Bar X Range Allotment Analysis

1978

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I. Introduction

The Bar X Ranch is currently comorised of four grazing allotments: Bar X, Haigler Creek, Young and Colcord, hereinafter referred to as the Bar X. These allotments have been combined into one ranch unit and managed as a single operation. The ranch is dissected by the Heber-Reno Sheep Driveway, from the Walnut Well, west of Young, to the Mogollon Rim.

The Bar X is quite variable in topography and type of terrain. Approximately 30% of the area is rolling, gently undulating slopes broke by several, minor drainages and canyons. The remainder of the ranch is quite steep and rocky. Rock bluffs, outcroppings and 70% to 90% slopes are common along Haigler Creek and Naegelin Rim.

Rolling topography near Bar X Headquarters.

Vegetative types found on the allotment are as follows: (1) pinyon-juniper, (2) ponderosa pine, (3) grassland, (4) Chaparral, and (5) riparian. The pinyon-juniper and grassland types at present have the highest potential to produce desirable forage. However, under current management and the high level of stocking, much of the forage consumed by livestock on the Bar X is comprised of browse in the chaparral type

Climatic conditions were quite variable during the range analysis peri (1976 through 1977). During 1975, rainfall was below average especially during the growing season. Precipitation during 1976 increased as it did in 1977. Growing season precipitation was above normal in both 1976 and 1977.

The "normal" annual precipitation at the official weather recording station in Young is 19.37 inches. The growing season precipitation average is 8.0 inches. The following chart indicates precipitation levels prior to and during the range analysis period:

	Total Annual Precipitation January-December	Total Growing Season Precipitation July-September
38 year average	19.37	8.0
1971	18.66	10.44
1972	21.96	4.85
1973	17.56	3.61
1974	16.99	5.84
1975	14.35	3.95
1976	19.90	8.97
1977	16.51	10.15

Range condition on the Bar X is generally poor with a downward trend. Small areas of fair and very poor range condition may be found; a downward trend also occurs on these areas. The woodland/grassland areas at the lower elevation zones (5500-5900 feet) are rapidly deteriorating under current stocking levels. A prolonged history of overstocking and unsatisfactory management has depleted the range resource to a very critical point. At present, most areas still have an existi seed source of the more desirable range plants. Consequently, through protection from overgrazing for an extended period of time, range condition improvement could occur. The pine-type is severely depleted. Ground cover is adequate, however, composed predominantly of ponderosa pine needle-cast. Grass and desirable forb cover is often nonexistant in many areas. The overall browse resource is in poor condition due to hedging and overuse of the desirable browse species. Steep slopes and areas which would normally be ungrazed with proper stocking are currently utilized extensively because of the lack of sufficient forag in the grazable zones.

During the early 1960's, the Bar X was grazed under a continuous yearlong system. In the mid 1960's, a management system in conjunction with an extensive juniper control project was implemented. The system provided rest for each unit one year out of four. The excessive stock rate caused the management system to fail due to a lack of sufficient forage. When the cattle were placed into a unit, there was not enough forage to sustain them during the desired period of use. At present, nonuse for convenience has reduced the grazing pressure only slightly. Consistent overstocking has reduced grazing capacity each year and has resulted in a denuded watershed with intolerable soil loss. The pre-

sent system of management provides deferment to several pastures, although nearly all pastures are grazed each year. The current grazing system is not working satisfactorily. Erosion is continuing due to the lack of vegetative ground cover because of overgrazing.

The Bar X range analysis was conducted by two Pleasant Valley Range Conservationists over a period of three years. Charles E. Shipp, Range Conservationist, conducted the Range Condition Trend Studies in 1975. He was assisted by Del Stott, S.O. Range Sub-Staff and James Webb, Pleasant Valley District Ranger. Bar X ranch foreman, James Hackett accompanied Charles Shipp on two occasions during the field portion of reading the clusters. The vegetative typing, subtyping, range condition classing and grazing capabilities were determined by Richard Kvale, Range Conservationist during 1977. Del Stott Joseph A. Chiarella, Pleasant Valley District Ranger, and Andy Travers Range Conservationist assisted occasionally in the mapping process. Soil resource inputs from both S.O. Soil Scientists and R.O. Soil Scientists were utilized in determining grazing capability. Bar X ranch foreman, Francis Cline, accompanied Rich Kvale occasionally during the field mapping.

