above the Hurricane Cliffs lies near or above the 6,000 feet elevation level which is considered crucial deer summer range. Observation and studies over the years have indicated that this area receives only light to moderate use by mule, primarily as transitional habitat between summer and winter range. The higher elevations within the ponderosa pine forests of nearby Mt. Trumbull and Mt. Logan are considered better quality habitat for mule deer.

Nongame wildlife found on the allotment is typical of the area, including a variety of small mammals, grassland birds, raptors, and reptiles. All waters within this arid area are important for wildlife.

3. Recreation

The Mt. Trumbull Allotment is considered to have recreation value for its geology, scenic view sheds, remoteness and solitude. General recreation activities include: recreational OHV use, driving for pleasure, horseback riding, hiking, backpacking, camping, hunting, rock collecting, photography, bird watching, and nature study.

4. Wilderness

No wilderness or Wild and Scenic Rivers resources exist in this allotment.

G. Issues

1. Issues Relating to Rangeland Health

a. The lack of maintenance in the old chaining areas has allowed the cliffrose to grow too high for deer and livestock use.
b. Apparent downward trend in the Rim Pasture, Key Area #1 and Boys Pasture Key Area #11.
c. Pinyon and juniper tree densities on the Hurricane Rim.
d. The loss of soil and lack of a grass/forb understory due to a dense, monoculture stand of sagebrush in the Langs Run drainage.

2. Issues Not Relating to Rangeland Health and not discussed further in this document.

None

IV. MANAGEMENT EVALUATION

A. Purpose of Evaluation

The purpose of this assessment is to determine if the existing permitted livestock use, Allotment Management Plan, and other activity plans, which identify terms and conditions for management on public lands within the Mt Trumbull Allotment are meeting/making progress toward meeting or are not meeting the Arizona Standards for Rangeland Health. If the current livestock grazing practices are determined to be causing the non-attainment of Standards, then they will be modified to comply with the Guidelines for Grazing Administration. This assessment will also evaluate and update existing Activity Plan objectives to ensure multiple use objectives are tied to the indicators for rangeland health.

B. Summary of Studies Data

1. Actual Livestock Use

Actual use was determined from licensed use. Total active preference for the allotment is 1,558 AUMs.

Grazing year	AUMs Used	Percent of Authorized AUMs Used
1991	1020 AUMs	65
1992	1337 AUMs	86
1993	1335 AUMs	86
1994	1391 AUMs	89
1995	1406 AUMs	90
1996	1474 AUMs	95
1997	1366 AUMs	88
1998	1439 AUMs	92
1999	1454 AUMs	93
2000	1352 AUMs	87

Voluntary non-use: 119-323 AUMs with average of 228 AUMs since 1991, which reflects seasonally dry seasons or drought years. Actual use never exceeded authorization.

2. Precipitation

The Mt. Trumbull Allotment falls within three precipitation (ppt.) zones. Precipitation on the allotment is most represented by the Carroll Catchment, Bundyville, and Cinder Knoll rain gauges. Higher elevations above the Hurricane Cliffs are in the 13-17" ppt. zone. The Carroll Catchment rain gauge, which represents the higher elevation summer pastures is located in T36N, R9W, Sec. 19, approximately 1 ½ miles north of

the allotment boundary. Average precipitation is ~14.58" annually. Approximately 13 percent (1.87") comes in the fall, 28 percent (4.06") in the winter, 22 percent (3.23") in the spring and 37 percent (5.42") in the summer.

The area below the cliffs around the town of Bundyville is in the 10-13" ppt. zone. The Bundyville gauge is located in T35N, R9W, Sec. 19 within the allotment boundaries. Average annual precipitation for this area is ~10.88". Approximately 13 percent (1.42") comes in the fall, 24 percent (2.63") in the winter, 24 percent (2.56") in the spring, and 39 percent (4.27 percent) in the summer.

The Frog and Cane portion of the allotment is the lowest in elevation and falls within the 7-11" ppt. zone. The Cinder Knoll gauge is located in T32N, R9W, Sec.15 on the Frog and Cane winter pasture. Average precipitation is ~8.46" annually. Seasonal amounts are distributed by 18 percent (1.49") coming in the fall, 31 percent (2.66") in the winter, 21 percent (1.79") in the spring, and 30 percent (2.52") in the summer.

3. Utilization

Utilization is the portion or amount of a key plant species' current year's growth that is consumed or destroyed by animals.

Utilization data from 1990-1998 has been compiled for this evaluation. The Key Species Grazed Class method was used to collect the data. Utilization is read at or around the designated key area for each pasture.

Utilization levels during the analysis period have been below the 50 percent allowable level. During the evaluation period, average utilization levels across all pastures for cool season grasses were 38 percent, warm season grasses 36 percent and browse species 34 percent. The total utilization for all key species was 37 percent. Heaviest utilization occurred in years 1990 and 1996. In 1990, pasture averages on key species were 38 percent on cool season grasses, 40 percent on warm season grasses and 48 percent on browse. The 1996 utilization levels were slightly higher at 43 percent on cool seasons, 40 percent on warm seasons, and 43 percent on browse species.

4. Trend

Trend monitoring was conducted at eight key areas over the allotment. Each pasture, except for the private and state section pastures, has a key area location in which trend data is collected. Trend data is collected using the Pace-Frequency method. This method of monitoring measures the frequency of forage and non-forage plant species. In addition, it measures the percent cover of bare ground, litter, rock and live vegetation.

Of the eight key areas monitored, four are in an upward trend, two are static and two show an apparent down trend (Key Areas #1 and #11). In analyzing the data for these two areas, a couple of factors in the downward trend for these sites became evident. Both key areas were read in November 1998, one week after being grazed when snow covered the ground. Trying to read trend on short stubble with a snow blanket could, and most likely did, result in erroneous data. There was an obvious decrease in some of the more prevalent warm season grass species – in some instances a 24 percent decrease. This is very uncommon and may be attributed to reading the plot too late in the year when all evidence of many plant species was obscured by snow. The other obvious factor was the increase in the cool season grass needle and thread (*Stipa comata*), and that it is not included the key species frequency percentage. Needle and thread is very palatable to livestock and should be listed as a key species and included in the key species frequency percentage for that key area. See trend summaries for each pasture.

Key Area #1, Rim Pasture - Limestone Slopes 13-17" pz, Elevation = 6,160
Apparent Trend = Static, 22 percent Live Vegetative Cover

Key Area #3, North Stockade Pasture - Limestone Slopes 13-17" pz, Elevation = 6,260
Apparent Trend = Static, 10 percent Live Vegetative Cover

Key Area #5, Whitmore Point Pasture - Loamy Upland 9-13" pz, Elevation = 5,320
Apparent Trend = Up, 17 percent Live Vegetation Cover

Key Area #7, Side of Mountain Pasture - Loamy Upland (Calcarious) 9-13" pz, Elevation = 5,540
Apparent Trend = Up, 30 percent Live Vegetation Cover

Key Area #8, Frog and Cane - Range site unknown, Elevation = 3,600
Apparent Trend = Up, 2 percent Live Vegetative Cover

Key Area #9, South Stockade - Clay Loam Upland (Gravelly) 13-17" pz, Elevation = 6,100
Apparent Trend = Static, 6 percent Live Vegetative Cover

Key Area #10, "160" Pasture - Loamy Upland (Calcarious) 9-13" pz, Elevation = 5,480
Apparent Trend = Up, 16 percent Live Vegetation Cover

Key Area #11, Boys Pasture - Loamy Upland 13-17"pz, Elevation = 6,080
Apparent Trend = Static, 24 percent Live Vegetation Cover

5. Ecological Site Inventory

Ecological condition is the present state of the vegetation on the ecological site in relation to the potential natural community for the site. Ecological status is also defined in terms of different seral stages. Seral stages are developmental stages of ecological succession. The ecological status classes correspond to a similarity percentage of the potential natural community (PNC).

Early Seral (0-25 percent)
Mid Seral (26-50 percent)
Late Seral (51-75 percent)
Potential Natural Community (>76 percent)

Key Area #1 - Limestone Hills 13-17" pz, Late Seral (58 percent of PNC)
Key Area #3 - Limestone Hills 13-17" pz, Late Seral (62 percent)
Key Area #5 - Loamy Upland/Shallow Loamy 10-14" pz Late Seral (69 percent)
Key Area #7 - Loamy Upland (Calcarious) 10-14" pz, Late Seral (73 percent)
Key Area #9 - Clay Loam Upland (Gravelly) 13-17" pz Late Seral (58 percent)
Key Area #10 - Shallow Loamy 10-14" pz, PNC (88 percent)
Key Area #11 - Loamy Upland 10-14"pz, PNC (81 percent)

6. Wildlife Habitat

Special Status Species:

a. BLM Sensitive and State Species of Concern:

There are no monitoring programs in place to document changes in the abundance of ferruginous hawks, black-crowned night herons or snowy egrets. Bats are monitored annually at livestock waters in the Mt. Trumbull area. A 1999 study of bat roosting habitat in the Mt. Trumbull area concluded that most local bat species rely on ponderosa pine snags and rocky outcrops for roost sites. No indications of declining populations were detected for any of these species.

b. Other Wildlife Species:

Mule deer and all big game species populations are monitored annually by the Arizona Game and Fish Department. Population survey data, counts, and estimates of total population are available from the Department (see appendixes: Section B for specific information). Mule deer numbers appear to be stable to gradually increasing over the past fifteen years. The highest count on record for Game Management Unit 13A was 108 deer in 1999, though this may be an artifact of changes in survey methodologies. Population estimates for the entire Game

Management Unit range from 450 to 600 animals. No official population estimates are available for the Mt. Trumbull Allotment. Total mule deer population on the allotment probably does not exceed 50 animals.

The Mt. Trumbull HMP describes areas above 6,000 feet in elevation as crucial summer range for mule deer, an area of some 21,930 acres (34.3 miles^2). Although portions of the allotment are above 6,000 feet, ponderosa pine has not been reported in the immediate area. Mule deer surveys suggest that deer densities are higher on neighboring allotments within ponderosa pine forests. The allotment typically is used as year-long habitat, or serves as a transitional habitat between summer and winter areas.

7. Riparian/Fisheries Habitat

There is no riparian or fisheries habitat on the allotment.

8. Wild Horse and Burro Habitat

There is no wild horse and burro habitat on the allotment.

9. Soils and Lithology

Lithology:

The north half of the allotment has outcrops of Kaibab limestone atop the Uinkaret Plateau. The Moenkopi formation outcrops in the lower part of the canyon, in the middle of the allotment, where the switchbacks of the road to Mt. Trumbull are carved. The south half of the allotment, on the Shivwits Plateau, has Moenkopi and Kaibab outcrops.

Soils: SSA 623 and SSA 625 are joined within this allotment.

The only soils monitoring data for this area is the Phase 1 Watershed Conservation and Development Inventory of 1971-1973 (See Field Office Files 7300). It was based upon a general soils map and thus ended up as broad interpretations and averages over large areas. Other more specific and detailed soils information is as follows:

SSA 623

08 Barx fine sandy loam, 1 to 5 percent slopes, (fan terraces), mixed; Sandy Loam Upland (calcareous), 7" to 11"
14 Boquillas family-Showlow complex, 25 to 50 percent slopes; Boquillas and Sholow=Basalt Slopes, 13" to 17"

20 Dermala fam-Guy fam-Rock Outcrop complex, 10 to 40 percent slopes; Dermala and Guy=Basalt Slopes, 13" to 17"
40 Ivanpatch fine sandy loam, 1 to 5 percent slopes, (fan terraces); Gypsum Fan, 9" to 13"
45 Mellenthin-Rock outcrop-Torriorthents complex, 10 to 70 percent slopes; Mellenthin=Shallow Loamy, 9" to 13"; Torriorthents=Breaks, 9" to 13"
46 Mellenthin-Strych Complex, 4 to 25 percent slopes, cool; Mellenthin=Shallow Loamy, 9" to 13"; Strych=Loamy Upland, 9" to 13"
48 Mellenthin-Tanbark complex, 5 to 50 percent slopes, cool; Mellenthin=Shallow Loamy, 9" to 13"; Tanbark=Gypsum Hills, 9" to 13"
49 Mellenthin-Tanbark complex, 5 to 50 percent slopes, dry; Mellenthin=Limey Upland, 9" to 13"; Tanbark= Gypsum Hills, 9" to 13"
51 Meriwhitica-Rock outcrop-Strych complex, 35 to 70 percent slopes; Meriwhitica= Breaks, 9" to 13"; Strych= Loamy Upland, 9" to 13"
61 Pocum-Spenlo complex, 1 to 10 percent slopes, (mesa); Pocum= Basalt Upland, 9" to 13"; Spenlo= Loamy Upland, 9" to 13"
72 Springerville-Delenbaw complex, 3 to 25 percent slopes; Springerville and Delenbaw= Clay Loam Upland (gravelly), 13" to 17"
75 Tanbark loam, 15 to 75 percent slopes; Gypsum Hills (calcareous), 9" to 13"

SSA 625
48 Poley cobbly silty clay loam, 1 to 5 percent slopes, complex, 1 to 15 percent slopes; Showlow= Clay Loam Upland,14" to 18"; Section= Loamy Upland, 14" to 18"
57 Showlow-Section; Clay Loam Upland, 10" to14"
59 Showlow very cobbly clay loam, 1 to 15 percent slopes; Clay Loam Upland, 14" to 18"
60 Showlow very cobbly silty clay loam, 15 to 35 percent slopes; Clay Loam Upland, 14" to 18"
61 Sponiker gravelly loam, 1 to 15 percent slopes; Loamy Upland, 18" to 30?"
63 Torriorthents-RO complex, 30 to 70 percent slopes; Breaks, 10" to 14"
64 Torriorthents-RO complex, dry, 30 to 70 percent slopes; Breaks, 7" to 11"
66 Whiskey silt loam, 1 to 4 percent slopes; Loamy Upland, 14" to 18"
72 Yumtheska very gravelly loam, 4 to 20 percent slopes; Shallow Loamy, 14" to 18"
73 Yumtheska very gravelly loam, 30 to 50 percent slopes; Limestone Hills, 14" to 18"

Soil condition evaluations were accomplished by field inspections. Most of the soils are within acceptable parameters. The Whiskey soils in the bottom drainages along Langs Run, on the northeast side of the allotment, show evidence of past disturbance. They are now dominated by sagebrush and have severe gully erosion which has since run its course. Some lateral cutting is evident. Management of this allotment is good, and runoff from it into Langs Run is minimal. A lateral cut is working from the main

gully to the road, due mainly to the channeling of runoff along the road to that point of release. Resolving the Langs Run issue involves land within several allotments and specifically, reducing the runoff and peak flows from the uplands at Mt. Trumbull and Mt. Logan, at the head of the watershed. The Upper Langs Run Watershed Plan and the Ponderosa Pine Restoration Activities address the uplands issues relevant to Langs Run.

C. Information and/or Data Pertaining to Issues (from III.G.1.)

1. Issues Relating to Rangeland Health

   a. *The lack of maintenance in the old chaining areas has allowed the cliffrose to grow too high for deer and livestock use.*

      The chainings were implemented in the mid to late 1960s. A combination of no maintenance activities, time, and natural succession has allowed cliffrose (cowania mexicana) to grow beyond usable levels for mule deer. For browse species such as cliffrose to be of any forage value for deer, the plants need to be at heights of 4 ½ feet and below. Presently, much of the cliffrose in the chainings is approaching heights above 7 feet.

   b. *Apparent downward trend in the Rim Pasture, Key Area #1, and Boys Pasture Key Area #11.*

      See Section IV.B.4.

   c. *Pinyon and juniper tree densities on the Hurricane Rim.*

      Most pinyon/juniper woodland stands on the Hurricane Rim are in a medium (30 - 60 percent) canopy cover class. The canopy class is determined by a rating index per canopy in the specific site description for each ecological site. As the canopy cover and tree densities increase, the understory plant species such as shrubs, forbs, and grasses decrease. It is the decrease in understory species that is of concern to the team.

   d. *The loss of soil and lack of a grass/forb understory due to a dense, monoculture stand of sagebrush in the Langs Run drainage.*

      See Section IV.B.9.

V. CONCLUSIONS

A. Pertaining to Objectives

1. **Land Use Plan Objectives: Shivwits Resource Area Implementation Plan For The Arizona Strip Resource Management Plan** (*objectives in italics are taken from section III.C.*)

GZ17 - Allowable use on key forage species is 50 percent on allotments with rotational grazing systems.

This objective has been met. Utilization on some individual key species has occasionally exceeded the 50 percent allowable level, however the overall use for all key species is 37 percent, well below the 50 percent allowable.

OH01 - Implement the designation of off-highway vehicle use for the Shivwits Resource Area as follows:
Use of existing roads and trails: 1,031,341 acres.
Use of designated roads and trails: 278,921 acres.
Closed: 68,404 acres (excludes wilderness, which is off limits to vehicular travel).
Open for unlimited off-road travel: 0 acres (for further evaluation)

This objective has been met.

RR02 - Evaluate requests for additional recreation permits through the National Environmental Policy Act process and for their consistency with management goals and objectives, and process on a case-by-case basis.

This objective has been met. Special Recreation Use Permits are routinely evaluated using the NEPA process and issued for this area and other areas across the district.

RR03 - Limit camping to 14 days at any one location unless otherwise authorized.

This objective has been met. This limit is enforced by District law enforcement officers across the district as needed.

RR04 - Recreation management direction includes:

1. Accommodate current uses, protect cultural values, and complement wilderness management plans where appropriate.

This objective has been met. Actual recreational use has been limited or minimal on this allotment and no wilderness resources are found on it. Conflicts have been minimal.

2. Provide visitor information.

This objective has been met. Information is disseminated by the Field Office Information Center and district staff.

3. Use various methods to acquire visitor use data on an annual basis. Maintain a system of traffic counters, monitor results monthly and field-verify results annually.

This objective has been met. A traffic counter system was established for the district some years ago, and it is maintained and the counters are read on a monthly basis.

4. Conduct compliance patrols (district ranger).

This objective has been met. The ranger does routine patrols to check areas and resources across the district.

5. Consider visual impacts on all proposed actions and protect scenic values by using mitigation measures where feasible, including alternative locations, camouflage, vegetation or topographic screening and other measures.

This objective has been met. When there are surface disturbing activities or projects, visual impacts are considered in the NEPA process, and mitigation measures prescribed to protect visual resources.

RR05- Improve and increase the number of road signs and develop a sign inventory system.

This objective has been met. The district's signs are routinely inventoried, maintained, and installed as necessary to keep the public informed.

RR06- Implement actions to restore and/or maintain natural conditions or appearance in all areas.

This objective is a constant that is considered but not always implemented on disturbed areas due to varying conditions and other resource objectives.

RR07- Maintain primary access roads, particularly Quail Hill Road, on a year round basis.

This objective has been met. Roads across the Arizona Strip are maintained by BLM Force Account Maintenance Personnel and local County Road Maintenance Personnel.

RR08- Manage the majority of the Resource Area for extensive recreation while maintaining its naturalness/remoteness. The exception to this is the Cedar Pockets campground.

This objective has been met. No developed recreation sites have been established on this allotment.

RR09- Commercial recreation permits would be issued to the extent that their cumulative impacts are consistent with the overall objectives of this plan and in the public interest.

This objective has been met. Limited numbers of SRPs have been issued in the area of this allotment and those were mostly for hunting guides.

RR12- In Visual Resource Management Class 3 and 4 areas, provide settings for recreational opportunities associated with motorized vehicle use such as exploring back country roads, vehicle camping and picnicking. Other management decisions in these areas are:

1. Allow for some changes in Recreational Opportunity Spectrum classes from semi-primitive non-motorized to roadbed-natural where necessary to meet recreational needs or other resource development. However, the goal is to maintain the desired recreational settings.

This objective is going to be evaluated in the upcoming planning effort for the two new national monuments and the lands left over on the Arizona Strip District the monument designations, and be compared to the ROS classifications done in the Arizona Strip RMP of 1990.

2. Provide recreational settings where restrictions on visitors are not noticeable, but blend with the natural setting.

This objective has been met.

3. Develop sign plans to provide road information for interpretation, public safety, and coordinate the plans with the Arizona Strip visitor map.

This objective has been met. A sign plan for the SRA has been completed.

4. Regulate visitor use only if monitoring indicates a need for limiting or restricting use.

This objective has been met. No limits or restrictions have been determined to be necessary to date.

RR13- In Visual Resource Management Class 1 & 2 areas, ensure continued public use and enjoyment of a variety of recreation activities that are compatible with the protection and enhancement of natural and cultural values.

Other management decisions are:

1. Enhance opportunities for high quality, back country recreation experiences, and provide for a range of recreational activities, including camping, vehicle exploring, sightseeing, hiking, limited off-road travel, horseback riding, rock hounding, and hunting.

This objective is going to be evaluated in the upcoming planning effort for the two new national monuments and the lands left over on the Arizona Strip District the monument designations, and be compared to the ROS classifications done in the Arizona Strip RMP of 1990.

2. Provide recreation settings where visitor restrictions are subtle.

This objective has been met.

3. Ensure maintenance of desired resource and social settings.

This objective has been met.

4. Regulate visitor use only when monitoring indicated a trend toward unacceptable change to desired recreation settings brought about by such use.

This objective has been met. Monitoring hasn't indicated a need for change in current management of the area.

5. Inventory and develop sign plans compatible with the objectives of the area, while maintaining the minimum number of signs necessary to provide public safety and information.

This objective has been met. A sign plan for the SRA has been completed.

VR01: Assign Visual Resource Management Classes for the Resource Area as follows:

153,815 acres as Class I.
310,318 acres as Class II (Includes the primary travel corridors).
188,695 acres as Class III.
879,652 as Class IV.

This objective has been met.

VR-05: Activities which would cause adverse long-term impacts to the important visual resources in the following areas would be prohibited or mitigated to the extent practicable: Hurricane Rim, Upper and Lower Grand Wash Cliffs, Diamond Butte, Andrus and Parashant Canyons.

This objective has been met.

b. Vermilion Resource Area Implementation Plan

A small portion of this allotment, on its southern end, lies on the Mt. Trumbull Resource Conservation Area (roughly 20 percent).

RR17: Institute visitor limits, regulation, or restriction in the resource area only when monitoring of resource and social conditions indicate a trend toward unacceptable change to desired recreation settings brought about by such use.

No need for visitor limits, regulations or restrictions to manage unacceptable changes in this allotment has been identified.

RR19: Designate the Mt. Trumbull area as a Resource Conservation Area and a Special Recreation Management Area with recreation as one of the primary management programs emphasized.

This objective has been met. A Mt. Trumbull Resource Conservation Area Plan was completed July 1995, with emphasis on recreation.

RR20: Provide recreation settings in the Mt. Trumbull Resource Conservation Area that range from Roadbed Natural to Primitive. Recreation opportunities associated with motorized vehicle use such as exploring back country roads, vehicle camping, sightseeing, and picnicking are balanced with opportunities associated with non-motorized use such as primitive camping, backpacking, hiking, horseback riding, mountain bike

riding, and hunting.

The range of settings is briefly described below from less to more primitive:

- *Physical setting – ranges from areas that are generally natural where resource uses and modifications are evident, to essentially unmodified environments.*

- *Social setting – ranges from areas where concentration of users is low to moderate and there may be moderate evidence of the sights and sounds of others, to areas where concentration of users is very low and evidence of others is minimal.*

- *Management setting – ranges from areas where control and restrictions offer a sense of security, some rustic facilities may be provided, and conventional motorized use is allowed, to areas that are almost free of controls and restrictions, no facilities are provided, and motorized use is not allowed.*

This objective has been met. The above recreational settings are available to recreationists in the Mt. Trumbull Resource Conservation Area.

RR21: Promote, through various means, conservation of natural and human resource values in the Mt. Trumbull Resource Conservation Area, for the purposes of education, scientific study, and recreational opportunities.

This objective has been met.

RR22: Write a coordinated, multi-resource activity plan for the Mt. Trumbull Resource Conservation Area, which will satisfy the requirements for a Recreation Area Management Plan.

This objective has been met. July 1995.

RR25: As visitor use increases in the Mt. Trumbull Resource Conservation Area, consider low-intensity development of facilities to better manage user impacts.

This objective has not been met. Recreation planning for the area has considered potential trailhead developments for the Mt. Trumbull Trail, but no improvements have been constructed or authorized at this time.

RR27: Manage the Mt Trumbull Resource Conservation Area as a Visual Resource Management Class II area; changes to the land form, vegetation, or structures should be subtle and not attract attention.

This objective has not been met. Restoration activities of tree removal and hauling, and slash reduction have created impacts that are quite visible, but they will disappear as the goals of restoration are met.

VR02: Management of primary access roads will be guided by Visual Resource Management Class II objectives. Changes to the land form, vegetation, or structures along the roads in the foreground or middle ground should be subtle and not attract attention. (These roads, with accompanying numbers, may include, but are not limited to the following): Clayhole/Nixon (5), Trumbull (109), Tuweap (115), Craig Ranch (263), Black Point (1014), Temple Trail (1001), Antelope Trail (1015), State Highway 89A, State Highway 389, Buffalo Ranch (1049), Two-Mile (1065), Ryan (FS 422), Winter Road (1025), Gunsight (1048), Hack Canyon, Cane Beds (237), Big Warren (1068), Navajo Trail (30), Robinson (1058), June Tank (1057), Findlay Tank (1010), Sandridge (1055), Pine Tree Pockets (1017).

This objective has been met. For County Road 5 through this allotment, no major changes have been made to impact this objective since it was initiated.

c. **Mt Trumbull Resource Conservation Area Plan**

Objective 4: Manage the spectrum of recreational settings in the Resource Conservation Area so that selected indicators of resource and social conditions are within or below the following ranges described below in Table 1.

This objective has not been met.

Table 1.

Resource Conditions	Natural Setting	Backcountry Setting	Primitive Setting
a. Visitor[1] impacts at five monitoring locations.[2]	Not to exceed 1 highly impacted and 4≤ moderately impacted campsites.	Not to exceed 3 moderately impacted and two ≤ minimally impacted campsites	Not to exceed 1 moderately impacted and 4 ≤ impacted campsites.
B. Impacts from other uses as evaluated at key observation points.[3]	Not to exceed an overall low visual contrast rating.		Not to exceed an overall low visual contrast rating. Impacts in wilderness must not be noticeable.
Social Conditions			
c. Annual increase in traffic counts tallied.	No more than 5 percent at Toroweap junction and Hurricane Rim sites.	No more than 2 percent at Mt. Logan Road and Death Valley Lake Road sites.	No more than 1 percent at Mt. Trumbull Trail and Mt. Logan Trail sites.
D. Average # of encounters[4] with other groups/day.	No more than 20 during peak visitor use periods.[5]	No more than 10 during peak visitor use periods.	No more than 6 during peak use periods.

Table 1 Footnotes:

1. Visitors are people who are in the area primarily for a recreational purpose, such as hunting or sightseeing.
2. Frequency of monitoring campsites for each setting if once every three years. Impact ratings will be based on monitoring worksheets developed for the RCA, taking into account such factors as number of campfire rings, litter, vegetative damage, camp size, etc.
3. BLM Visual Resource Management contrast rating worksheets, using specific key observation points, will be used as projects are proposed. Key observation points are generally selected by determining where the most people might be in site of the project. Contrast rating will assume that the initial construction phase of any project may not met visual objectives, but that given a reasonable specified time and rehabilitation/mitigation measures, the desired degree of contrast will be met.
4. An "encounter is" is any visual or auditory contact with another person or group of persons not part of the observer's group while at a designated monitoring site.
5. "Peak visitor use periods" are the weekend days associated with: Memorial Day, July 4th, July 24th, Labor Day, and the opening of the general season deer hunt.

Objective 5: Enhance visitor experience opportunities with information, interpretation, services, and facilities in order for the visitors to make appropriate choices about participation in recreation activities within the RCA using guidelines described below in Table 2.

This objective has not been met.

Table 2.

Management Guidelines	Natural Setting	Backcountry Setting	Primitive Setting
a. Overall management conditions.	Focus on maintaining recreation settings that frequently provide for use confidence and convenience.	Focus on maintaining recreations settings that occasionally provide for user confidence and convenience.	Focus on maintaining recreation settings that rarely provide for user confidence and convenience.
b. Visitor contact with management personnel.	Frequent	Frequent to occasional	Occasional to rare
c. Type, level, and location of visitor information.	Formal, moderate, on-site/off-site	Informal, occasional, off-site	Informal, rare, off-site
d. Signing	Frequent to occasional, generally permanent	Occasional	Rare, temporary
e. Typical road standard	Improved gravel or dirt, frequent maintenance	Dirt, occasionally maintained	Dirt or none, rarely maintained
f. Degree of user facilities development	Moderate to low	Very low to none	None

2. Specific Resource Objectives

a. Mt. Trumbull Allotment Management Plan being evaluated in this process (*objectives in italics, are taken from section III.C.3.*).

Key Area Objectives

- *Increase ground cover of perennial grasses in pastures #1 Rim, #2 North Stockade, #3 South Stockade and #7 Boys from the present average of 8.96 percent to 15 percent.*

  This objective has been met. The 1998-99 perennial grass ground cover average for these pastures was 16.7 percent.

- *Increase the ground cover of perennial grasses in pastures #4 Side of Mountain, #5 Whitmore and #8 One-Sixty from the present average of 7.35 to 13 percent.*

  This objective has been met. Perennial grass ground cover in 1998-99 for pastures #4, #5, and #8 was 21 percent.

- *Reduce the forage utilization around waters (within ½ mile) in the Frog and Cane pasture from the present 60-70 percent to 50-60 percent.*

  This objective is being met. Overall forage utilization in the Frog & Cane pasture from 1992-99 was 43 percent.

Long term objectives

- *Provide a minimum of 274 Animal Unit Months (AUMs) of mule deer forage on a sustained yield basis.*

  This objective is being met. Actual Use AUMs have never exceeded that authorized for the allotment. Since 1991, there has been an average of 228 AUMs in non-use.

- *To maintain essential ground cover for watershed protection, utilization will not exceed 60 percent on pastures that are grazed each year on a deferred rotation.*

  This objective is being met. Utilization levels have not exceeded 60 percent on any pasture during the evaluation period.

- *Proposed developments on the allotment will be coordinated with recreation interests to protect aesthetic values and enhance recreational experiences.*

  This objective is being met. All range improvement developments have addressed all resource values, not solely aesthetics and recreation resources.

Desired Plant Community (DPC) Objectives developed during this evaluation process

Key Areas #1 and #3**:**

Maintain ecological condition in Mid or Late Seral through 2025 by:
- *Maintaining the tree/shrub composition between 10-50 percent through 2025*
- *Maintaining the grass composition between 35-65 percent through 2025 for mule deer as stated in the Mt. Trumbull HMP*
- *Maintaining the forb composition between 5-10 percent through 2025 for mule deer as stated in the Mt. Trumbull HMP*

These objectives have been met. The ecological condition in key area #1 is 58 percent similar to PNC which places it at Late Seral. Tree and shrub compositions are at 28 percent, perennial grass composition is at 64 percent and forbs/annuals are at 8 percent. Ecological condition in key area #3 is 62 percent similar to PNC which is also Late Seral. Tree composition is at 4 percent, shrubs are at 47 percent, perennial grasses are at 36 percent, and forbs and annuals are at 13 percent.

Key Area #5:

Maintain ecological condition in Mid or Late Seral through 2025 by:
- *Maintaining the tree/shrub composition between 15-35 percent through 2025 for mule deer and other browse dependent species as per the Mt. Trumbull HMP*
- *Maintaining the grass composition between 60-75 percent through 2025*
- *Maintaining the forb composition between 0-10 percent through 2025*

These objectives have been met. Ecological condition is 69 percent similar to PNC, which is Late Seral condition. Present plant compositions are as follows: Trees 2 percent, shrubs 37 percent, grasses 60 percent, and forbs 1 percent.

Key Area #7:

Maintain ecological condition in Mid or Late Seral through 2025 by:

- *Maintaining the tree/shrub composition between 15-25 percent through 2025 for mule deer and other browse dependent species as per the Mt. Trumbull HMP*
- *Maintaining the grass composition between 60-80 percent through 2025*
- *Maintaining the forb composition between 5-10 percent through 2025*

These objectives have been met. The ecological condition is 73 percent similar to PNC which is Late Seral. Tree/shrub composition is at 17 percent, grasses 77 percent, and forbs/annuals are at 6 percent.

Key Area #9:

Maintain ecological condition in Mid or Late Seral through 2025 by:

- *Maintaining the tree/shrub composition between 12-65 percent through 2025 for mule deer and other browse dependent species as per the Mt. Trumbull HMP*
- *Maintaining the grass composition between 27-75 percent through 2025*
- *Maintaining the forb composition between 2-10 percent through 2025*

These objectives have been met. The ecological condition is 58 percent similar to PNC which is Late Seral. Tree composition is at 9 percent, shrubs are at 44 percent, grasses are at 46 percent, and forbs are at 1 percent.

Key Area #10:

Maintain ecological condition in PNC through 2025 by:

- *Maintaining the tree/shrub composition between 20-30 percent through 2025 for mule deer and other browse dependent species as per the Mt. Trumbull HMP*
- *Maintaining the grass composition between 60-75 percent through 2025*
- *Maintaining the forb composition between 1-5 percent through 2025*

These objectives have been met. The ecological condition is 88 percent similar to PNC which is PNC. Tree/shrub composition is at 22 percent, grasses are at 76 percent and forbs are at 2 percent.

Key Area #11:

Maintain ecological condition in PNC through 2025 by:

- *Maintaining the tree/shrub composition between 10-35 percent through 2025 for mule deer and other browse dependent species as per the Mt. Trumbull HMP*
- *Maintaining the grass composition between 55-75 percent through 2025*
- *Maintaining the forb composition between 2-10 percent through 2025*

These objectives have been met. The ecological condition is 81 percent similar to PNC which is PNC. Tree/shrub composition is 44 percent, grasses are at 55 percent, and forbs are at 1 percent.

B. Pertaining to Issues

1. Issues Relating to Rangeland Health

a. *The lack of maintenance in the old chaining areas has allowed the cliffrose to grow too high for deer use.*

Presently, many of the cliffrose plants are in excess of seven feet tall, which is well above browsing limits for deer. Without habitat modification, either natural fire or mechanical, the current situation will not improve and may worsen.

b. *Apparent downward trend in the Rim pasture, key area #1 and Boys pasture key area #11.*

Trend studies in key areas #1 and #11 were re-read in November and December 1999. After data was analyzed, both key areas came out in static trend. The 1998 data suggested downward trend was due to a decrease in frequency percentage of key species. The 1999 data reflected the static frequency percentages of key species from previous years. The RRT team's suspicions as to why the key areas were in an apparent downward trend were confirmed. Key species were missed in the 1998 reading because the grazed stubble of key species were under a snow blanket.

c. *Pinyon and juniper tree densities on the Hurricane Rim.*

After some discussion, the teams came to consensus about the density of pinyon-juniper trees on the rim, decided it was acceptable, and abandoned this as an issue. However, the more open, scattered distribution of trees away from the rim in the treatment areas seems to be preferable. The teams reemphasized the importance of

maintaining existing vegetation treatments by addressing invading trees to maintain a diverse plant community that benefits all resources.

d. *The loss of soil and lack of a grass/forb understory due to a dense, monoculture stand of sagebrush in the Langs Run drainage.*

Much of the erosion taking place in the Langs Run drainage is outside the Mt. Trumbull Allotment. Brush management projects in the uplands of the Mt. Trumbull Allotment are having a positive influence on the Langs Run watershed problem by creating an understory more dominated by grasses and forbs.

Federal, State Listed or BLM Sensitive Species:

There are no objectives in the Mt. Trumbull Habitat Management Plan that specifically address special status species. However, the HMP indicates that implementation of the plan and proper management of livestock grazing operations should benefit peregrine falcon, black-crowned night herons, and snowy egrets.

Other Wildlife Species

HMP II.B.1. Increase the carrying capacity of the habitat from the present 2,000 deer year-long to 4,000 deer year-long by improving the habitat.

Success in meeting this objective is difficult to determine, as habitat features that benefit mule deer are not uniformly distributed within the Habitat Management Area (HMA). As a result, carrying capacity and deer densities are not uniformly distributed. For the HMA to provide habitat for 4,000 mule deer, the 33,000-acre Mt. Trumbull Allotment would need to support over 300 deer. Actual mule deer numbers are well below the carrying capacity values presented in the HMP. None of the existing vegetation monitoring studies provide any indication about the carrying capacity of the habitat for mule deer. However, trend and utilization studies indicate that availability of key forage species is not limiting mule deer herd expansion.

HMP II.B.3a. Above 6,000 feet, increase forb densities from a trace to five percent and grasses from five percent to 15 percent.

This objective is being met. Key areas #1 and #3 are above 6,000 in elevation. Forb densities are above 10 percent at both key areas. Grass densities exceed 60 percent on both key areas.

HMP II.B.3b. Below 6,000 feet, increase the density of cliffrose, bitterbrush and ceanothus from ten percent to 20 percent.

This objective is not being met for the species identified, but is being met for desirable shrub species as a whole. Shrub densities in key areas #5, #7, #9, #10, and #11 exceed 15 percent. However, percent composition of individual species varies considerably. Much of the cliffrose within the allotment is too tall to be effectively browsed by mule deer. While cliffrose is a key component of most of these shrub communities, ceanothus is infrequently encountered and bitterbrush does not occur on the allotment. These HMP objectives do not adequately reflect the shrub species present on this allotment.

HMP II.B.6. Increase the mule deer production and fawn survival rate from the present five year average of 30 fawns per hundred does to a five year average of 75 fawns per hundred does by 1996.

This objective is not being met. Average mule deer production/fawn survival rates have been between 25 - 40 fawns per 100 does since 1990. Neither the HMP or AMP provide any planned actions that would effectively increase fawn production or survival. While fawn production rates may exceed 60 fawns per 100 does in exceptional years, the Arizona Game and Fish Department shows no records of fawn survival ever reaching 75 fawns per 100 does in any unit in the State. This objective is unattainable.

The following is added for conclusions relative to implementation of the Standards for Rangeland Health and Guidelines for Grazing Administration

Based on the analyses and supporting documentation referenced herein, resource conditions on the allotment:

X Meet all applicable standards for rangeland health

❑ Are making significant progress toward meeting the applicable standards for rangeland health

Do not meet the standards for rangeland health for:

❑ No. 1: Upland sites
❑ No. 2: Riparian-Wetland sites
❑ No. 3: Desired Resource Conditions

❑ Have not been sufficiently documented to make a specific determination, but there is no reason to believe that current management would preclude meeting the standards for rangeland health.

VI. RECOMMENDATIONS

A. Recommendations relating to Grazing Administration, to meet or make significant progress towards meeting standards.

1. It was recommended that at some point the chaining areas be maintained with the use of fire or mechanical means. This type of maintenance treatment would reduce the height of cliffrose and make it more readily available for deer forage. It is also recommended that management plans be written with the ability to maintain existing treatments without additional NEPA requirements.

2. Accept trend data re-read in 1999 for key areas #1 and #11 and added to include the cool season perennial grass needle and thread (*Stipa comata*) as a key species in key areas #1 and #11.

B. Recommendations are not required in order to meet, or make significant progress towards meeting, standards.

1. The team concluded the Langs Run issue was beyond the scope of this evaluation process, and recommended the Langs Run Watershed Plan be revisited while entertaining appropriate and adequate treatments to solve problems.

AUTHORIZED OFFICER CONCURRENCE:

__X__ I concur with the conclusions and recommendations as written.

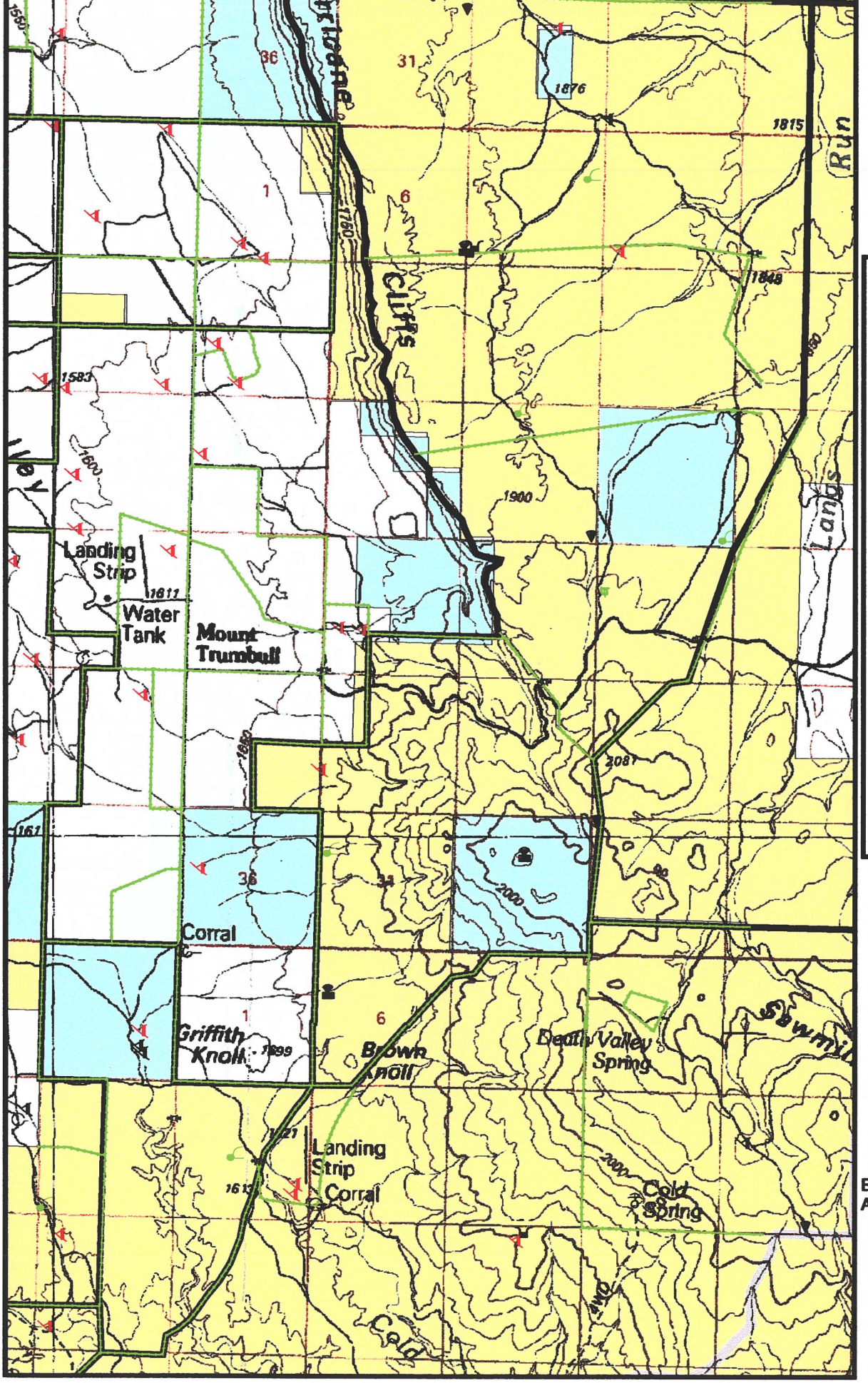
_____ I do not concur.

_____ I concur, with the following modifications:

Ronald Taylor

Field Manager
Arizona Strip Field Office

10/12/01
Date



Mt. Trumbull Allotment

Legend

- Wildlife Catchment
- Livestock Catchment
- Well
- Storage Tank
- Cattleguard
- Corral
- Unfenced Reservoir
- Trough
- Fenced Reservoir
- Developed Spring
- Key Area
- Fence
- Allotment Boundary
- Wilderness Area
- Private Ownership
- State Ownership
- BLM Ownership

0 0.5 Miles

1:63556

Bureau of Land Management
Arizona Strip Field Office

Map produced by Linda Pric
September 199

Appendix A

ARIZONA STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR GRAZING ADMINISTRATION

INTRODUCTION

The Department of the Interior's final rule for Grazing Administration, issued on February 22, 1995, and effective August 21, 1995, requires that Bureau of Land Management (BLM) State Directors develop State or regional standards and guidelines for grazing administration in consultation with BLM Resource Advisory Councils (RAC), other agencies and the public. The final rule provides that fallback standards and guidelines be implemented, if State standards and guidelines are not developed by February 12, 1997. Arizona Standards and Guidelines and the final rule apply to grazing administration on public lands as indicated by the following quotation from the Federal Register, Volume 60, Number 35, page 9955.

> "The fundamentals of rangeland health, guiding principles for standards and the fallback standards address ecological components that are affected by all uses of public rangelands, not just livestock grazing. However, the scope of this final rule, and therefore the fundamentals of rangeland health of §4180.1, and the standards and guidelines to be made effective under §4180.2, are limited to grazing administration."

Although the process of developing standards and guidelines applies to grazing administration, present rangeland health is the result of the interaction of many factors in addition to grazing by livestock. Other contributing factors may include, but are not limited to, past land uses, land use restrictions, recreation, wildlife, rights-of-way, wild horses and burros, mining, fire, weather, and insects and disease.

With the commitment of BLM to ecosystem and interdisciplinary resource management, the standards for rangeland health as developed in this current process will be incorporated into management goals and objectives. The standards and guidelines for rangeland health for grazing administration, however, are not the only considerations in resolving resource issues.

The following quotations from the Federal Register, Vol. 60, No. 35, page 9956, February 22, 1995, describe the purpose of standards and guidelines and their implementation:

> "The guiding principles for standards and guidelines require that State or regional standards and guidelines address the basic components of healthy rangelands. The Department believes that by implementing grazing-related actions that are consistent with the fundamentals of §4180.1 and the guiding principles of §4180.2, the long-term health of public rangelands can be ensured.
>
> "Standards and guidelines will be implemented through terms and conditions of grazing permits, leases, and other authorizations, grazing-related portions of activity plans (including Allotment Management Plans), and through range improvement-related activities.

"The Department anticipates that in most cases the standards and guidelines themselves will not be terms and conditions of various authorizations but that the terms and conditions will reflect the standards and guidelines.

"The Department intends that assessments and corrective actions will be undertaken in priority order as determined by BLM.

"The Department will use a variety of data including monitoring records, assessments, and knowledge of the locale to assist in making the "significant progress" determination. It is anticipated that in many cases it will take numerous grazing seasons to determine direction and magnitude of trend. However, actions will be taken to establish significant progress toward conformance as soon as sufficient data are available to make informed changes in grazing practices."

FUNDAMENTALS AND DEFINITION OF RANGELAND HEALTH

The Grazing Administration Regulations, at §4180.1 (43 Code of Federal Regulation [CFR] 4180.1), Federal Register Vol. 60, No. 35, pg. 9970, direct that the authorized officer ensures that the following conditions of rangeland health exist:

(a) Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and timing and duration of flow.

(b) Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

(c) Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established BLM management objectives such as meeting wildlife needs.

(d) Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species.

These fundamentals focus on sustaining productivity of a rangeland rather than its uses. Emphasizing the physical and biological functioning of ecosystems to determine rangeland health is consistent with the definition of rangeland health as proposed by the Committee on Rangeland Classification, Board of Agriculture, National Research Council (Rangeland Health, 1994, pg. 4 and 5). This Committee defined Rangeland Health ". . .as the degree to which the integrity of the soil and the ecological processes of rangeland ecosystems are sustained." This committee emphasized ". . .the degree of integrity of the soil and ecological processes that are most important in sustaining the capacity of rangelands to satisfy values and produce commodities." The Committee also recommended that "The determination of whether a rangeland is healthy, at risk, or unhealthy should be based on the evaluation of three criteria: degree of soil stability and watershed function, integrity of nutrient cycles and energy flow, and presence of

functioning mechanisms" (Rangeland Health, 1994, pg. 97-98).