The range *Grazing Capability classification breakdown is as follows:

No Capacity 24,654 acres
Potential Capacity 4,813 acres
Full Capacity 742 acres

The current status of the Full Capacity acreage on the Bar X in terms of range condition and trend is indicated below.

Very poor range condition - downward trend 167 acres
Poor range condition - downward trend 412 acres
Fair range condition - downward trend 163 acres
Good range condition 0 acres
Excellent range condition 0 acres

Current utilization is extremely high and often exceeds 80% in key areas. The Production-Utilization Studies in 1973, 1974, and 1975 indicate extreme utilization 80-90% in key areas such as canyon bottoms and riparian zones. Utilization was also extreme (70-80%) on most open mesas, juniper areas and grassland areas. During 1976 and 1977, utilization remained excessively high, even under quite favorabl moisture conditions and convenience nonuse for 34 cattle in 1976 and 89 cattle in 1977.

* Current Region 3 Grazing Capability classifications are broken into three (3) catagories, "No Capacity" (NC) "terrain which is incapable of being grazed by domestic livestock on a sustained yield basis under reasonable management. "Potential Capacity" (PC) "terrain which is presently undergoing accelerated erosion because it does not have sufficient effective ground cover to protect the soil". "Full Capacity" (FC) "terrain which is presently stable because effective ground cover is holding soil loss to an acceptable level".

Extensive areas of vertisol activity (churning soils) have developed as a result of top soil and plant loss caused by excessive forage utilization. The nearly total removal of herbaceous plant material and perennial grass die-off has resulted in a lack of adequate effective ground cover.

Consequently, accelerated sheet erosion is common throughout the allotment. As the lower horizons of the soil profile (which are high in clay content) become exposed, a churning action begins that may, in fact, be impossible to arrest or rehabilitate.

In conjunction with a continuing depletion of vegetative cover through livestock use, the mechanical control of juniper with a bulldozer has exposed the clay horizons of the soil profile and has accelerated the vertisol activity.

Watershed conditions are quite deteriorated throughout the woodland zone of the Bar X. A lack of effective ground cover allows extensive, rapid run-off, causing sheet erosion and gully erosion. Livestock trampling has caused some soil compaction, compounding the run-off problem affected by over utilization of grass. Extensive run-off has reduced plant available moisture in the soil and undoubtedly has reduced ground water recharge. This is evidenced by many dry denuded riparian areas that were at one time dotted with springs.

Wildlife habitat has been damaged significantly by the removal of herbaceous plant cover (grass) and often by direct livestock/wildlife competition for food.

II. Current Status and Use

Livestock - Kind, Class, Numbers and Season of Use

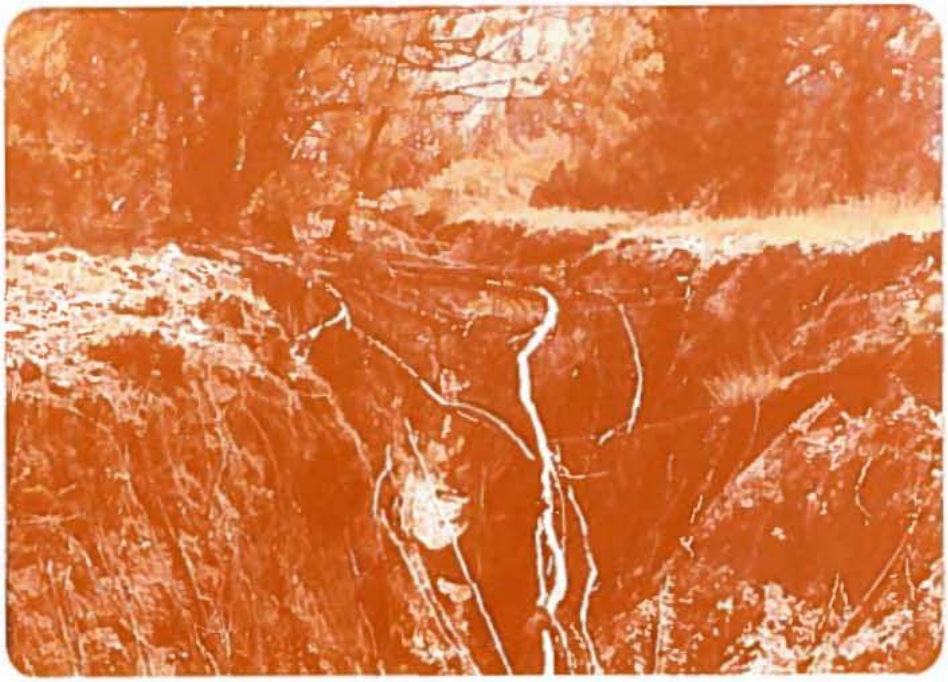
The current term permit for the Bar X provides for 468 cattle yearlong and all of the yearling progeny (NI) for 10 months. Until December 31 1977, 10 horses yearlong have been permitted by Free Use Permit. Each of the allotments and the respective term permit numbers are shown below by kind, class, and season of use:

Number Of Livestock	Kind Of Livestock	Class Of Livestock	Kind Of Permit	Period of Use From	To	Grazing Allotment
188	Cattle	Adult	Term	1/1	12/31	Bar X
107	Cattle	Yearlings	Term	1/1	10/31	Bar X
35	Cattle	Adult	Term	1/1	12/31	Colcord
163	Cattle	Adult	Term	1/1	12/31	Young
75	Cattle	Yearlings	Term	1/1	10/31	Young
82	Cattle	Adult	Term	1/1	12/31	Haigler Cr.
25	Cattle	Yearlings	Term	1/1	10/31	Haigler Cr.

Grazing System and Current Management

The current grazing system provides occasional yearlong rest for the pine type ranges, however, each pasture in the Woodland Zone is graze during the year. At present a deferment system is being used which provides seasonal deferment for some units during July through September. Livestock are often scattered throughout the allotment without compliance to specified management. This results in the loss of the expected benefits from grazing deferment. The current stocking rate is too high to enable implementation of a grazing system that wi provide resource protection and a favorable impact upon range condition.

Maintenance of range improvements on the Bar X during the past has be poor. Fence repair and other improvement maintenance has improved slightly during 1976 and 1977. The maintenance of stock tanks has be quite poor. Often the stock tank maintenance provided by the permitt has nearly resulted in the destruction of the improvement.



Gully resulting from the lack of spillway maintenance on a dirt tank.

Prior to 1976, salt was located on nearly all watering facilities. Th permittee was instructed to remove the salt from water and did so. Un current overstocking, the use of salt as a distribution tool is of no great value. At present, the search for forage by livestock has distributed grazing into all of the accessible areas and most of the seem ingly inaccessible areas leaving little to gain from an attempt at dis tribution using salt.

Unauthorized use occurred on the Bar X in 1975 (389 AUM's). Mr. Hamilton, permittee, had taken non-use for a portion of his livestock permitted by term permit, but the livestock were not removed from the allotment at the beginning of the grazing year, nor until the livestock were discovered by the Forest Service during Mr. Hamilton's grazing application in 1976.

Salt in Naegelin Canyon, a normal livestock concentration area because of the presence of water.

Vegetative Condition and Trend

The four allotments which make up the Bar X, cover a total of 30,208 acres (NF). Of this acreage, 4,813 acres are classed as Potential Capacity, 742 acres are classed as Full Capacity, and 24,654 acre are classed as No Capacity. Of the Full Capacity acreage, poor range condition exists on 412 acres (56%), very poor range condition exists on 167 acres (22%) and fair range condition on 163 acres (22%). Trend is downward on all areas inventoried. All of the range condition clusters on the Bar X, Haigler Creek, Colcord, and Young Allotments indicate a downward trend. A comparison of the range trend transect data from 1966 and 1975 portrays a continuing degradation of the range resource.

In 1966, 2.7% of the suitable acres (13,018 acres) rated very poor in a downward trend, 81.5% were in poor condition with 80% in a downward trend and 20% with no apparent trend, 15.8% were in a fair condition with a downward trend. Eleven years later, in 1977, 22% of the full capacity acres were in very poor condition, 56% in poor condition and 22% in fair condition, all with a downward trend. During the elapsed time from 1966 to 1977, range deterioration was so extensive that land capability to support grazing was drastically reduced. Of the 13,018 acres determined to be capable of sustaining grazing in 1966, only 742 acres have enough ground cover to sustain grazing in 1977.

The downward trend in range condition, apparent over all of the allotment is reflected in the transect measurement data. The following summary indicates the change in hits* from 1966 to 1975.