Standards describe conditions necessary to encourage proper functioning of ecological processes on specific ecological sites. An ecological site is the logical and practical ecosystem unit upon which to base an interpretation of rangeland health. Ecological site is defined as:

". . . a kind of land with specific physical characteristics which differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its response to management" (Journal of Range Management, 48:279, 1995). Ecological sites result from the interaction of climate, soils, and landform (slope, topographic position). The importance of this concept is that the "health" of different kinds of rangeland must be judged by standards specific to the potential of the ecological site. Acceptable erosion rates, water quality, productivity of plants and animals, and other features are different on each ecological site.

Since there is wide variation of ecological sites in Arizona, standards and guidelines covering these sites must be general. To make standards and guidelines too specific would reduce the ability of BLM and interested publics to select specific objectives, monitoring strategies, and grazing permit terms and conditions appropriate to specific land forms.

Ecological sites have the potential to support several different plant communities. Existing communities are the result of the combination of historical and recent uses and natural events. Management actions may be used to modify plant communities on a site. The desired plant community for a site is defined as follows: "Of the several plant communities that may occupy a site, the one that has been identified through a management plan to best meet the plan's objectives for the site. It must protect the site as a minimum." (Journal of Range Management, 48:279, 1995.)

Fundamentals (a) and (b) define physical and biological components of rangeland health and are consistent with the definition of rangeland health as defined by the Committee on Rangeland Classification, Board on Agriculture, National Research Council, as discussed in the paragraph above. These fundamentals provide the basis for sustainable rangelands.

Fundamentals (c) and (d) emphasize compliance with existing laws and regulation and, therefore, define social and political components of rangeland health. Compliance with Fundamentals (c) and (d) is accomplished by managing to attain a specific plant community and associated wildlife species present on ecological sites. These desired plant communities are determined in the BLM planning process, or, where the desired plant community is not identified, a community may be selected that will meet the conditions of Fundamentals (a) and (b) and also adhere to laws and regulations. Arizona Standard 3 is written to comply with Fundamentals (c) and (d) and provide a logical combination of Standards and Guidelines for planning and management purposes.

STANDARD AND GUIDELINE DEFINITIONS

Standards are goals for the desired condition of the biological and physical components and characteristics of rangelands. Standards:

(1) are measurable and attainable; and

(2) comply with various Federal and State statutes, policies, and directives applicable to BLM Rangelands.

Guidelines are management approaches, methods, and practices that are intended to achieve a standard. Guidelines:

(1) typically identify and prescribe methods of influencing or controlling specific public land uses;

(2) are developed and applied consistent with the desired condition and within site capability; and

(3) may be adjusted over time.

IMPLEMENTING STANDARDS AND GUIDELINES

The authorized officer will review existing permitted livestock use, allotment management plans, or other activity plans which identify terms and conditions for management on public land. Existing management practices, and levels of use on grazing allotments will be reviewed and evaluated on a priority basis to determine if they meet, or are making significant progress toward meeting, the standards and are in conformance with the guidelines. The review will be interdisciplinary and conducted under existing rules which provide for cooperation, coordination, and consultation with affected individuals, federal, state, and local agencies, tribal governments, private landowners, and interested publics.

This review will use a variety of data, including monitoring records, assessments, and knowledge of the locale to assist in making the significant progress determination. Significance will be determined on a case by case basis, considering site potential, site condition, weather and financial commitment. It is anticipated there will be cases where numerous years will be needed to determine direction and magnitude of trend.

Upon completion of review, the authorized officer shall take appropriate action as soon as practicable but no later than the start of the next grazing year upon determining that the existing grazing management practices or level of use on public land are significant factors contributing to failure to achieve the standards and conform with the guidelines that are made effective under 43 CFR 4180.2. Appropriate action means implementing actions that will result in significant progress toward fulfillment of the standards and significant progress toward conformance with guidelines.

Livestock grazing will continue where significant progress toward meeting standards is being made. Additional activities and practices would not be needed on such allotments. Where new activities or practices are required to assure significant progress toward meeting standards, livestock grazing use can continue contingent upon determinations from monitoring data that the implemented actions are effective in making significant progress toward meeting the standards. In some cases, additional action may be needed as determined by monitoring data over time.

New plans will incorporate an interdisciplinary team approach (Arizona BLM Interdisciplinary Resource Management Handbook, April 1995). The terms and conditions for permitted grazing in these areas will be developed to comply with the goals and objectives of these plans which will be consistent with the standards and guidelines.

ARIZONA STANDARDS AND GUIDELINES

Arizona Standards and Guidelines (S&G) for grazing administration have been developed through a collaborative process involving the Bureau of Land Management State S&G Team and the Arizona Resource Advisory Council. Together, through meetings, conference calls, correspondence, and Open Houses with the public, the BLM State Team and RAC prepared Standards and Guidelines to address the minimum requirements outlined in the grazing regulations. The Standards and Guidelines, criteria for meeting Standards, and indicators are an integrated document that conforms to the fundamentals of rangeland health and the requirements of the regulations when taken as a whole.

Upland sites, riparian-wetland areas, and desired resource conditions are each addressed by a standard and associated guidelines.

Standard 1: Upland Sites

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform (ecological site).

Criteria for meeting Standard 1:

Soil conditions support proper functioning of hydrologic, energy, and nutrient cycles. Many factors interact to maintain stable soils and healthy soil conditions, including appropriate amounts of vegetative cover, litter, and soil porosity and organic matter. Under proper functioning conditions, rates of soil loss and infiltration are consistent with the potential of the site.

Ground cover in the form of plants, litter or rock is present in pattern, kind, and amount sufficient to prevent accelerated erosion for the ecological site; or ground cover is increasing as determined by monitoring over an established period of time.

Signs of accelerated erosion are minimal or diminishing for the ecological site as determined by monitoring over an established period of time.

As indicated by such factors as:

Ground Cover
- litter
- live vegetation, amount and type (e.g., grass, shrubs, trees, etc.)
- rock

Signs of erosion
- flow pattern
- gullies
- rills
- plant pedestaling

Exceptions and exemptions (where applicable):

none

Guidelines:

1-1. Management activities will maintain or promote ground cover that will provide for infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological sites within management units. The ground cover should maintain soil organisms and plants and animals to support the hydrologic and nutrient cycles, and energy flow. Ground cover and signs of erosion are surrogate measures for hydrologic and nutrient cycles and energy flow.

1-2. When grazing practices alone are not likely to restore areas of low infiltration or permeability, land management treatments may be designed and implemented to attain improvement.

Standard 2: Riparian-Wetland Sites

Riparian-wetland areas are in properly functioning condition.

Criteria for meeting Standard 2:

Stream channel morphology and functions are appropriate for proper functioning condition for existing climate, landform, and channel reach characteristics. Riparian-wetland areas are functioning properly when adequate vegetation, land form, or large woody debris is present to dissipate stream energy associated with high water flows.

Riparian-wetland functioning condition assessments are based on examination of hydrologic, vegetative, soil and erosion-deposition factors. BLM has developed a standard checklist to address these factors and make functional assessments. Riparian-wetland areas are functioning properly as indicated by the results of the application of the appropriate checklist.

The checklist for riparian areas is in Technical Reference 1737-9 "Process for Assessing Proper Functioning Condition." The checklist for wetlands is in Technical Reference 1737-11 "Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas." These checklists are reprinted on the pages following the Guidelines for Standard 3.

As indicated by such factors as:

Gradient
Width/depth ratio
Channel roughness and sinuosity of stream channel
Bank stabilization
Reduced erosion
Captured sediment
Ground-water recharge
Dissipation of energy by vegetation

Exceptions and exemptions (where applicable):

Dirt tanks, wells, and other water facilities constructed or placed at a location for the purpose of providing water for livestock and/or wildlife and which have not been determined through local planning efforts to provide for riparian or wetland habitat are exempt.

Water impoundments permitted for construction, mining, or other similar activities are exempt.

Guidelines:

2-1. Management practices maintain or promote sufficient vegetation to maintain, improve or restore riparian-wetland functions of energy dissipation, sediment capture, groundwater recharge and stream bank stability, thus promoting stream channel morphology (e.g., gradient, width/depth ratio, channel roughness and sinuosity) and functions appropriate to climate and landform.
2-2. New facilities are located away from riparian-wetland areas if they conflict with achieving or maintaining riparian-wetland function. Existing facilities are used in a way that does not conflict with riparian-wetland functions or are relocated or modified when incompatible with riparian-wetland functions.

2-3. The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect ecological functions and processes.

Standard 3: Desired Resource Conditions

Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

Criteria for meeting Standard 3:

Upland and riparian-wetland plant communities meet desired plant community objectives. Plant community objectives are determined with consideration for all multiple uses. Objectives also address native species, and the requirements of the Taylor Grazing Act, Federal Land Policy and Management Act, Endangered Species Act, Clean Water Act, and appropriate laws, regulations, and policies.

Desired plant community objectives will be developed to assure that soil conditions and ecosystem function described in Standards 1 and 2 are met. They detail a site-specific plant community, which when obtained, will assure rangeland health, State water quality standards, and habitat for endangered, threatened, and sensitive species. Thus, desired plant community objectives will be used as an indicator of ecosystem function and rangeland health.

As indicated by such factors as:

Composition
Structure
Distribution

Exceptions and exemptions (where applicable):

Ecological sites or stream reaches on which a change in existing vegetation is physically, biologically, or economically impractical.

Guidelines:

3-1. The use and perpetuation of native species will be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands, non-intrusive, non-native plant species are appropriate for use where native species (a) are not available, (b) are not economically feasible, (c) cannot achieve ecological objectives as well as non-native species, and/or (d) cannot compete with already established non-native species.

3-2. Conservation of Federal threatened or endangered, proposed, candidate, and other special status species is promoted by the maintenance or restoration of their habitats.

3-3. Management practices maintain, restore, or enhance water quality in conformance with State or Federal standards.

3-4. Intensity, season and frequency of use, and distribution of grazing use should provide for growth and reproduction of those plant species needed to reach desired plant community objectives.

3-5. Grazing on designated ephemeral (annual and perennial) rangeland may be authorized if the following conditions are met:

ephemeral vegetation is present in draws, washes, and under shrubs and has grown to useable levels at the time grazing begins;

sufficient surface and subsurface soil moisture exists for continued plant growth;

serviceable waters are capable of providing for proper grazing distribution;

sufficient annual vegetation will remain on site to satisfy other resource concerns, (i.e., watershed, wildlife, wild horses and burros); and

monitoring is conducted during grazing to determine if objectives are being met.

3-6. Management practices will target those populations of noxious weeds which can be controlled or eliminated by approved methods.

3-7. Management practices to achieve desired plant communities will consider protection and conservation of known cultural resources, including historical sites, and prehistoric sites and plants of significance to Native American peoples.

Appendix B

Team Membership

Interdisciplinary Assessment Team

Linda Price . . . . . Project Coordinator
435-688-3241

Michael Herder . . . . . Wildlife Biologist
435-688-3239

Larry Gearhart . . . . . Wilderness/Recreation Specialist
435-688-3269

Whit Bunting . . . . . Vegetation/Grazing Administration
435-688-3243

Bob Smith . . . . . Soils and Hazmat
435-688-3245

Art Meen . . . . . Soils and Vegetation
520-643-7062 (Natural Resource Conservation Service)

Rangeland Resource Team

Commodity Interests
Bill Gubler, Grazing
Rancher, St. George, UT

Maggie Sacher, Commercial Recreation/Tourism
Owner: Lee's Ferry Lodge, Marble Canyon, AZ

Non-Commodity Interests
Scott Hansen, Environmental Conservation
Retired, St. George, UT

Spence Esplin, Historical
Retired, St. George, UT

Phil Squire, Dispersed Recreation/Wildlife
Retired, St. George, UT

Local Area Interests

Al Rivas, Public-at-large
Retired, St. George, UT

Kent McComb, Public-at-Large
Retired, St. George, UT

Appendix C:

Vegetation and Precipitation Data

Key Area #1

09/09/99

VERMILLION RESOURCE AREA
UTILIZATION STUDY SUMMARY

ALLOTMENT = MT TRUMBULL | PASTURE = RIM | KEY AREA NUMBER = 1

COOL SEASON GRASSES	UTILIZATION EXPRESSED AS A PERCENT USE OF EACH SPECIES FOR THE PARTICULAR YEAR READ																				
	1998	1997	1996	1995	1994	1993	1992	1991	1990	0	0	0	0	0	0	0	0	0	0	0	AVERAGE
ORHY	44	35	48	54	34	37	34	53	47												43
SIHY	34	43	49	34	26	15	33	46	53												37
STIPA				48	30	21	30	48	46												37
AGCR																					
AGSM																					
AGROPY	41	48	54	22	38	16	45	65	73												44
ELJU																					
KOCR																					
POSE																					
CSGG																					
AVERAGE	40	40	50	42	30	21	33	51	53												40
WARM SEASON GRASSES																					
HIJA																					
SPCR	39	47	48	54	42	33	29	54	37												43
SPAI																					
SPNE																					
BOGR																					
BOER																					
HIRI																					
MUPO																					
TRPU																					
WSGG																					
AVERAGE	39	47	48	54	42	33	29	54	37												43
BROWSE																					
CELA																					
ATCA																					
EPNE																					
ARBI3																					
COME																					
KRPA																					
KRGR																					
CEGR																					

HYMO										
GARRYA										
AMDU										
SSSS										
AVERAGE										
AVG ALL SPECIES	40	42	49	46	34	25	33	52	50	41

PACE FREQUENCY TREND ANALYSIS

09/09/99 | ALLOTMENT MT TRUMBULL | PASTURE RIM | KEY AREA 1 | PAGE NUMBER 1

YEARS PLOT WERE READ

COVER CATEGORIES	1990	1993	1998	2001	2004	2007	2010	2013	2016	2019	2022
Bare Ground	70	72	71								
Pers Litter	12		1								
Litter											
Rock	13	6	3								
Live Vegetation	5	23	25								
BROWSE											
CELA											
ATCA2											
EPNE											
ATCO											
ARBI3											
COME											
PUTR											
PUGL											
AMUT											
ARFI											
ARAR8											
ARFR4											
MESC2											
QUGA											
XRPA											
XRGR											
GRSP											
AMDU2											
AMAL2											
ACGR											
CEGR											
ENCELA											
PRFA											
PETH2											
MESP											
OTHERBROWS											
TOTALS											
DESIRABLE GRASSES Cool Season											
ORHY	4	7									
SIHY	36	27	5								
STIPA	10	3	15								
AGCR			1								
AGSM	22	2									
SEEDED											
ELYMUS											
XOCR											
POA		1	3								
OTHER COOL SEASON GRASSES											
TOTALS	72	41	23								
Warm Season											
HIJA	6	38									
HIRI											
SPCR	13	26	1								
SPNE											
BOGR	50	93	53								
BOER											
BOCU											
SPAI											
MUPU2											
MUTO2											
MUPO2											
SPORO											
SPCO											
OTHER WARM SEASON GRASSES											
TOTALS	69	158	53								
DESIRABLE TOTAL	141	198	76								

TREND INDEX

COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX

BASE YEAR = 1990

COVER CATEGORIES	1993	1998	2001	2004	2007	2010	2013	2016	2019	2022
Bare Ground	3	1								
Pers Litter		-91								
Litter										
Rock	-54	-74								
Live Vegetation	315	351								
BROWSE										
CELA										
ATCA2										
EPNE										
ATCO										
ARBI3										
COME										
PUTR										
PUGL										
AMUT										
ARFI										
ARAR8										
ARFR4										
MESC2										
QUGA										
XRPA										
XRGR										
GRSP										
AMDU2										
AMAL2										
ACGR										
CEGR										
ENCELA										
PRFA										
PETH2										
MESP										
OTHERBROWS										
TOTALS										
DESIRABLE GRASSES Cool Season										
ORHY	71									
SIHY	-25	-86								
STIPA	-67	52								
AGCR		110								
AGSM	-89									
SEEDED										
ELYMUS										
XOCR										
POA	103	540								
OTHER COOL SEASON GRASSES										
TOTALS	-44	-68								
Warm Season										
HIJA	527									
HIRI										
SPCR	103	-96								
SPNE										
BOGR	87	5								
BOER										
BOCU										
SPAI										
MUPU2										
MUTO2										
MUPO2										
SPORO										
SPCO										
OTHER WARM SEASON GRASSES										
TOTALS	129	-23								
DESIRABLE TOTAL	41	-46								

PACE FREQUENCY TREND ANALYSIS CONTINUED PAGE NUMBER 2

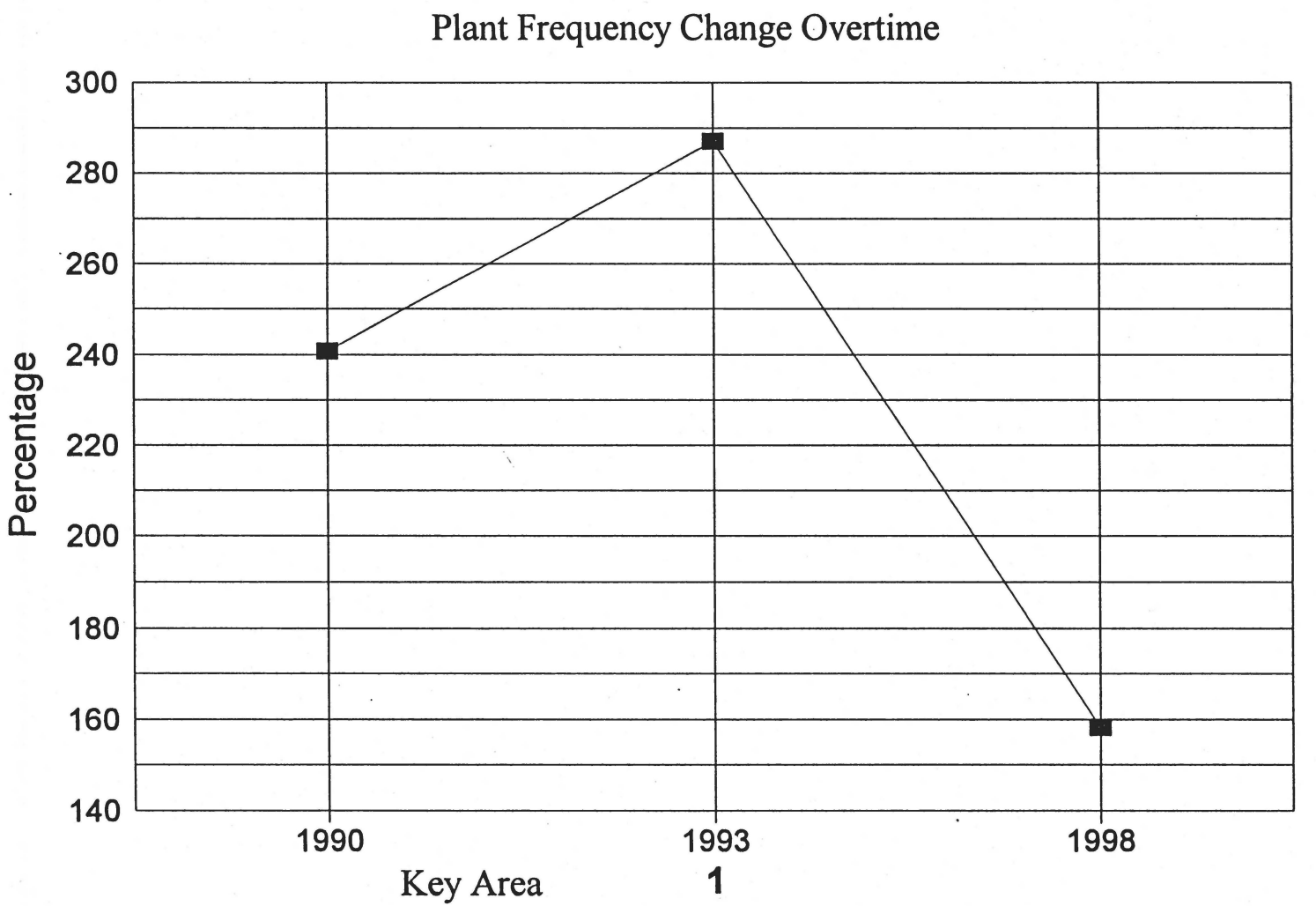
09/09/99 ALLOTMENT MT TRUMBULL PASTURE RIM KEY AREA 1

TREND INDEX
COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX
BASE YEAR = 1998

COVER CATEGORIES	YEARS PLOT WERE READ 1998	1993	1998	2001	2004	2007	2010	2013	2016	2019	2022	1993	1998	2001	2004	2007	2010	2013	2016	2019	2022
OTHER SHRUBS																					
GUSA2	46	19	9									-61	-82								
CHVIS	1																				
CHRYSO		1	3									100	300								
CORA																					
ARTR2		34	17									9929	3497								
OPUNT																					
LYAN																					
LYCIU																					
CHNA																					
ERIOG_SHRB																					
HAPP_ACAMP																					
POIN																					
TETRA																					
ARLU																					
SAVE																					
YUCCA																					
PEPU7																					
SENECIO																					
JUOS	2	3	5									78	200								
PEID	1	1										33									
PAPA																					
RHTR																					
QUTU																					
EPTO																					
EPVI																					
BERBERIS	2		1										-55								
DAFR																					
HYSA																					
BRAN2																					
YUBR																					
LATRT																					
PSCO2																					
PRGLT																					
THMO																					
ATHY																					
MOUT																					
GAFL2																					
OTHERSHRUB																					
TOTALS	54	58	35									6	-35								
OTHER GRASSES																					
ARIST																					
ARLO	38	17	31									-55	-19								
SCBR																					
TRPU																					
TRMU																					
PPGG																					
TOTALS	38	17	31									-55	-19								
FORBS																					
ASTRA	2																				
SAKA																					
SPHAE	2	5										100									
AAFF			6										1200								
AAGG		1										100									
ERIOG			7										1400								
PENST	1		2										99								
PLANTAGO																					
ERIGERON																					
MUSTARD																					
PPFF	2	7										200									
SENEC			1										100								
SPURGE																					
ASTER		1										100									
DAISY																					
AMSIN																					
PHACE																					
ERCH																					
TOTALS	8	14	16									74	101								
PLANT TOTALS	100	89	82									-11	-18								

MT TRUMBULL

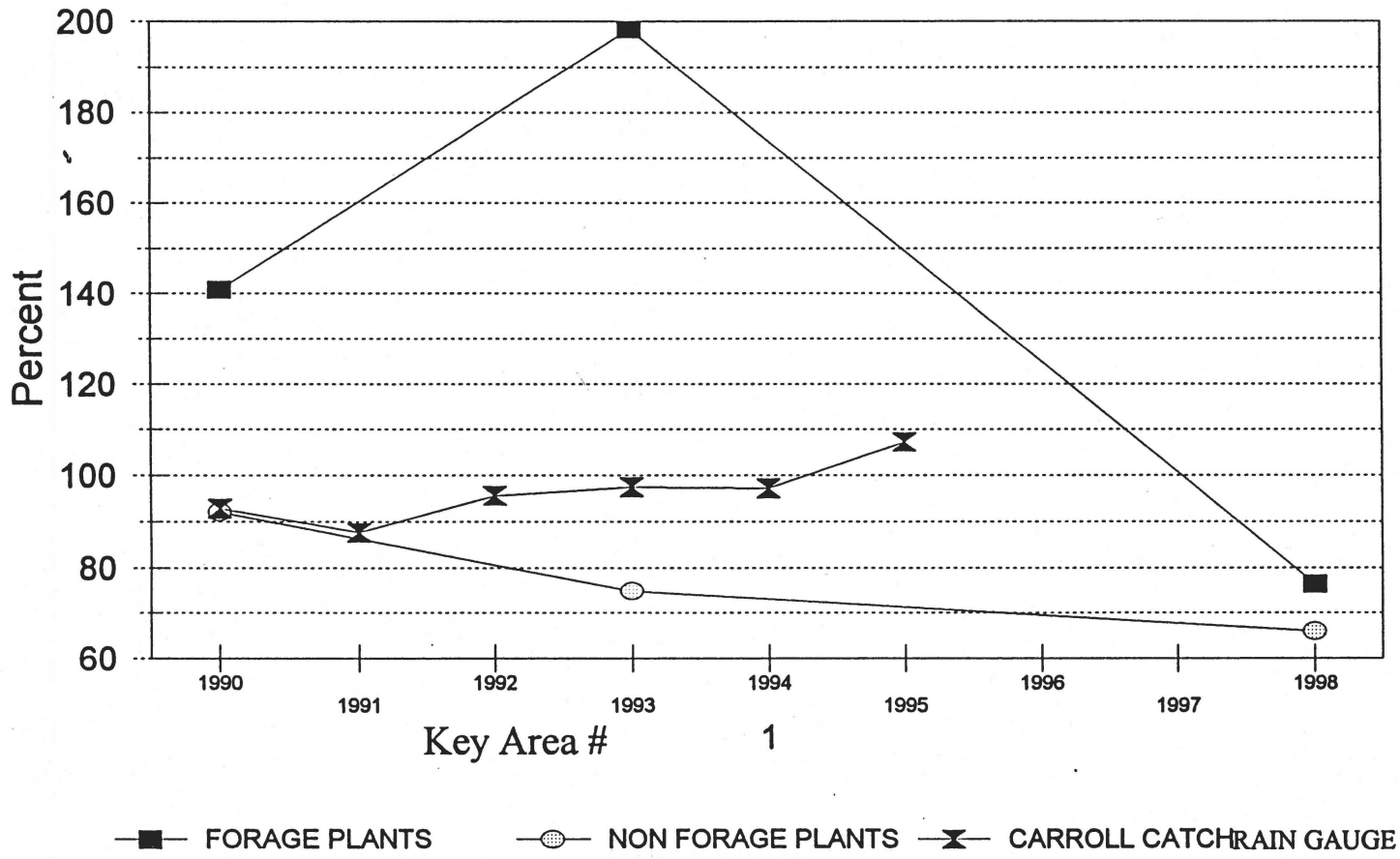
RIM



MT TRUMBULL

RIM

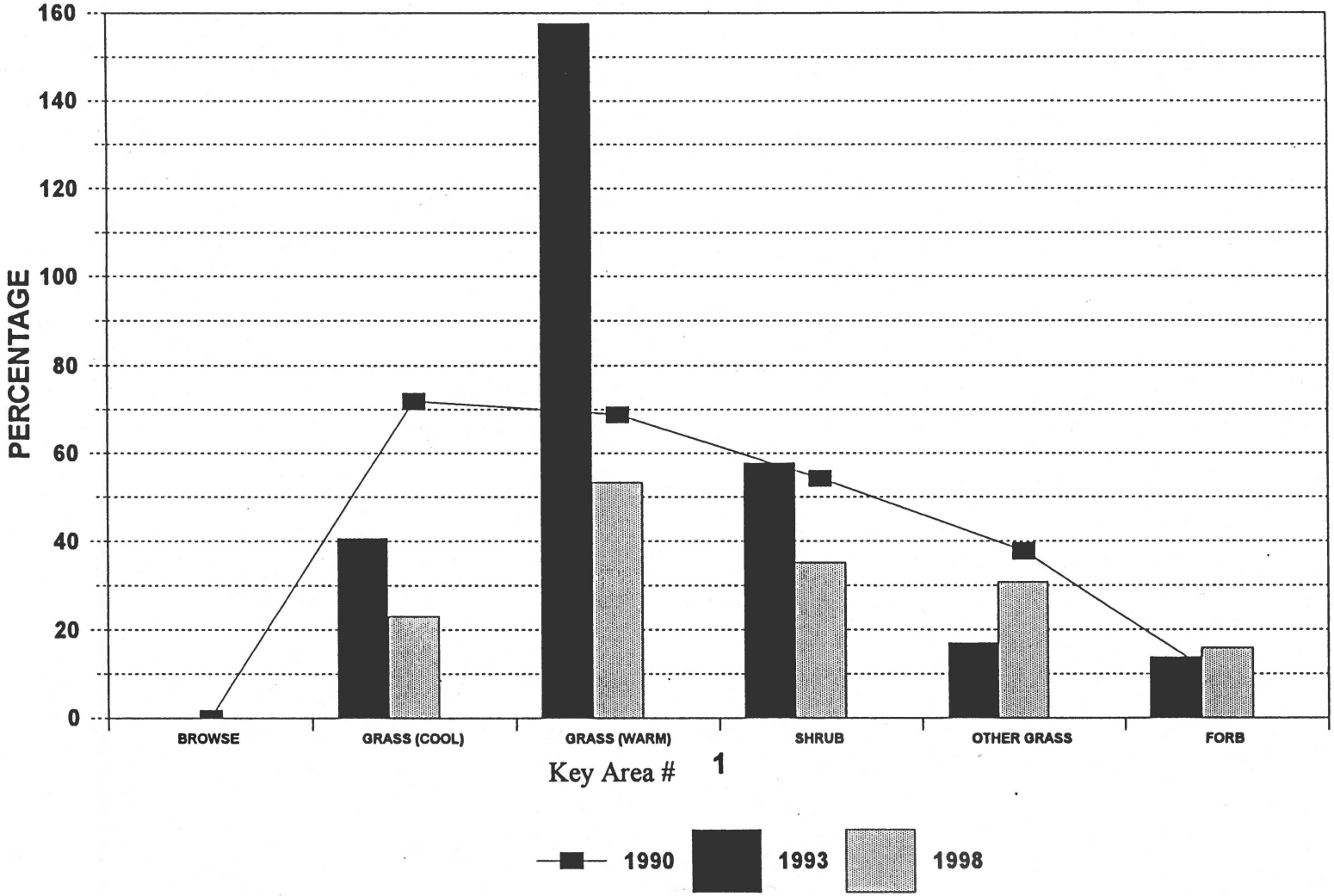
Compares Forage to Non-Forage Plants by years plots were read & the 5 year average Annual Precipitation



MT TRUMBULL

RIM

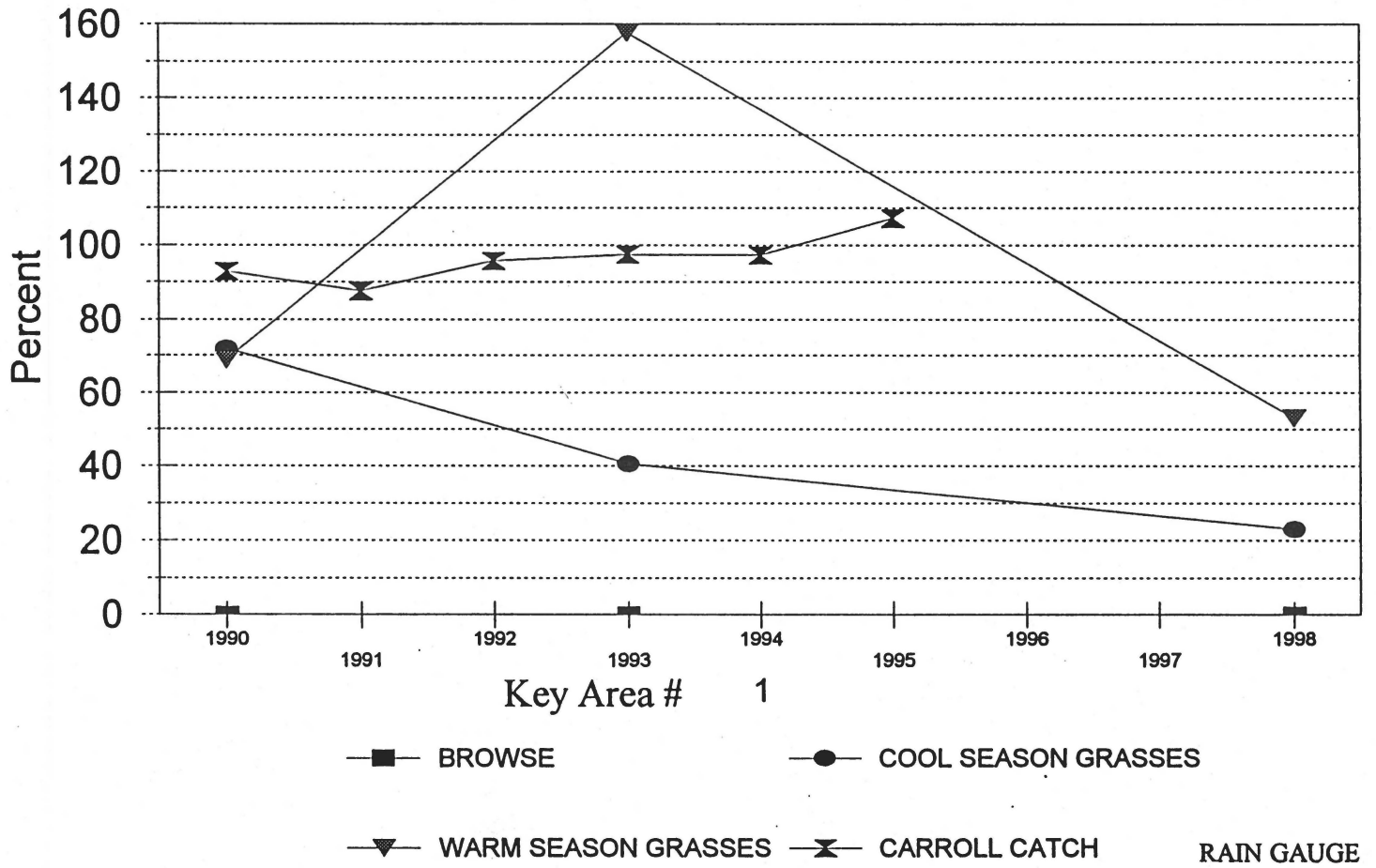
KEY AREA INDEX CHANGE COMPARED TO FIRST YEAR

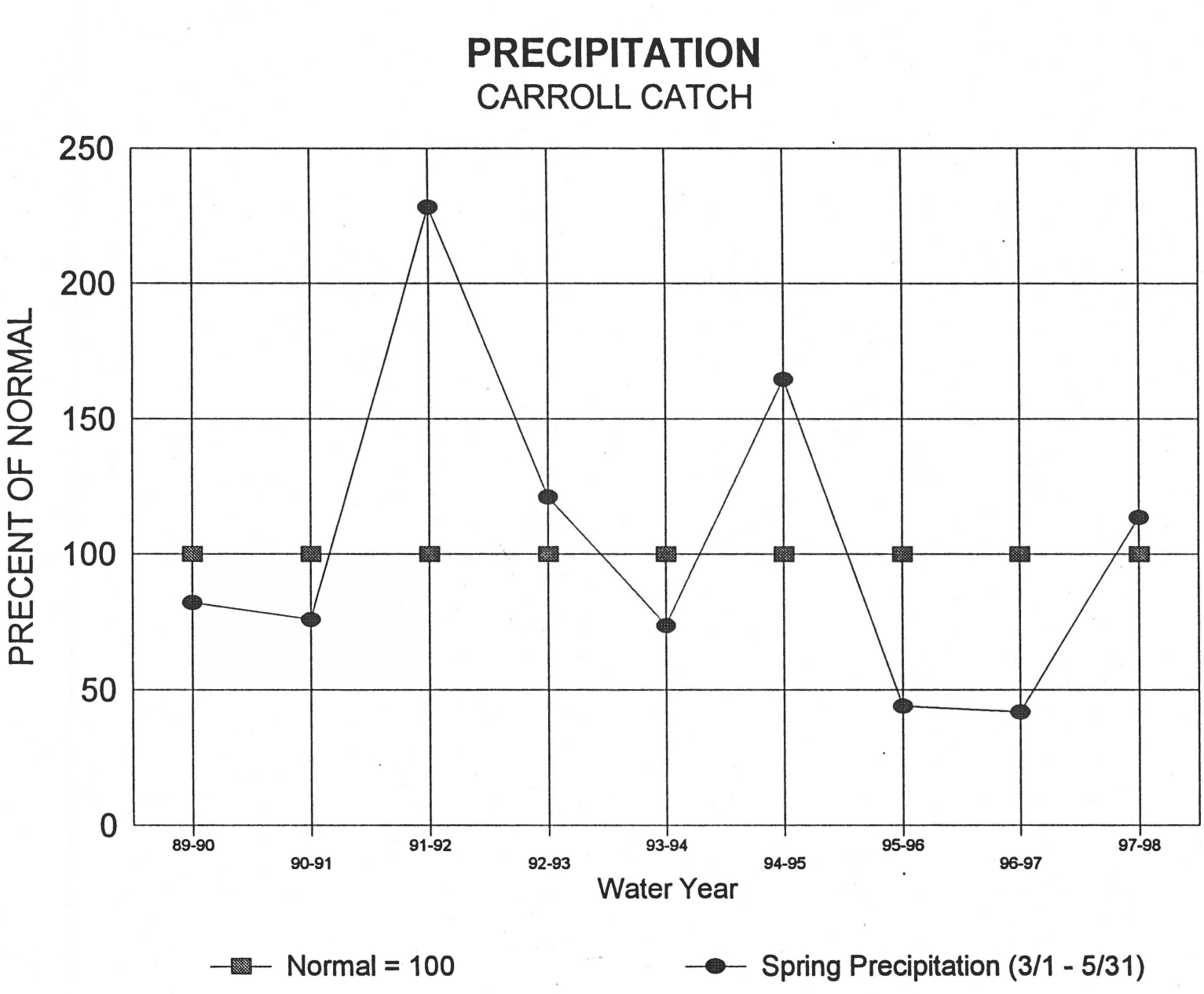


MT TRUMBULL

RIM

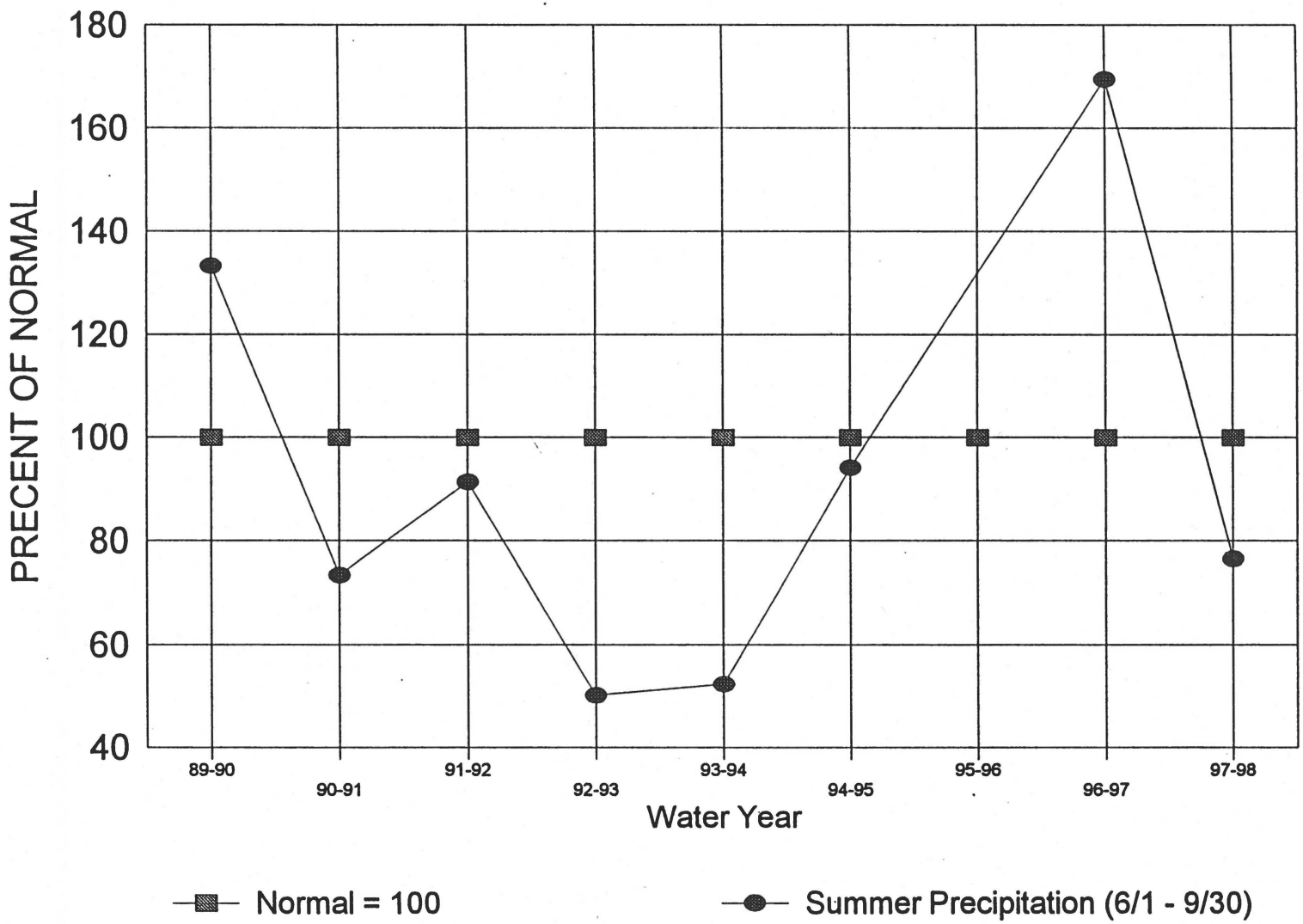
Plant Category changes overtime & the 5 year average Annual Precipitation




PRECIPITATION
CARROLL CATCH
PRECENT OF NORMAL
250
200
150
100
50
0
89-90
90-91
91-92
92-93
93-94
94-95
95-96
96-97
97-98
Water Year
Normal = 100
Spring Precipitation (3/1 - 5/31)