	Bar X			Haigler Cr.		Young		Colcord		
	C2	C3	C4	C1	C2	C1	C2	C1	C2	Total
Forage Plants	-10	-35	0	-16	-18	-13	-36	-4	-5	-137
All Plants	-12	-35	0	-15	-9	-13	-36	+4	-11	-131
Litter	-33	-7	-26	-39	-33	-57	0	-42	-9	-246
Bare Soil	+44	+66	+47	+45	+23	+86	+42	+44	+31	+428

The table indicates the change in hits either increase(+) or decrease (-) from 1966 to 1975, ie. (1966) 20/(1975)10 = -10 or (1 44/(1975) 88=+44. Taken from Cluster Summary Sheets.

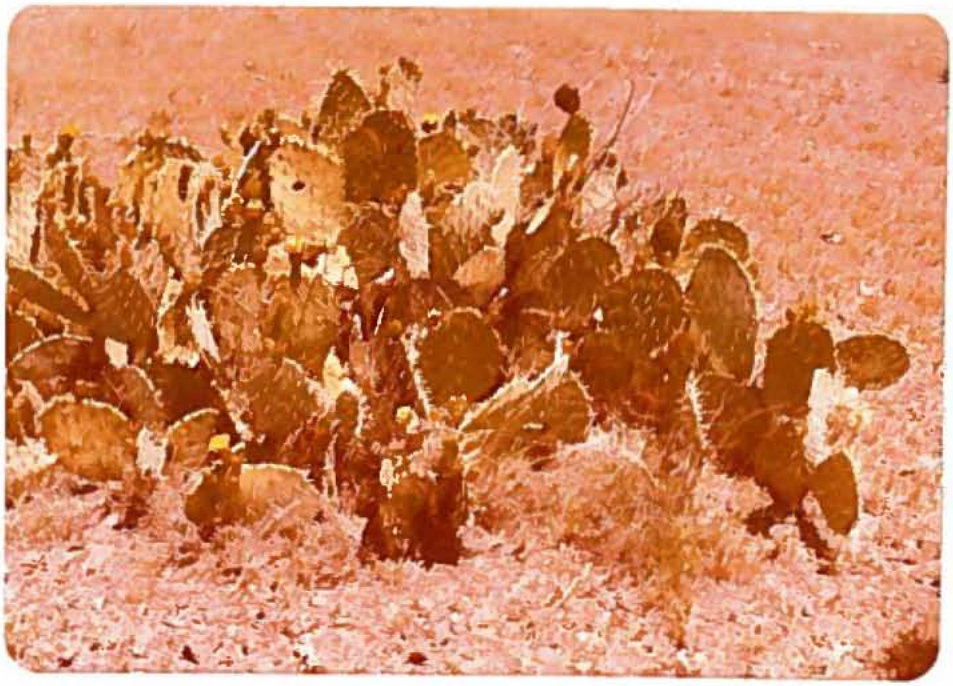
This clearly indicates a reduction in the number of plants and litter along the transect lines with a corresponding increase in the amount c bare soil. The reduction in hits on plants and litter during the 9 ye period between transect readings illustrates the decline in effective ground cover through the years. It also demonstrates the downward tre in range condition resulting in unacceptable soil loss and a damaged watershed.

Plant vigor throughout the four allotments is extremely low due to excessive utilization. Under heavy grazing, grass plants have been unable to sustain sufficient root growth. As a result, during very dry periods such as 1973 and 1975 grass plant mortality is quite high.

* Hits: That material encountered within a 3/4" loop, whether vegetativ (live root crown or overstory), litter (naturally occurring vegetative material on the soil surface, must effectively cover the soil surface, normally to a depth of 1/2" of greater), rock (rock fragments greater than 3/4" diameter, which cover more than 1/2 of the loop) or bare soi (bare soil covering more than 1/2 of the loop).

Forage Production and Current Utilization

Forage production in the Woodland Zone (Oak Woodland and Pinyon-Junip types) is quite low in comparison to the potential of the area. The soil resources inventory estimates the forage production potential fo the area (soil mapping units #60, #61, #66, #63, #20, #74, #401, and #151) is 1500 lb/acre. Present production varies from 75 lb/acre to 350 lb/acre. The heavy grazing pressure by livestock has reduced vigor and plant density to a point far below the site potential.



Grass plants protected from grazing by prickly pear (Opuntia spp. Blue grama (Bouteloua gracilis) and hairy grama (B. hirsuta) domi the unprotected site while bottlebrush squirreltail (Sitanion hys cane beardgrass (Andropogan barbinodis), sideoats grama (B. curti dula) and plains lovegrass (Eragrostis intermedia) are found in t protected site.

Grass production in the pine type is extremely low, often less than 50 lb/acre. Historic and current over-utilization, heavy needle-cast buildup and canopy overstory have reduced forage production drastical Forage production under improved conditions may never be significant. The soil resource inventory indicates a forage production potential o 250 lb/acre or less in soil mapping units #157 and #162. However the riparian zones in the pine type (soil mapping unit #22) in the soils inventory are listed as producing 75 lb/acre with a potential to prod 2,000 lb/acre. These areas are, of course, natural livestock concentration areas, receiving approximately 90% utilization each year.

Grazing Capability

The Bar X range trend studies were conducted under the guidelines and procedures provided in the 1970 Range Environmental Analysis Handbook R-3.

Condition typing, subtyping and capability were conducted as provided in the 1978 Range Analysis Handbook - R-3. Grazing capability was determined through the two methods outlined in the Range Analysis Handbook - 1) ocular method and the 2) erosion hazard method. All initial field mapping was done utilizing the ocular method.

Mapping delineations derived from the ocular method were checked agair the erosion hazard method (Universal Soil Loss Equation - USLE). Duri the initial field work, slope and ground cover measurements were taker for later application of the erosion hazar method. The erosion hazar method utilizes slope, slope length, storm intensity, soil property, and ground cover data in an empirical computer model which provided guidelines for determining grazing capability based on soil stability.

The use of the erosion hazard method on those mapping units classified as Full Capacity (FC) under the ocular method indicated soil loss potential high enough to warrant a Potential Capacity (PC) designatior The empirical information derived from USLE indicates 742 acres on the Bar X and Heber-Reno Sheep Driveway are Full Capacity and the remainde either Potential Capacity (PC) or No Capacity (NC). Existing guidelines for R-3 in the Range Allotment Analysis Handbook state that grazing capacity estimates must be based on Full Capacity acres only. Mapping units delineated in a Production-Utilization Study should not be assigned an allowable use if the unit is Potential Capacity range. The reason, of course is the fact that sufficient ground cover is not present to prevent unacceptable soil losses.

The grazing capability of various sites on the Bar X and the Heber-Ren Sheep Driveway is specified on the allotment analysis map and determined by the following guidelines:

No Capacity - NC - Terrain which is incapable of being grazed by domestic livestock on a sustained-yield basis under reasonable management goals. This includes areas under natural condition that are not capable of producing vegetation, soils that are not capable of producing more vegetation than is needed to prevent unacceptable accelerated erosion, Full Capacity or Potential Capacity islands within NC areas. Dense brushfields and extremely steep slopes are delineated as NC in the Bar X Allotment Analysis. Examples of this type are found in the Oxbow Unit.

Emory oak, manzanita and juniper form an extremely dense thicket which greatly impairs mobility. These sites are also normally located on slopes of 30% to 90%. Much of the pine type is delineated as NC because of steep slopes (40%+) in conjunction with a lack of forage. The pine type is quite steep, broken country

with dense reproduction of pine. Needle-cast is two inches deep with herbaceous forage nearly absent. Often, both herbaceous cover and needle-cast are lacking in the pine type allowing extensive erosion.

Total No Capacity on Bar X - 24,654 acres NF.

Pine type in Clay Springs area.

Potential Capacity - PC - This grazing capability class was applied by the following criteria:

1) Terrain which is presently undergoing accelerated erosion because it does not have sufficient vegetative ground cover to protect the soil.

2) Riparian zones which are severely denuded and cannot be grazed at present without additional resource damage.

3) Terrain which cannot be grazed until forage plant density increases. Ex. gentler slopes of Naegelin Rim in the Pine Type.

Total Potential Capacity on Bar X - 4,813 acres NF.

Full Capacity - FC - Terrain which is presently stable because effective ground cover is holding soil loss to an acceptable level. These are the areas used to compute gross estimated grazing capacity.

Total Full Capacity on Bar X - 742 acres NF.

In cases where grazing capability was questionable, the area was designated as "Full Capacity" rather than "Potential Capacity".

Naegelin Canyon Turkey Plot (behind fence) - Note the amount of silt which has accumulated (foreground) in the fence. The thermos (in the center) is 18 inches tall. Originally the top of the fence post was 5 ft. above the soil surface and is now only 3-1/2 ft. above the soil surface.