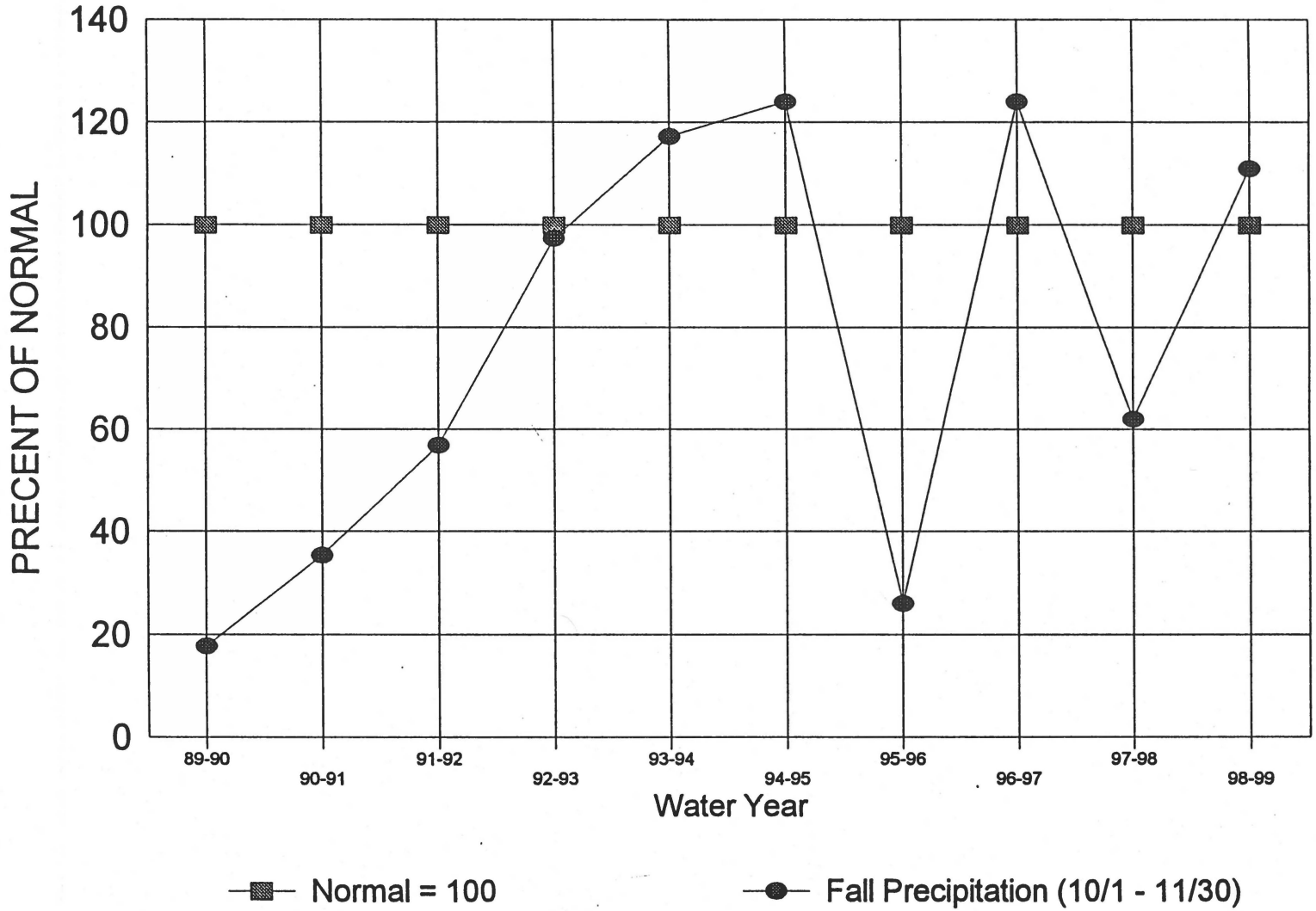
PRECIPITATION

CARROLL CATCH



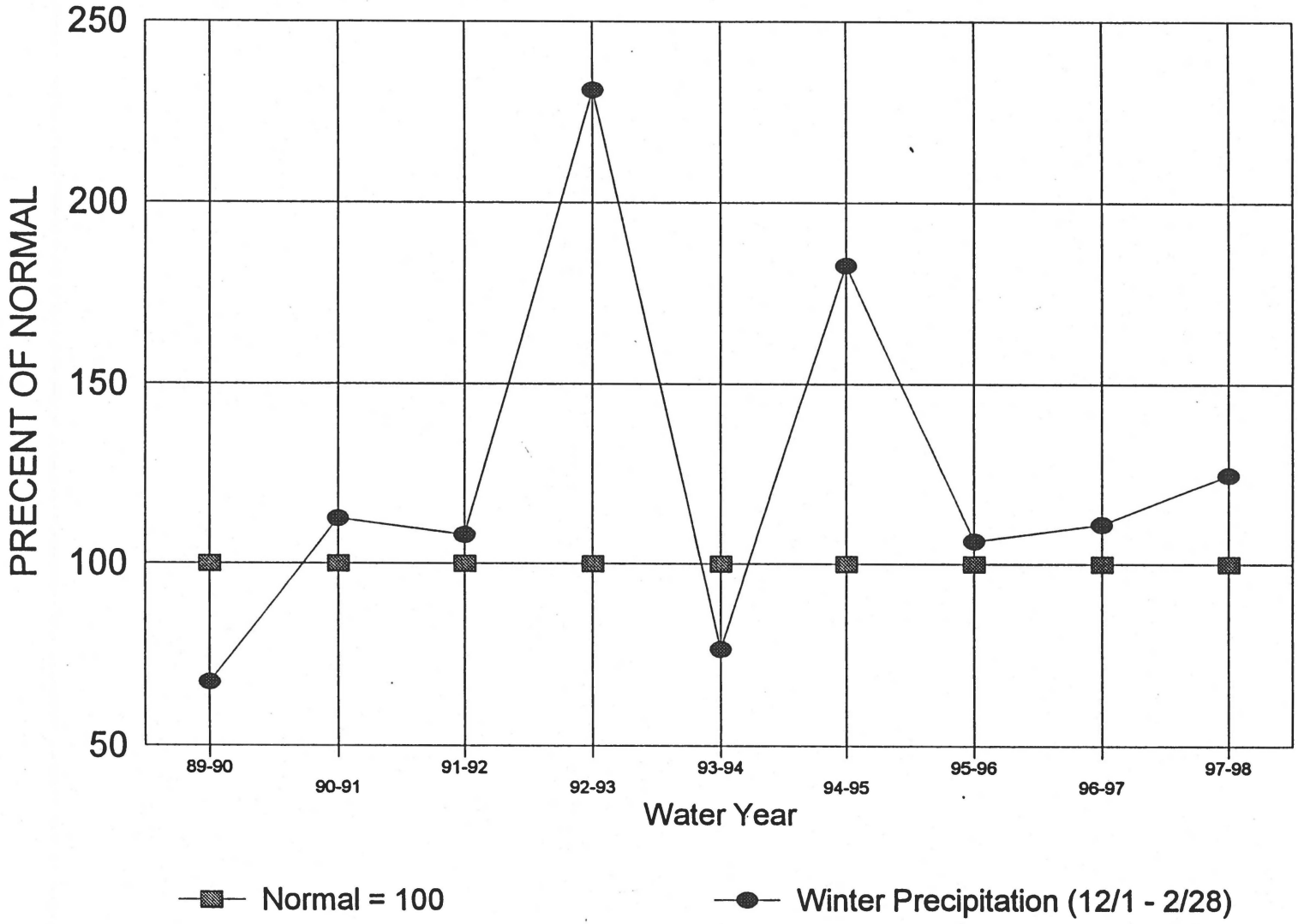
PRECIPITATION

CARROLL CATCH

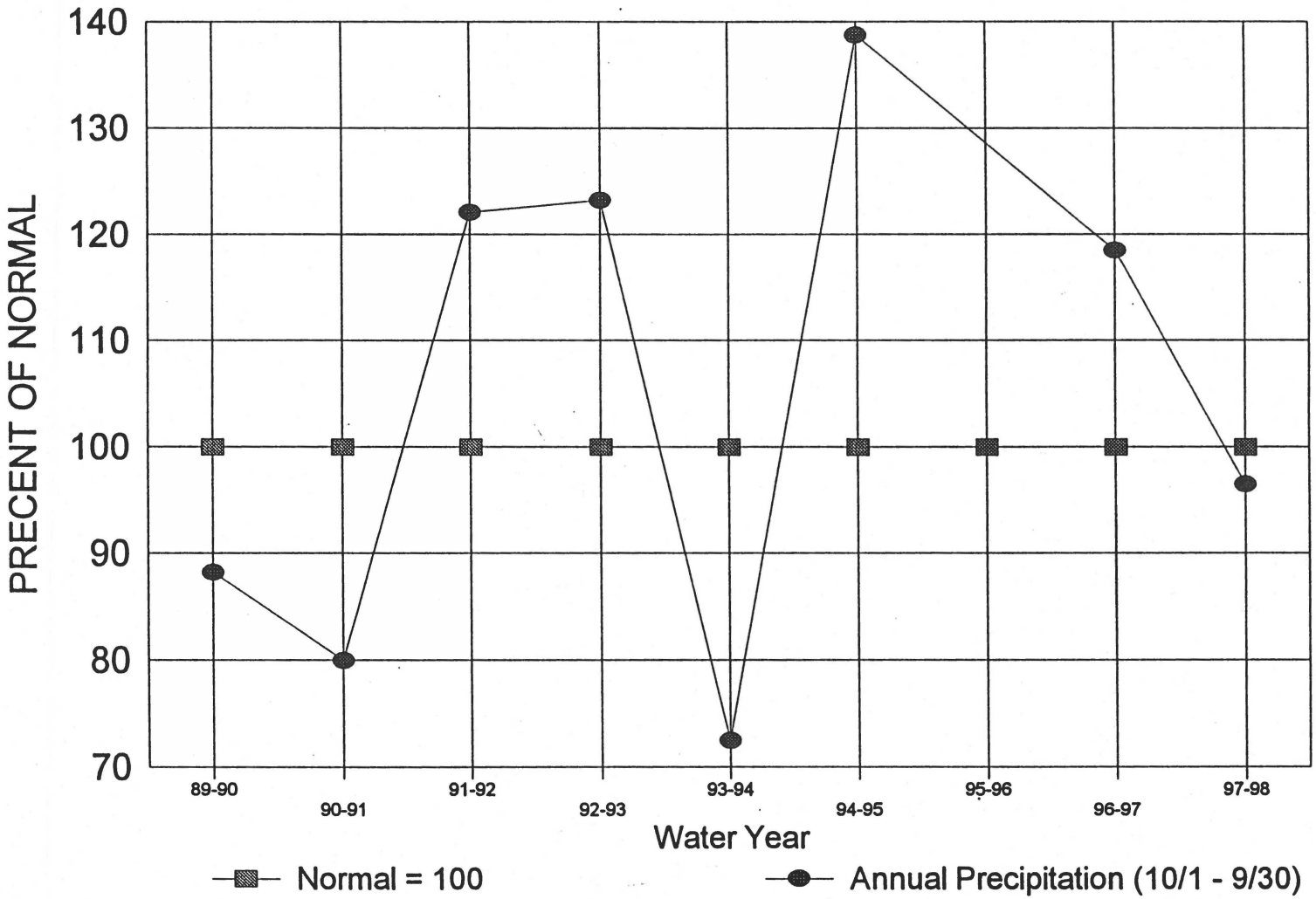


PRECIPITATION

CARROLL CATCH



PRECIPITATION
CARROLL CATCH



Key Area #3

09/09/99

VERMILLION RESOURCE AREA
UTILIZATION STUDY SUMMARY

ALLOTMENT = MT TRUMBULL | PASTURE = NO. STOCKADE | KEY AREA NUMBER = PASTURE SUMMARY

COOL SEASON GRASSES	UTILIZATION EXPRESSED AS A PERCENT USE OF EACH SPECIES FOR THE PARTICULAR YEAR READ																				
	1998	1997	1996	1995	1994	1993	1991	1990	0	0	0	0	0	0	0	0	0	0	0	0	AVERAGE
ORHY	45	42	52	51	51	23	49	59													47
SIHY	41	40	52	54	34	22	39	50													42
STIPA																					
AGCR																					
AGSM																					
AGROPY																					
ELJU																					
KOCR																					
POSE																					
CSGG																					
AVERAGE	43	41	52	53	40	22	42	53													44
WARM SEASON GRASSES																					
HIJA	34	42	44	56	39	36	56	32													44
SPCR						36	59	45													40
SPAI																					
SPNE																					
BOGR																					
BOER																					
HIRI																					
MUPO																					
TRPU																					
WSGG																					
AVERAGE	34	42	44	56	39	36	57	36													43
BROWSE																					
CELA																					
ATCA																					
EPNE																					
ARBI3																					
COME	26	33	50	14	32	8	51	42													29
KRPA																					
KRGR																					
CEGR																					

HYMO									
GARRYA									
AMDU									
SSSS									
AVERAGE	26	33	50	14	32	8	51	42	29
AVG ALL SPECIES	38	40	50	47	38	25	49	48	41

PACE FREQUENCY TREND ANALYSIS

00/00/00	ALLOTMENT	MT TRUMBULL	PASTURE	NO. STOCKADE	KEY AREA	3	PAGE NUMBER	1

COVER	YEARS PLOT WERE READ											TREND INDEX COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX BASE YEAR =									
CATEGORIES	1998	1999	2001	2004	2007	2010	2013	2016	2019	2022	2025	1998	2001	2004	2007	2010	2013	2016	2019	2022	2025
Bare Ground	64	41										-36									
Pers Litter	14																				
Litter																					
Rock	16	47										200									
Live Vegetation	6	12										95									
BROWSE																					
CELA																					
ATCA2																					
EPNE																					
ATCO																					
ARBI3																					
COME	5	11										110									
PUTR																					
PUGL																					
AMUT																					
ARFI																					
ARAR8																					
ARFR4																					
MESC2																					
QUGA																					
XRPA																					
XRGR																					
GRSP																					
AMDU2																					
AMAL2																					
ACGR																					
CEGR																					
ENCELA																					
PRFA																					
PETH2																					
MESP																					
OTHERBROWS																					
TOTALS	5	11										110									
DESIRABLE GRASSES **Cool Season**																					
ORHY	7	8										21									
SIHY	70	40										-30									
STIPA	1	3										195									
AGCR																					
AGSM																					
SEEDED																					
ELYMUS																					
XOCR																					
POA	1	4										515									
OTHER COOL SEASON GRASSES																					
TOTALS	79	64										-19									
Warm Season																					
HIJA	2	11										481									
HIRI																					
SPCR	1	1										-49									
SPNE																					
BOGR	52	74										43									
BOBR																					
BOCU																					
SPAI																					
MUPU2																					
MUTO2																					
MUPO2																					
SPORO																					
SPCO																					
OTHER WARM SEASON GRASSES																					
TOTALS	55	85										56									
DESIRABLE TOTAL	139	160										15									

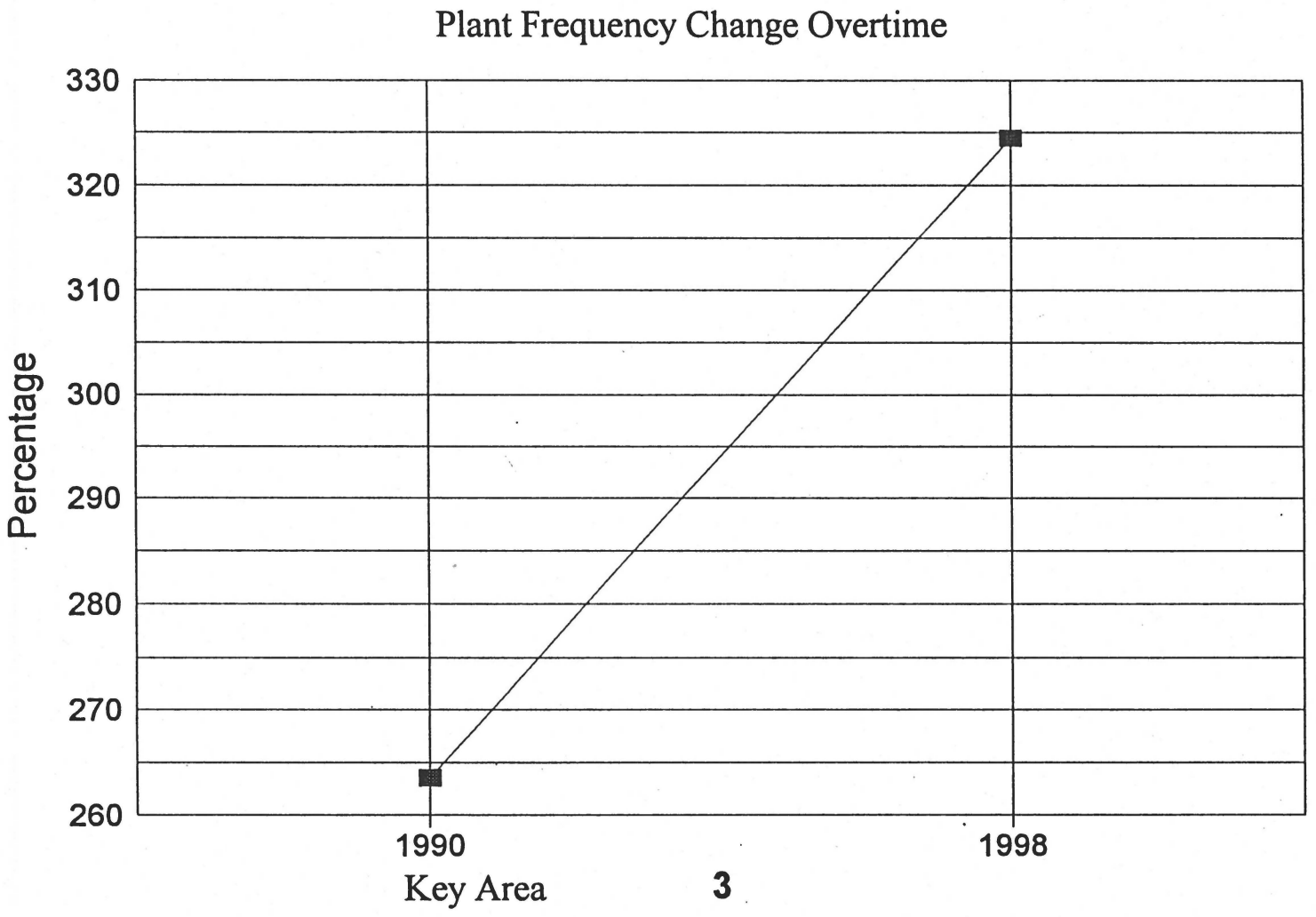
PACE FREQUENCY TREND ANALYSIS CONTINUED PAGE NUMBER 2

09/09/99 ALLOTMENT MT TRUMBULL PASTURE NO. STOCKADE KEY AREA 3

COVER CATEGORIES	YEARS PLOT WERE READ 1999	1999	2001	2004	2007	2010	2013	2016	2019	2022	2025	TREND INDEX COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX BASE YEAR = 1999 1999	2001	2004	2007	2010	2013	2016	2019	2022	2025
OTHER SHRUBS																						
GUSA2	55	39										-35										
CHVI8																						
CHRYSO																						
CORA																						
ARTR2	51	59										15										
OPUNT	1	2										54										
LYAN																						
LYCIU																						
CHNA																						
ERIOG_SHRB	1																					
HAPP_ACAMP																						
POIN																						
TETRA																						
ARLU																						
SAVE																						
YUCCA																						
PEPU7																						
SENECIO																						
JUOS	2	5										139										
PEID	2	3										71										
PAPA																						
RHTR																						
QUTU																						
EPTO																						
EPVI																						
BERBERIS																						
DAFR																						
MYSA																						
ERAN2																						
YUBR																						
LATRT																						
PSCO2																						
PROLT																						
THMO																						
ATHY																						
MOUT																						
GAFL2																						
OTHERSHRUB																						
TOTALS	113	105										-7										
OTHER GRASSES																						
ARIST																						
ARLO	3	3										3										
BOBR																						
TRPU																						
TRMU																						
PPGG																						
TOTALS	3	3										3										
FORBS																						
ASTRA																						
BAKA																						
SPHAE	9	14										56										
AAFF																						
AAGG																						
ERIOG		35										7007										
PENST																						
PLANTAGO																						
ERIGERON																						
MUSTARD																						
PPFF	1	3										156										
SENEC																						
SPURGE		4										774										
ASTER																						
DAISY																						
AMSIN																						
PHACE																						
ERCH																						
TOTALS	9	57										545										
PLANT TOTALS	125	165										32										

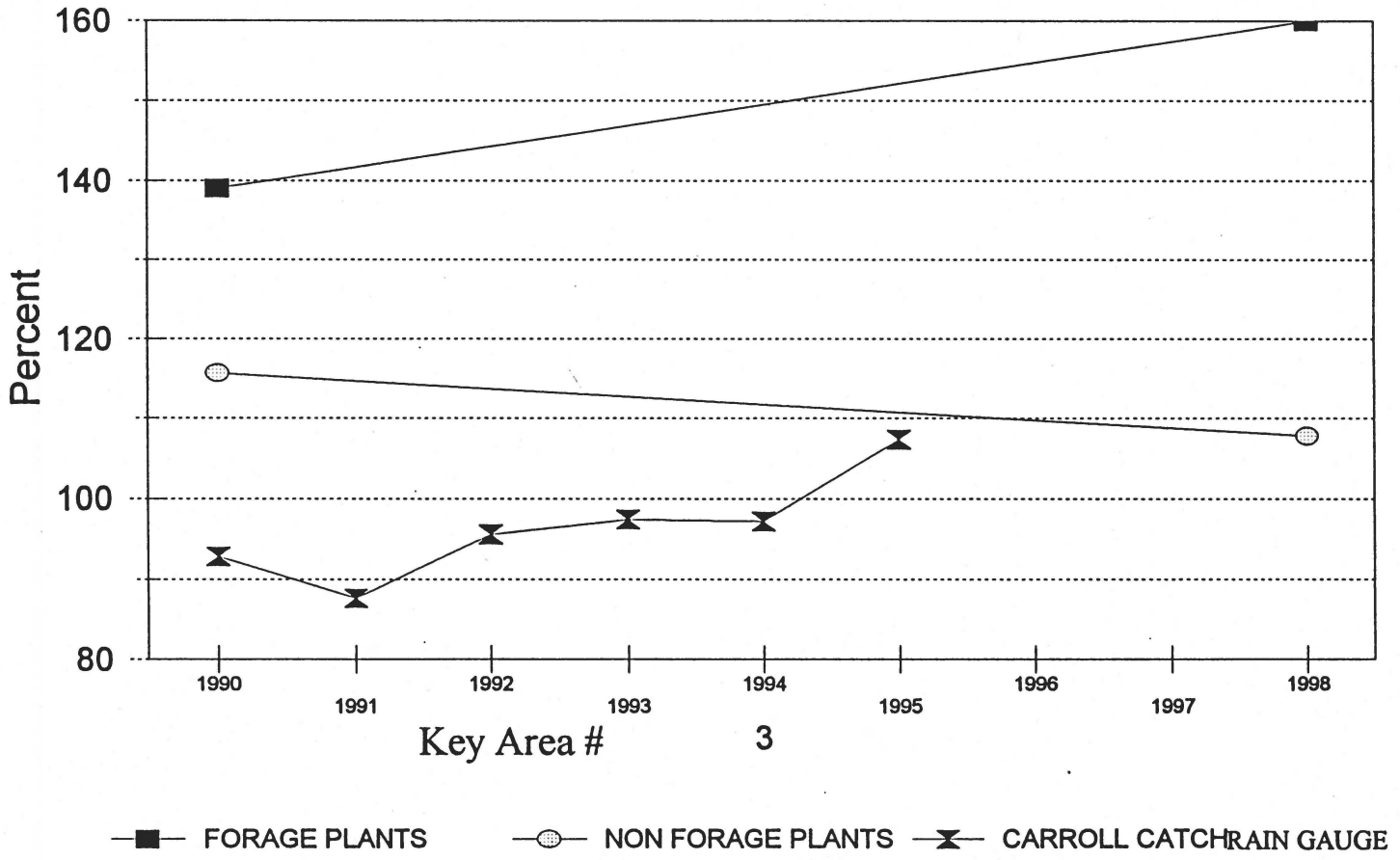
MT TRUMBULL

NO. STOCKADE



MT TRUMBULL
NO. STOCKADE

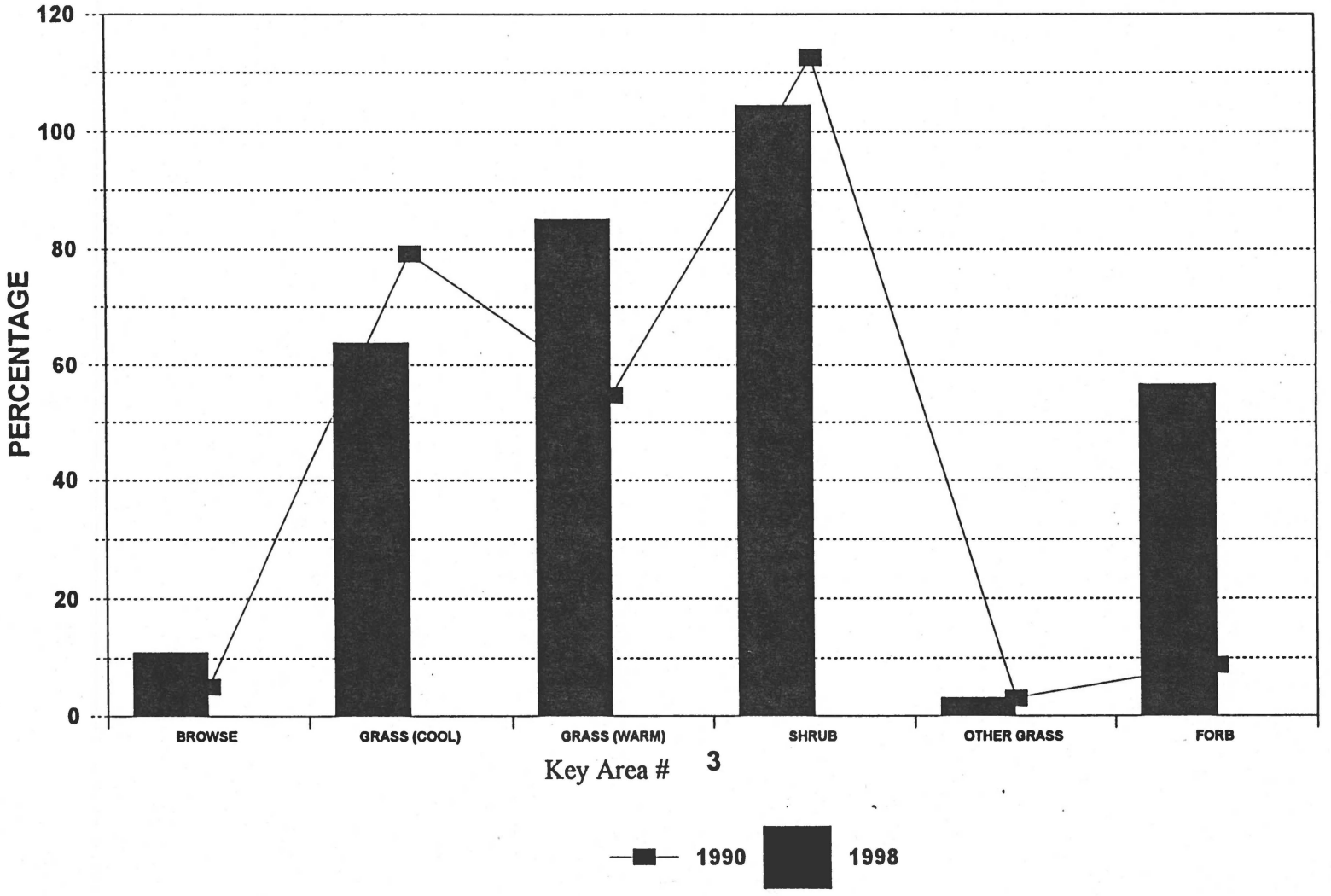
Compares Forage to Non-Forage Plants by years plots were read & the 5 year average Annual Precipitation



MT TRUMBULL

NO. STOCKADE

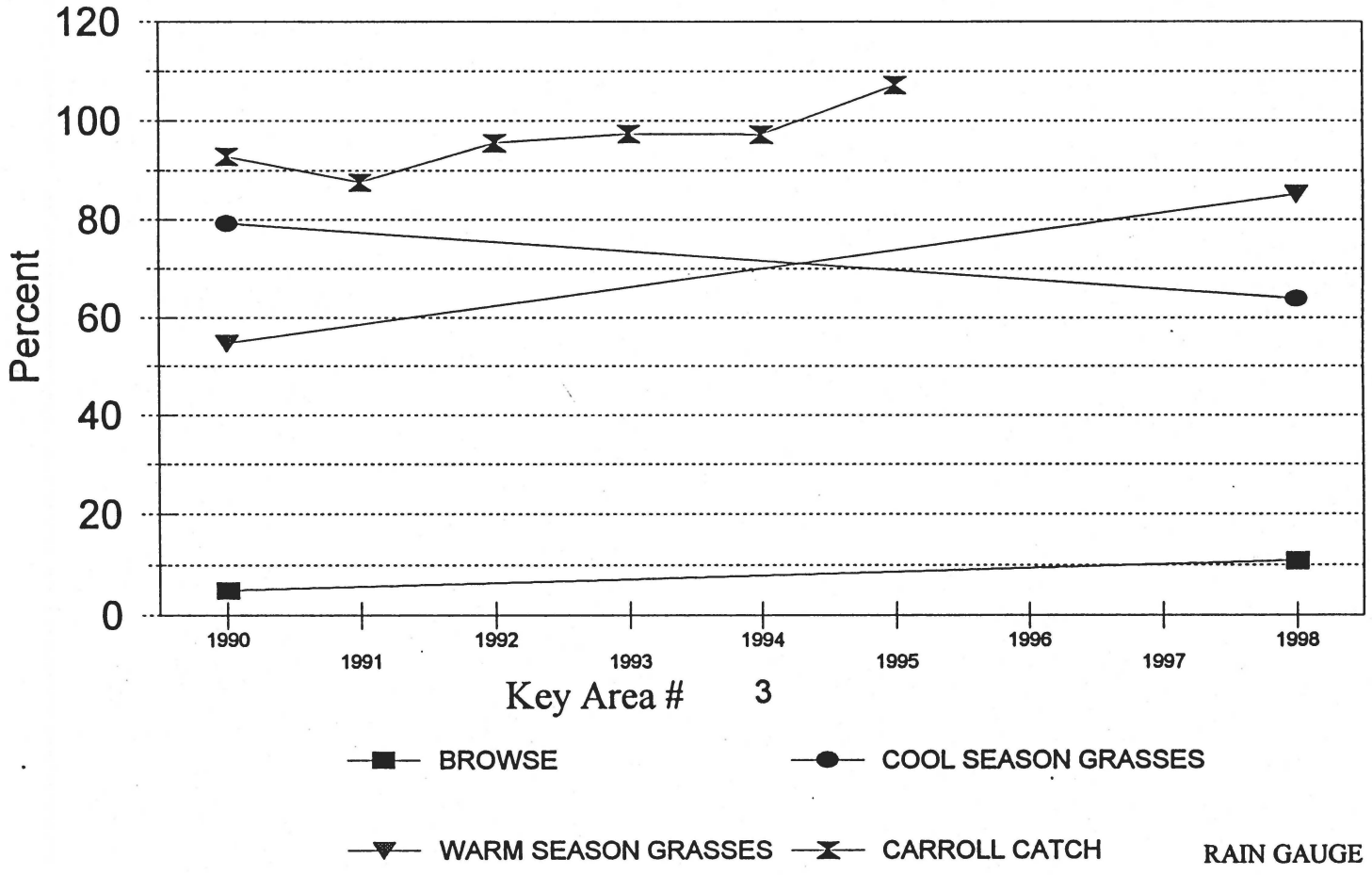
KEY AREA INDEX CHANGE COMPARED TO FIRST YEAR



MT TRUMBULL

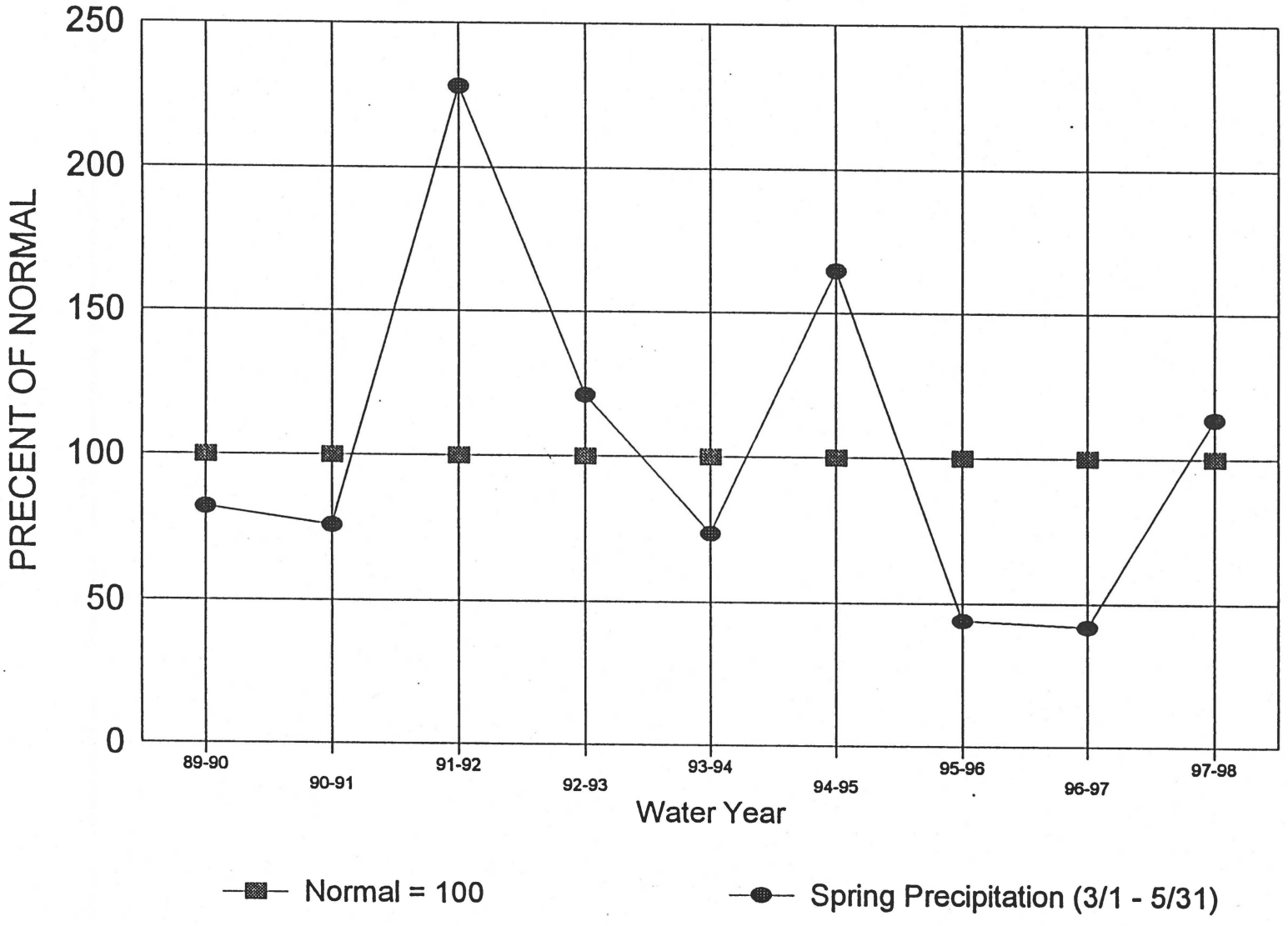
NO. STOCKADE

Plant Category changes overtime & the 5 year average Annual Precipitation



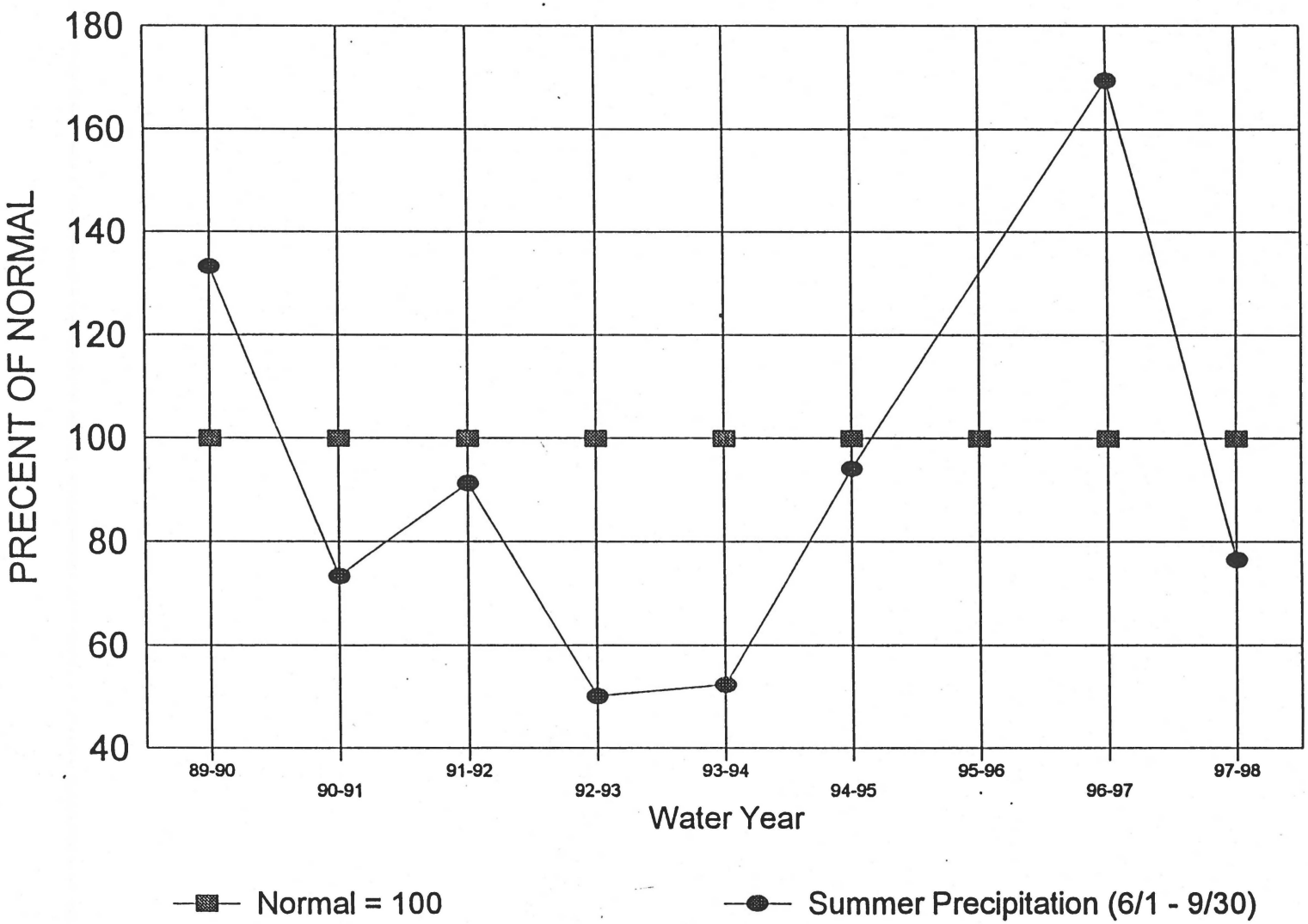
PRECIPITATION

CARROLL CATCH



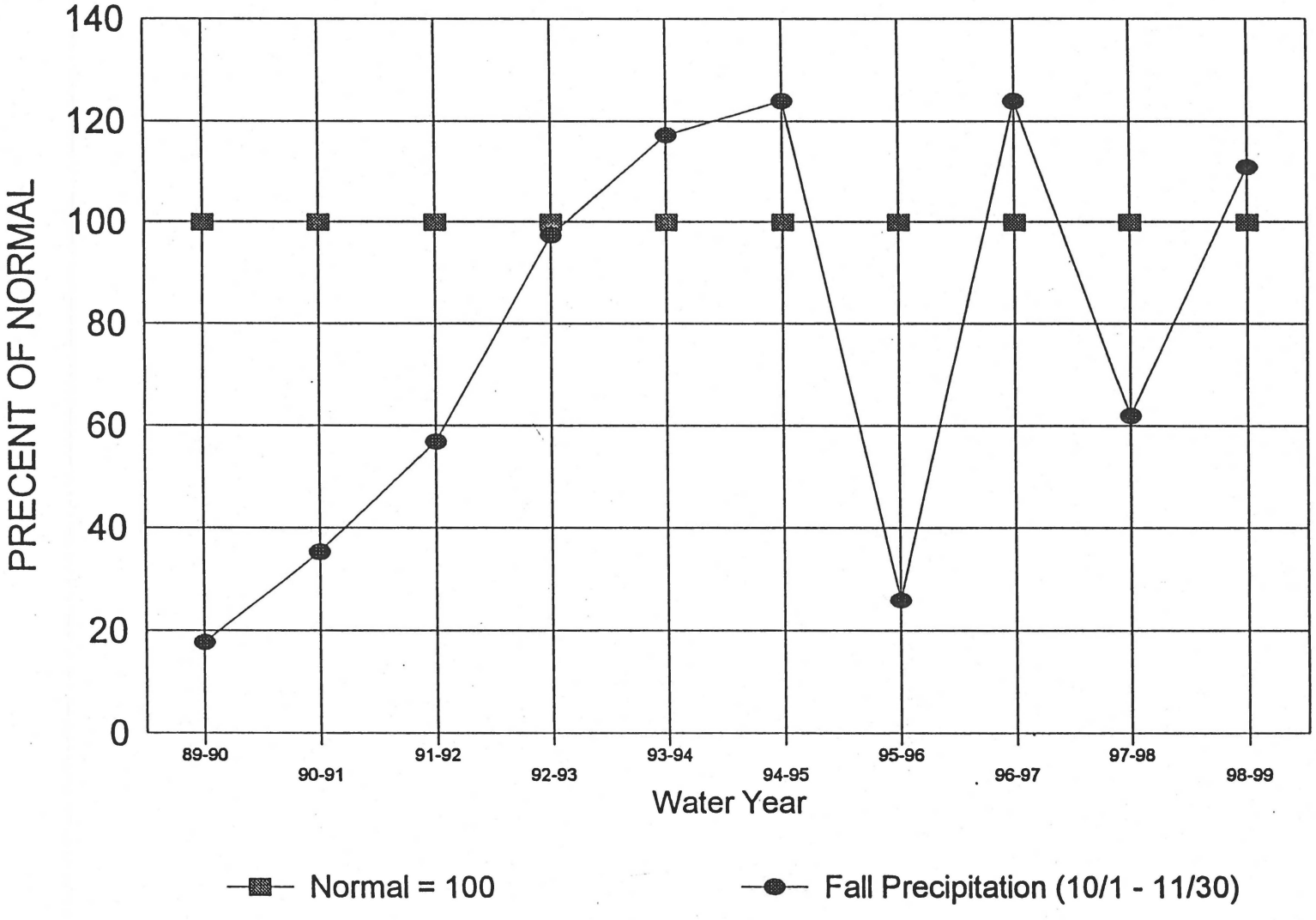
PRECIPITATION

CARROLL CATCH



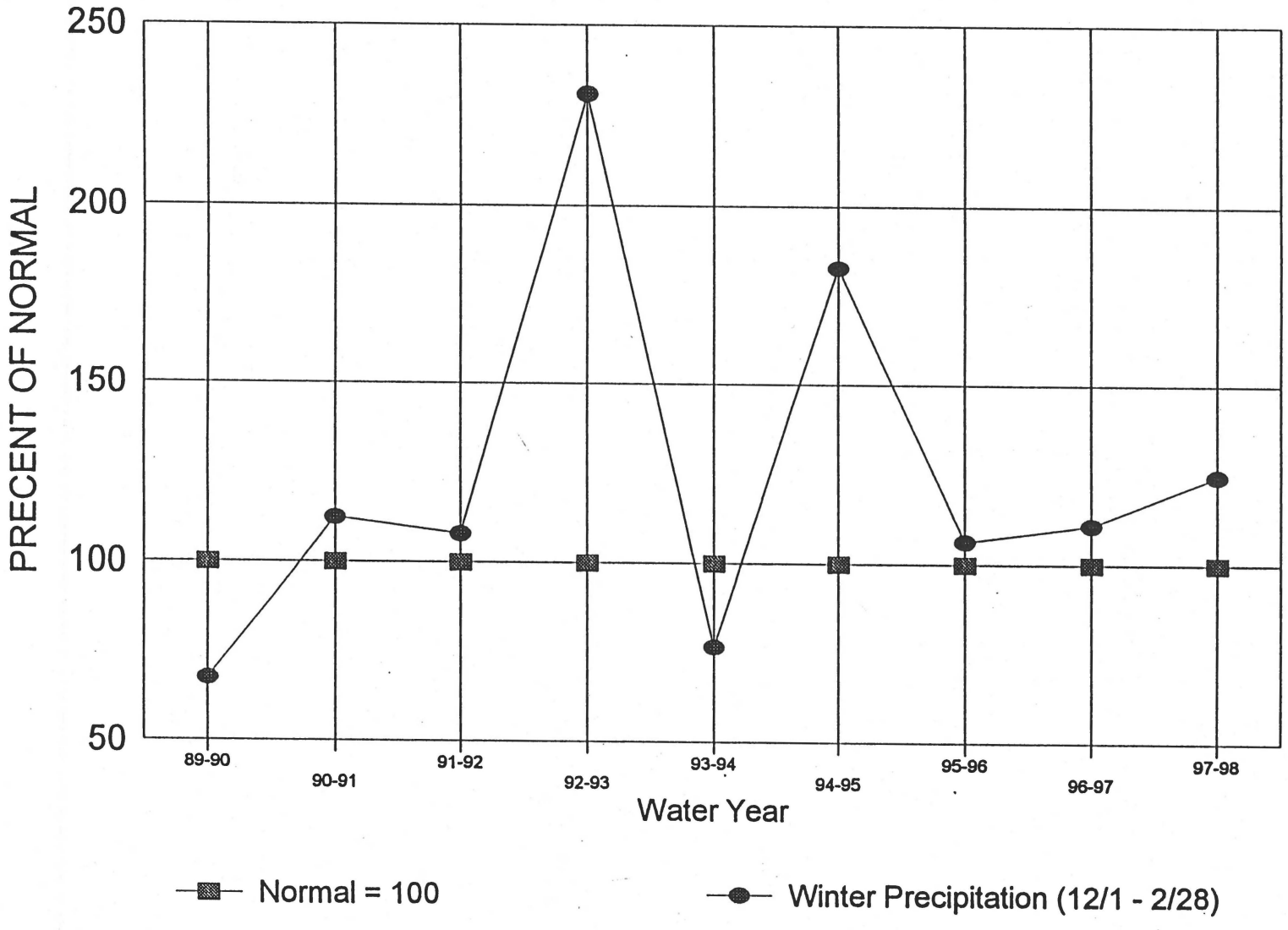
PRECIPITATION

CARROLL CATCH



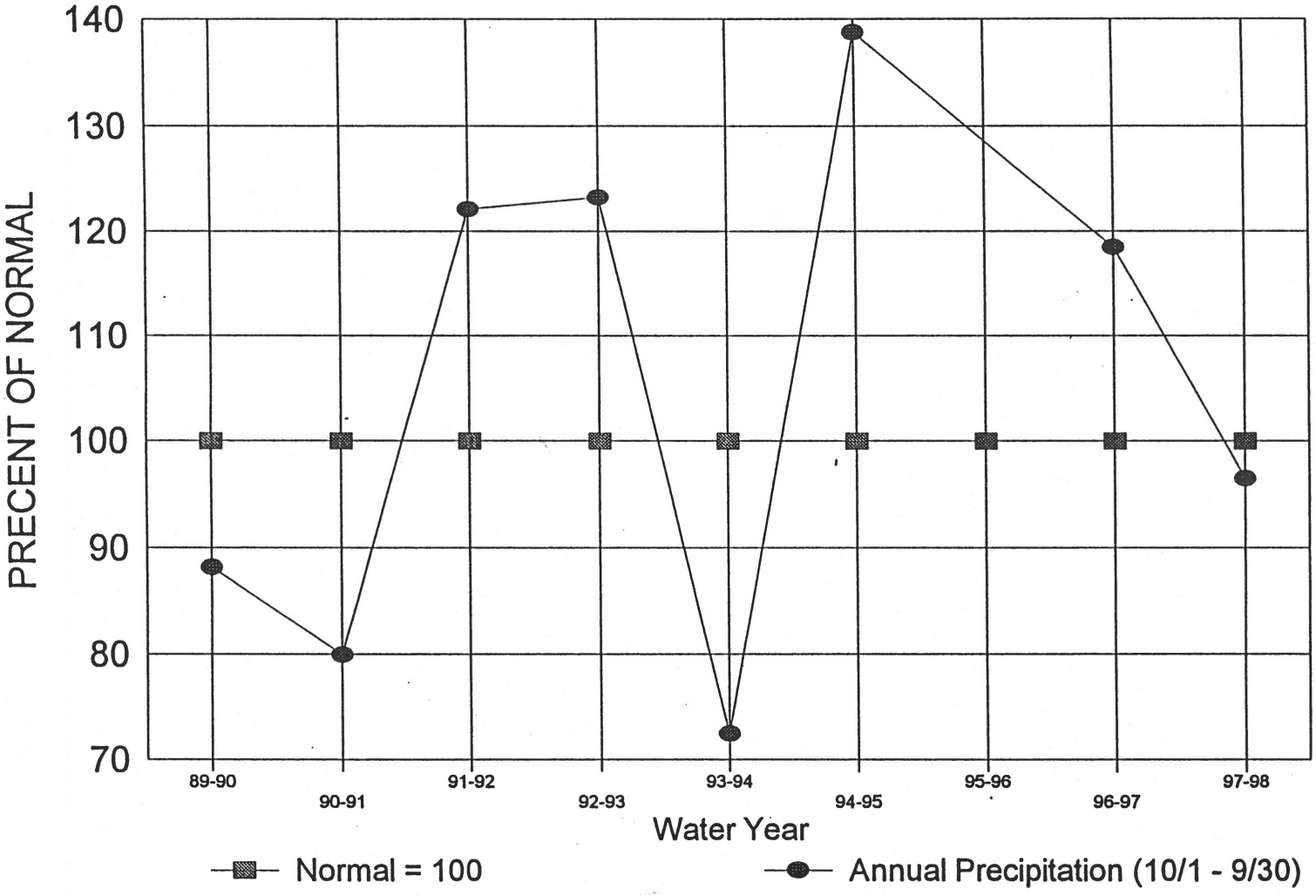
PRECIPITATION

CARROLL CATCH



PRECIPITATION

CARROLL CATCH



Key Area #5

09/09/99

VERMILLION RESOURCE AREA
UTILIZATION STUDY SUMMARY

ALLOTMENT = MT TRUMBULL | PASTURE = WHITMORE PNT | KEY AREA NUMBER = PASTURE SUMMARY

COOL SEASON GRASSES	UTILIZATION EXPRESSED AS A PERCENT USE OF EACH SPECIES FOR THE PARTICULAR YEAR READ																				
	1999	1997	1996	1994	1993	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	AVERAGE
ORHY	35	16	27	51	38	73															37
SIHY	36	22	23	47	37	62															39
STIPA																					
AGCR																					
AGSM																					
AGROPY																					
ELJU																					
KOCR																					
POSE																					
CSGG																					
AVERAGE	35	19	25	49	38	65															38
WARM SEASON GRASSES																					
HIJA	34	19	31	43	38	54															38
SPCR																					
SPAI																					
SPNE																					
BOGR																					
BOER																					
HIRI																					
MUPO																					
TRPU																					
WSGG																					
AVERAGE	34	19	31	43	38	54															38
BROWSE																					
CELA																					
ATCA																					
EPNE																					
ARBI3																					
COME																					
KRPA																					
KRGR																					
CEGR																					

HYMO							
GARRYA							
AMDU							
SSSS							
AVERAGE							
AVG ALL SPECIES	35	19	27	47	38	59	38

PACE FREQUENCY TREND ANALYSIS

00/00/00	ALLOTMENT	MT TRUMBULL	PASTURE	WHITMORE PT.	KEY AREA	5	PAGE NUMBER	1

TREND INDEX

COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX

BASE YEAR = 1999

COVER CATEGORIES	YEARS PLOT WERE READ 1999	1999	2002	2005	2008	2011	2014	2017	2020	2023	2026	1999	2002	2005	2008	2011	2014	2017	2020	2023	2026
Bare Ground	65	61										-6									
Pers Litter	15																				
Litter																					
Rock	12	15										25									
Live Vegetation	8	24										213									
BROWSE																					
CELA																					
ATCA2	2	1										-50									
EPNE																					
ATCO																					
ARBI3																					
COMI	4	7										80									
PUTR																					
PUGL																					
AMUT																					
ARFI																					
ARAR8																					
ARFR4																					
MESC2																					
QUGA																					
XRPA																					
XROR																					
GRSP																					
AMDU2																					
AMAL2																					
ACOR																					
CEOR																					
ENCELA																					
PRPA																					
PETH2																					
MESP																					
OTHERBROWS																					
TOTALS	5	8										46									
DESIRABLE GRASSES Cool Season																					
ORHY	2	9										350									
SIHY	27	45										66									
STIPA		2										420									
AGCR																					
AGSM	1	6										438									
SEEDED																					
ELYMUS																					
XOCR																					
POA		1										140									
OTHER COOL SEASON GRASSES																					
TOTALS	30	62										106									
Warm Season																					
MUA	25	83										132									
MURI																					
SPCR		4										300									
SPNE																					
BOGR	67	51										-32									
BOER																					
BOCU	6																				
SPAI																					
MUPU2																					
MUTO2		1										140									
MUPO2																					
SPORO																					
SPCO																					
OTHER WARM SEASON GRASSES																					
TOTALS	100	138										38									
DESIRABLE TOTAL	143	208										46									

PACE FREQUENCY TREND ANALYSIS CONTINUED PAGE NUMBER 2

09/09/99 ALLOTMENT MT TRUMBULL PASTURE WHITMORE PT. KEY AREA 5

TREND INDEX

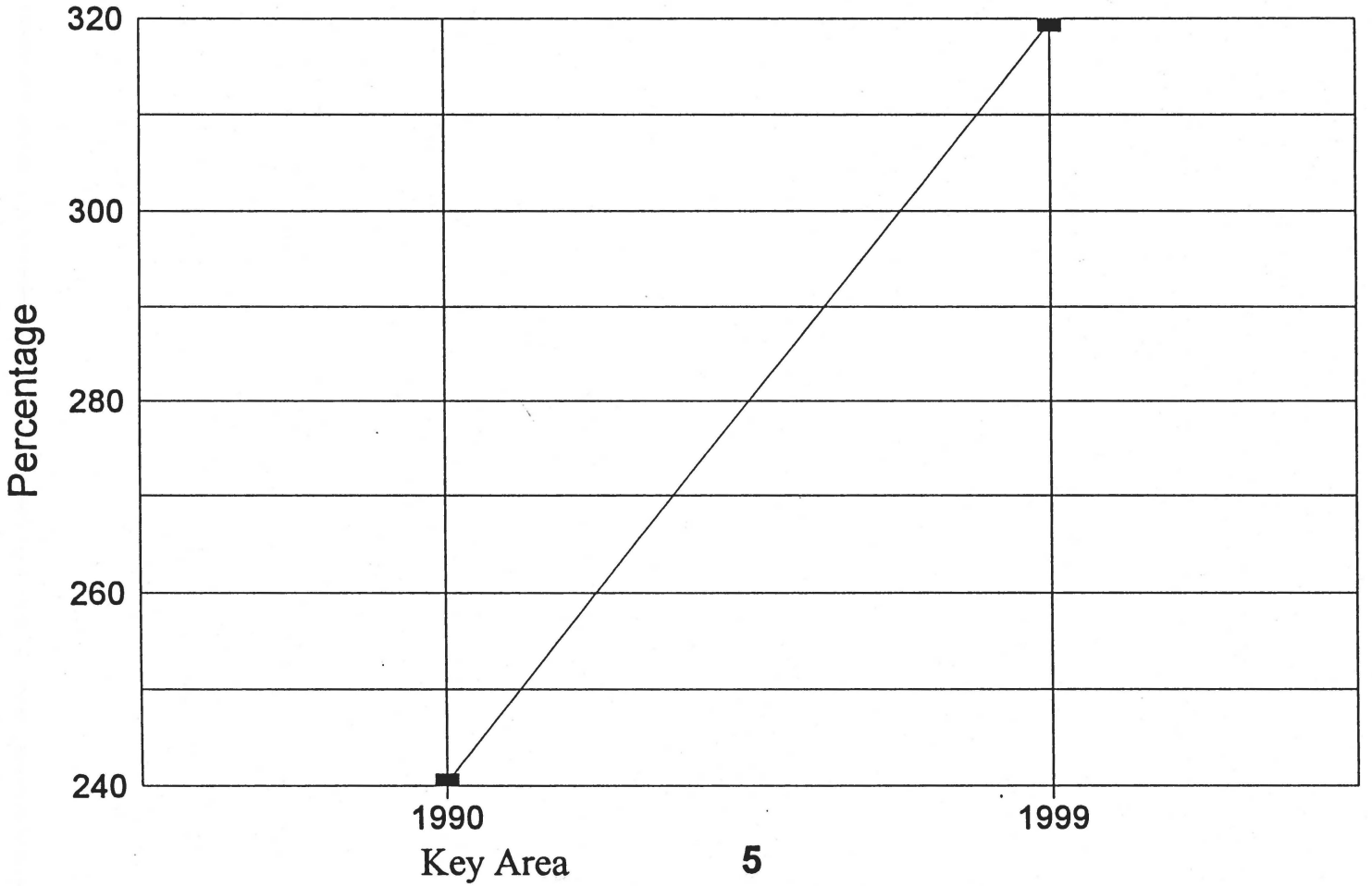
COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX

COVER CATEGORIES	YEARS PLOT WERE READ 1999	1999	2002	2005	2008	2011	2014	2017	2020	2023	2026	BASE YEAR = 1999 1999	2002	2005	2008	2011	2014	2017	2020	2023	2026
OTHER SHRUBS																					
GUSA2	26	19										-50									
CHVI8	4	3										-15									
CHRYSO																					
CORA																					
ARTR2	40	55										25									
OPUNT																					
LYAN																					
LYCIU																					
CHNA																					
ERIOG_SHRB																					
HAPP_ACAMP																					
PORN																					
TETRA																					
ARLU																					
SAVE																					
YUCCA	2																				
PEPU7																					
SENECIO																					
JUOS	4	6										50									
PEID		1										200									
YAPA																					
RHTR																					
QUTU																					
EPTO																					
EPVI																					
BERBERIS		1										200									
DAFR																					
HYSA																					
BRAN2																					
YUBR																					
LATRT																					
PSCO2																					
PROLT																					
THMO																					
ATMY																					
MOUT																					
GAFL2																					
OTHERSHRUB																					
TOTALS	86	85										-2									
OTHER GRASSES																					
ARIST																					
ARLO	9	8										-4									
BOBR																					
TRPU																					
TRMU																					
PPGG																					
TOTALS	9	8										-4									
FORBS																					
ASTRA																					
BAKA																					
SPHAE	2																				
AAFF		7										1300									
AAGG																					
ERIOG	1																				
PENST																					
PLANTAGO																					
ERIGERON																					
MUSTARD																					
PPFF		12										2370									
SENEC																					
SPURGE																					
ASTER																					
DAISY																					
AMSIN																					
PHACE																					
ERCIC																					
TOTALS	3	19										540									
PLANT TOTALS	98	112										15									

MT TRUMBULL

WHITMORE PT.