Evaluation of Cover Factors

vs.

Soil Loss in Determining Grazing Capability

with the Universal Soil Loss Equation (USLE)

Of rea n nit	Soil Unit	% Slope	% Veg.	% Litter	% Coarse Fragments	Bare Soil	Current Soil Loss	Allow. Soil Loss	% Current Good Cover	% Allow. Good Cover	Capability Classificati
9.1	60	5	20	1	5	69	3.6T/a	2T/a	26	45	Potential Ca
2.3	66	6	22	9	2	64	5.1T/a	2T/a	33	60	Potential Ca
1.2	68	2	13	5	6	70	1.2T/a	2T/a	24	20	*Full Capac
4.2	162	40	12	45	6	20	7.3T/a	2T/a	63	95	No Capacity
5.4	61	25	23	1	9	58	29.3T/a	2T/a	33	85	No Capacity
.7	22	2	5	58	10	27	.2T/a	2T/a	73	15	Full Capaci
9.0	74	30	25	6	15	39	15.1T/a	2T/a	46	85	No Capacity
2.9	75	35	25	5	16	39	15.1T/a	2T/a	46	90	No Capacity
.4	150	5	25	4	17	37	1.1T/a	1T/a	46	50	Potential Ca
2.1	151	25	28	10	15	47	13.3T/a	2T/a	53	80	No Capacity
5.3	157	4	9	46	9	27	1.5T/a	2T/a	64	50	Full Capaci
5.0	161	60	10	67	6	20	30.4T/a	2T/a	83	95	No Capacity
2.1	21	2	15	58	11	5	.2T/a	2T/a	84	0	Full Capaci
.7	20	2	36	2	2	54	.5T/a	2T/a	40	5	Full Capaci
6.0	165	50	10	57	10	13	7.4T/a	2T/a	77	95	No Capacity
3.3	601	25	20	30	18	14	9.5T/a	1T/a	55	80	No Capacity
4.4	602	50	20	38	14	14	17.7T/a	1T/a	60	90	No Capacity

* 30% of soil unit 68 are Udorthentic Chromosterts with vertic properties with a current erosion rate of 2.8 T/a.

EROSION BY SLOPE-LENGTH AND COVER FACTOR
SOIL NAME MU61,74,75-NAEGELIN

25% Avg (61)
30% Avg (74)
No Avg. (75)

R FACTOR = 106.000 PERCENT CANOPY COVER = 25
K FACTOR = .470 SURFACE COVER TYPE = G
P FACTOR = 1.000 EROSION UNITS = TONS/ACRE

SLOPE PR,CENT	SLOPE LENGTH	SLOPE-LENGTH FACTOR	.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0
			PER CENT GOOD GROUND COVER									
			COVER FACTOR									
			.4200	.3250	.2680	.2250	.1900	.1600	.1460	.1160	.1000	.0810
5.00	100.0	2.535	53.04	41.04	33.85	28.42	24.00	20.21	18.44	14.65	12.63	10.23
0.00	100.0	4.032	84.33	65.29	53.84	45.20	38.17	32.14	29.33	23.30	20.09	16.27
5.00	100.0	5.814	121.6	98.13	77.62	65.17	55.03	46.34	42.29	33.60	28.96	23.46
0.00	100.0	7.837	164.0	126.9	104.6	87.84	74.18	62.47	57.00	45.29	39.04	31.62
5.00	100.0	10.06	210.4	162.8	134.3	112.7	95.19	80.16	73.15	58.12	50.10	40.50
0.00	100.0	12.43	260.0	203.2	165.9	139.3	117.6	99.06	90.40	71.02	61.91	50.15
5.00	100.0	14.91	311.9	241.4	199.0	167.1	141.1	118.8	108.4	86.15	74.27	60.16
0.00	100.0	17.45	365.2	282.6	233.0	195.6	165.2	139.1	127.0	100.9	86.95	70.43
5.00	100.0	20.03	419.1	324.3	267.4	224.5	189.6	159.7	145.7	115.8	99.79	80.83
0.00	100.0	22.61	473.0	366.0	301.8	253.4	214.0	180.2	164.4	130.6	112.6	91.22
5.00	100.0	25.15	526.3	407.3	335.8	281.9	238.1	200.5	183.0	145.4	125.3	101.5
0.00	100.0	27.65	578.5	447.7	369.2	309.9	261.7	220.4	201.1	159.8	137.7	111.6
5.00	100.0	30.08	629.4	487.0	401.6	337.2	284.7	239.8	218.8	173.8	149.8	121.4
0.00	100.0	32.42	678.5	525.0	432.9	363.5	306.9	258.5	235.8	187.4	161.5	130.8
5.00	100.0	34.68	725.7	561.5	463.1	388.8	328.3	276.5	252.3	200.4	172.8	140.0
0.00	100.0	36.84	770.9	596.5	491.9	413.0	348.7	293.7	268.0	212.9	183.5	148.7