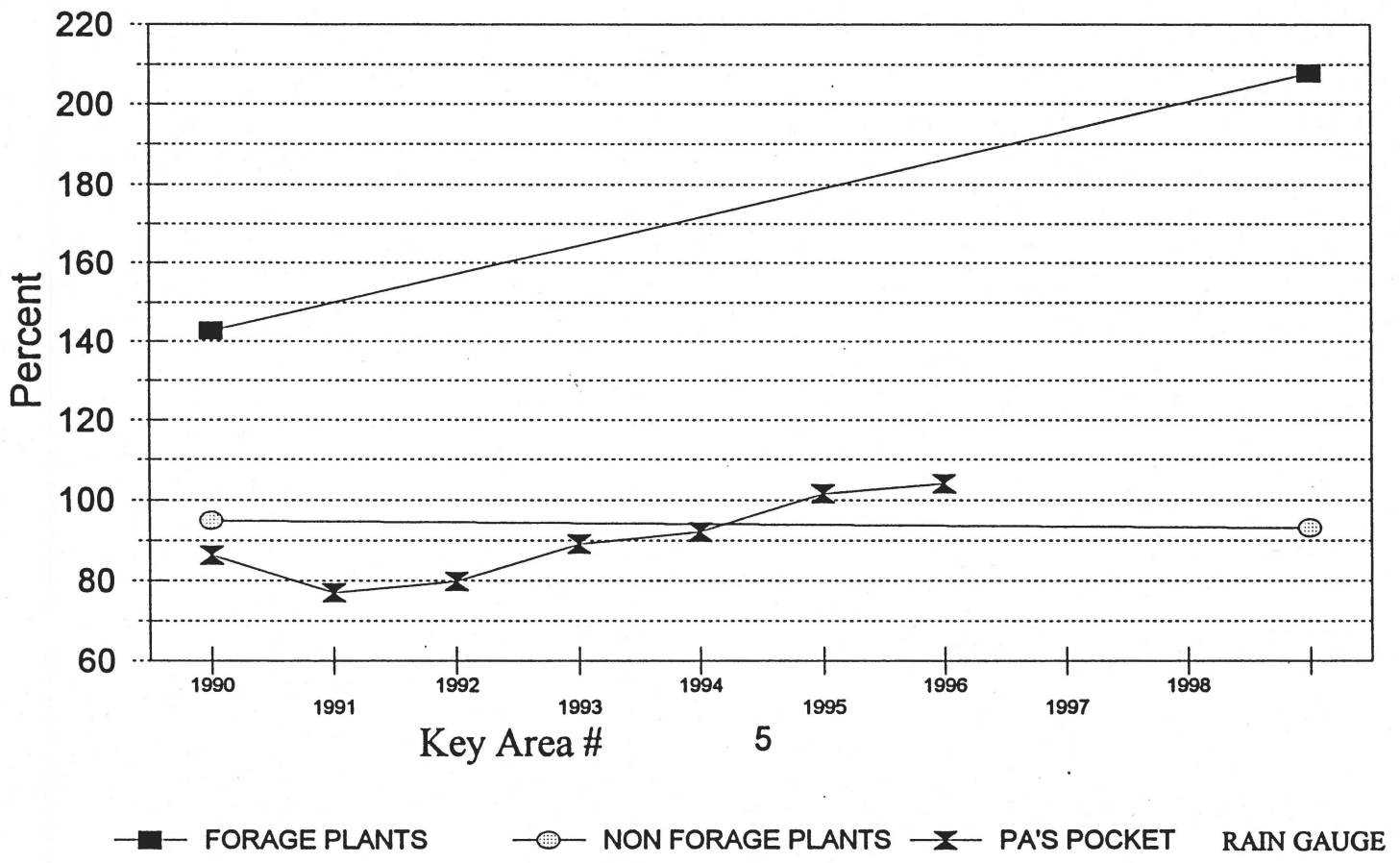
Plant Frequency Change Overtime



MT TRUMBULL

WHITMORE PT.

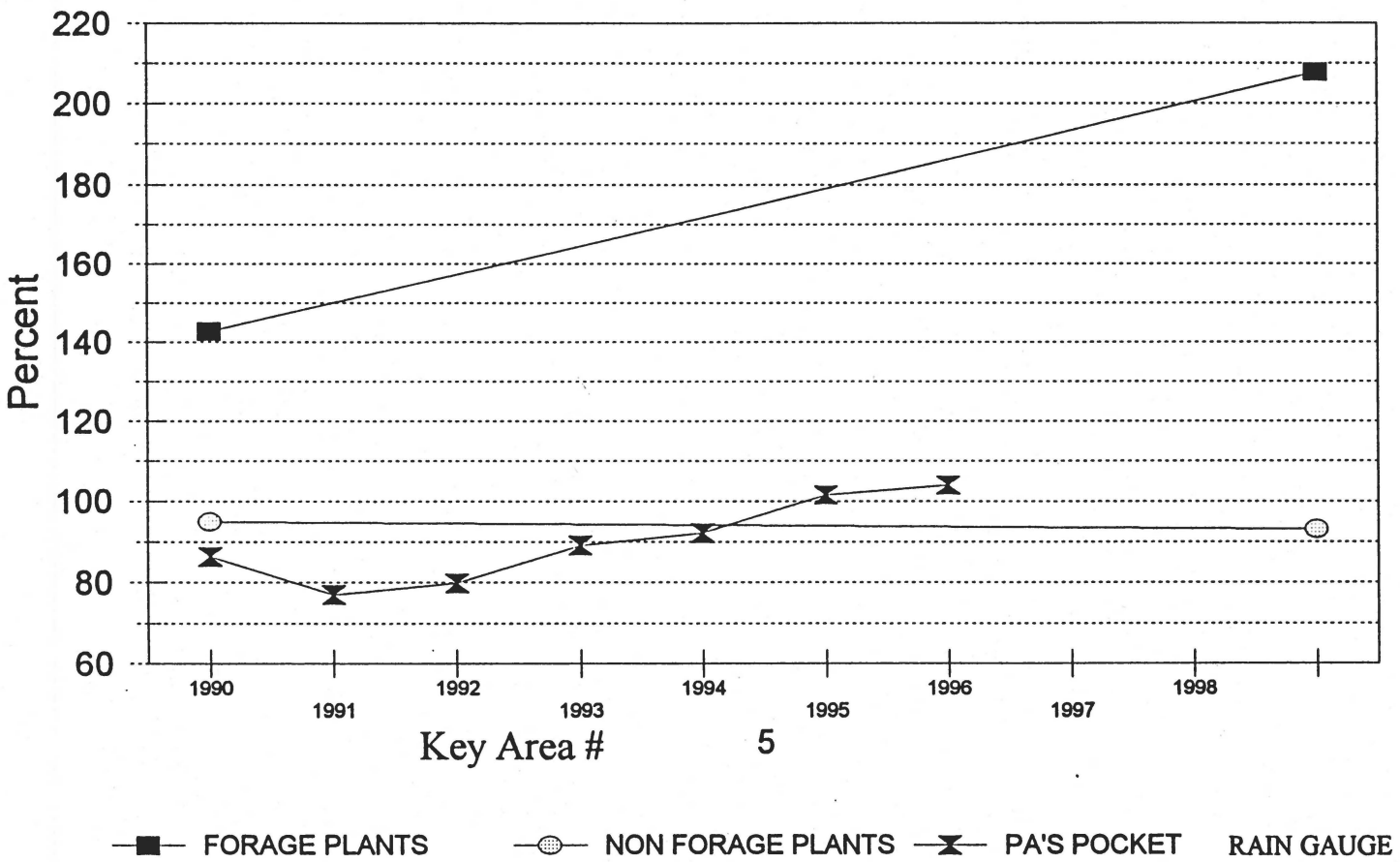
Compares Forage to Non-Forage Plants by years plots were read & the 5 year average Annual Precipitation



MT TRUMBULL

WHITMORE PT.

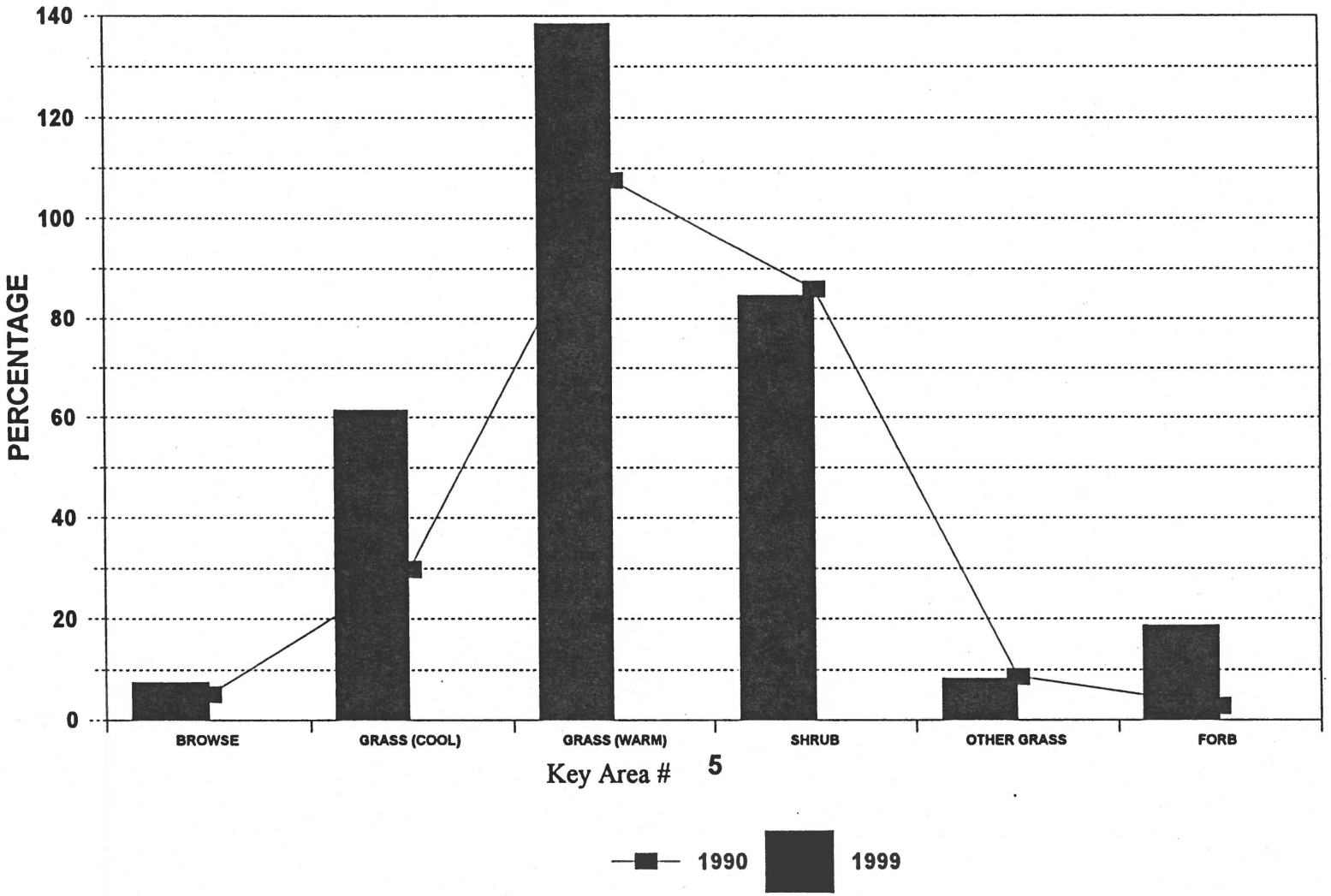
Compares Forage to Non-Forage Plants by years plots were read & the 5 year average Annual Precipitation



MT TRUMBULL

WHITMORE PT.

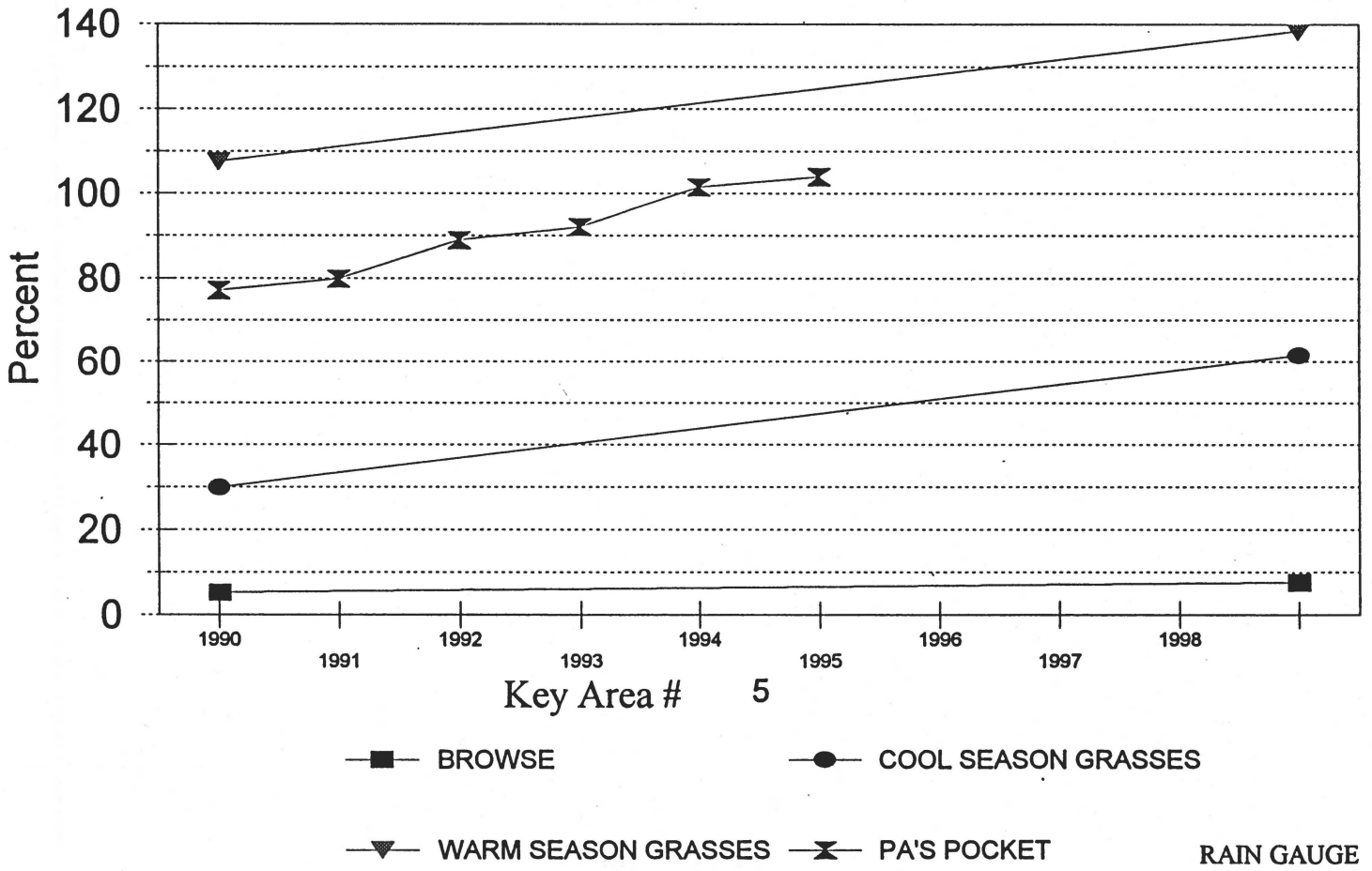
KEY AREA INDEX CHANGE COMPARED TO FIRST YEAR



MT TRUMBULL

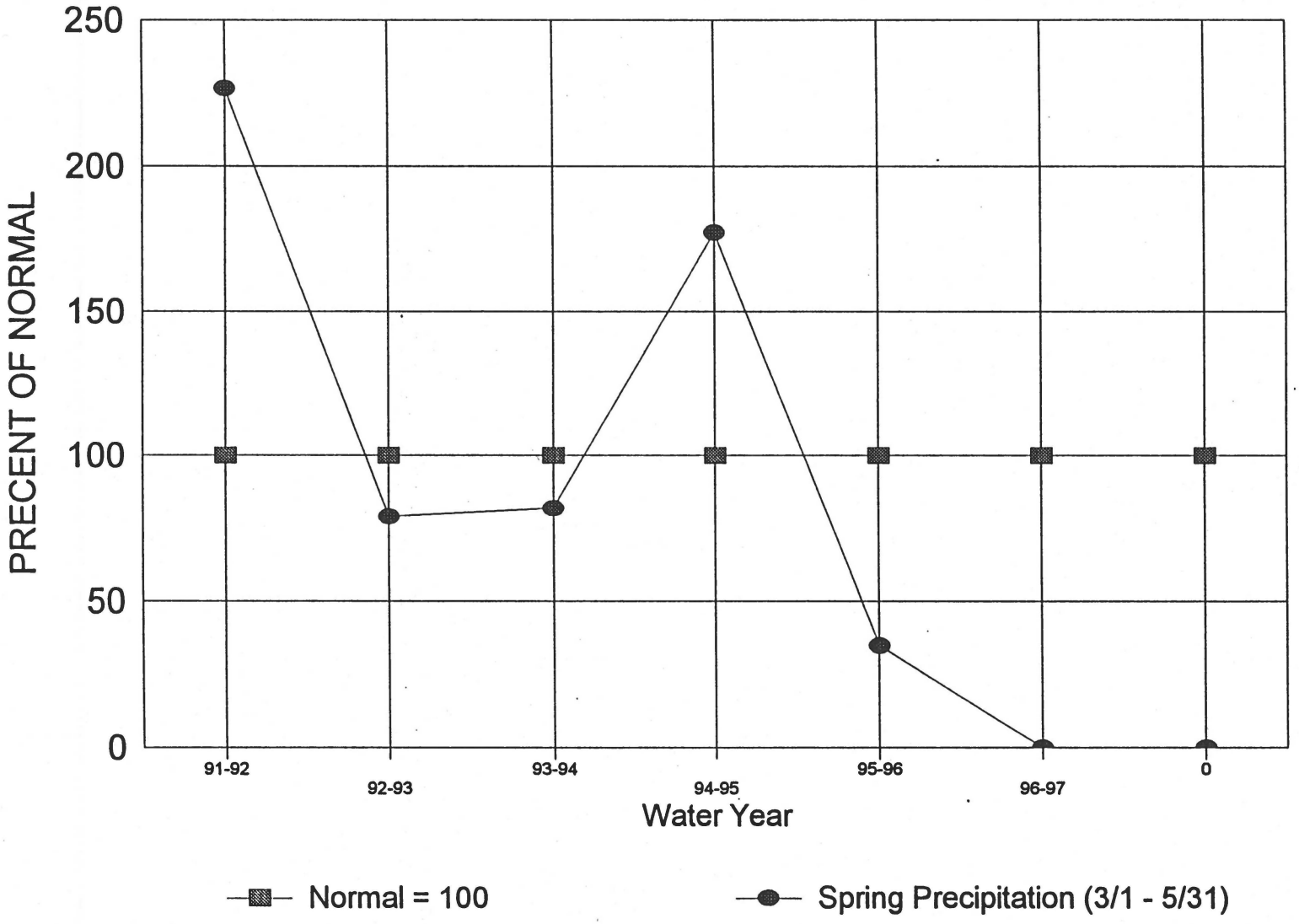
WHITMORE PT.

Plant Category changes overtime & the 5 year average Annual Precipitation



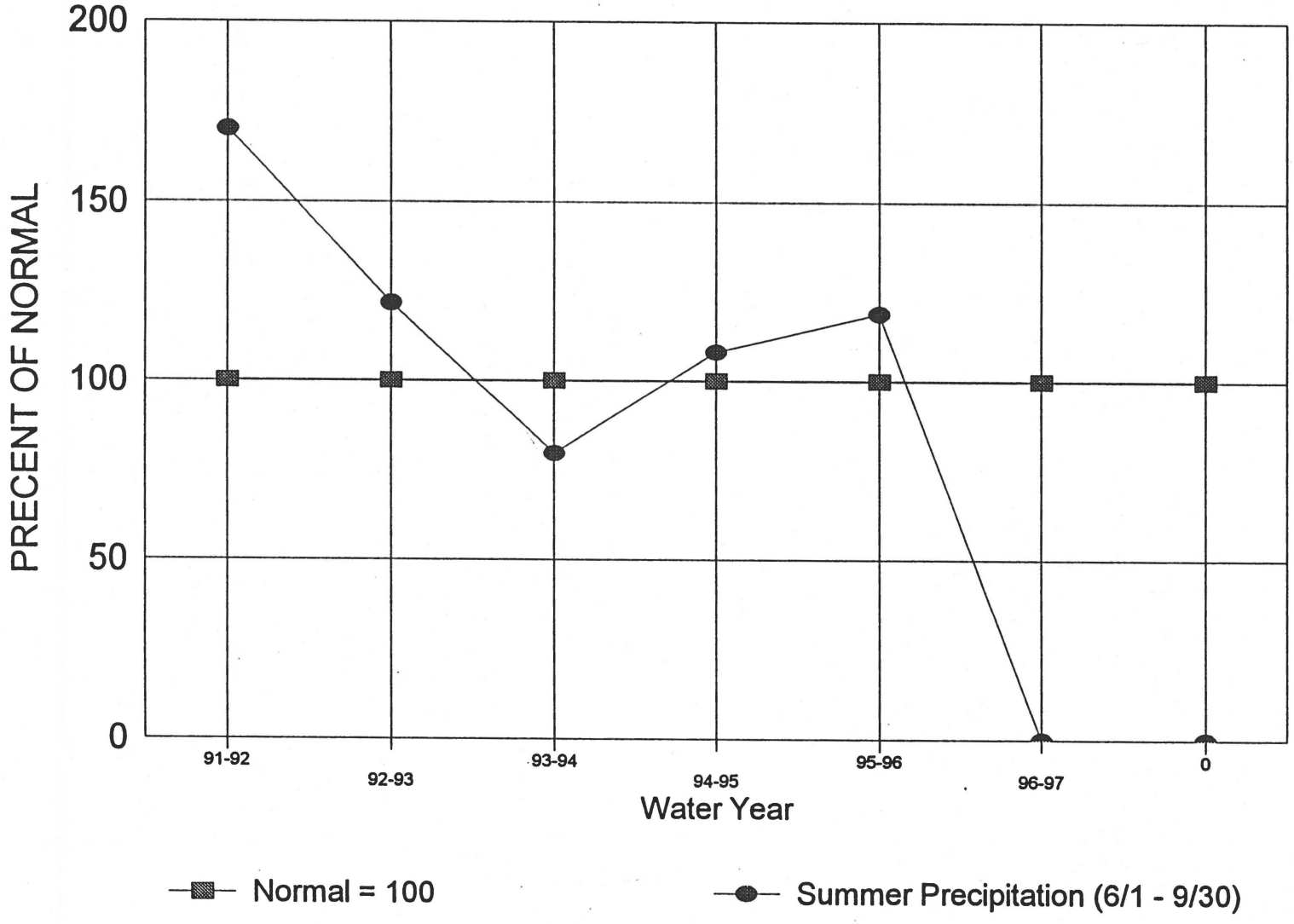
PRECIPITATION

SIDE OF MT.



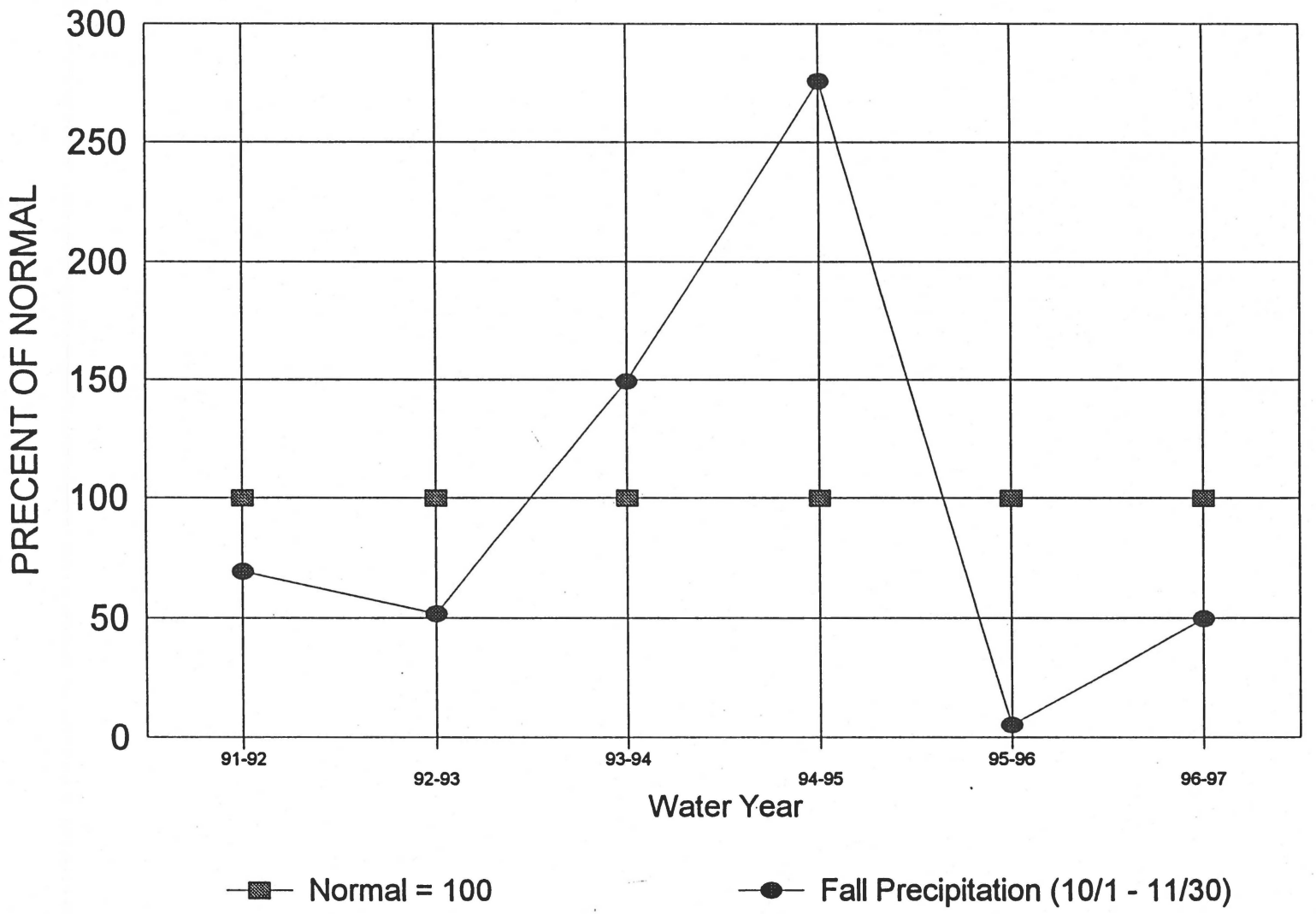
PRECIPITATION

SIDE OF MT.



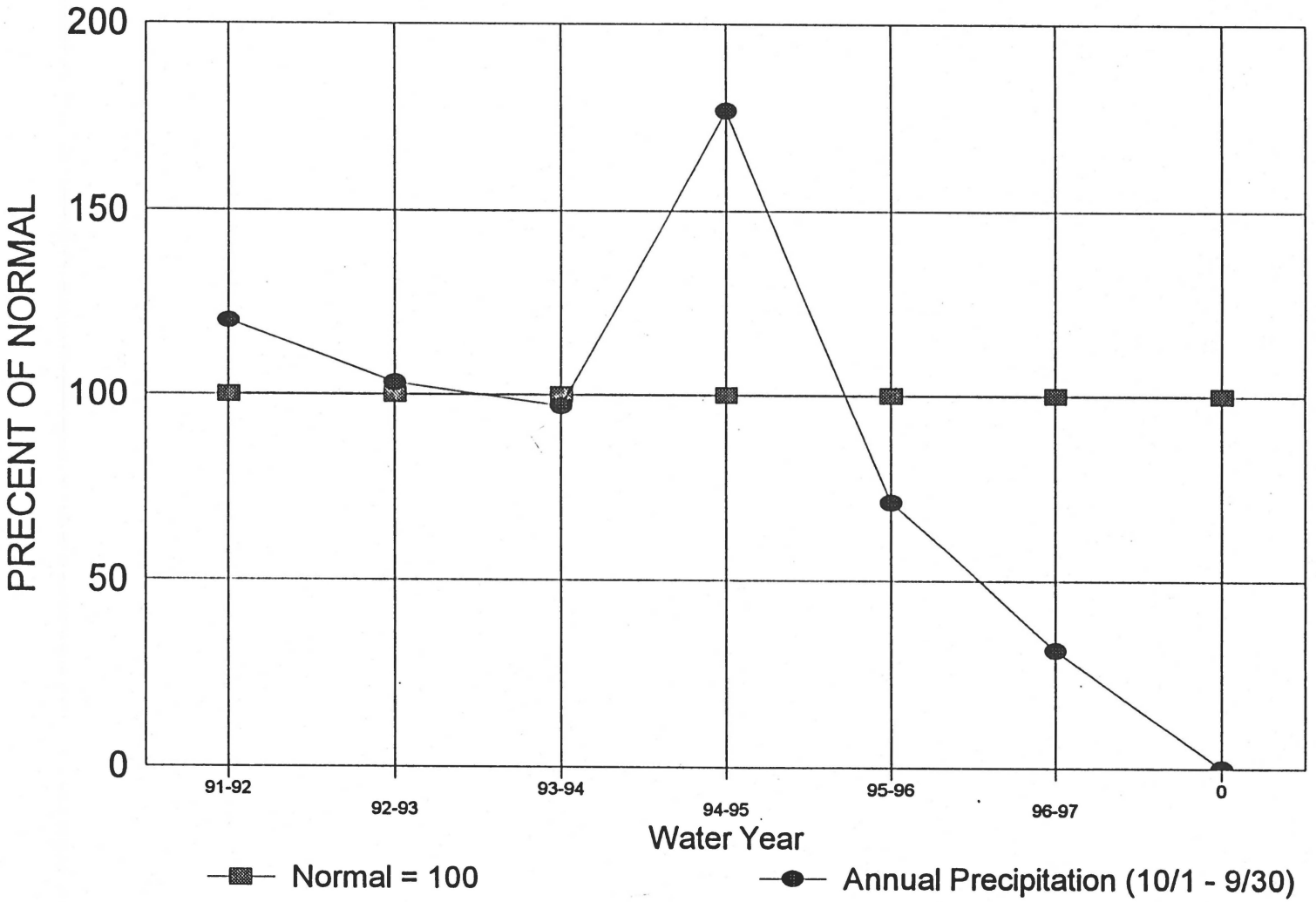
PRECIPITATION

SIDE OF MT.



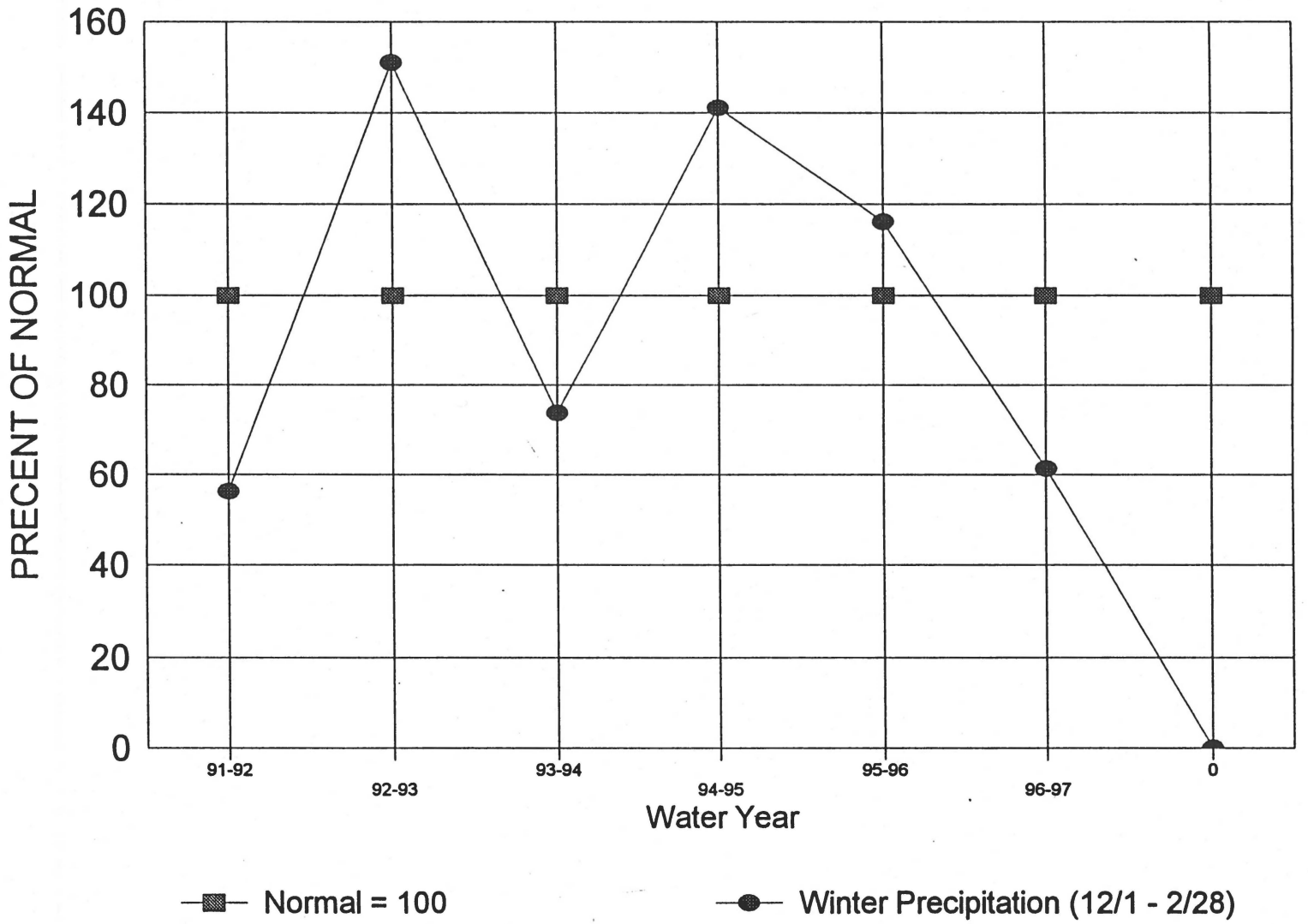
PRECIPITATION

SIDE OF MT.



PRECIPITATION

SIDE OF MT.



Key Area #7

09/09/99

VERMILLION RESOURCE AREA
UTILIZATION STUDY SUMMARY

ALLOTMENT = MT TRUMBULL | PASTURE = SIDE OF MTN | KEY AREA NUMBER = PASTURE SUMMARY

COOL SEASON GRASSES	UTILIZATION EXPRESSED AS A PERCENT USE OF EACH SPECIES FOR THE PARTICULAR YEAR READ																					AVERAGE
	1998	1996	1995	1994	1992	1991	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
ORHY	20	37	19	51	35	39	28															33
SIHY	18	46	18	32	37	41	34															32
STIPA	11	31																				21
AGCR																						
AGSM																						
AGROPY																						
ELJU																						
KOCR																						
POSE																						
CSGG																						
AVERAGE	16	38	19	42	36	40	32															32
WARM SEASON GRASSES																						
HIJA	8	31	22	22	21	19	9															20
SPCR			40	38	14	40	27															32
SPAI																						
SPNE																						
BOGR																						
BOER																						
HIRI																						
MUPO																						
TRPU																						
WSGG																						
AVERAGE	8	31	29	31	17	28	15															24
BROWSE																						
CELA																						
ATCA																						
EPNE																						
ARBI3																						
COME																						
KRPA																						
KRGR																						
CEGR																						

HYMO								
GARRYA								
AMDU								
SSSS								
AVERAGE								
AVG ALL SPECIES	15	36	24	36	26	34	21	28

PACE FREQUENCY TREND ANALYSIS

00/00/00	ALLOTMENT	MT TRUMBULL	PASTURE	SIDE OF MTN	KEY AREA	7	PAGE NUMBER	1

TREND INDEX

COVER	YEARS PLOT WERE READ											COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX BASE YEAR = 1998									
CATEGORIES	1998	1999	2001	2004	2007	2010	2013	2016	2019	2022	2025	1998	2001	2004	2007	2010	2013	2016	2019	2022	2025
Bare Ground	10	37										107									
Pers Litter	3																				
Litter																					
Rock	50	22										-63									
Live Vegetation	20	41										107									
BROWSE																					
CELA																					
ATCA2																					
EPNE		1										267									
ATCO																					
ARBI3																					
COMI																					
PUTR																					
PUGL																					
AMUT																					
ARFI																					
ARAR8																					
ARFR4																					
MESC2																					
QUGA																					
KRPA																					
KRGR																					
GRSP																					
AMDU2																					
AMAL2																					
ACGR																					
CEGR																					
SINCELA																					
PRFA																					
PETH2																					
MESP																					
OTHERBROWS																					
TOTALS		1										267									
DESIRABLE GRASSES Cool Season																					
ORHY	25	8										-67									
SIHY	23	46										100									
STIPA	25	49										101									
AGCR																					
AGSM																					
SEEDED																					
ELYMUS																					
KOCR																					
POA																					
OTHER COOL SEASON GRASSES																					
TOTALS	72	105										46									
Warm Season																					
HIJA	167	95										-43									
HIRI																					
SPCR	7	1										-86									
SPNE																					
BOGR	72	29										-60									
BOER																					
BOCU		1										267									
SPAI																					
MUPU2																					
MUTO2																					
MUPO2																					
SPORO																					
SPCO																					
OTHER WARM SEASON GRASSES																					
TOTALS	246	126										-49									
DESIRABLE TOTAL	318	233										-27									

PACE FREQUENCY TREND ANALYSIS CONTINUED PAGE NUMBER 2

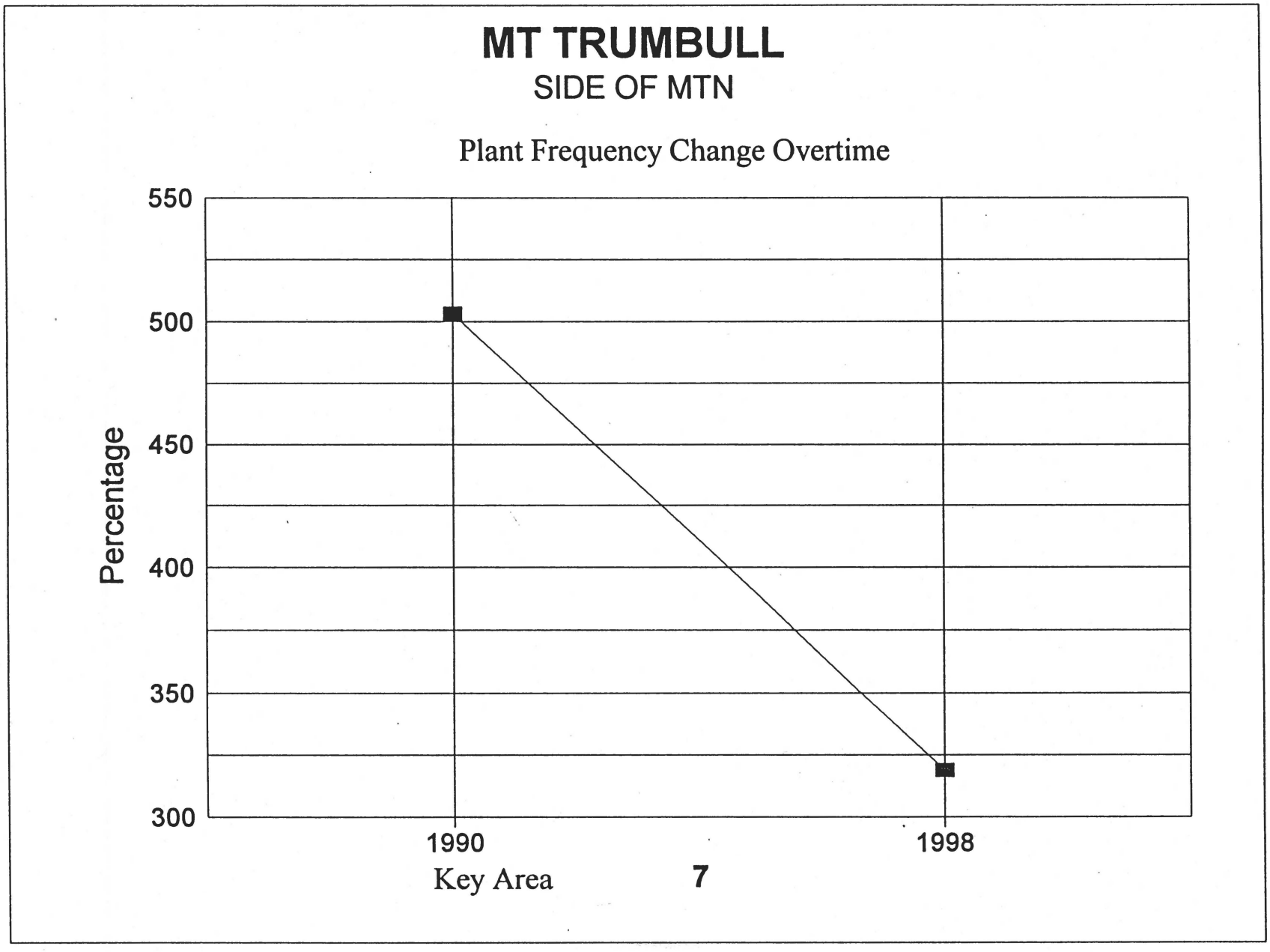
09/09/99 ALLOTMENT MT TRUMBULL PASTURE SIDE OF MTN KEY AREA 7

TREND INDEX
COMPARES DATA FROM THIS YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX
BASE YEAR = 1999

COVER CATEGORIES	YEARS PLOT WERE READ 1999	1999	2001	2004	2007	2010	2013	2016	2019	2022	2025	1999	2001	2004	2007	2010	2013	2016	2019	2022	2025
OTHER SHRUBS																					
QUSA2	126	26										-79									
CHVI8	21	9										-58									
CHRYSO																					
CORA																					
ARTR2	3																				
OPUNT		2										400									
LYAN																					
LYCIU																					
CHNA																					
ERIOG_SHRB		1										267									
HAPP_ACAMP																					
POIN																					
TETRA																					
ARLU																					
SAVE																					
YUCCA																					
PEPU7																					
SENECIO																					
JUOS	5	7										36									
PEID																					
FAPA																					
RHTR																					
QUTU																					
SPTO																					
SPVI																					
BERBERIS																					
DAFR																					
HYSA																					
ERAN2																					
YUBR																					
LATRT																					
PSCO2		7										1333									
PROLT																					
THMO																					
ATHY																					
MOUT																					
GAFL2																					
OTHERSHRUB																					
TOTALS	156	53										-66									
OTHER GRASSES																					
ARIST																					
ARLO	26	9										-64									
SCBR																					
TRPU																					
TRMU																					
PPGG																					
TOTALS	26	9										-64									
FORBS																					
ASTRA		1										267									
SAKA																					
SPHAE		2										400									
AAFF																					
AAGG		9										1067									
ERIOG		8										1600									
PENST																					
PLANTAGO																					
ERIGERON																					
MUSTARD																					
PPFF	3	5										67									
SENEC																					
SPURGE		1										267									
ASTER																					
DAISY																					
AMSIN																					
PHACE																					
ERCH																					
TOTALS	3	23										812									
PLANT TOTALS	185	86										-54									

MT TRUMBULL

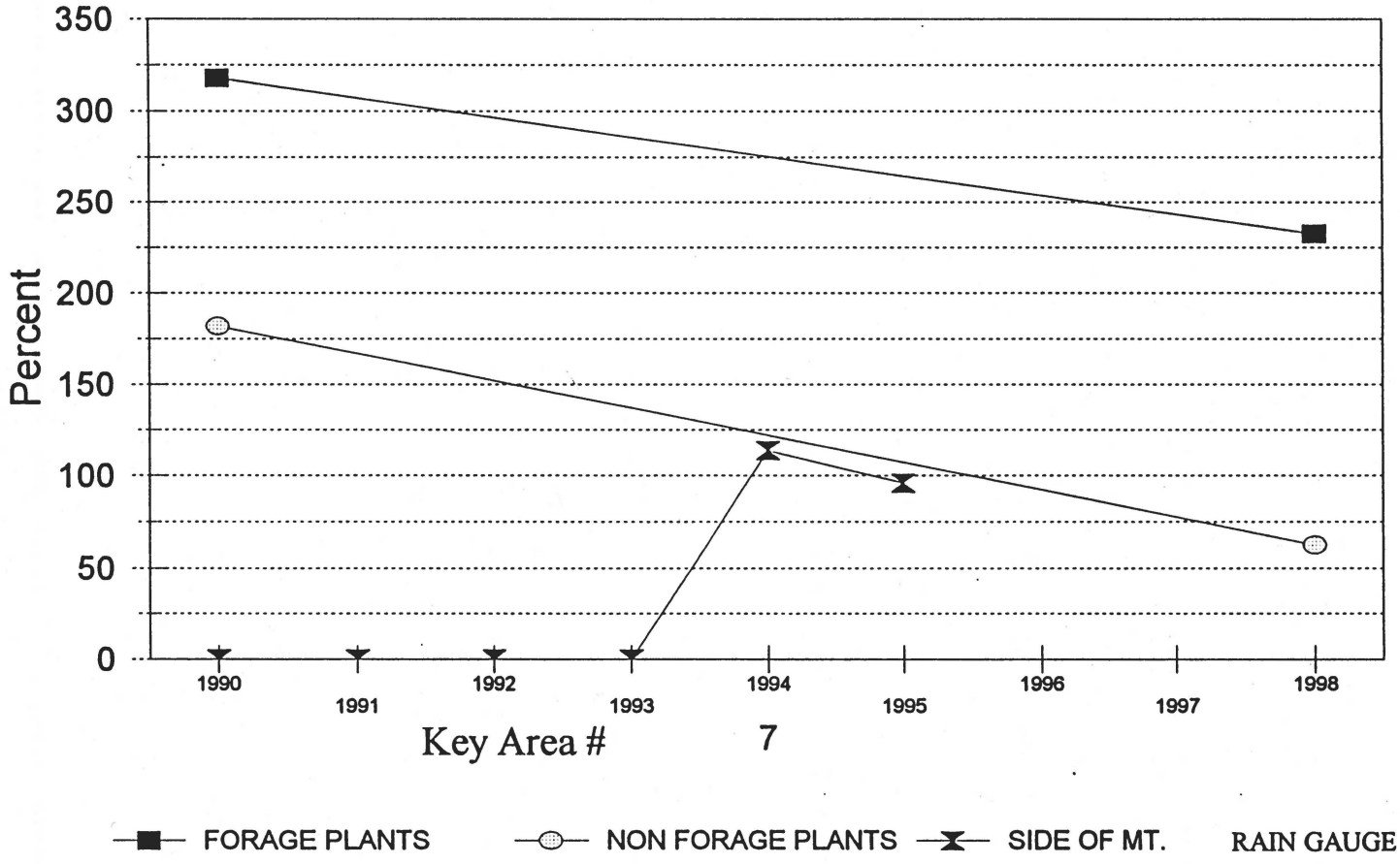
SIDE OF MTN



MT TRUMBULL

SIDE OF MTN

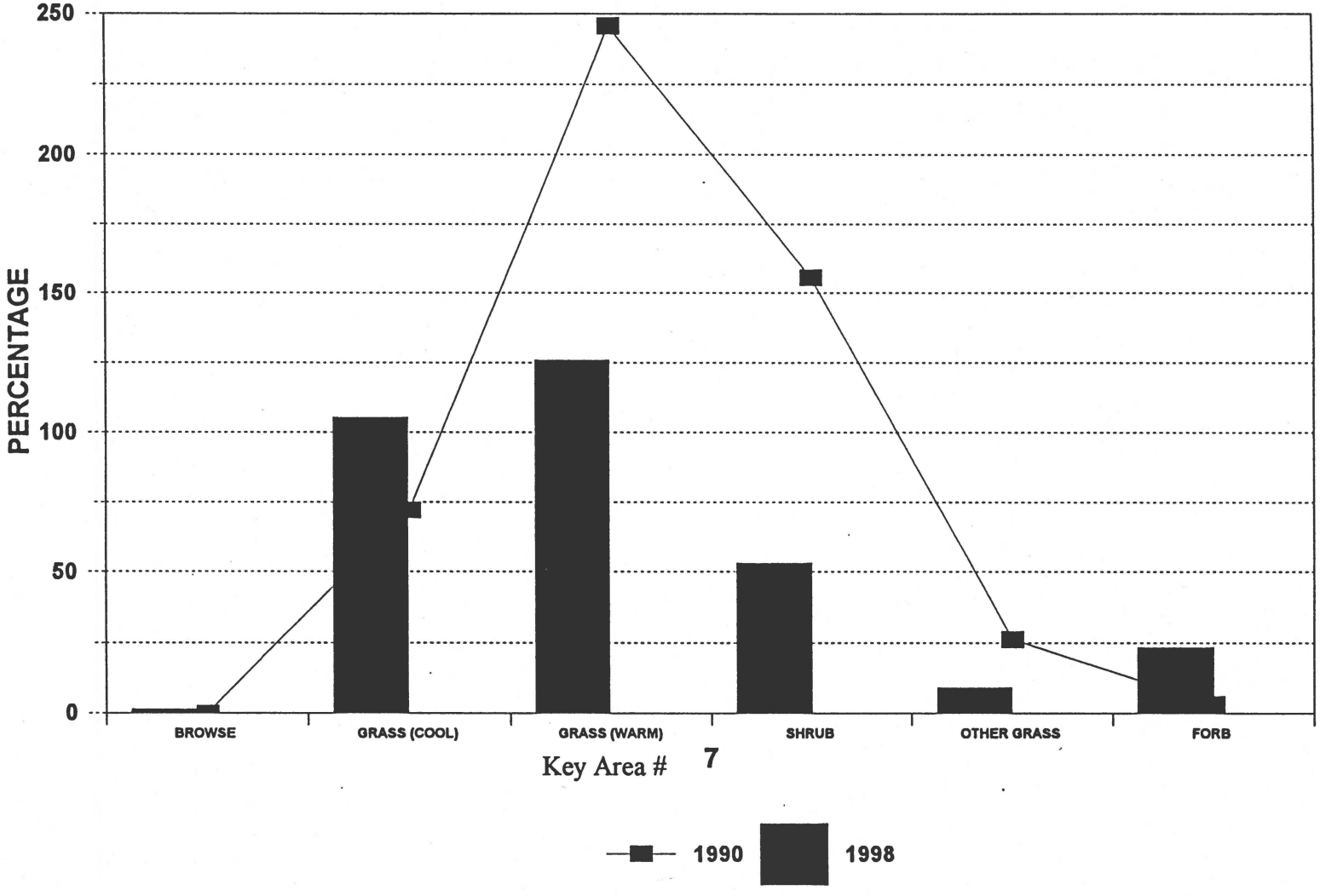
Compares Forage to Non-Forage Plants by years plots were read & the 5 year average Annual Precipitation



MT TRUMBULL

SIDE OF MTN

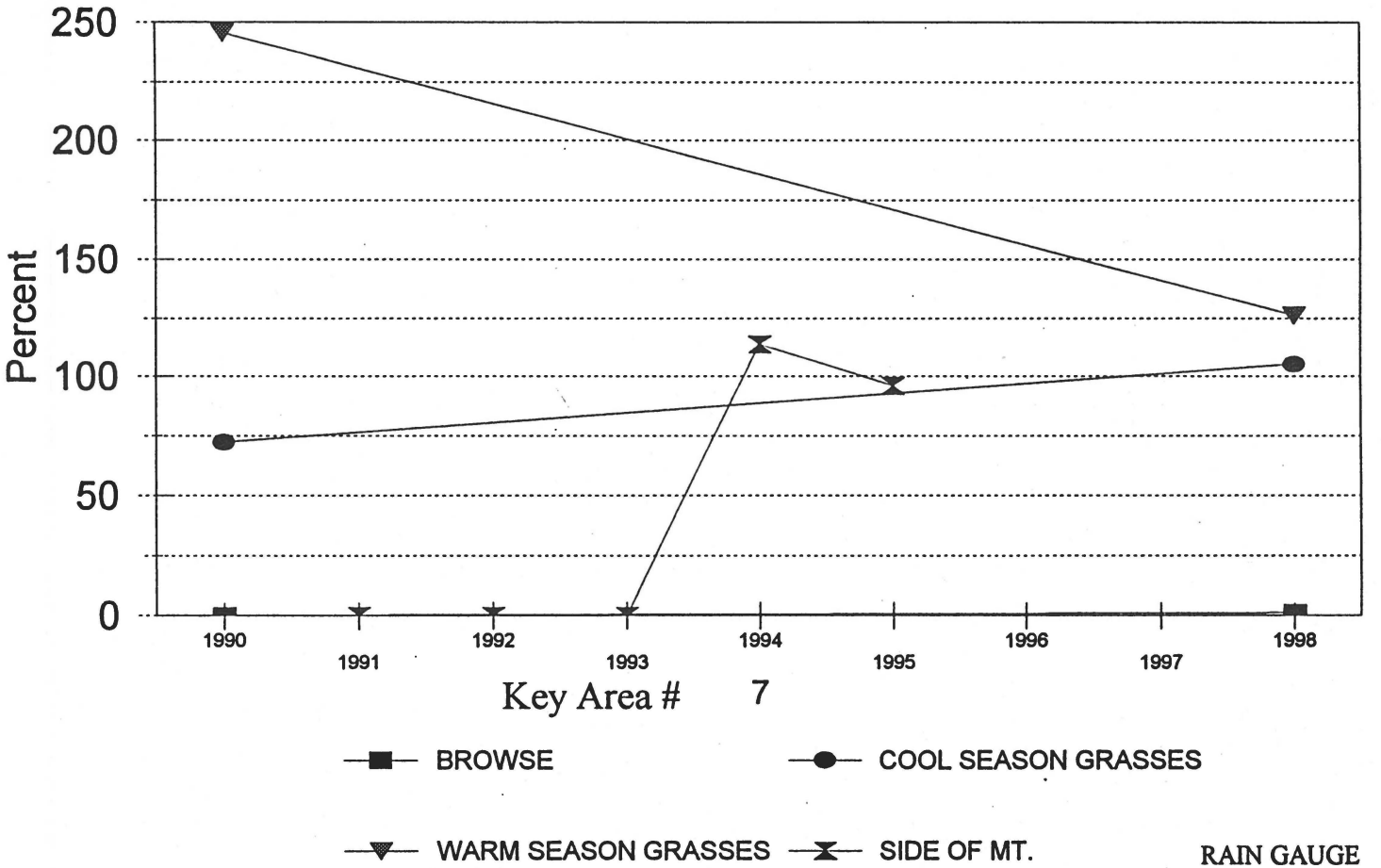
KEY AREA INDEX CHANGE COMPARED TO FIRST YEAR



MT TRUMBULL

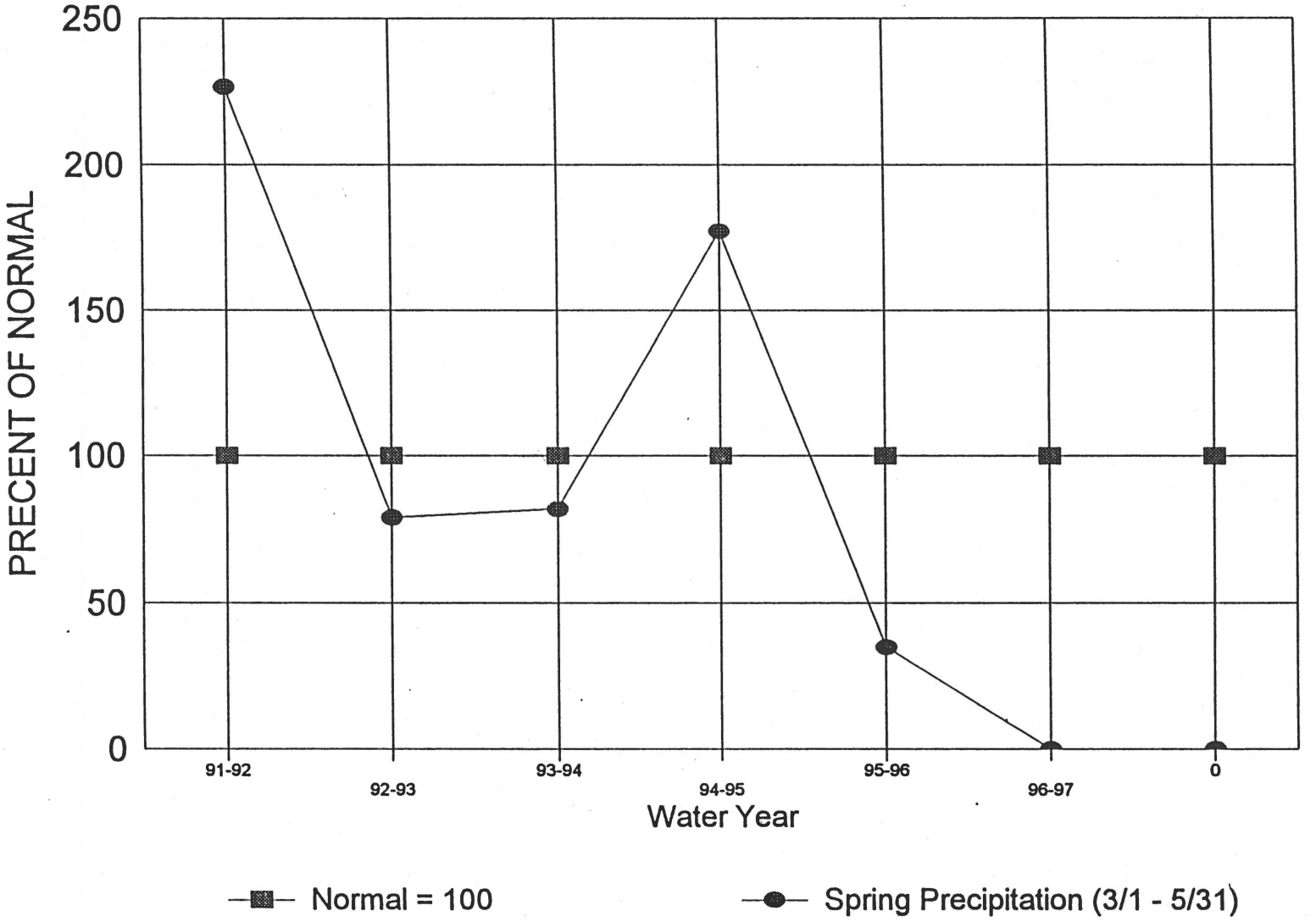
SIDE OF MTN

Plant Category changes overtime & the 5 year average Annual Precipitation



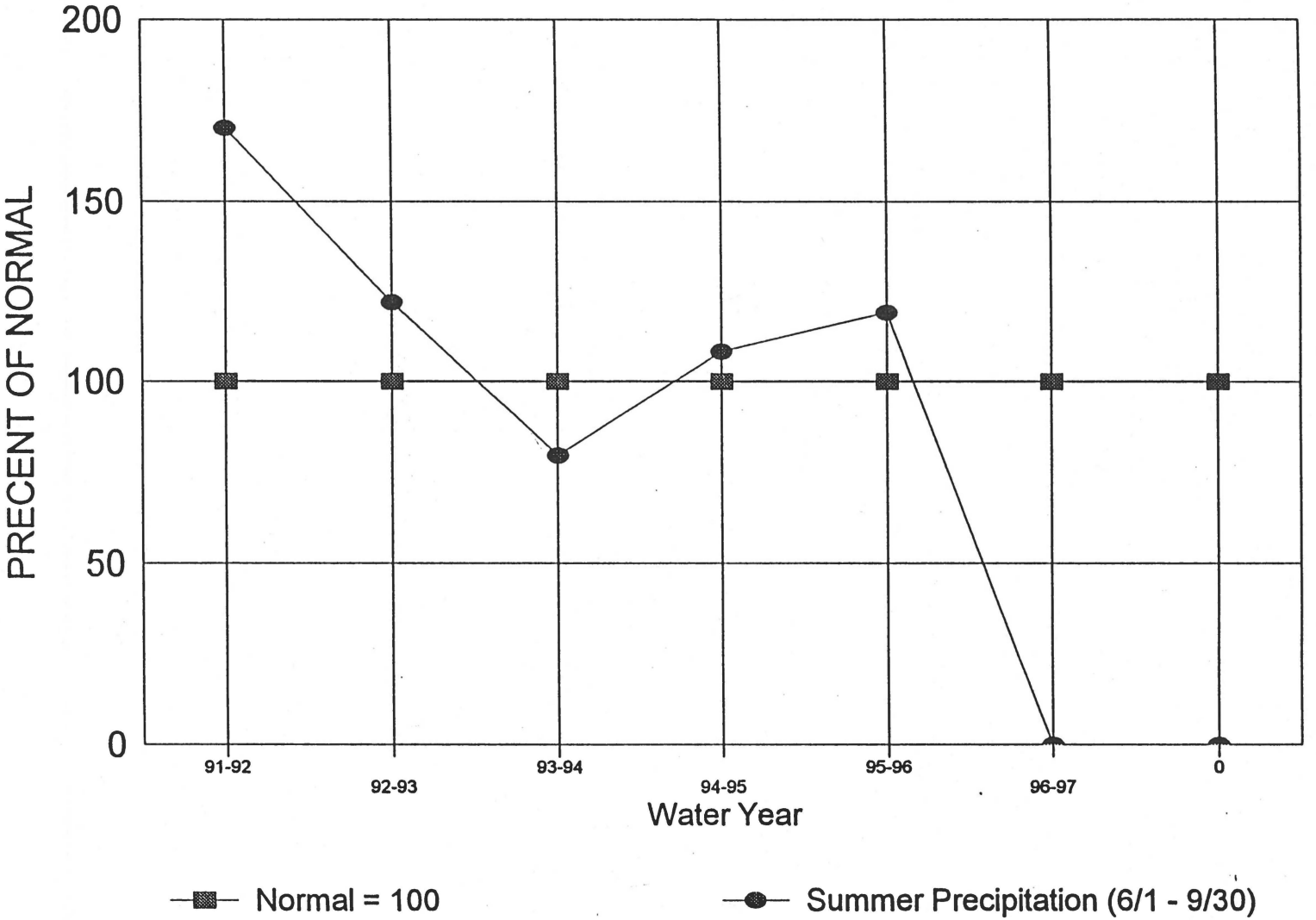
PRECIPITATION

SIDE OF MT.



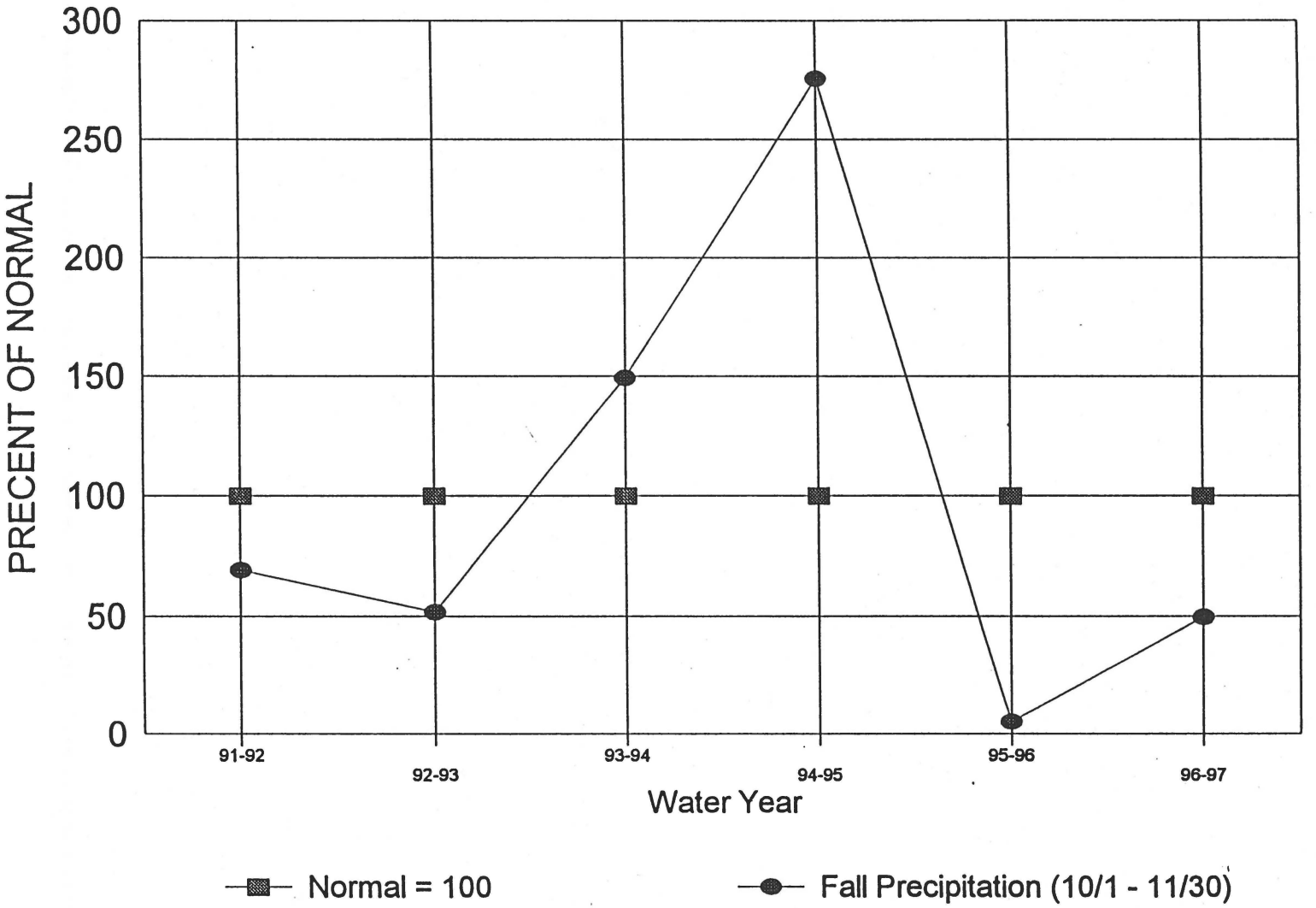
PRECIPITATION

SIDE OF MT.



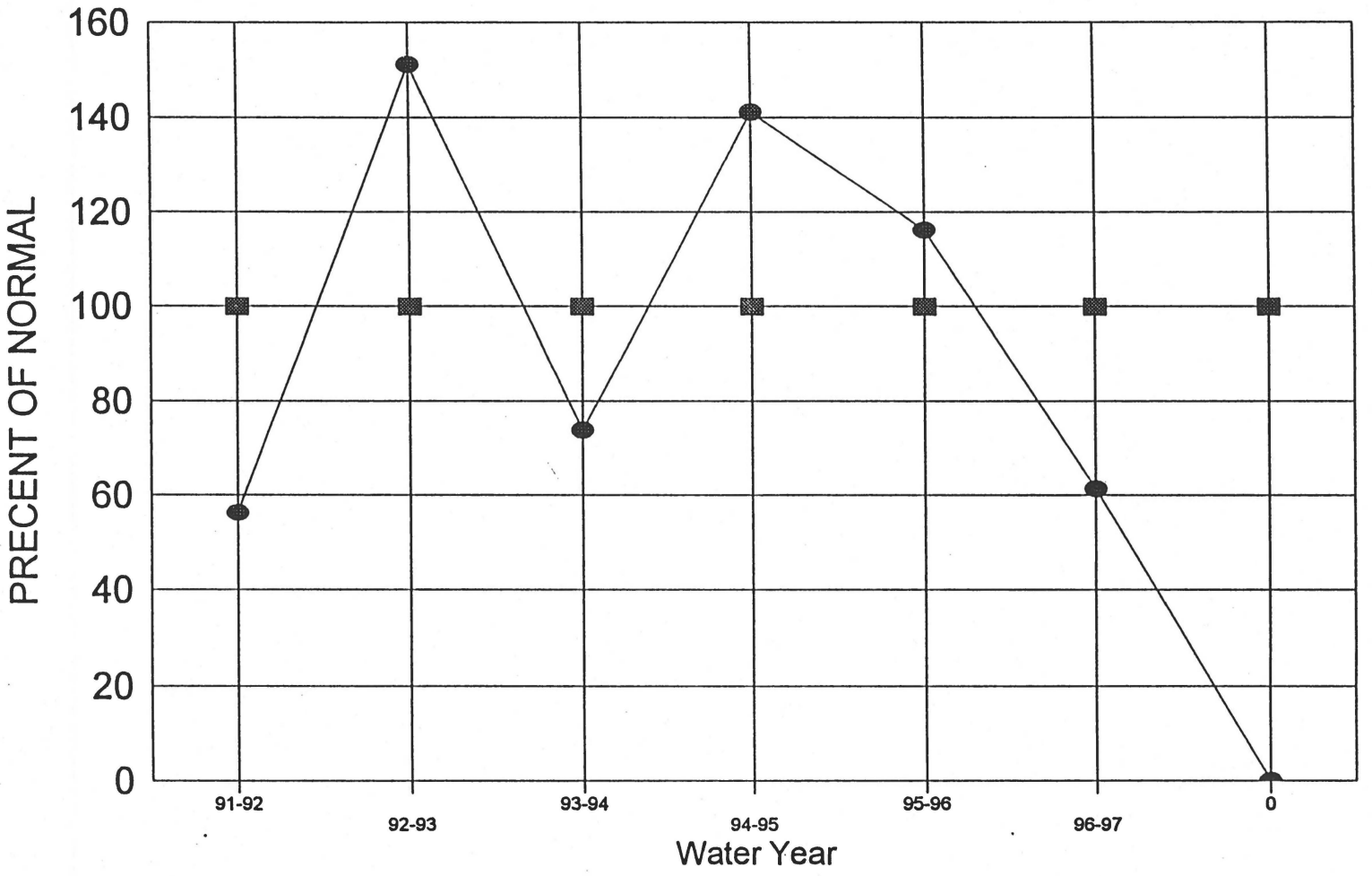
PRECIPITATION

SIDE OF MT.



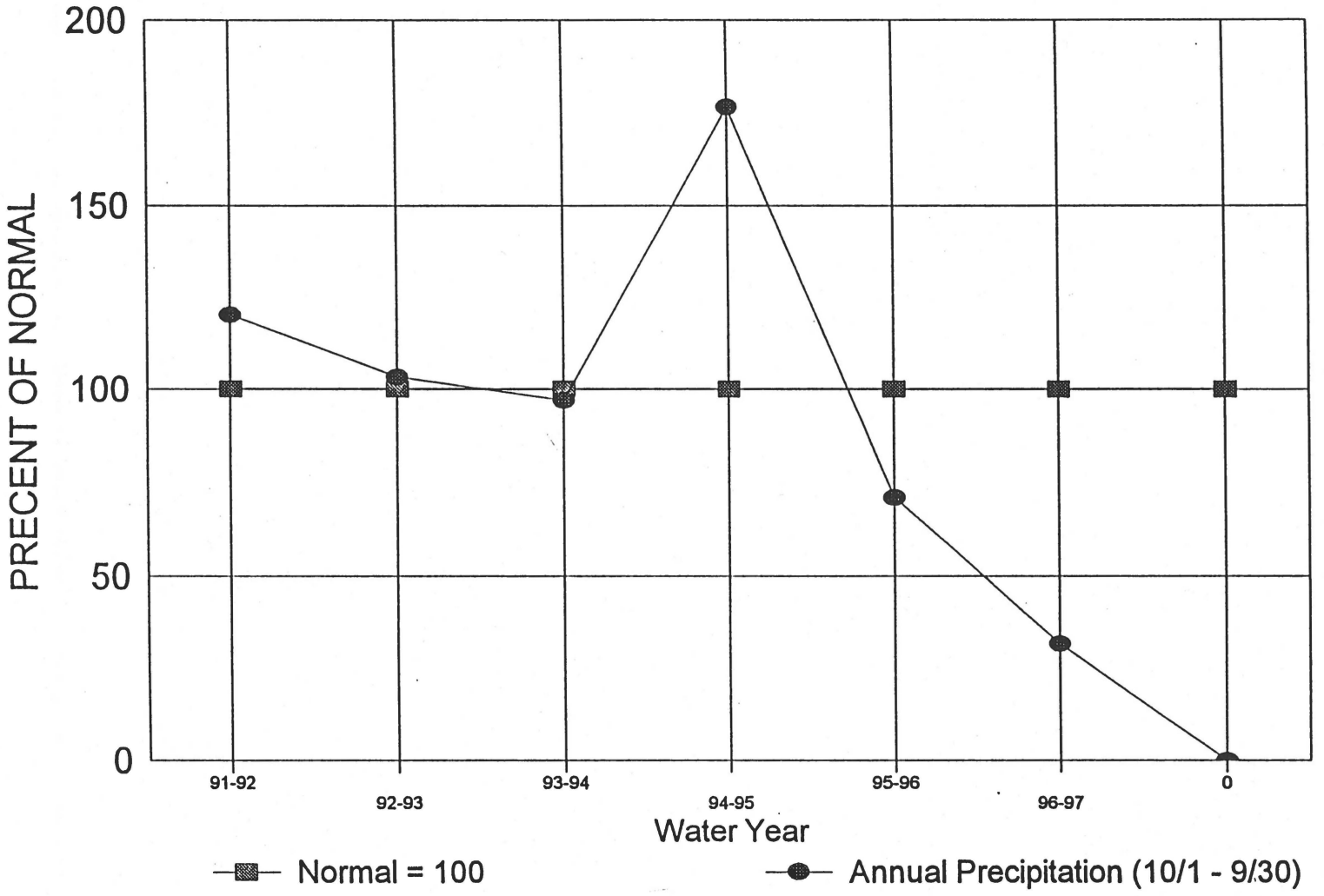
PRECIPITATION

SIDE OF MT.



PRECIPITATION

SIDE OF MT.



Key Area #8

09/09/99

VERMILLION RESOURCE AREA

UTILIZATION STUDY SUMMARY

ALLOTMENT = MT TRUMBULL	PASTURE = FROG&CANE	KEY AREA NUMBER = PASTURE SUMMARY	

COOL SEASON GRASSES	UTILIZATION EXPRESSED AS A PERCENT USE OF EACH SPECIES FOR THE PARTICULAR YEAR READ																				
	1999	1998	1997	1996	1995	1994	1993	1990	0	0	0	0	0	0	0	0	0	0	0	0	AVERAGE
ORHY																					
SIHY																					
STIPA																					
AGCR																					
AGSM																					
AGROPY																					
ELJU																					
KOCR																					
POSE																					
CSGG																					
AVERAGE																					
WARM SEASON GRASSES																					
HIJA																					
SPCR																					
SPAI																					
SPNE																					
BOGR																					
BOER	53	42	22	42	41	36	41	66													45
HIRI	51	36	47	45	42	41	36	59													44
MUPO	43	46	42	36	34	35	25	78													40
TRPU																					
WSGG																					
AVERAGE	50	40	40	41	39	39	36	63													44
BROWSE																					
CELA																					
ATCA																					
EPNE	51	46	52	55	49	41	40	63													48
ARBI3																					
COME																					
KRPA																					
KRGR																					
CEGR																					

HYMO									
GARRYA									
AMDU									
SSSS									
AVERAGE	51	46	52	55	49	41	40	63	48
AVG ALL SPECIES	50	42	43	44	41	39	37	63	45

PACE FREQUENCY TREND ANALYSIS

09/09/99	ALLOTMENT	MT TRUMBULL	PASTURE	FROG & CANE	KEY AREA	8	PAGE NUMBER	1

COVER	YEARS PLOT WERE READ											TREND INDEX COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX BASE YEAR = 1999										
CATEGORIES	1999	1993	1996	1999	2002	2005	2008	2011	2014	2017	2020	1993	1996	1999	2002	2005	2008	2011	2014	2017	2020
Bare Ground	91																				
Pers Litter	4																				
Litter																					
Rock	4																				
Live Vegetation	2																				
BROWSE																					
CELA																					
ATCA2																					
EPNE	11																				
ATCO																					
ARBI3																					
COME																					
PUTR																					
PUGL																					
AMUT																					
ARFI																					
ARAR8																					
ARFR4																					
MESC2																					
QUGA																					
KRPA																					
KRGR																					
ORSP																					
AMDU2																					
AMAL2																					
ACGR																					
CEOR																					
ENCELA																					
PRFA																					
PETH2																					
MESP																					
OTHERBROWS																					
TOTALS	11																				
DESIRABLE GRASSES Cool Season																					
ORHY	2																				
EHY																					
STIPA																					
AGCR																					
AGSM																					
SEEDED																					
ELYMUS																					
XOCR																					
POA																					
OTHER COOL SEASON GRASSES																					
TOTALS	2																				
Warm Season																					
HIJA																					
HIRI	12																				
SPCR	6																				
SPNE																					
BOGR																					
BOER	7																				
BOCU																					
SPAI																					
MUPU2																					
MUTO2																					
MUPO2	2																				
SPORO																					
SPCO																					
OTHER WARM SEASON GRASSES																					
TOTALS	27																				
DESIRABLE TOTAL	41																				

PACE FREQUENCY TREND ANALYSIS CONTINUED PAGE NUMBER 2

09/09/99 ALLOTMENT MT TRUMBULL PASTURE FROG & CANE KEY AREA 8

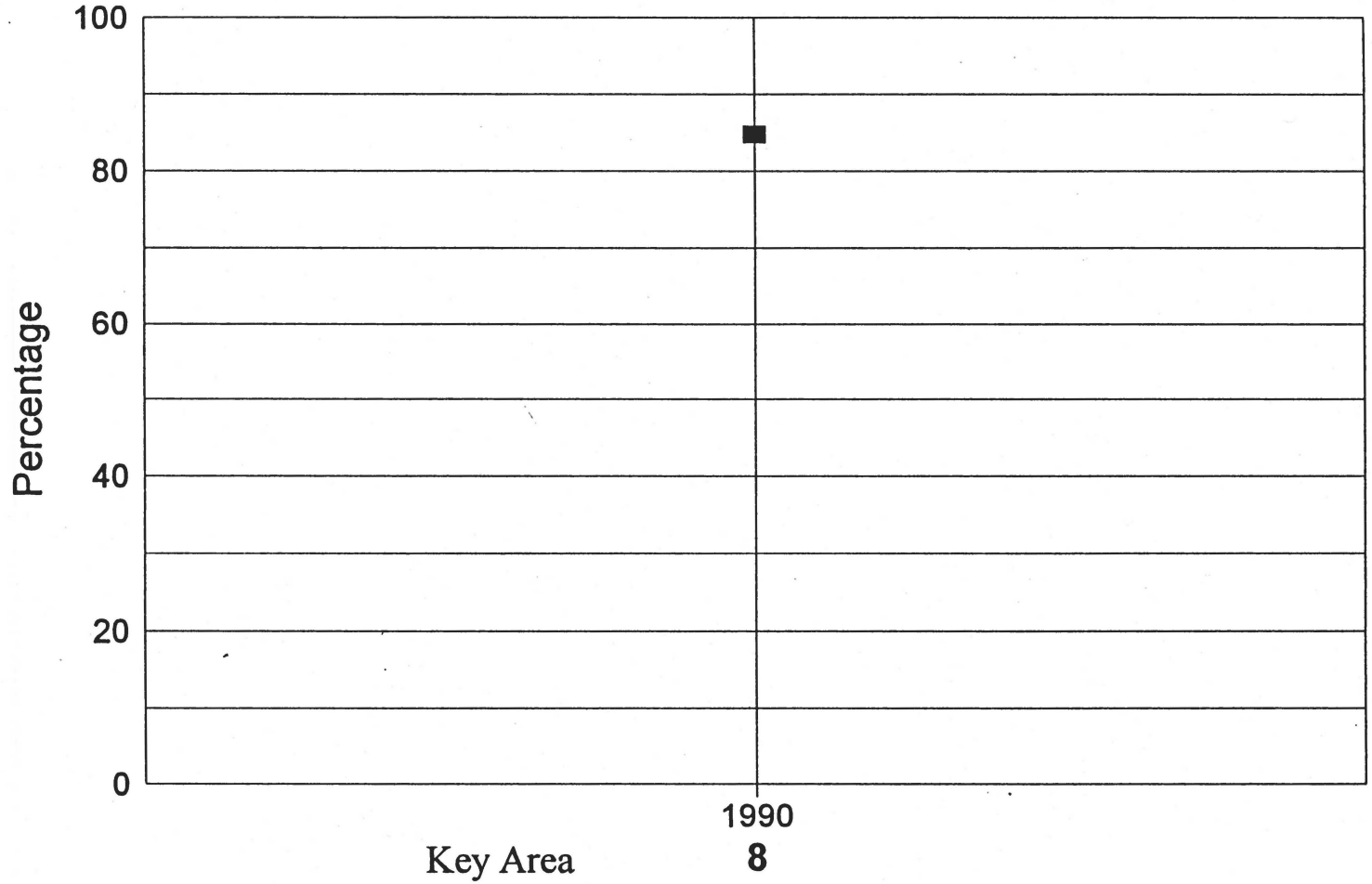
TREND INDEX
COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX
BASE YEAR = 1999

COVER CATEGORIES	YEARS PLOT WERE READ 1999	1993	1996	1999	2002	2005	2008	2011	2014	2017	2020	1993	1996	1999	2002	2005	2008	2011	2014	2017	2020
OTHER SHRUBS																					
GUSA2	15																				
CHVI8																					
CHRYSO	1																				
CORA																					
ARTR2	9																				
OPUNT	3																				
LYAN	2																				
LYCIU																					
CHNA																					
ERIOG_SHRB																					
HAPP_ACAMP																					
POIN																					
TETRA																					
ARLU																					
SAVE																					
YUCCA	5																				
PEPU7																					
SENECIO																					
JUOS																					
PEID																					
ZAPA																					
RHTR																					
QUTU																					
EPTO																					
EPVI																					
BERBERIS																					
DAFR																					
HYSA																					
ERAN2																					
YUBR																					
LATRT																					
PSCO2																					
PRGLT																					
THMO																					
ATHY																					
MOUT																					
GAFL2																					
OTHERSHRUB																					
TOTALS	30																				
OTHER GRASSES																					
ARIST																					
ARLO	1																				
SCBR																					
TRPU	2																				
TRMU																					
PPGG																					
TOTALS	4																				
FORBS																					
ASTRA																					
SAKA																					
SPHAE	2																				
AAFF																					
AAGG																					
ERIOG																					
PENST																					
PLANTAGO																					
ERIGERON																					
MUSTARD																					
PPFF	2																				
SENEC																					
SPURGE																					
ASTER																					
DAISY																					
AMSIN																					
PHACE																					
ERCH																					
TOTALS	5																				
PLANT TOTALS	44																				

MT TRUMBULL

FROG & CANE

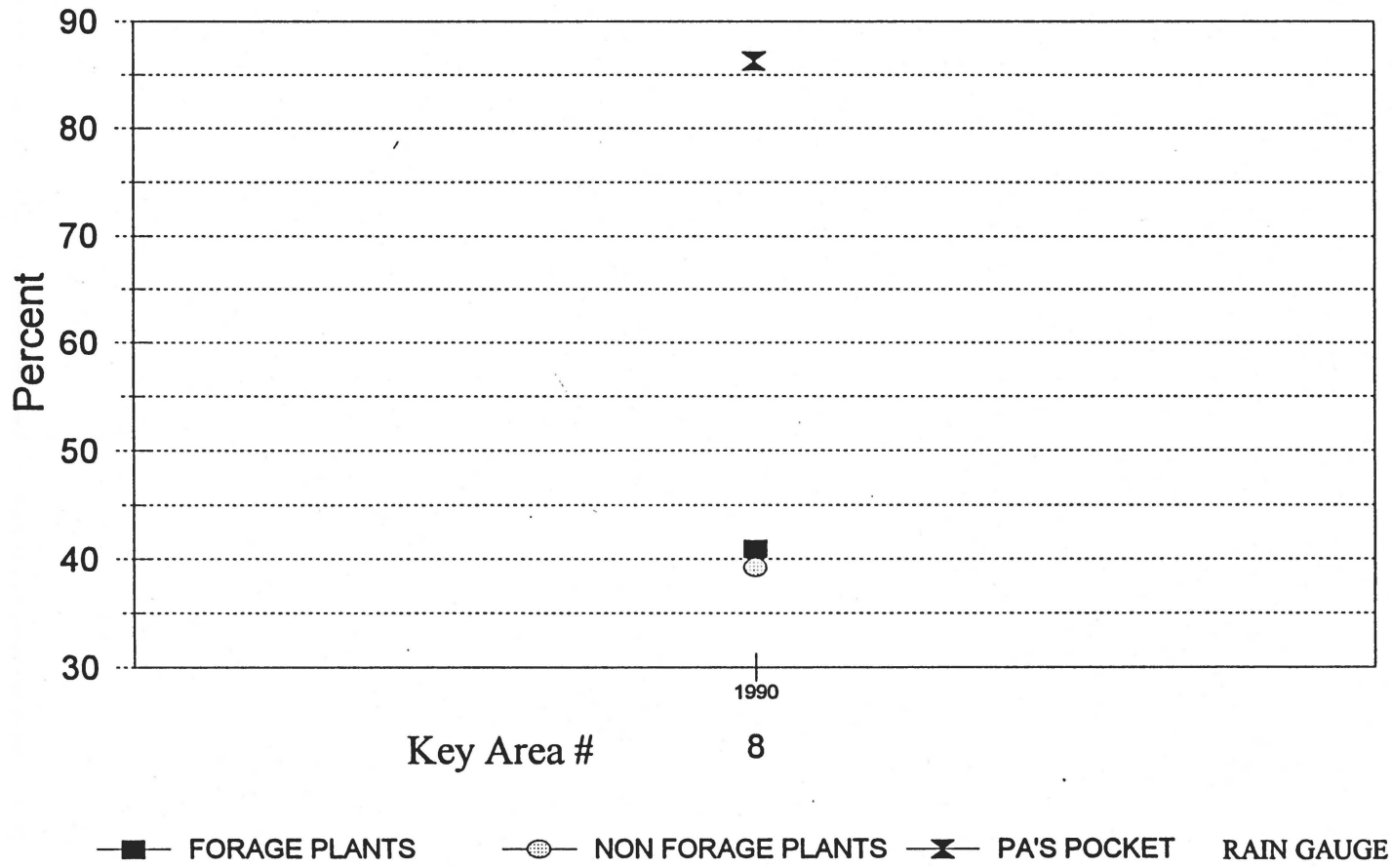
Plant Frequency Change Overtime



MT TRUMBULL

FROG & CANE

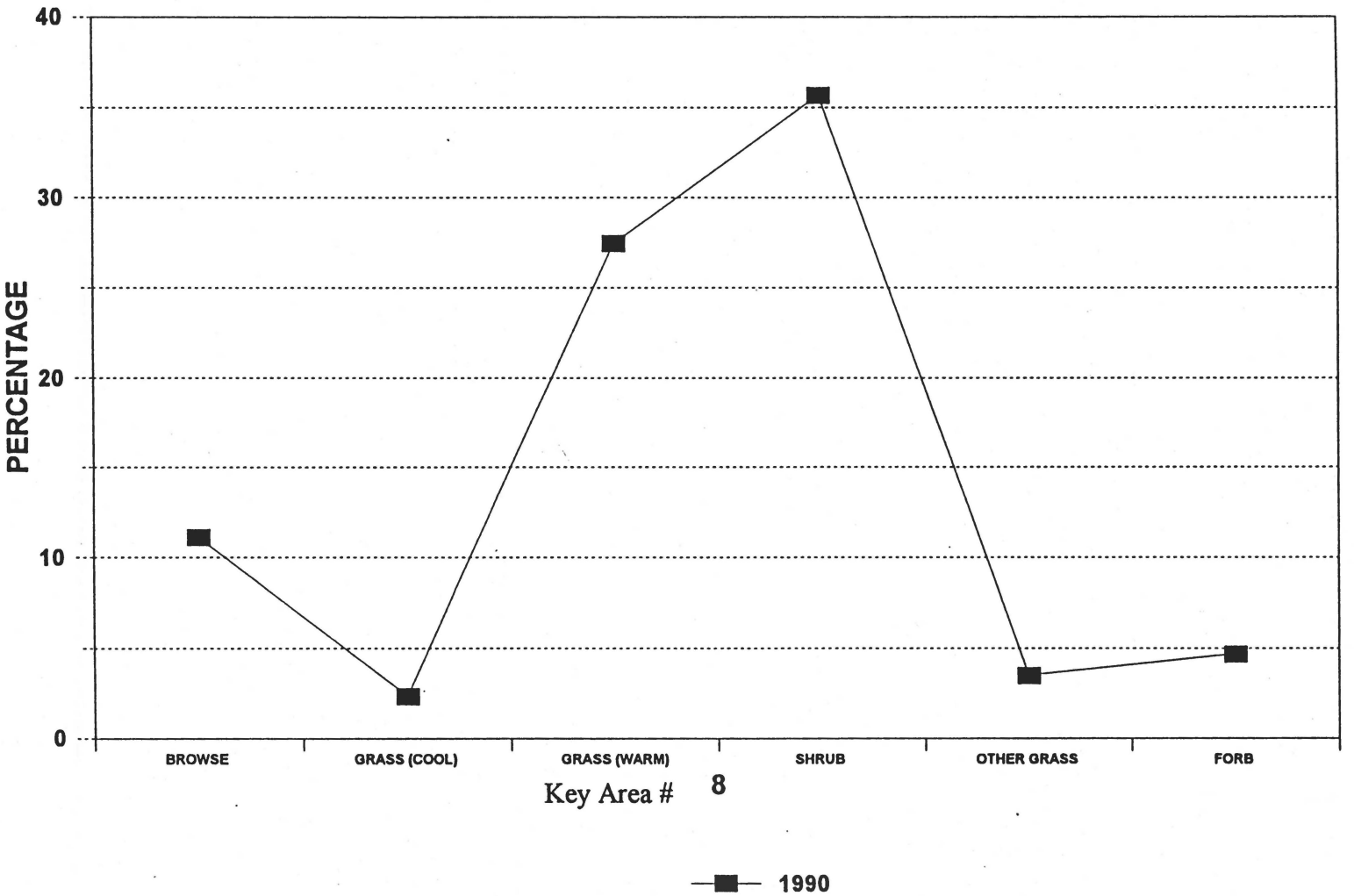
Compares Forage to Non-Forage Plants by years plots were read & the 5 year average Annual Precipitation



MT TRUMBULL

FROG & CANE

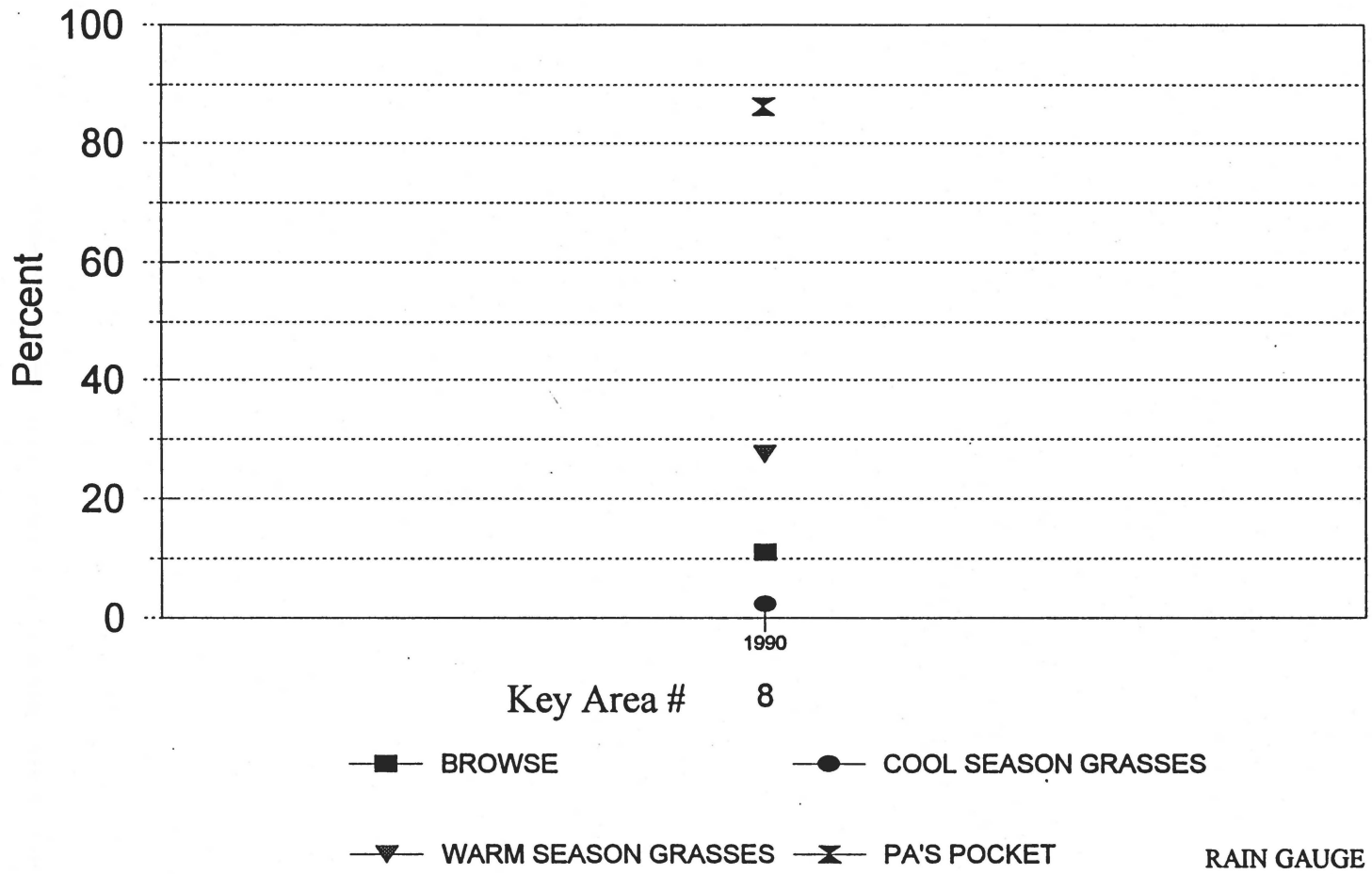
KEY AREA INDEX CHANGE COMPARED TO FIRST YEAR



MT TRUMBULL

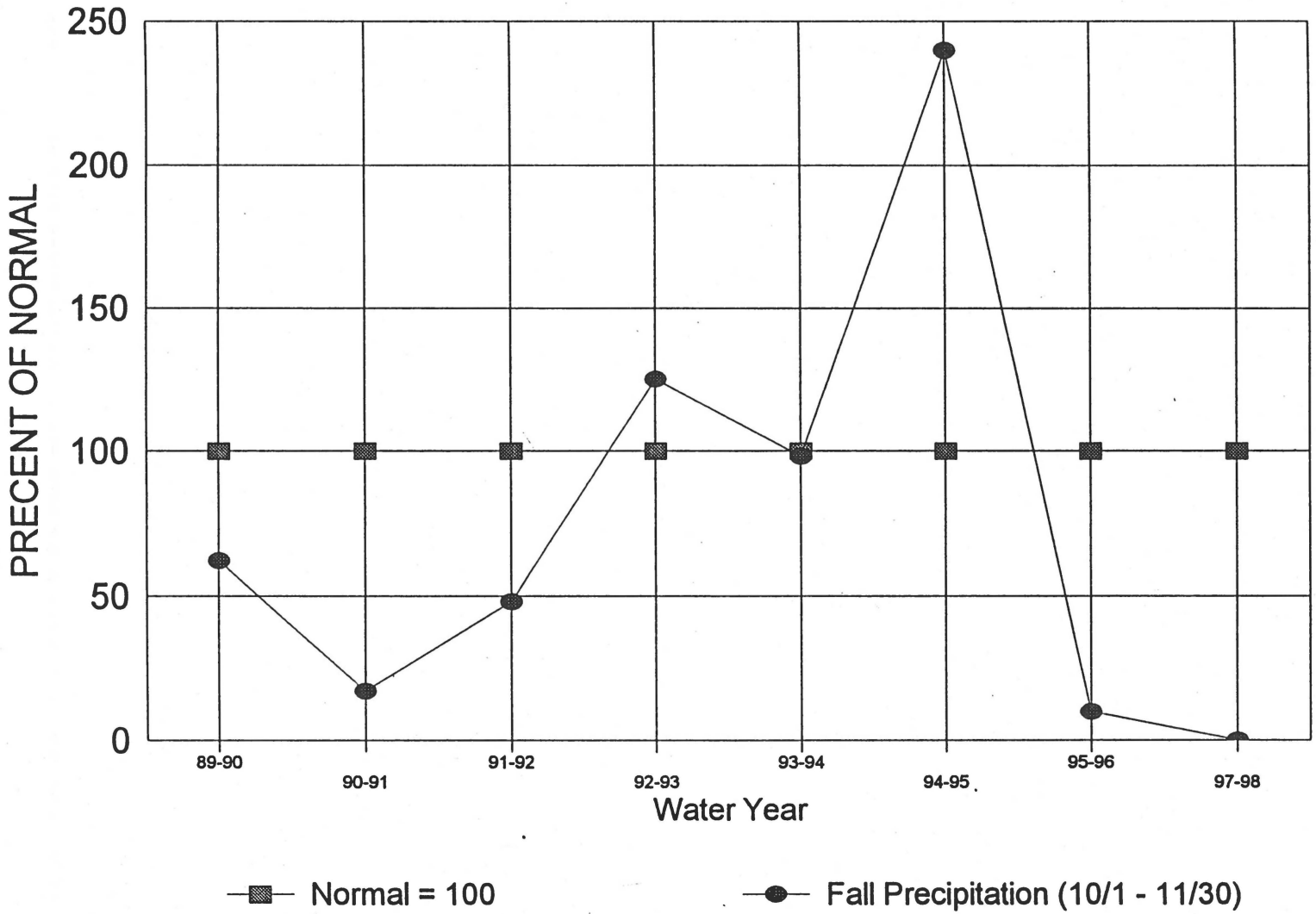
FROG & CANE

Plant Category changes overtime & the 5 year average Annual Precipitation



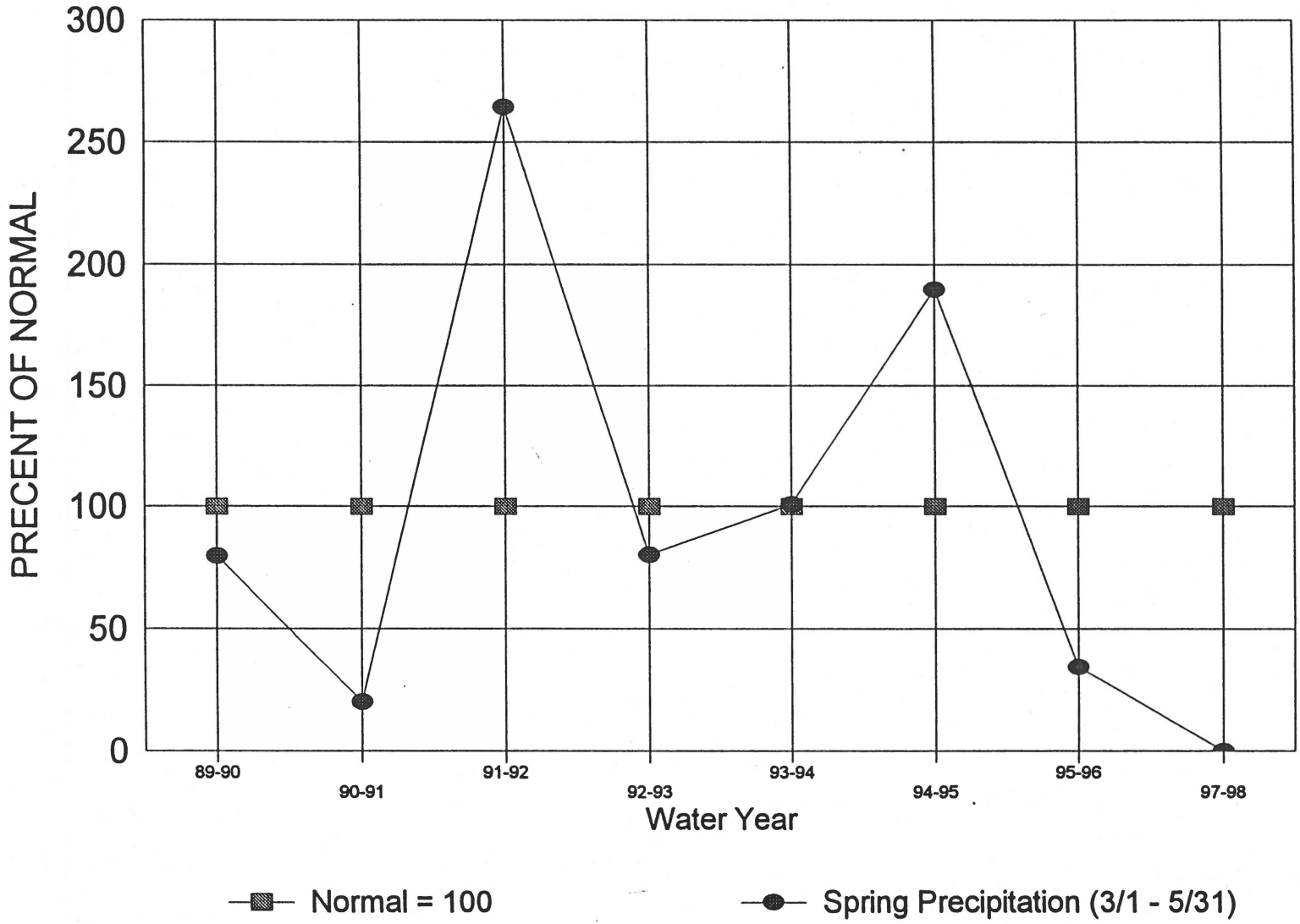
PRECIPITATION

PA'S POCKET



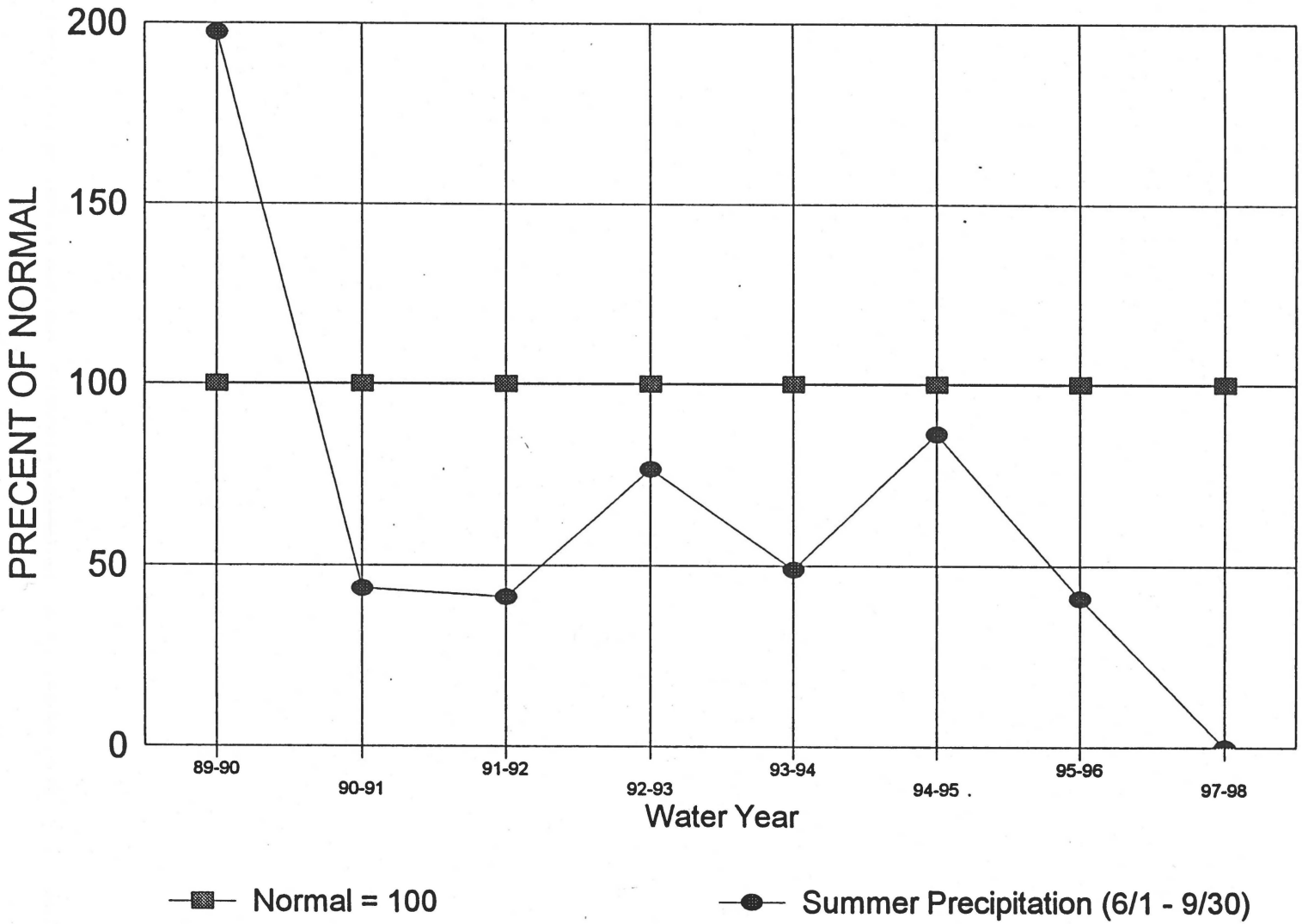
PRECIPITATION

PA'S POCKET



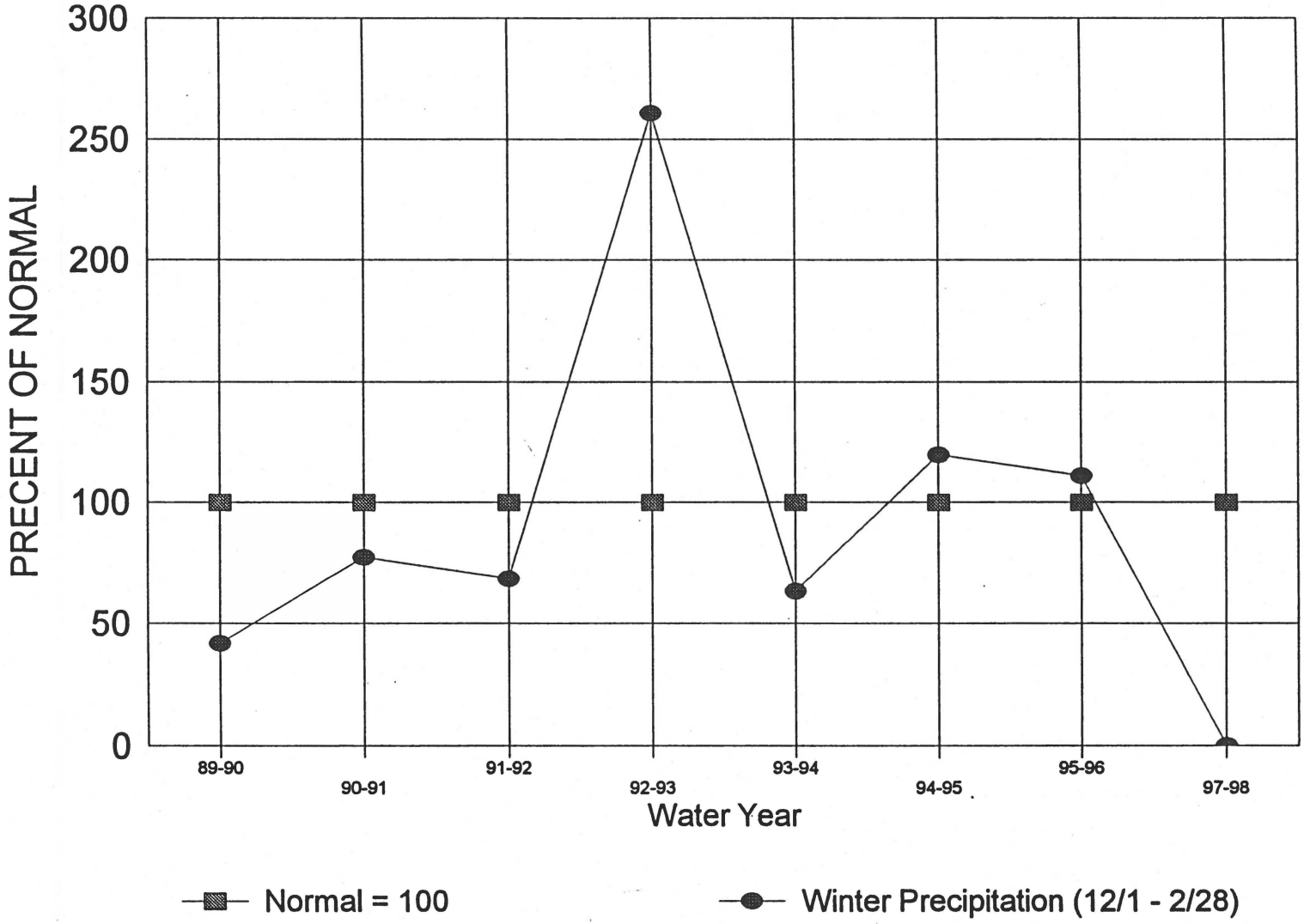
PRECIPITATION

PA'S POCKET



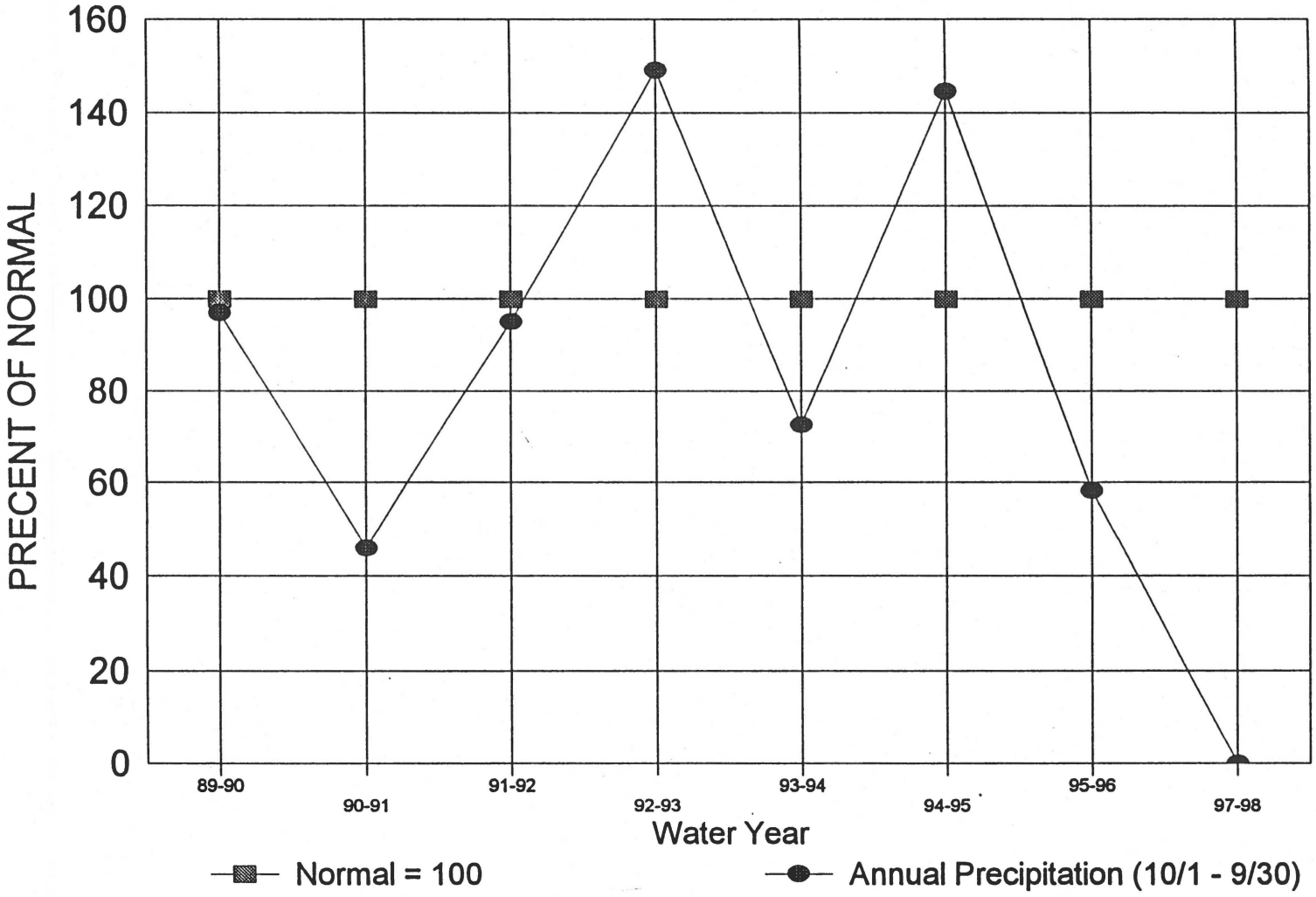
PRECIPITATION

PA'S POCKET



PRECIPITATION

PA'S POCKET



Key Area #9

09/09/99

VERMILLION RESOURCE AREA
UTILIZATION STUDY SUMMARY

ALLOTMENT = MT TRUMBULL | PASTURE = SO STOCKADE | KEY AREA NUMBER = PASTURE SUMMARY

COOL SEASON GRASSES	UTILIZATION EXPRESSED AS A PERCENT USE OF EACH SPECIES FOR THE PARTICULAR YEAR READ																				
	1998	1996	1995	1994	1993	1992	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	AVERAGE
ORHY	43	48	49	52	41	34	46														44
SIHY	36	46	41		24	41	46														39
STIPA																					
AGCR																					
AGSM																					
AGROPY	28	40	47	43	33	46	48														39
ELJU																					
KOCR																					
POSE																					
CSGG																					
AVERAGE	34	45	45	47	32	40	46														40
WARM SEASON GRASSES																					
HIJA	41	53	32	38	25	50	49														40
SPCR																					
SPAI																					
SPNE																					
BOGR																					
BOER																					
HIRI																					
MUPO																					
TRPU																					
WSGG																					
AVERAGE	41	53	32	38	25	50	49														40
BROWSE																					
CELA																					
ATCA																					
EPNE																					
ARBI3																					
COME				23																	23
KRPA																					
KRGR																					
CEGR																					

HYMO								
GARRYA								
AMDU								
SSSS								
AVERAGE				23				23
AVG ALL SPECIES	36	46	42	38	30	43	47	40

PACE FREQUENCY TREND ANALYSIS

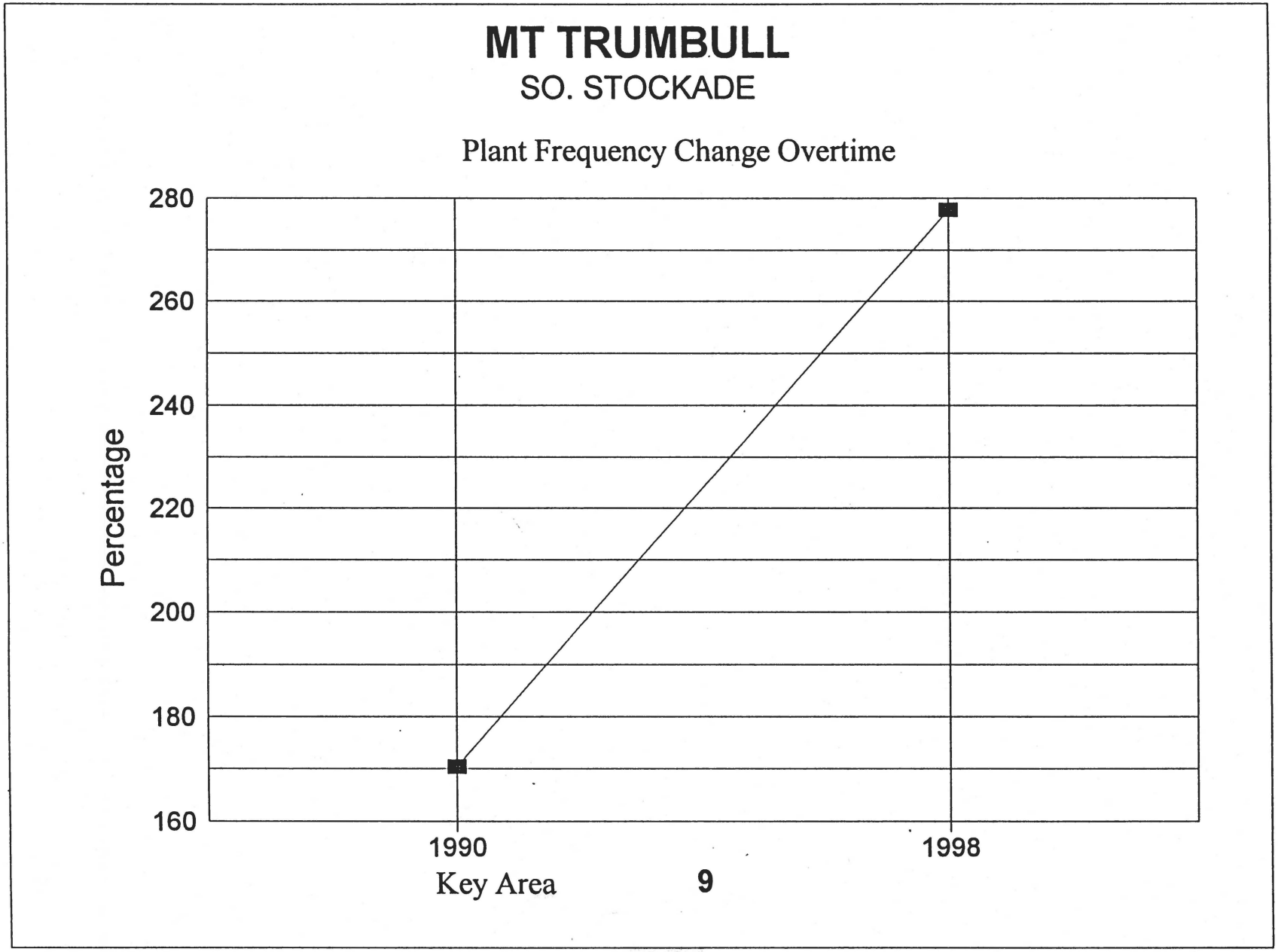
09/09/99 | ALLOTMENT: MT TRUMBULL | PASTURE: SO. STOCKADE | KEY AREA: 9 | PAGE NUMBER: 1

COVER CATEGORIES	YEARS PLOT WERE READ 1998	1999	2001	2004	2007	2010	2013	2016	2019	2022	2025	TREND INDEX: COMPARES DATA FROM THIS YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX. BASE YEAR = 1998: 1998	2001	2004	2007	2010	2013	2016	2019	2022	2025
Bare Ground	68	69										1									
Pers Litter	20																				
Litter																					
Rock	1	21										2000									
Live Vegetation	11	10										-12									
BROWSE																					
CELA																					
ATCA2																					
EPNE																					
ATCO																					
ARIS9																					
COME		3										661									
PUTR																					
PUGL																					
AMUT																					
ARFI																					
ARARS																					
ARFR4																					
MESC2																					
QUGA																					
KRPA																					
XROR																					
GRSP																					
AMDU2																					
AMAL2																					
ACGR																					
CEGR																					
ENCELA																					
FRFA																					
FETH2																					
MESP																					
OTHERBROWS																					
TOTALS		3										661									
DESIRABLE GRASSES Cool Season																					
ORHY	5	15										192									
SIHY	10	33										80									
STIPA																					
AGCR																					
AGSM	9	7										-9									
SEEDED																					
ELYMUS																					
XOCR																					
POA																					
OTHER COOL SEASON GRASSES																					
TOTALS	32	55										75									
Warm Season																					
HIJA	10	31										70									
HIRI																					
SPCR																					
SPNE																					
BOGR	42	43										1									
BOER																					
BOCU																					
SPAI																					
MUPU2																					
MUTO2																					
MUPO2																					
SPORO																					
SPCO																					
OTHER WARM SEASON GRASSES																					
TOTALS	60	74										24									
DESIRABLE TOTAL	92	133										45									

PACE FREQUENCY TREND ANALYSIS CONTINUED PAGE NUMBER 2

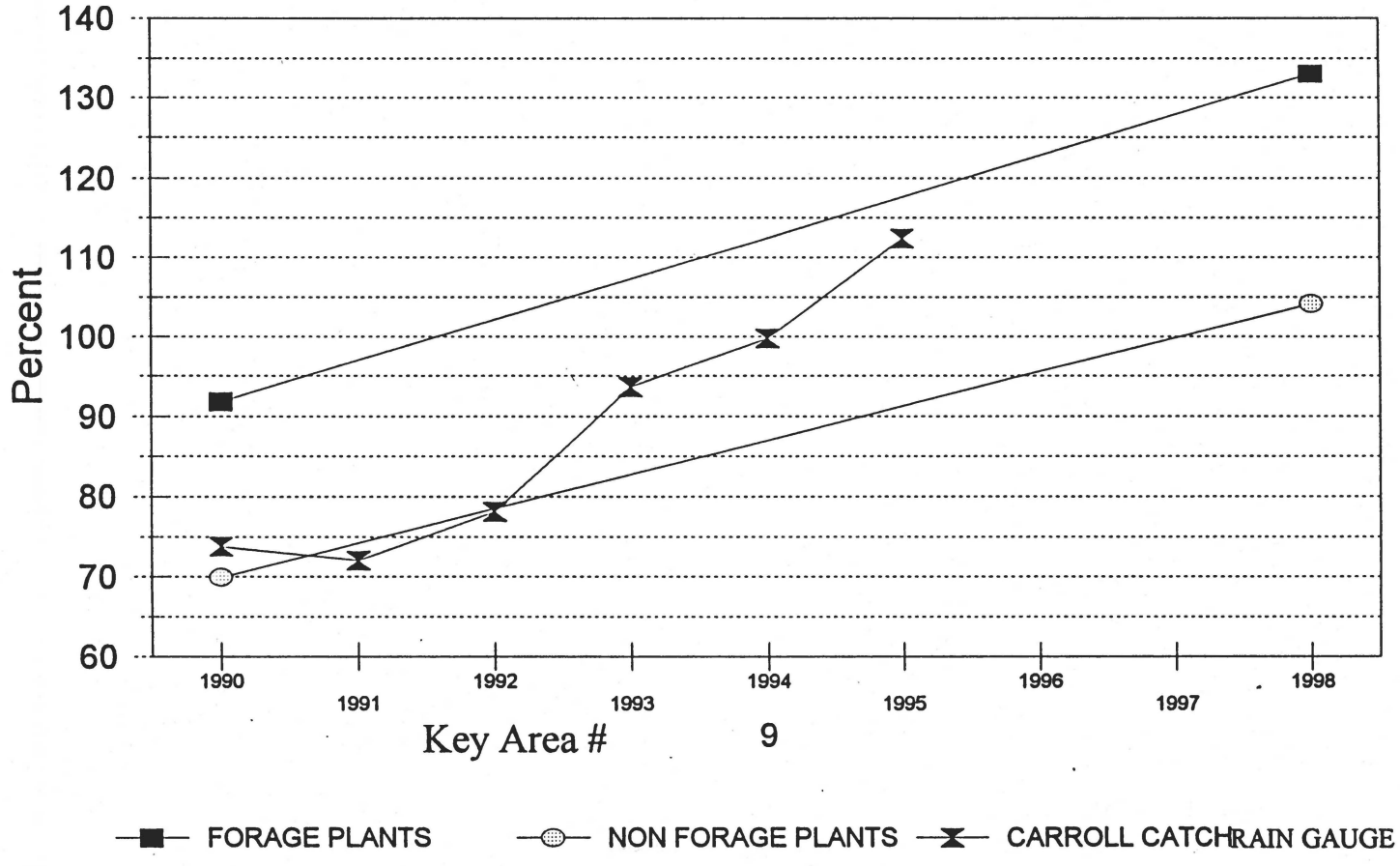
09/09/99	ALLOTMENT	MT TRUMBULL	PASTURE	SO. STOCKADE	KEY AREA	9

COVER CATEGORIES	YEARS PLOT WERE READ 1998	1999	2001	2004	2007	2010	2013	2016	2019	2022	2025	TREND INDEX COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX BASE YEAR = 1998 1998	2001	2004	2007	2010	2013	2016	2019	2022	2025
OTHER SHRUBS																					
QUSA2	25	10										-60									
CHVI8	3																				
CHRYSO																					
CORA																					
ARTR2	19	71										267									
OPUNT																					
LYAN																					
LYCIU																					
CHNA																					
ERIOG_SHRB																					
HAPP_ACAMP																					
ZOIN																					
TETRA																					
ARLU																					
SAVE																					
YUCCA																					
PEPU7																					
SENECIO																					
JUOS	9	7										30									
PEIO	4	2										-60									
ZAPA																					
RHTR																					
QUTU																					
EPTO																					
EPVI																					
BERBERIS																					
DAFR																					
HYSA																					
ERAN2																					
YUBR																					
LATRT																					
PSCO2																					
PRGLT																					
THMO																					
ATHY																					
MOUT																					
GAFL2																					
OTHERSHRUB																					
TOTALS	60	90										47									
OTHER GRASSES																					
ARIST																					
ARLO	4	7										85									
SCBR																					
TRPU																					
TRMU																					
PPGG																					
TOTALS	4	7										85									
FORBS																					
ASTRA	1																				
SAKA																					
SPHAE	3	4										35									
AAFF		9										1810									
AAGG																					
ERIOG	2																				
PENST	1	7										540									
PLANTAGO																					
ERIGERON																					
MUSTARD																					
PPFF	2	21										1250									
SENEC																					
SPURGE																					
ASTER																					
DAISY																					
AMSIN																					
PHACE																					
ERCH																					
TOTALS	9	40										367									
PLANT TOTALS	79	145										84									


MT TRUMBULL
SO. STOCKADE
Plant Frequency Change Overtime
280
260
240
220
200
180
160
Percentage
1990
1998
Key Area
9

MT TRUMBULL
SO. STOCKADE

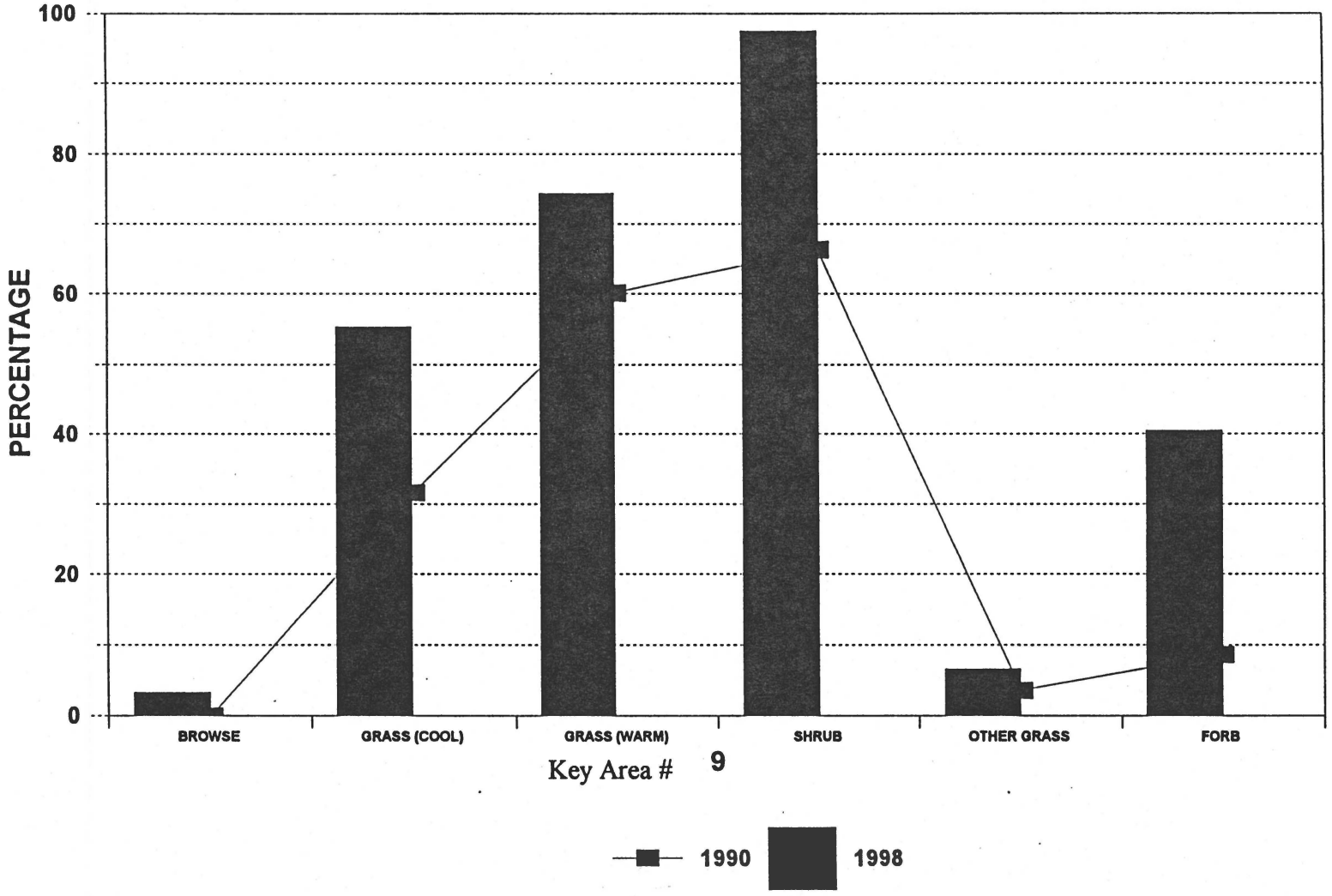
Compares Forage to Non-Forage Plants by years plots were read & the 5 year average Annual Precipitation



MT TRUMBULL

SO. STOCKADE

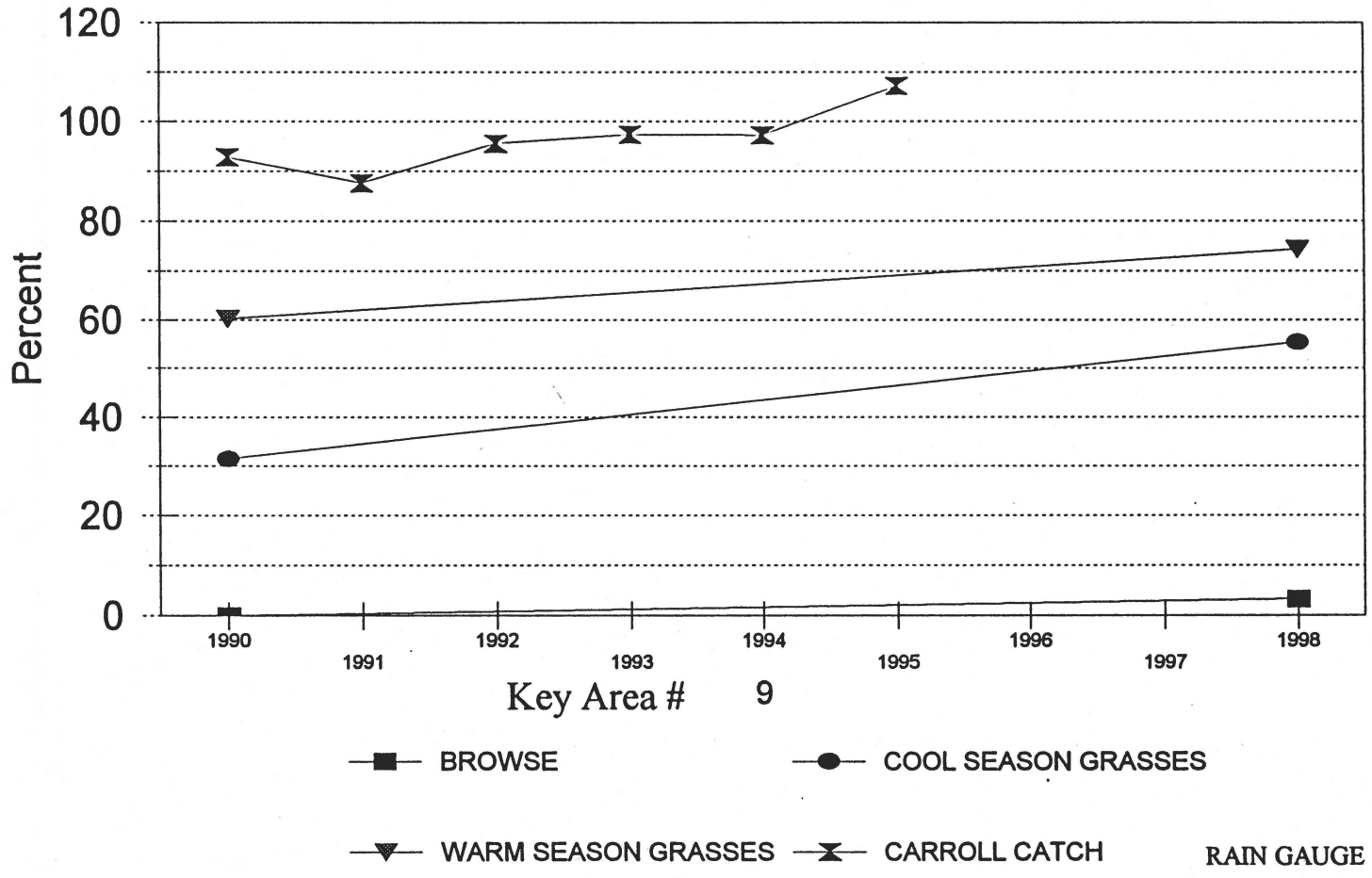
KEY AREA INDEX CHANGE COMPARED TO FIRST YEAR



MT TRUMBULL

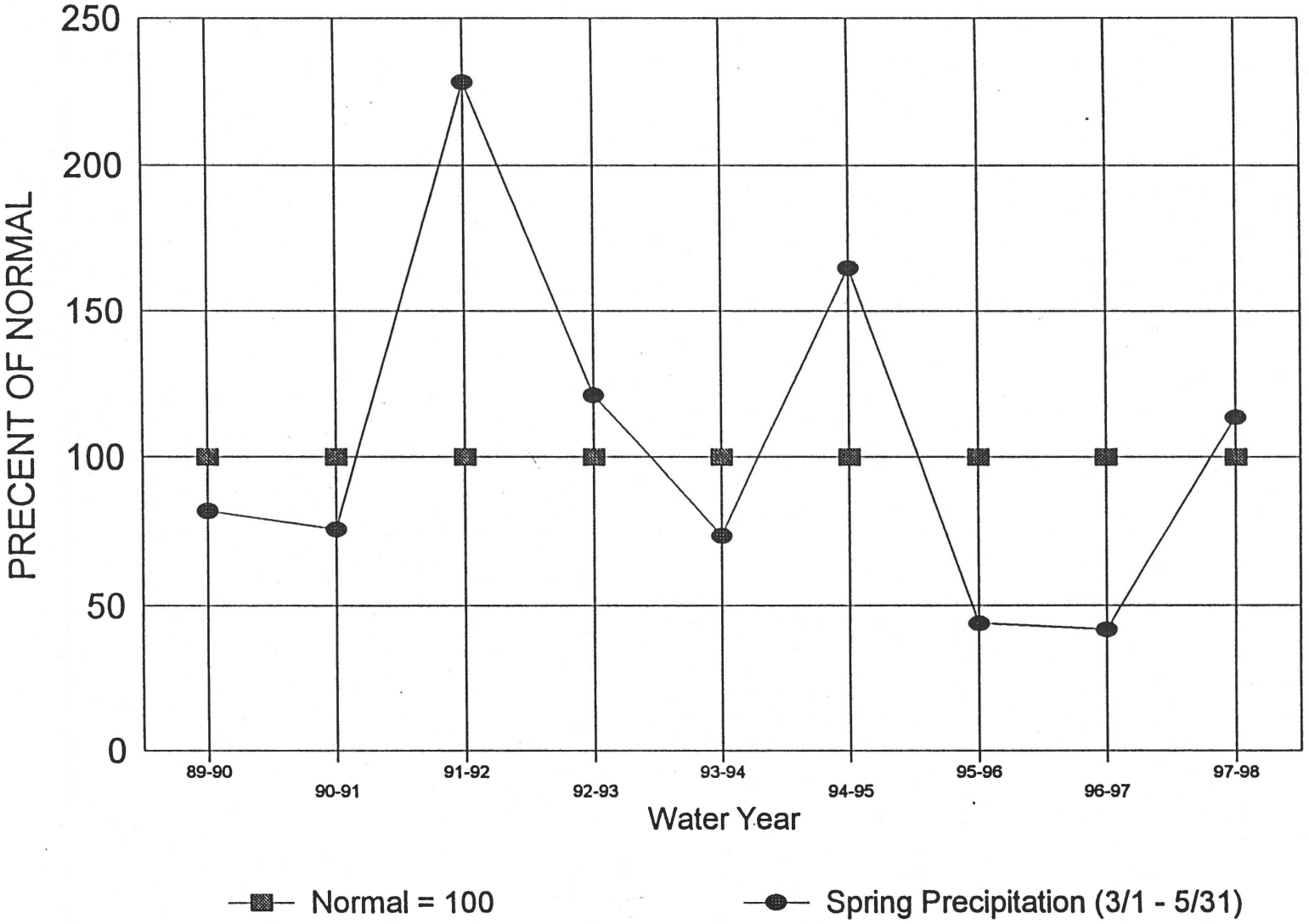
SO. STOCKADE

Plant Category changes overtime & the 5 year average Annual Precipitation



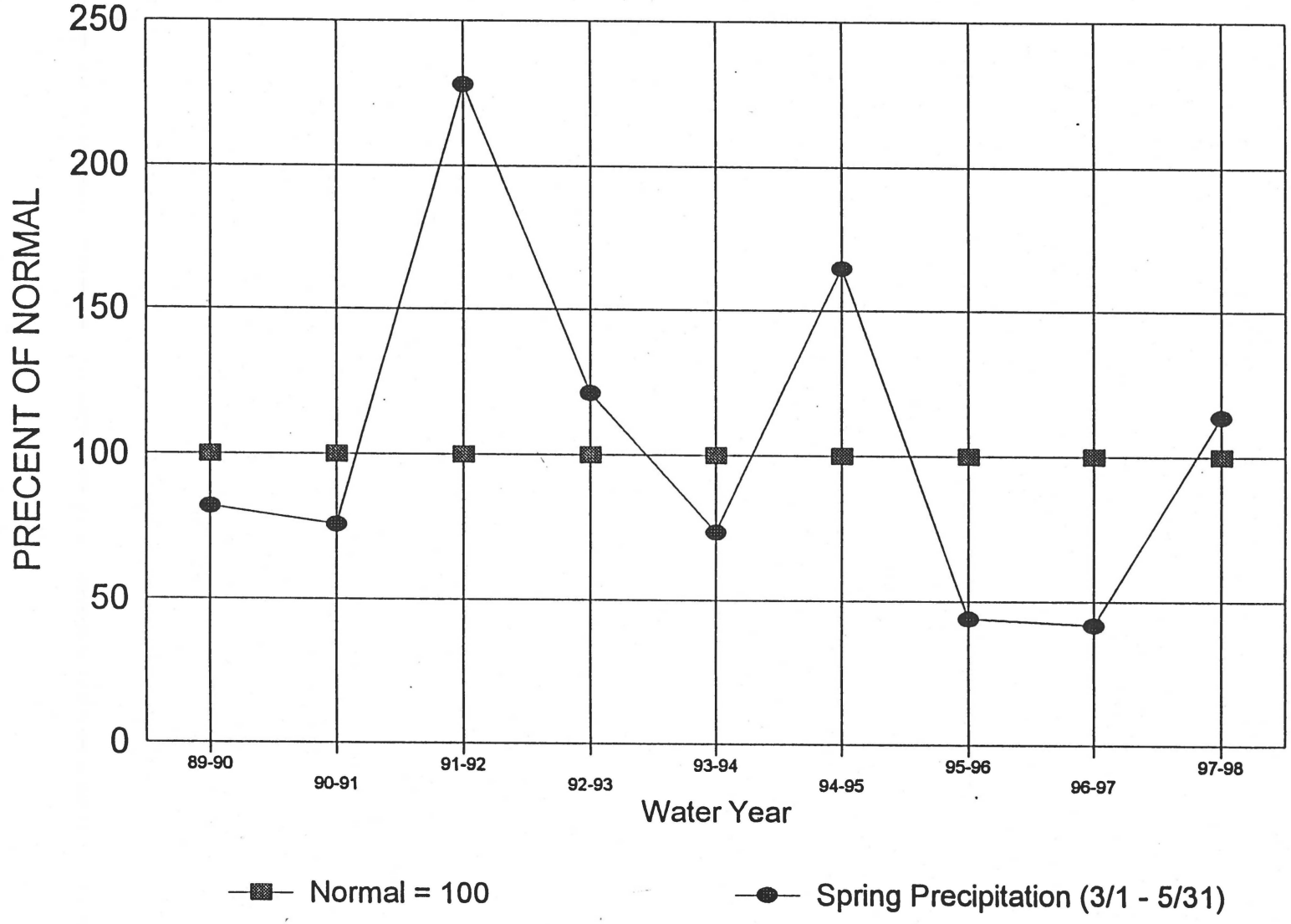
PRECIPITATION

CARROLL CATCH



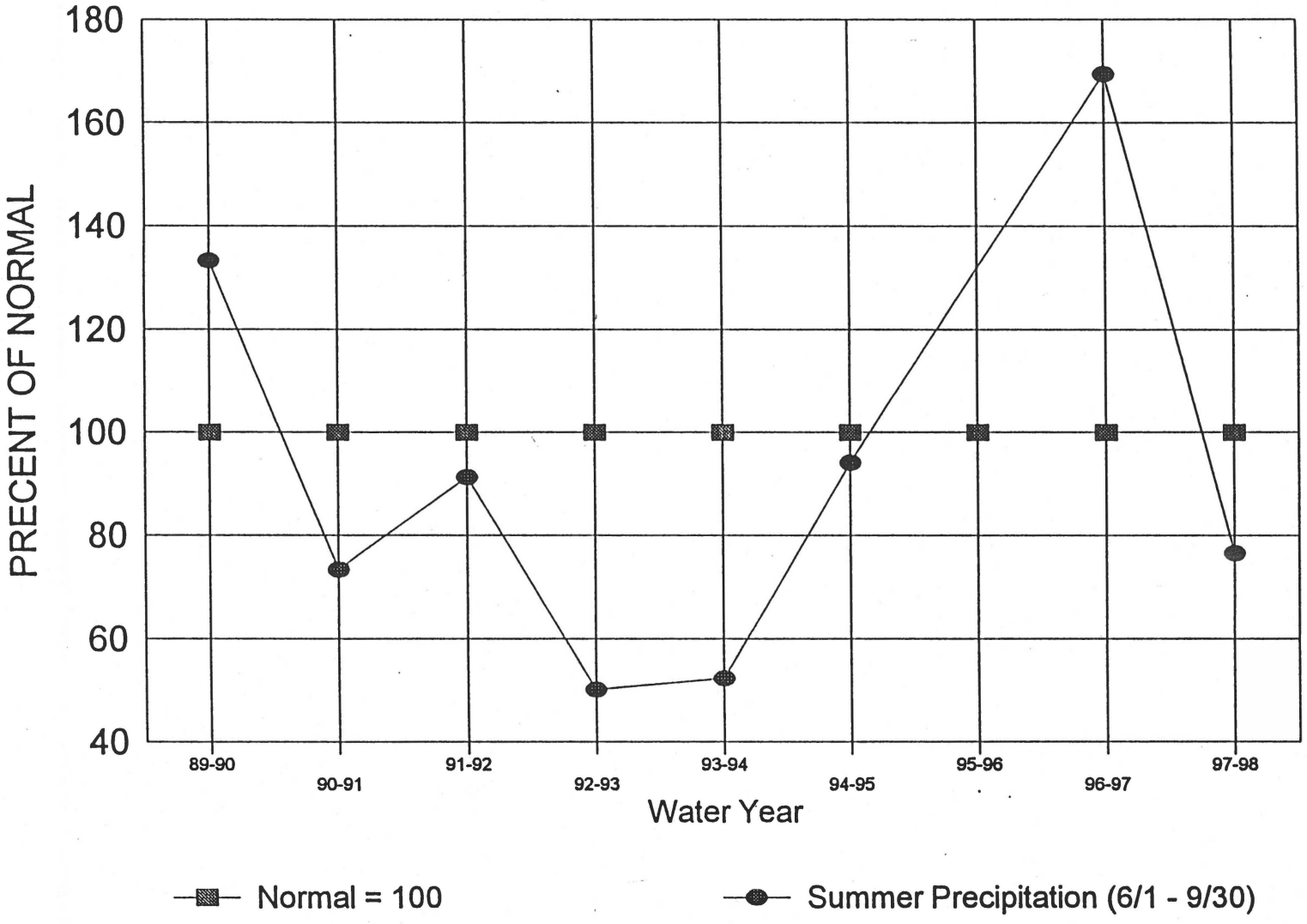
PRECIPITATION

CARROLL CATCH



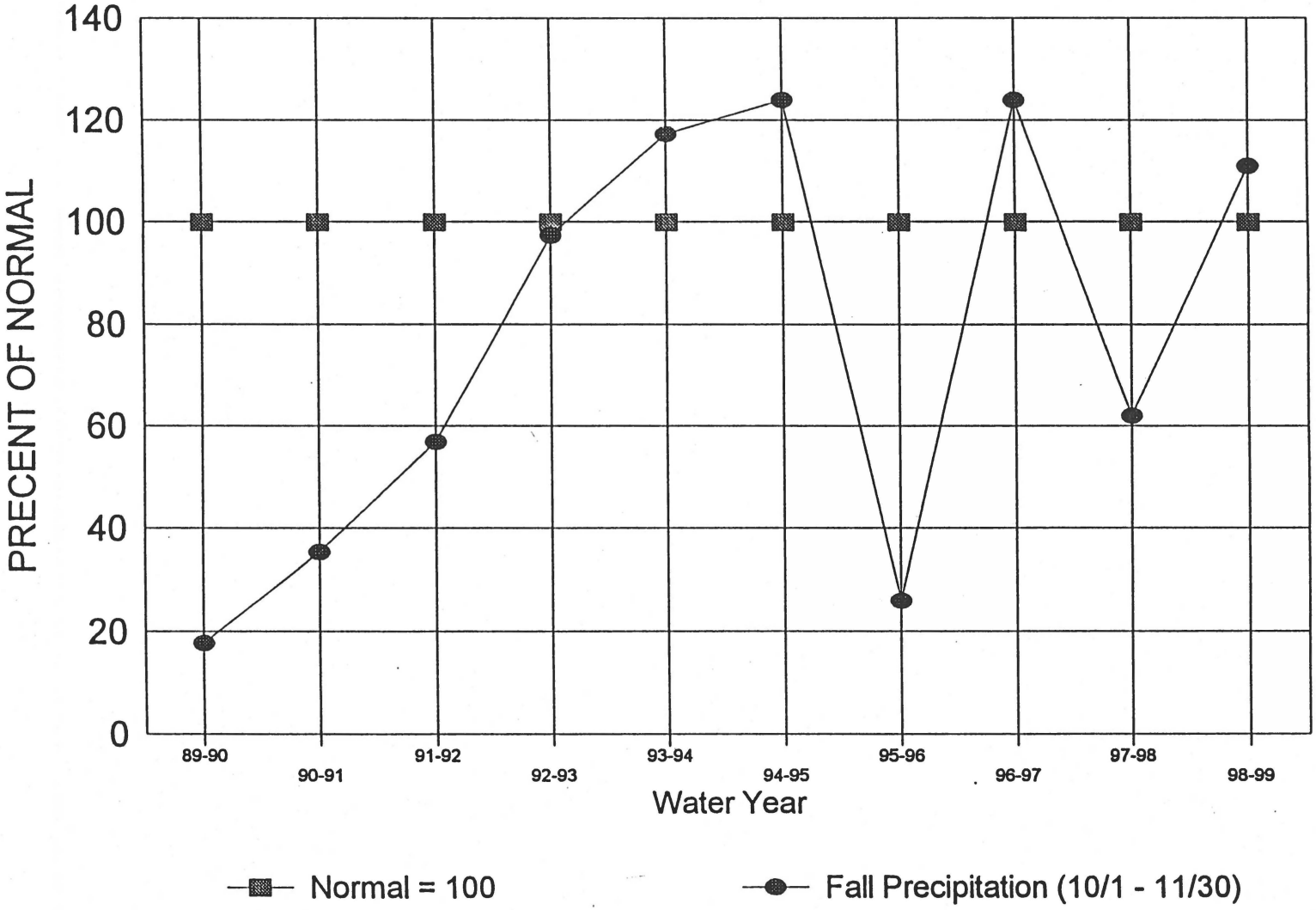
PRECIPITATION

CARROLL CATCH



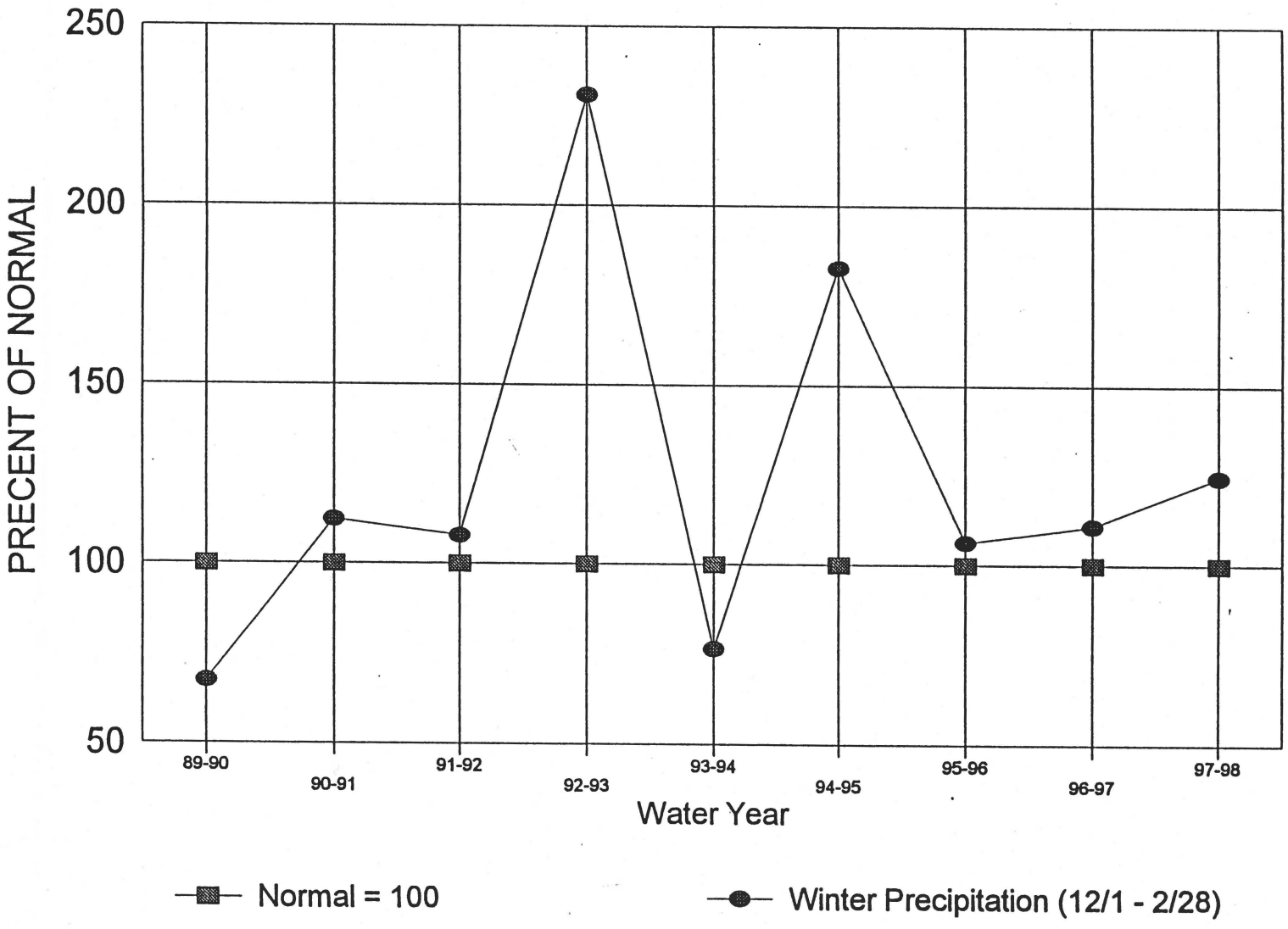
PRECIPITATION

CARROLL CATCH



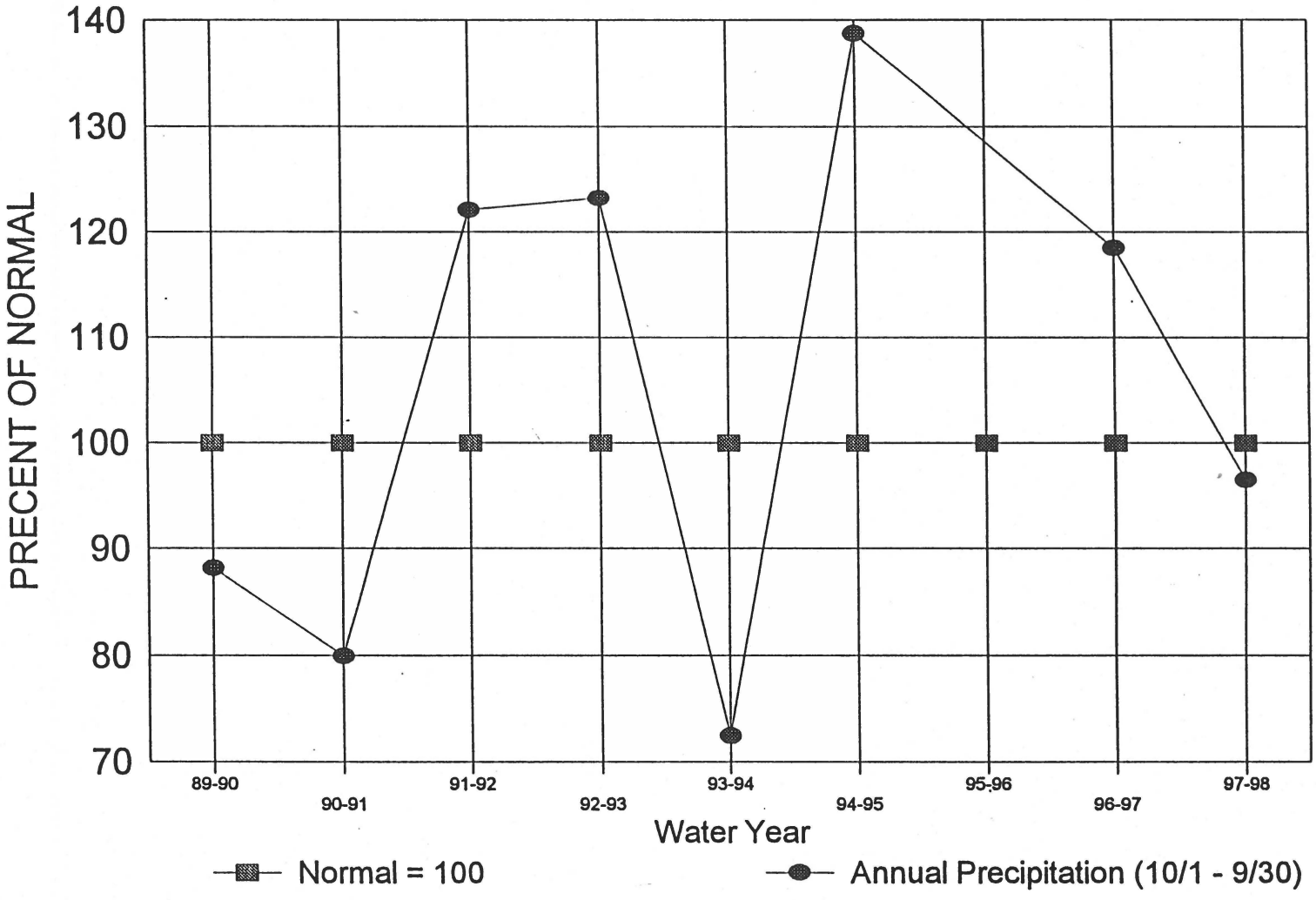
PRECIPITATION

CARROLL CATCH



PRECIPITATION

CARROLL CATCH



Key Area #10

09/09/99

VERMILLION RESOURCE AREA

UTILIZATION STUDY SUMMARY

ALLOTMENT = MT TRUMBULL | PASTURE = 160 | KEY AREA NUMBER = PASTURE SUMMARY

COOL SEASON GRASSES	UTILIZATION EXPRESSED AS A PERCENT USE OF EACH SPECIES FOR THE PARTICULAR YEAR READ																				
	1997	1996	1995	1994	1991	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	AVERAGE
ORHY																					
SIHY																					
STIPA																					
AGCR																					
AGSM																					
AGROPY																					
ELJU																					
KOCR																					
POSE																					
CSGG																					
AVERAGE																					
WARM SEASON GRASSES																					
HIJA	29	34	31	31	22	28															29
SPCR	40	28	26	33	46	35															34
SPAI																					
SPNE																					
BOGR	24	25	7	11	35	29															23
BOER																					
HIRI																					
MUPO																					
TRPU																					
WSGG																					
AVERAGE	31	29	24	26	33	29															28
BROWSE																					
CELA																					
ATCA	36		39		41	12															35
EPNE		44		36	17	7															32
ARBI3																					
COME																					
KRPA																					
KRGR																					
CEGR																					

HYMO							
GARRYA							
AMDU							
SSSS							
AVERAGE	36	44	39	36	34	9	34
AVG ALL SPECIES	32	33	26	28	33	26	29

PACE FREQUENCY TREND ANALYSIS

09/09/09 | ALLOTMENT MT TRUMBULL | PASTURE 160 PASTURE | KEY AREA 10 | PAGE NUMBER 1

TREND INDEX

COVER CATEGORIES	YEARS PLOT WERE READ 1999	1999	2002	2005	2008	2011	2014	2017	2020	2023	2026	COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX BASE YEAR = 1999 1999	2002	2005	2008	2011	2014	2017	2020	2023	2026
Bare Ground	79	58										-25									
Pers Litter	0																				
Litter																					
Rock	4	20										444									
Live Vegetation	18	22										118									
BROWSE																					
CELA																					
ATCA2		7										1301									
EPNE	1	3										119									
ATCO																					
ARBI3																					
COME		5										952									
PUTR																					
PUGL																					
AMUT																					
ARFI																					
ARAR8																					
ARFR4																					
MESC2																					
QUGA																					
KRFA																					
KROR																					
ORSP																					
AMDU2																					
AMAL2																					
ACOR																					
CEOR																					
SNCELA																					
PRFA																					
PETH2																					
MESP																					
OTHERBROWS																					
TOTALS	1	14										1043									
DESIRABLE GRASSES Cool Season																					
ORHY	3	5										52									
SIHY	11	29										169									
STIPA	6	40										614									
AGCR																					
AGSM																					
SEEDED																					
ELYMUS																					
KOCR																					
POA																					
OTHER COOL SEASON GRASSES																					
TOTALS	18	73										270									
Warm Season																					
MUA	41	67										63									
MIRI																					
SPCR	18	11										-39									
SPNE																					
BOGR	54	61										13									
BOER																					
BOCU	8	32										294									
SPAI																					
MUPU2																					
MUTO2																					
MUPO2	1																				
SPORO																					
SPCO																					
OTHER WARM SEASON GRASSES																					
TOTALS	121	171										42									
DESIRABLE TOTAL	141	259										83									

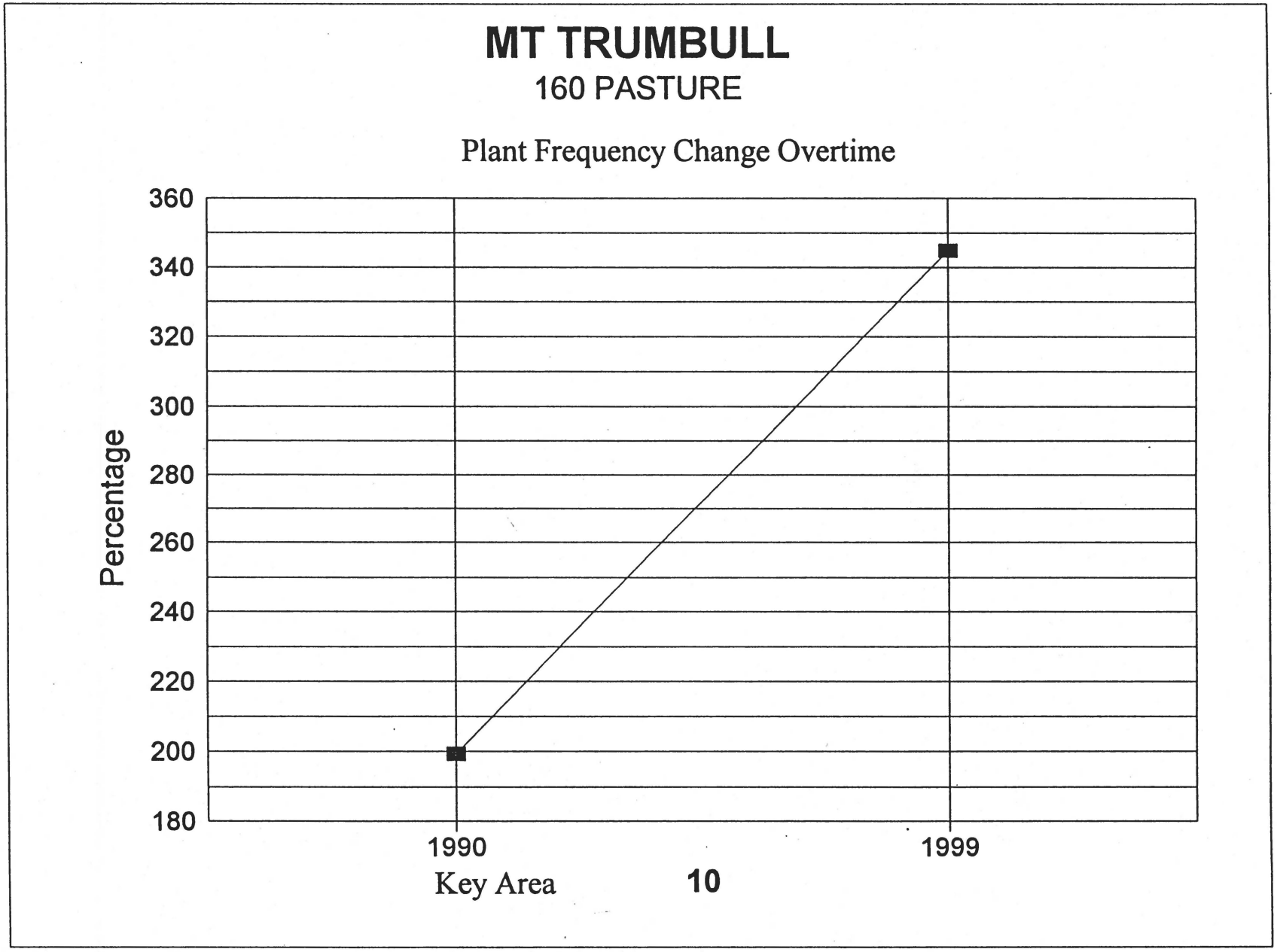
09/09/99 ALLOTMENT MT TRUMBULL PASTURE 160 PASTURE KEY AREA 10

TREND INDEX
COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX
BASE YEAR = 1990

COVER CATEGORIES	YEARS PLOT WERE READ 1990	1999	2002	2005	2008	2011	2014	2017	2020	2023	2026	1990	2002	2005	2008	2011	2014	2017	2020	2023	2026
OTHER SHRUBS																					
GUSA2	24	20										23									
CHVI8	13	12										-2									
CHRYSO																					
CORA																					
ARTR2																					
OPUNT																					
LYAN																					
LYCIU																					
CHNA																					
ERIOG_SHRB																					
HAPP_ACAMP																					
POIN																					
TETRA																					
ARLU																					
SAVE																					
YUCCA		1										272									
PEPU7																					
SENECIO																					
JUOS	2	9										227									
PSID	2																				
PAPA																					
RHTR																					
QUTU																					
EPTO																					
EPVI																					
BERBERIS																					
DAPR																					
MYBA																					
ERAN2																					
YUBR																					
LATR7																					
PSCO2		9										1224									
PR9LT																					
THMO																					
ATHY																					
MOUT																					
GAFL2																					
OTHERSHRUB																					
TOTALS	40	55										30									
OTHER GRASSES																					
ARIST																					
ARLO	12	14										20									
SCBR																					
TRPU																					
TRMU																					
PPOG																					
TOTALS	12	14										20									
FORBS																					
ASTRA																					
SAKA																					
SPHAE	3	9										161									
AAFF																					
AAGG																					
ERIOG																					
PENST	1																				
PLANTAGO																					
ERIGERON																					
MUSTARD																					
PPFF	3	9										254									
SENEC																					
SPURGE																					
ASTER																					
DAISY																					
AMSIN																					
PHACE																					
ERCH																					
TOTALS	6	17										172									
PLANT TOTALS	58	86										49									

MT TRUMBULL

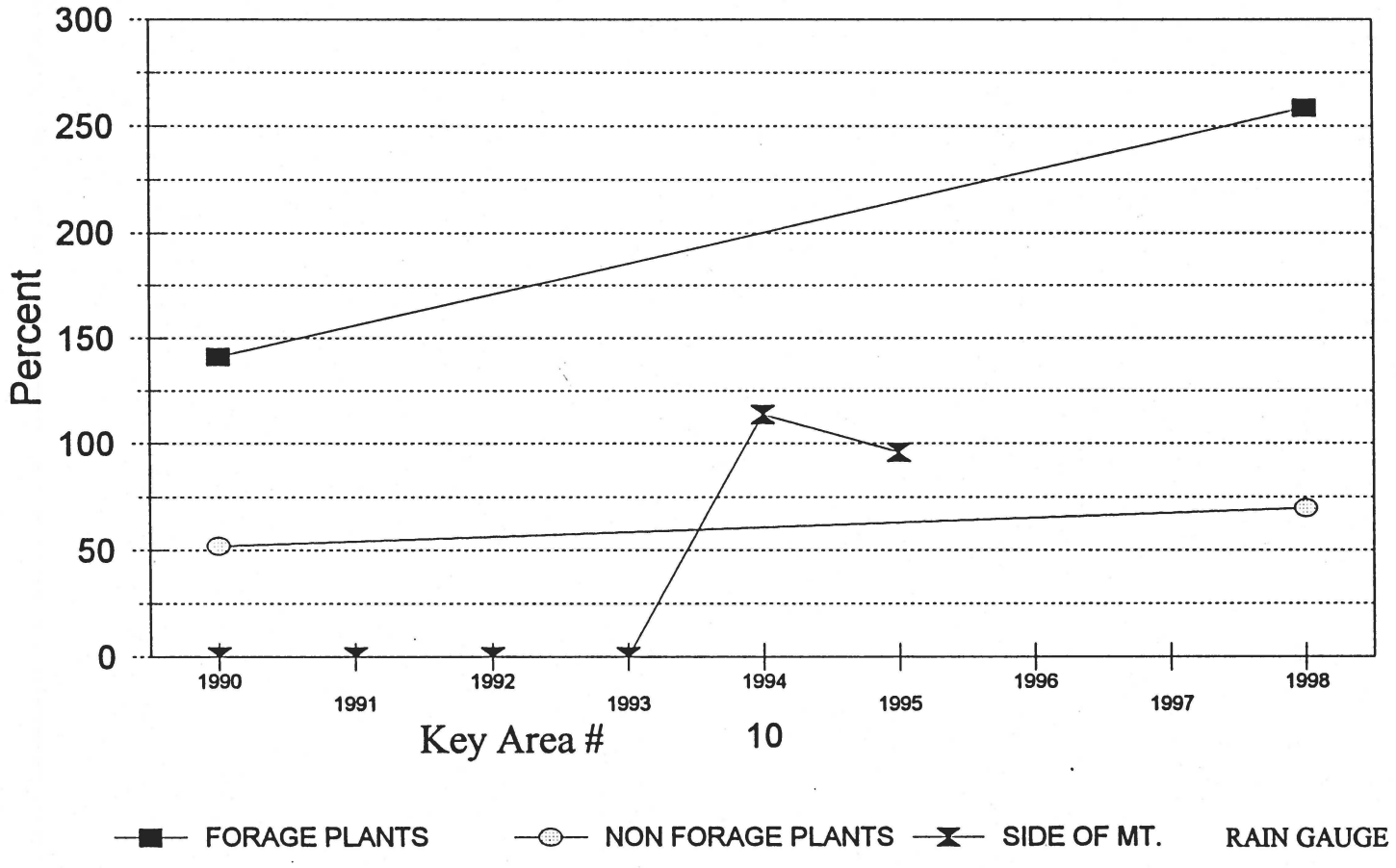
160 PASTURE



MT TRUMBULL

160 PASTURE

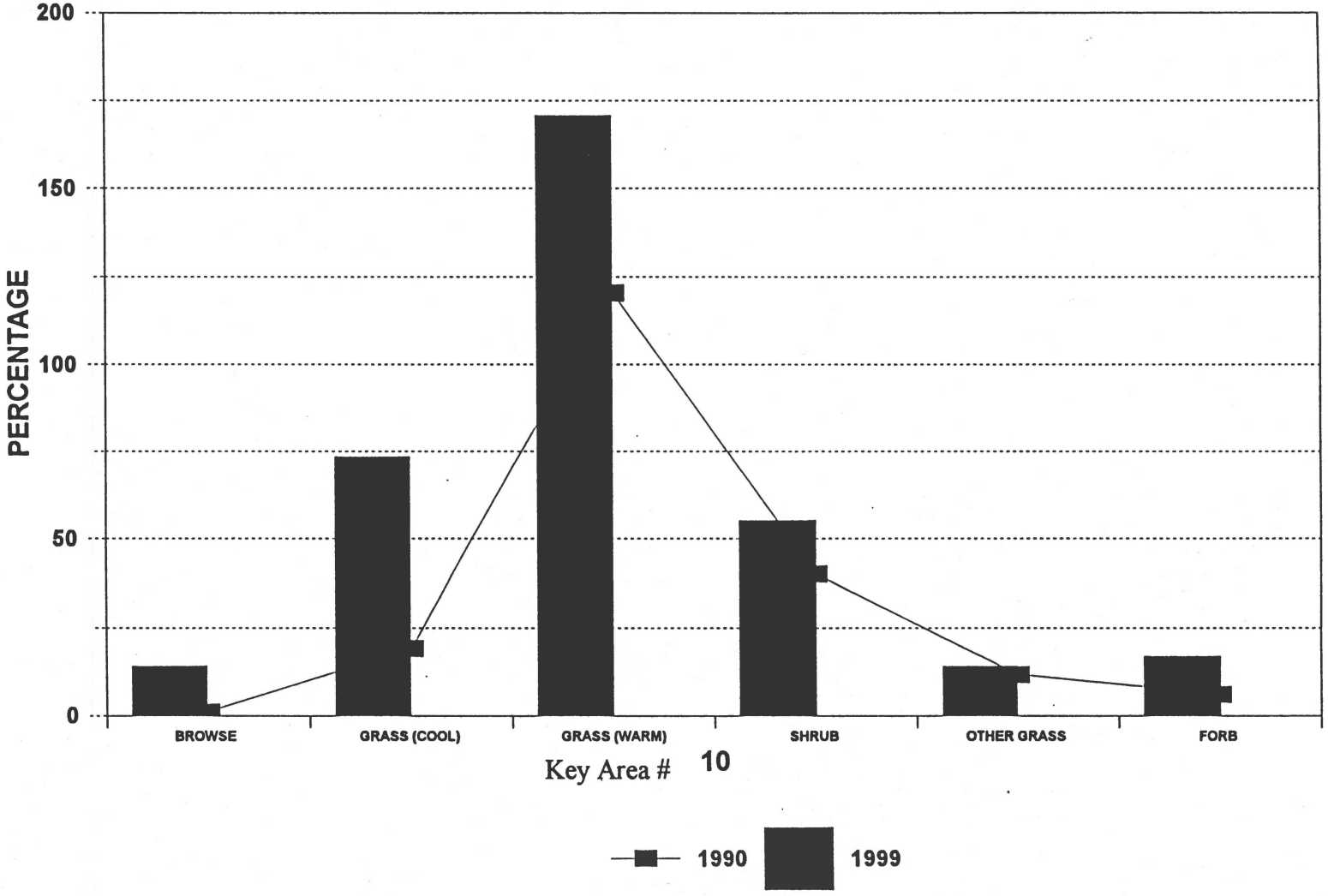
Compares Forage to Non-Forage Plants by years plots were read & the 5 year average Annual Precipitation



MT TRUMBULL

160 PASTURE

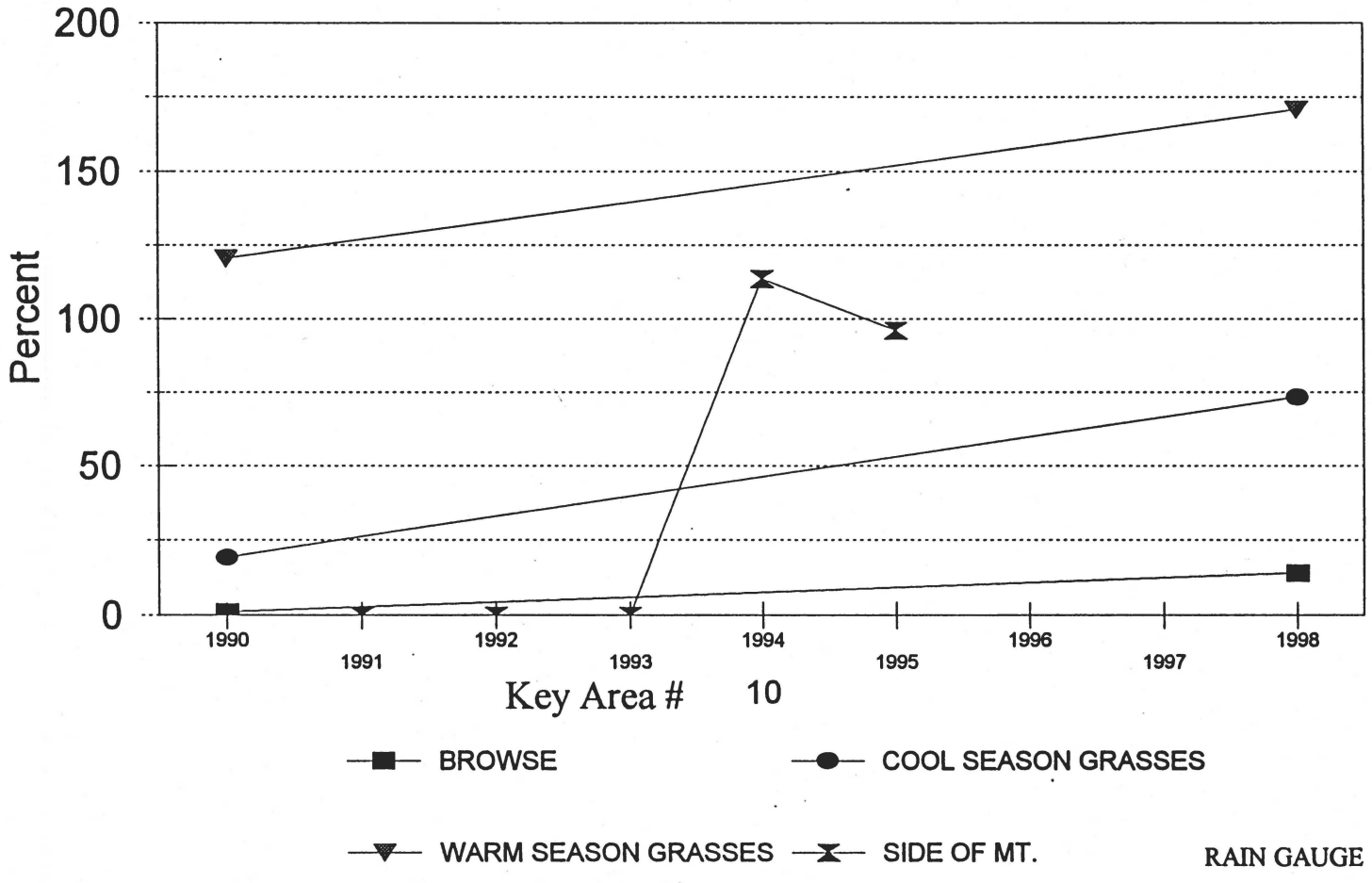
KEY AREA INDEX CHANGE COMPARED TO FIRST YEAR



MT TRUMBULL

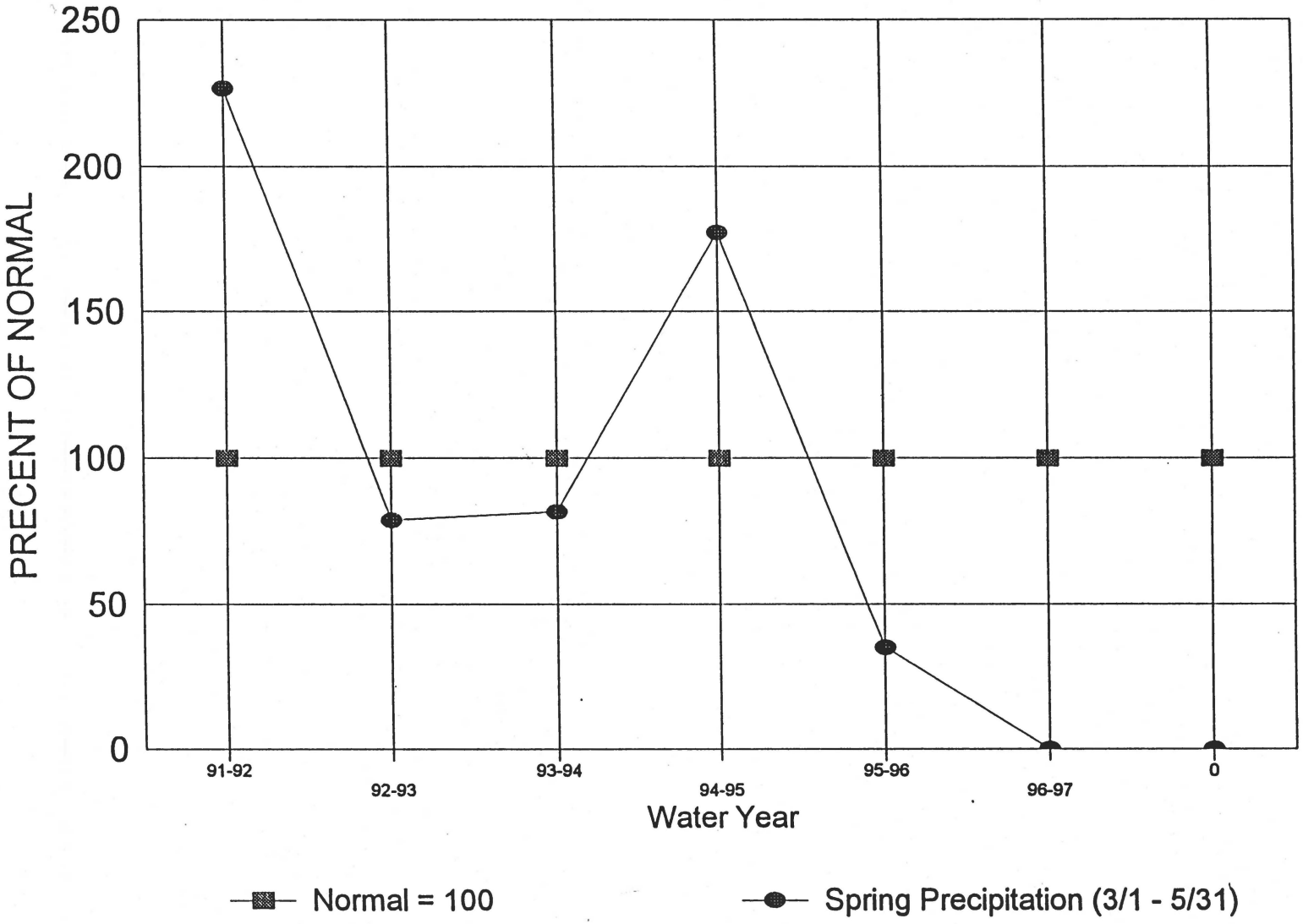
160 PASTURE

Plant Category changes overtime & the 5 year average Annual Precipitation



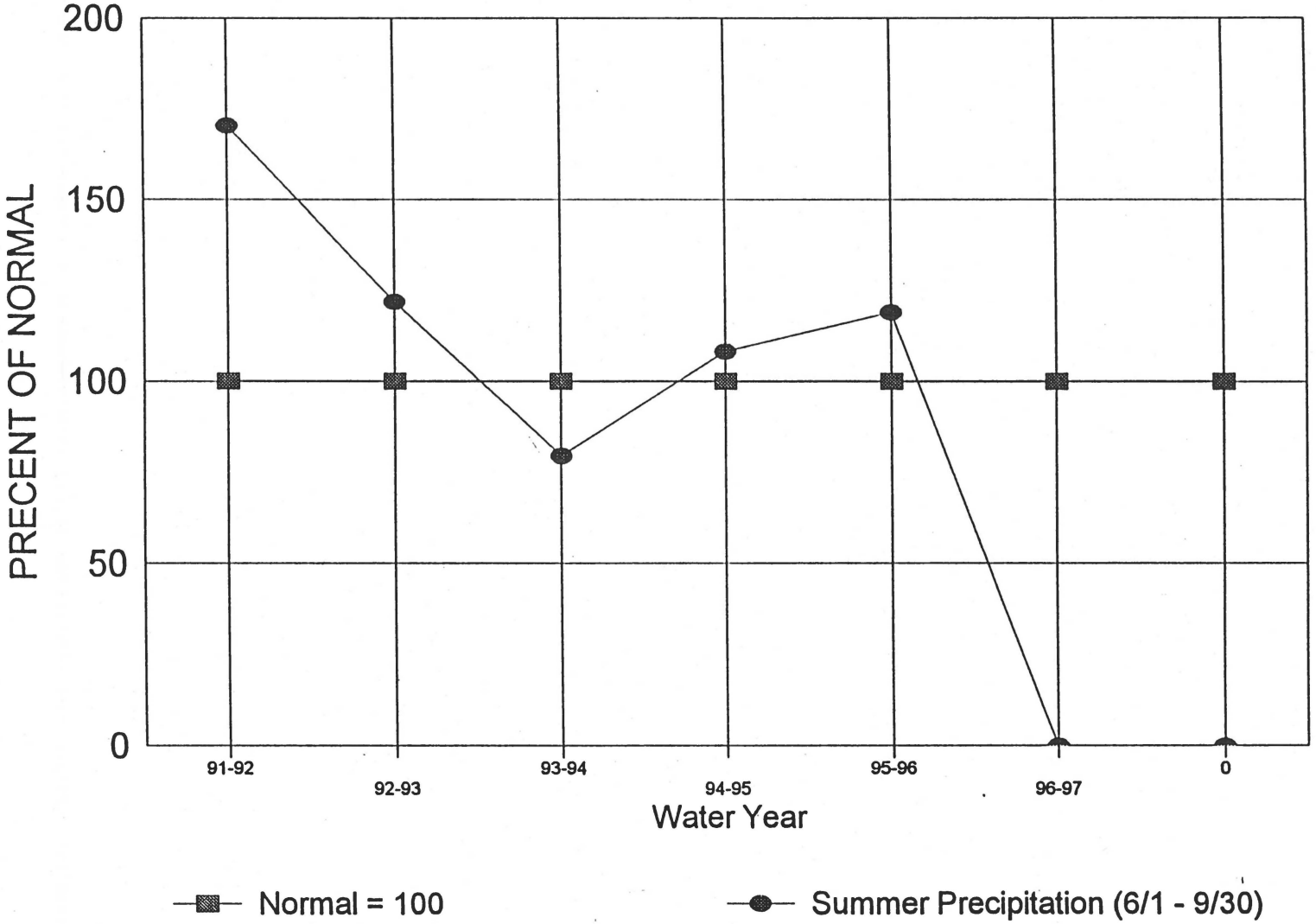
PRECIPITATION

SIDE OF MT.



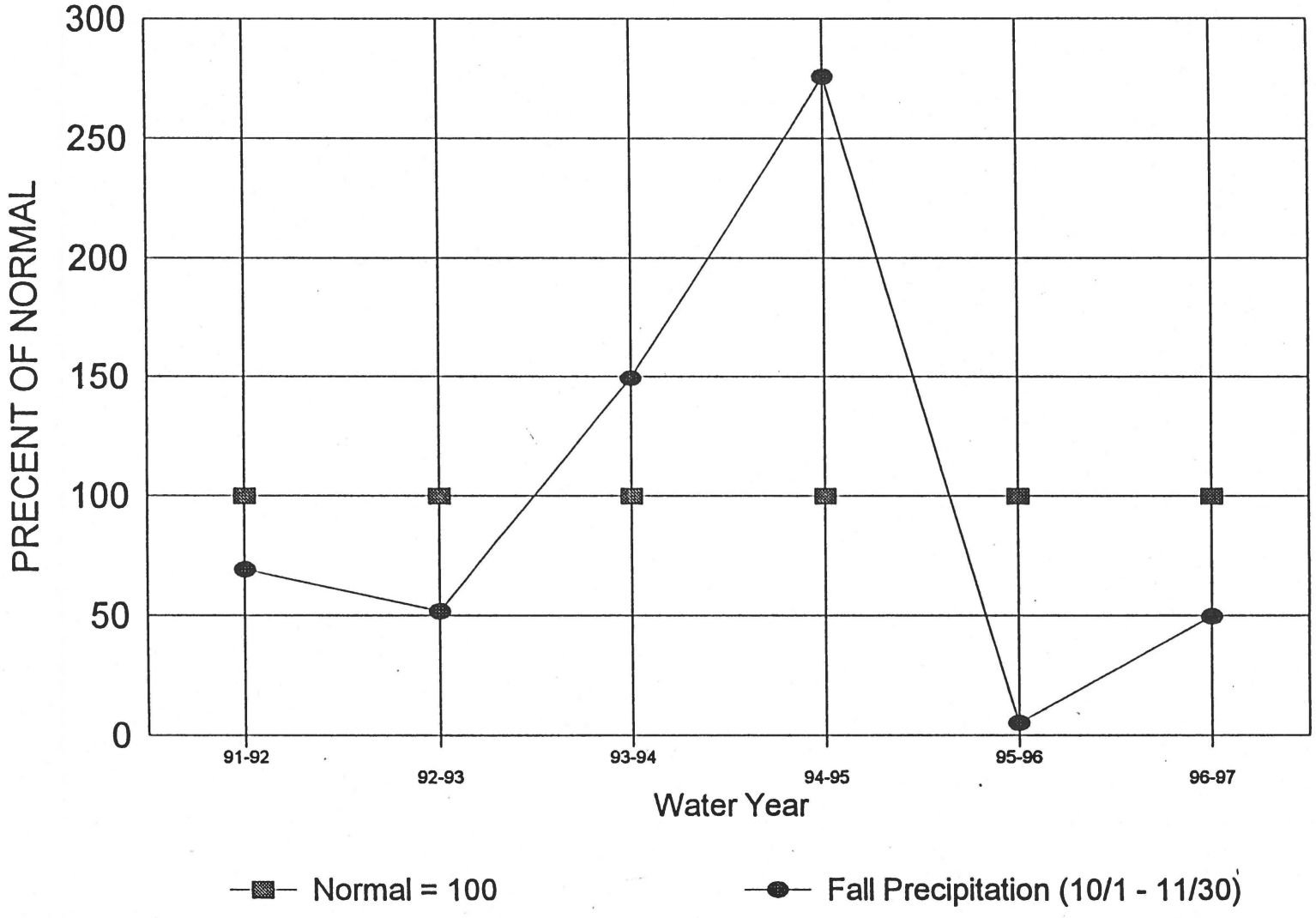
PRECIPITATION

SIDE OF MT.



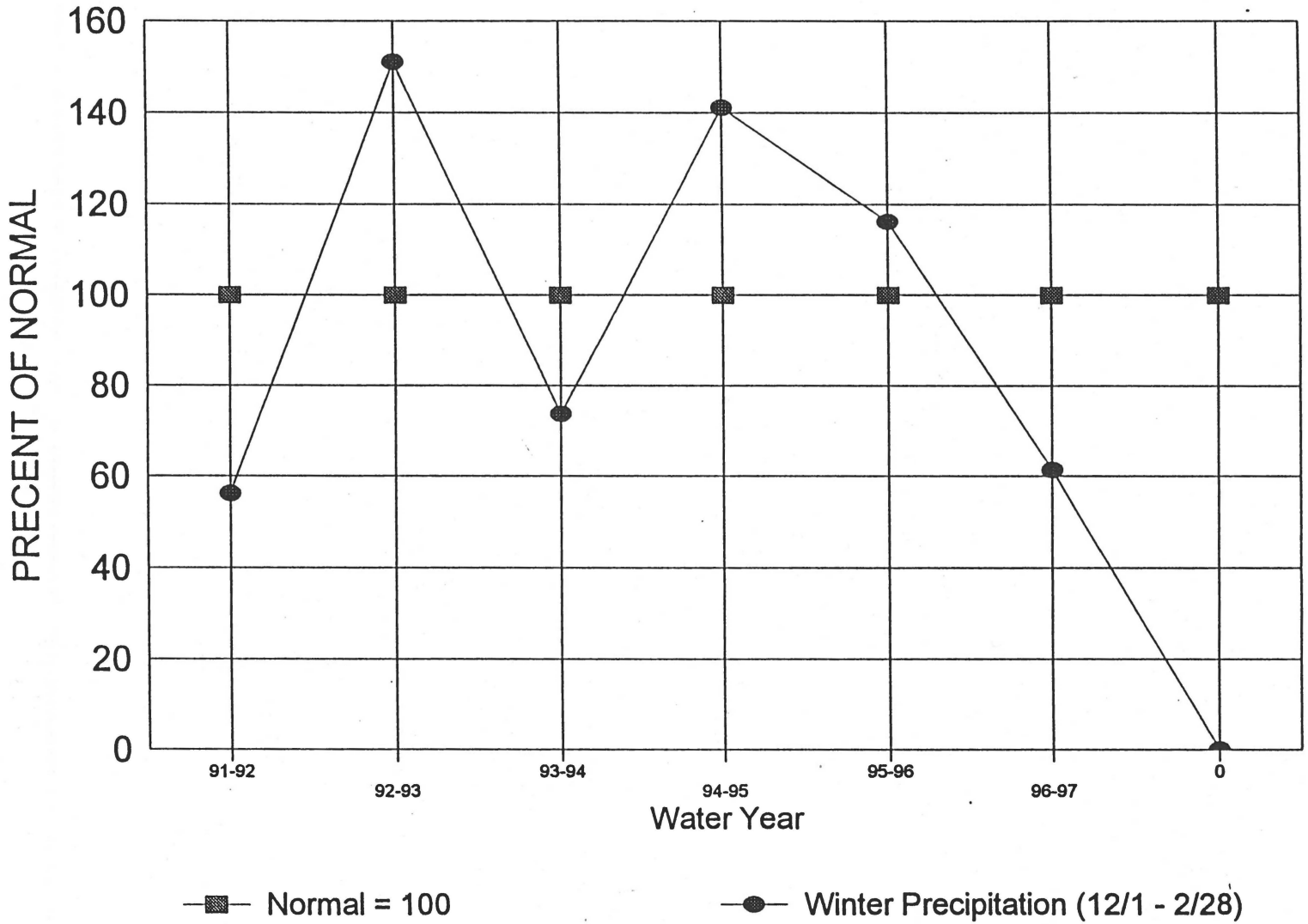
PRECIPITATION

SIDE OF MT.



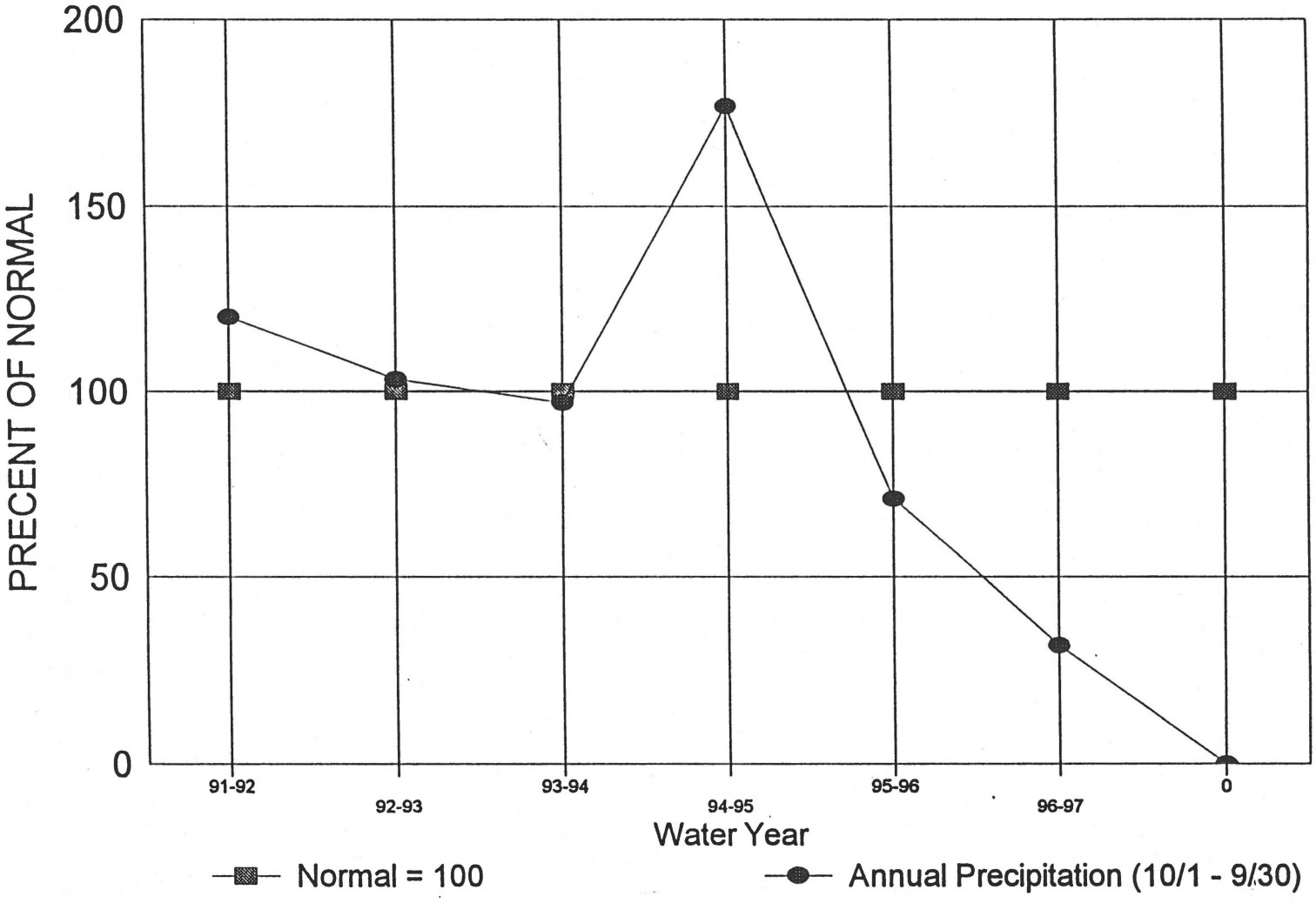
PRECIPITATION

SIDE OF MT.



PRECIPITATION

SIDE OF MT.



Key Area #11

09/09/99

VERMILLION RESOURCE AREA
UTILIZATION STUDY SUMMARY

PASTURE = BOYS | KEY AREA NUMBER = PASTURE SUMMARY

COOL SEASON GRASSES	UTILIZATION EXPRESSED AS A PERCENT USE OF EACH SPECIES FOR THE PARTICULAR YEAR READ																					
	1998	1997	1996	1995	1994	1993	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	AVERAGE
ORHY	17	43	51	34	32	36	43															36
SIHY	18	31	48	14	16	41	44															32
STIPA																						
AGCR																						
AGSM																						
AGROPY																						
ELJU																						
KOCR																						
POSE																						
CSGG																						
AVERAGE	17	37	49	26	23	39	44															34
WARM SEASON GRASSES																						
HIJA																						
SPCR	29	33	53	45	31	33	61															37
SPAI																						
SPNE																						
BOGR	14	23	36	15	18	37	35															27
BOER																						
HIRI																						
MUPO																						
TRPU																						
WSGG																						
AVERAGE	22	28	45	33	25	36	39															31
BROWSE																						
CELA																						
ATCA																						
EPNE																						
ARBI3																						
COME																						
KRPA																						
KRGR																						
CEGR																						

HYMO								
GARRYA								
AMDU								
SSSS								
AVERAGE								
AVG ALL SPECIES	20	33	47	29	24	38	42	33

PACE FREQUENCY TREND ANALYSIS

09/09/99 | ALLOTMENT MT TRUMBULL | PASTURE BOYS | KEY AREA 11 | PAGE NUMBER 1

COVER CATEGORIES	YEARS PLOT WERE READ 1998	1998	2001	2004	2007	2010	2013	2016	2019	2022	2025	TREND INDEX COMPARES DATA FROM THE YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX BASE YEAR = 1998 1998	2001	2004	2007	2010	2013	2016	2019	2022	2025
Bare Ground	78	72										-7									
Pers Litter	10	1										-94									
Litter																					
Rock	1																				
Live Vegetation	11	27										152									
BROWSE																					
CELA																					
ATCA2																					
SPNE																					
ATCO																					
ARBI3																					
COME																					
PUTR																					
PUGL																					
AMUT																					
ARFI																					
ARAR8																					
ARFR4																					
MESC2																					
QUGA																					
XRPA																					
XRGR																					
GRSP																					
AMDU2																					
AMAL2																					
ACGR																					
CEGR																					
ENCELA																					
PRFA																					
PETH2																					
MESP																					
OTHERBROWS																					
TOTALS																					
DESIRABLE GRASSES Cool Season																					
ORHY	13																				
SIHY	65	25										-62									
STIPA	23	6										-75									
AGCR																					
AGSM																					
SEEDED																					
ELYMUS																					
KOCR																					
POA																					
OTHER COOL SEASON GRASSES																					
TOTALS	101	30										-70									
Warm Season																					
MUA																					
MURI																					
SPCR	2																				
SPNE																					
BOGR	110	97										-12									
BOER																					
BOCU																					
SPAI																					
MUPU2																					
MUTO2																					
MUPO2		1										114									
SPORO																					
SPCO																					
OTHER WARM SEASON GRASSES																					
TOTALS	112	97										-13									
DESIRABLE TOTAL	213	127										-40									

PACE FREQUENCY TREND ANALYSIS CONTINUED PAGE NUMBER 2

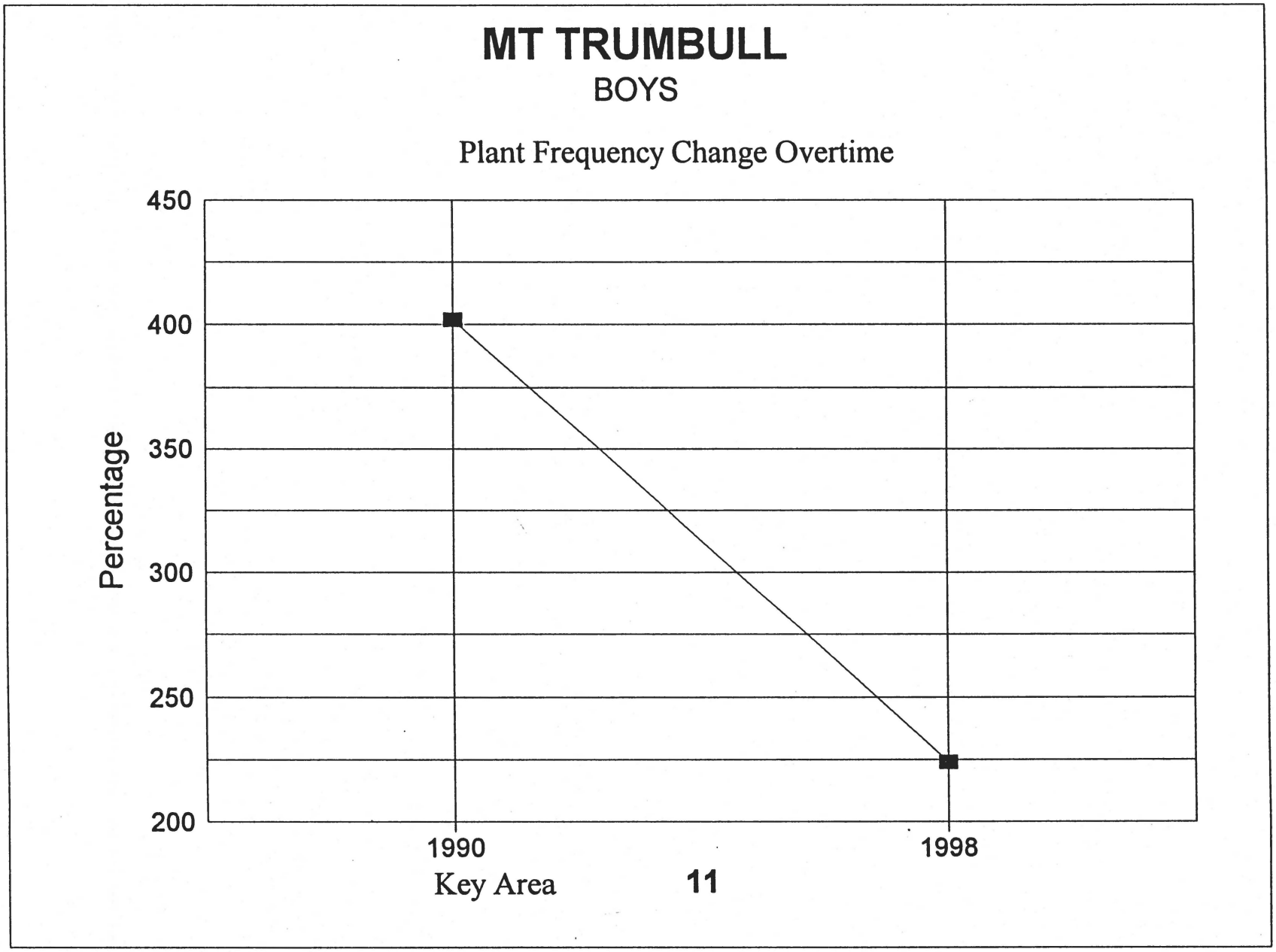
09/09/99	ALLOTMENT	MT TRUMBULL	PASTURE	BOYS	KEY AREA	11

TREND INDEX
COMPARES DATA FROM THIS YEAR READ BACK TO BASE YEAR TO DETERMINE INDEX
BASE YEAR = 1998

COVER CATEGORIES	YEARS PLOT WERE READ 1998	1999	2001	2004	2007	2010	2013	2016	2019	2022	2025	TREND INDEX 1998	2001	2004	2007	2010	2013	2016	2019	2022	2025
OTHER SHRUBS																					
GUSA2	67	29										-57									
CHVI8	5																				
CHRYSO																					
CORA																					
ARTR2	40	25										-47									
OPUNT	2																				
LYAN																					
LYCIU																					
CHNA																					
ERIOG_SHRB																					
HAPP_ACAMP																					
POIN																					
TETRA																					
ARLU																					
SAVE																					
YUCCA																					
PEPU7																					
SENECIO																					
JUOS																					
PEID	1																				
TAPA																					
RHTR																					
QUTU																					
EPTO																					
EPVI																					
BERBERIS																					
DAPR																					
HYSA																					
ERAN2																					
YUBR																					
LATRT																					
PSCO2																					
PROLT																					
THMO																					
ATHY																					
MOUT																					
GAFL2																					
OTHERSHRUB																					
TOTALS	123	54										-56									
OTHER GRASSES																					
ARIST																					
ARLO	20	18										-30									
BOBR																					
TRPU																					
TRMU																					
PPOG		1										220									
TOTALS	20	19										-30									
FORBS																					
ASTRA	4	5										12									
SAKA																					
SPHAE	5	1										-70									
AAFF		1										114									
AAGG																					
ERIOG	16	4										-74									
PENST	1	1										69									
PLANTAGO																					
ERIGERON																					
MUSTARD																					
PPFF	5																				
SENEC																					
SPURGE																					
ASTER	6	13										105									
DAISY																					
AMSIN																					
PHACE																					
SRCH																					
TOTALS	37	24										-35									
PLANT TOTALS	180	97										-46									

MT TRUMBULL

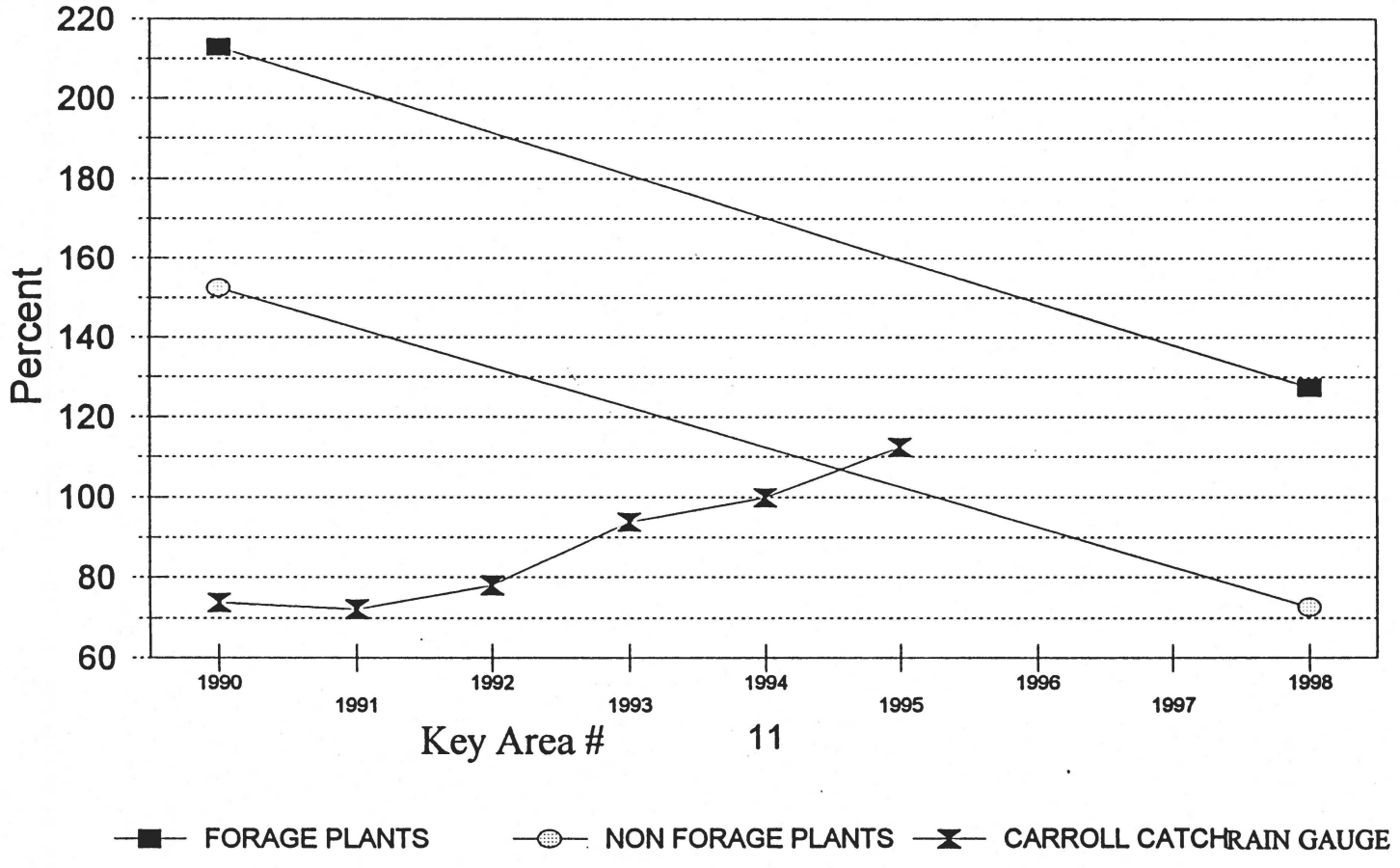
BOYS



MT TRUMBULL

BOYS

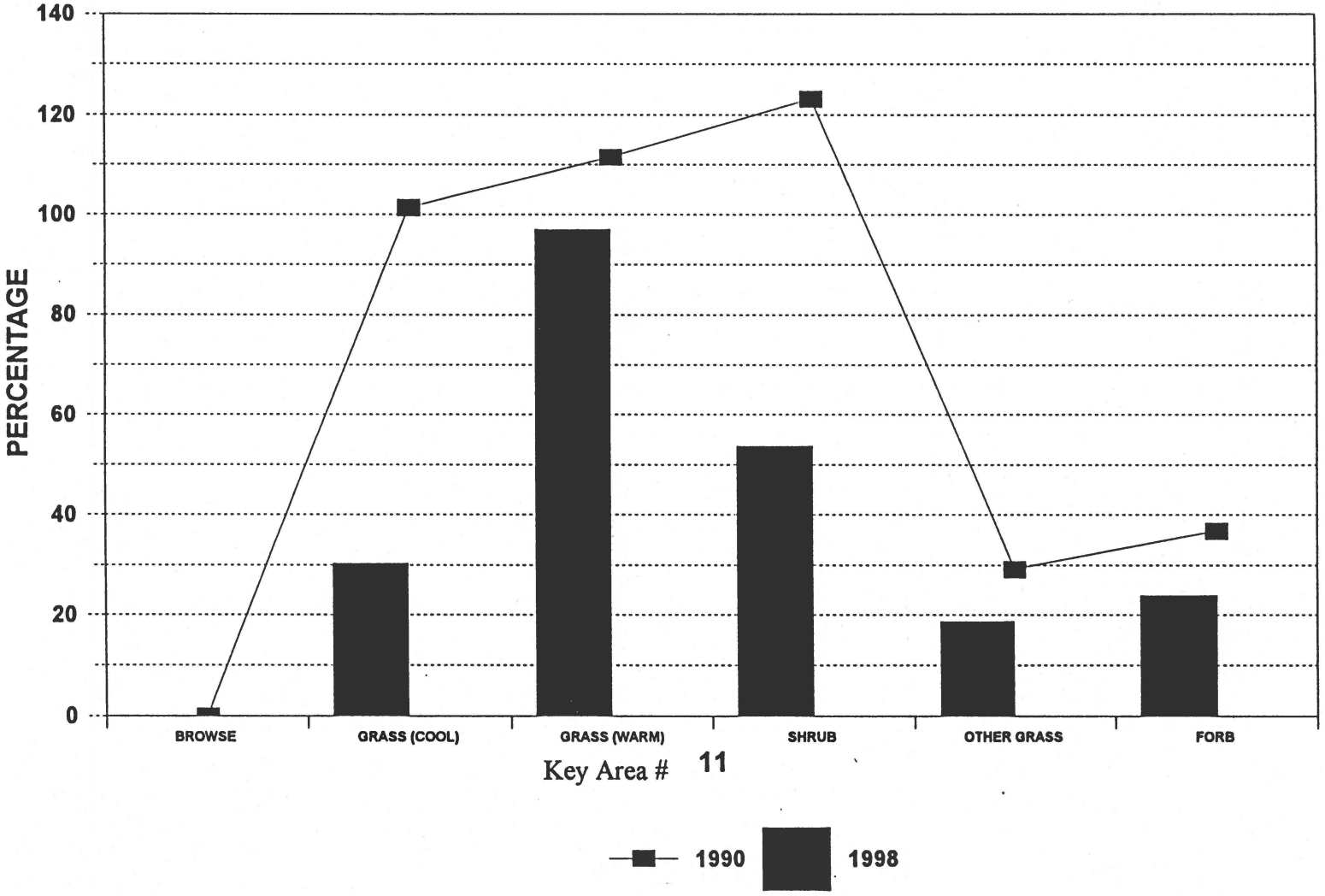
Compares Forage to Non-Forage Plants by years plots were read & the 5 year average Annual Precipitation



MT TRUMBULL

BOYS

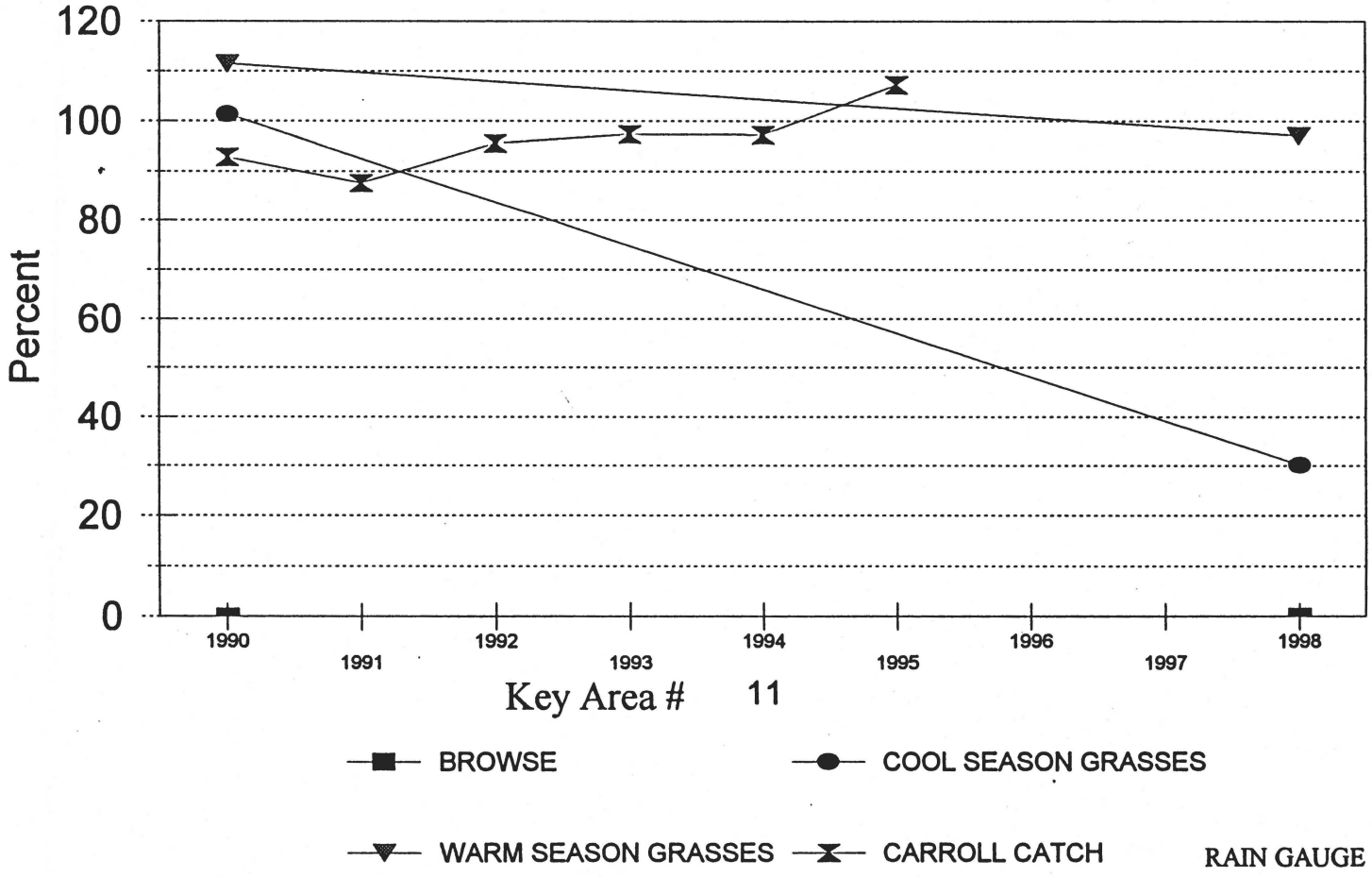
KEY AREA INDEX CHANGE COMPARED TO FIRST YEAR



MT TRUMBULL

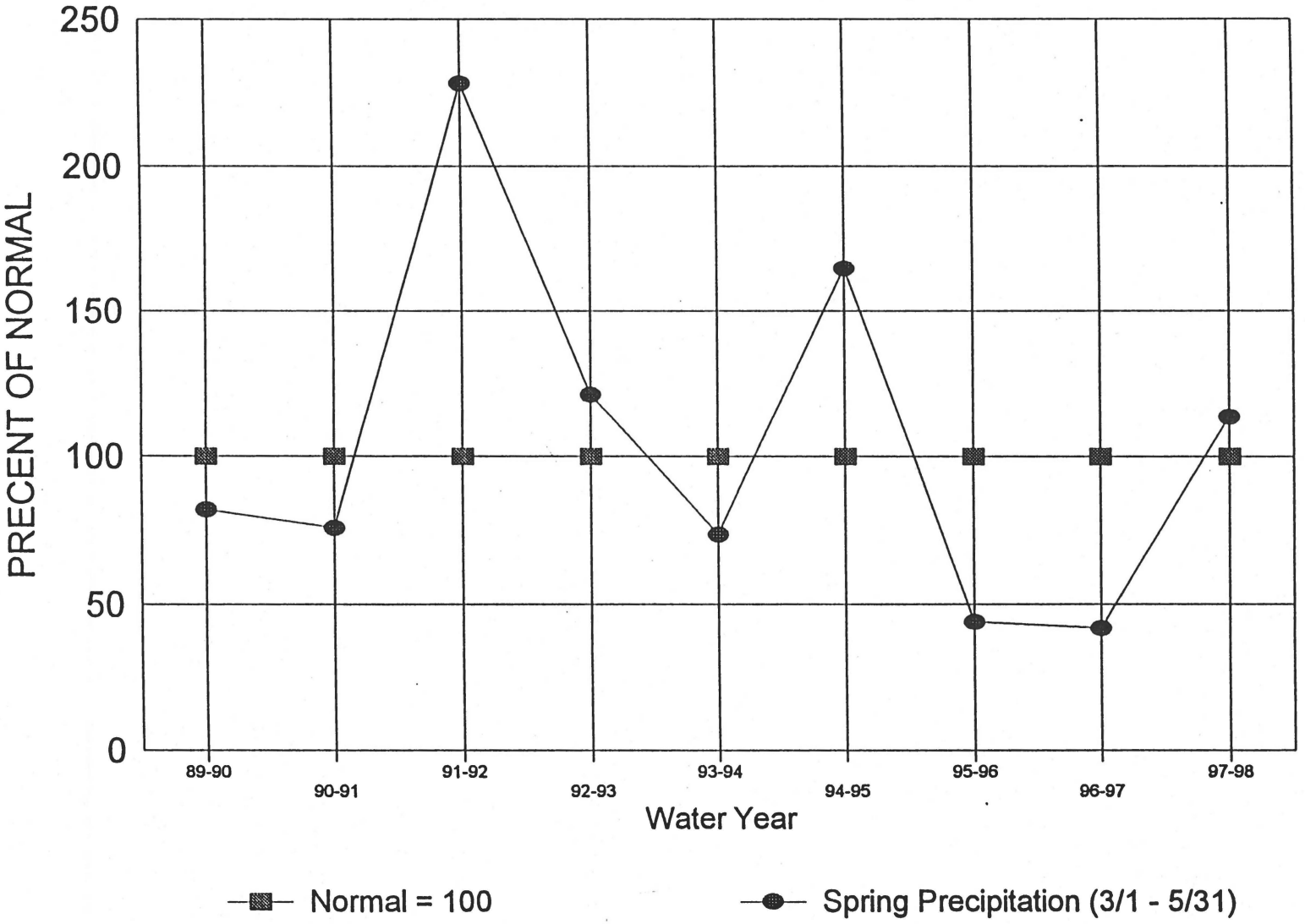
BOYS

Plant Category changes overtime & the 5 year average Annual Precipitation



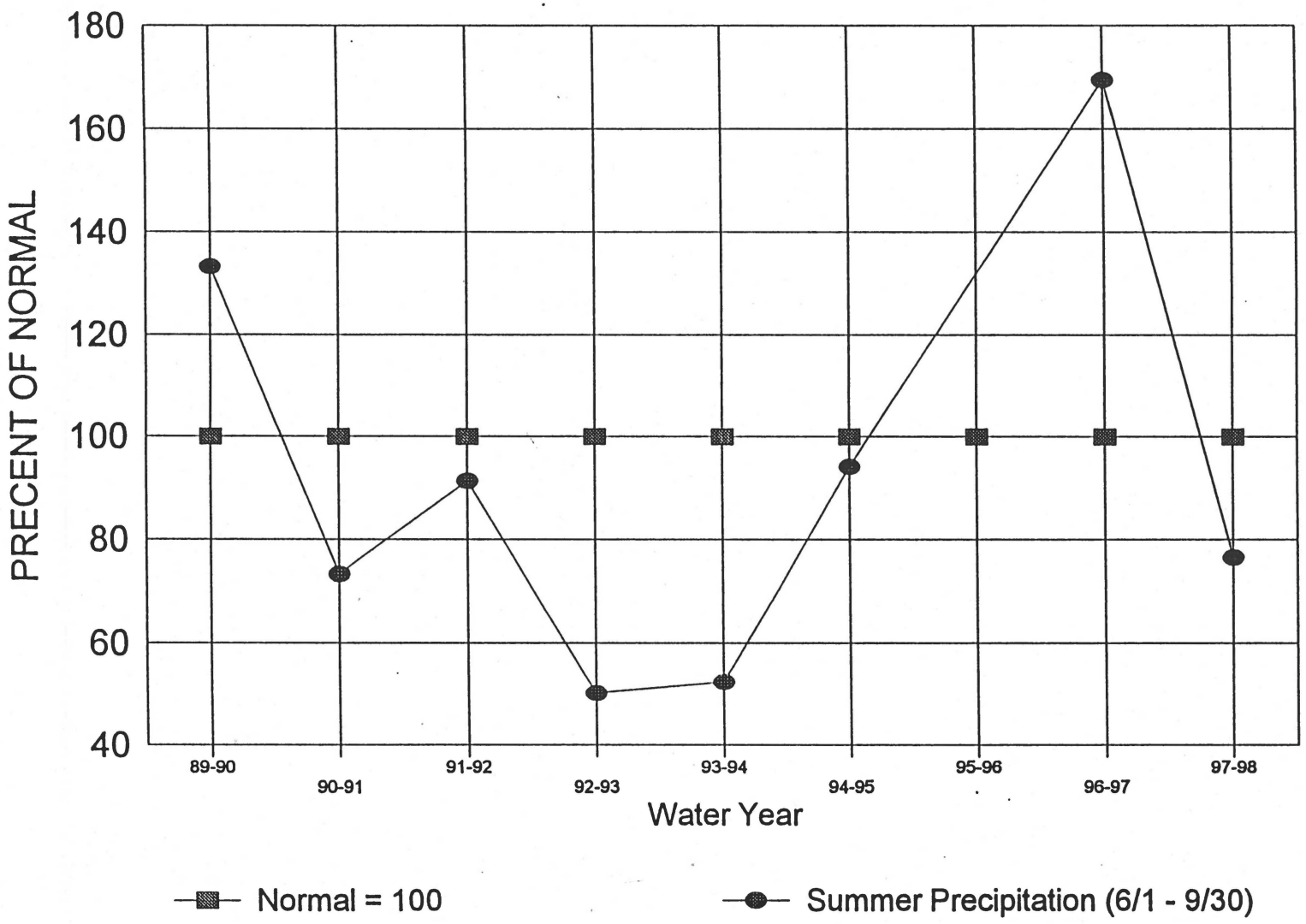
PRECIPITATION

CARROLL CATCH



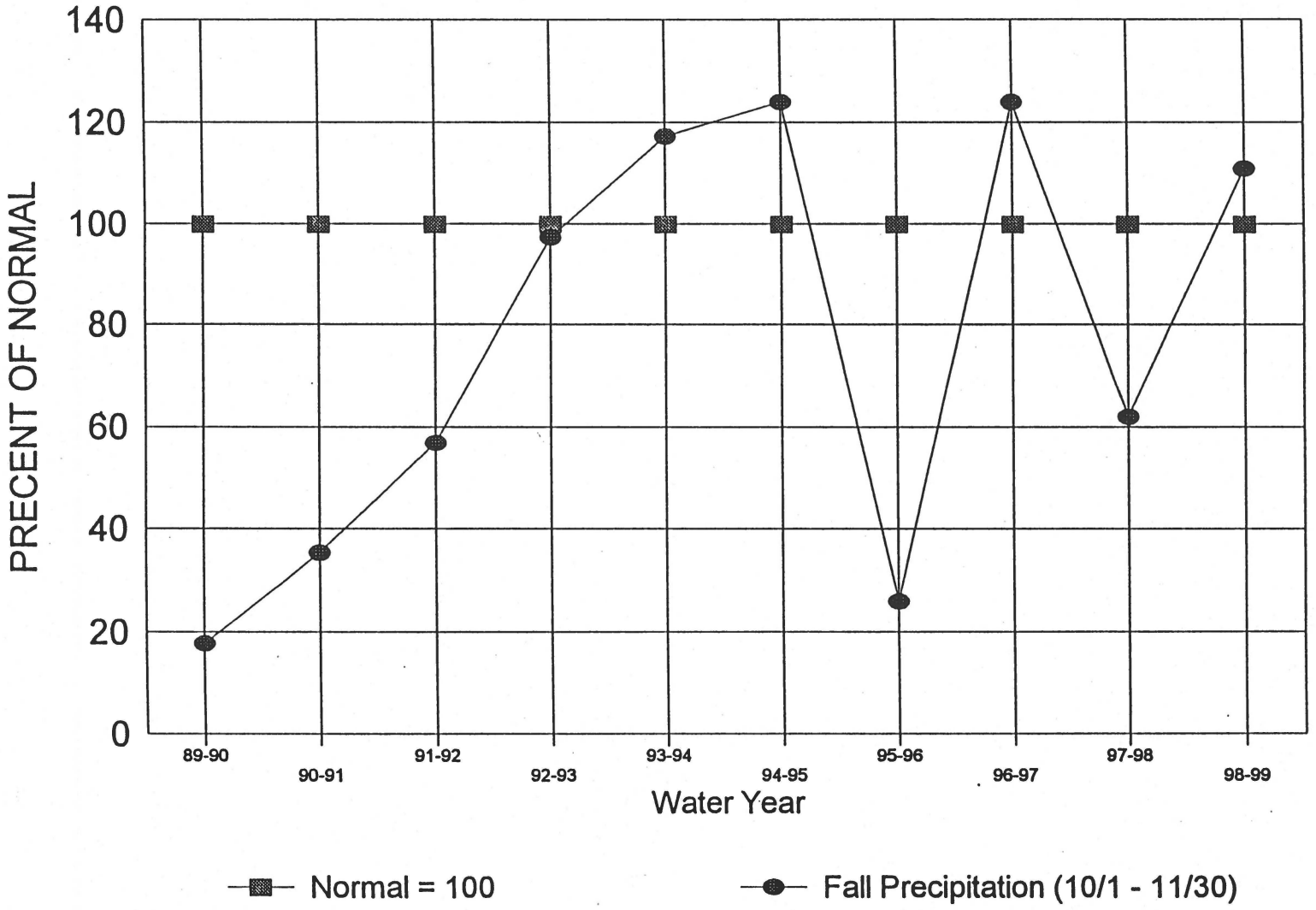
PRECIPITATION

CARROLL CATCH



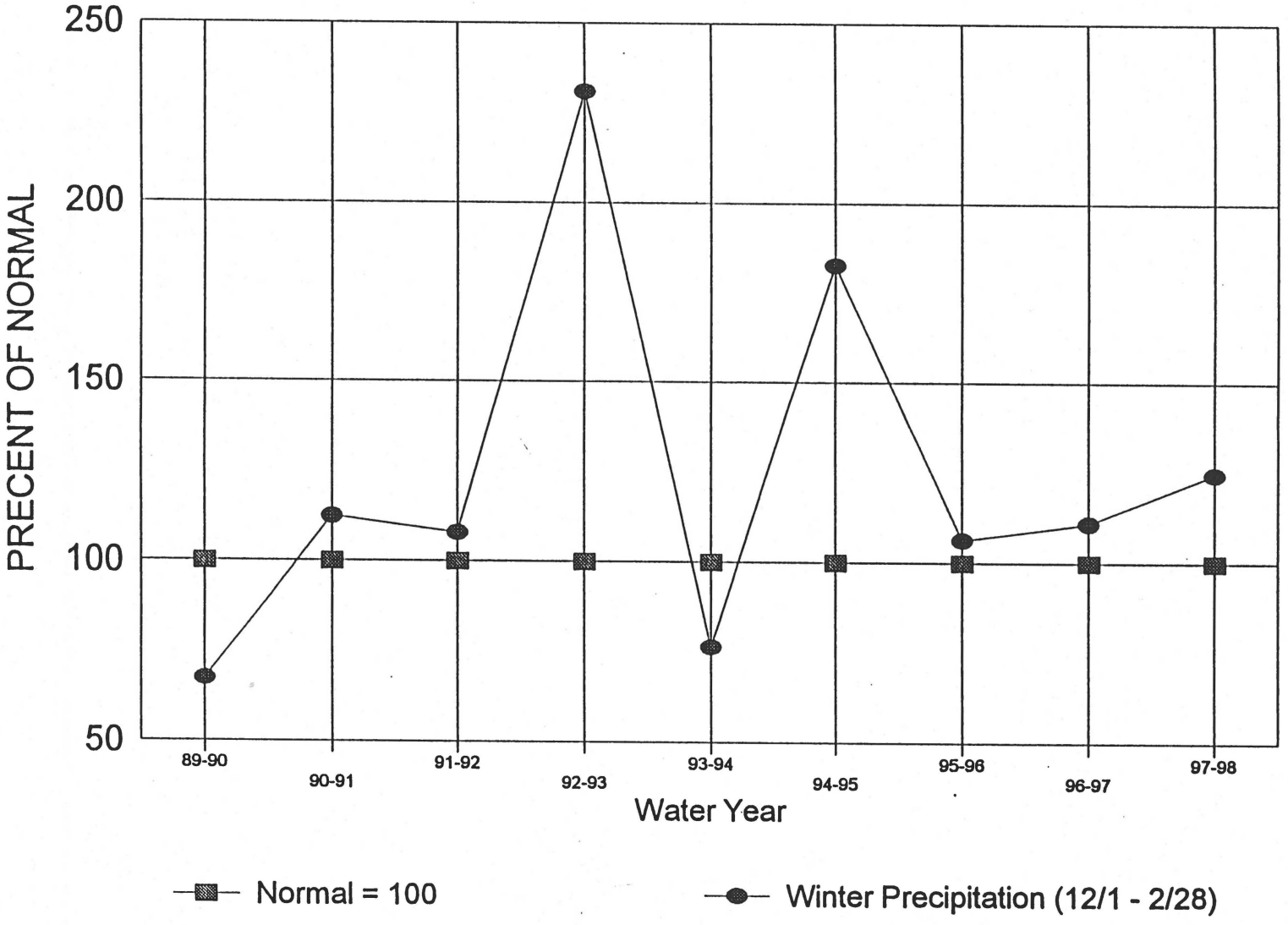
PRECIPITATION

CARROLL CATCH



PRECIPITATION

CARROLL CATCH



PRECIPITATION

CARROLL CATCH