5% Avg (60 + 6
2% Avg (68

EROSION BY SLOPE-LENGTH AND COVER FACTOR
SOIL NAME :60,66,68, .*NAEGELIN

R FACTOR = 106.000 PERCENT CANOPY COVER = 25
K FACTOR = .470 SURFACE COVER TYPE = G
P FACTOR = 1.000 EROSION UNITS = TONS/ACRE

				PER CENT GOOD GROUND COVER								
				.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0
				COVER FACTOR									
SLOPE PER.CENT	SLOPE LENGTH	SLOPE-LENGTH FACTOR		.4200	.3250	.2680	.2250	.1900	.1600	.1460	.1160	.1000	.0810
.0000	175.0	.6866E-01	1.772	1.371	1.130	.9499	.8014	.6749	.6150	.4873	.4218	.3417
2.000	175.0	.2566	6.950	5.850	3.159	2.652	2.239	1.886	1.721	1.367	1.179	.9547
4.000	175.0	.6976	10.01	8.057	6.644	5.578	4.710	3.966	3.619	2.876	2.479	2.008
6.000	175.0	.8836	10.89	14.31	11.80	9.907	8.366	7.045	6.429	5.108	4.403	3.566
8.000	175.0	1.[illegible]	25.25	21.08	17.39	14.60	12.33	10.38	9.472	7.525	6.487	5.255
10.00	175.0	1.757	30.40	29.09	23.99	20.14	17.01	14.32	13.07	10.38	8.952	7.251
12.00	175.0	2.546	[illegible]	38.31	31.60	26.52	22.39	18.86	17.21	13.67	11.79	9.547
14.00	175.0	3.[illegible]	[illegible]	48.68	40.15	33.70	28.46	23.97	21.87	17.36	14.96	12.13
16.00	175.0	3.717	77.70	60.19	49.63	41.67	35.19	29.63	27.04	21.48	18.52	15.00

(14)

EROSION BY SLOPE-LENGTH AND COVER FACTOR
SOIL NAME MU22-HAPLOBOROLLS

R FACTOR = 125.000   PERCENT CANOPY COVER = 25
K FACTOR = .270   SURFACE COVER TYPE = G
P FACTOR = 1.000   EROSION UNITS = TONS/ACRE

		PER CENT GOOD GROUND COVER	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0
		COVER FACTOR	.0660	.0520	.0410	.0320	.0240	.0160	.0130	.0060	.0040	.0020
SLOPE PER.CENT	SLOPE LENGTH	SLOPE-LENGTH FACTOR										
.0000	150.0	.6054-01	.1801	.1419	.1119	.8731-01	.6546-01	.4365-01	.3547-01	.1637-01	.1091-01	.5457-02
[illegible].000	150.0	.2259	.5031	.3964	.3126	.2440	.1830	.1220	.9911-01	.4574-01	.3049-01	.1525-01
[illegible].000	150.0	.4676	1.042	.6210	.6474	.5052	.3789	.2526	.2053	.9473-01	.6316-01	.3158-01
[illegible].000	150.0	.8102	1.823	1.436	1.132	.8037	.6623	.4418	.3590	.1657	.1105	.5523-01
[illegible].000	150.0	1.2[illegible]	2.[illegible]	2.116	1.665	1.302	.9765	.6510	.5290	.2441	.1620	.8138-01
0.00	150.0	1.666	3.7[illegible]	2.920	2.302	1.797	1.347	.8983	.7299	.3369	.2245	.1123

(15)

EROSION BY SLOPE-LENGTH AND COVER FACTOR
SOIL NAME HU60,66,60,..-NAEGELIN

R FACTOR = 106.000 PERCENT CANOPY COVER = 0
K FACTOR = .470 SURFACE COVER TYPE = G
P FACTOR = 1.000 EROSION UNITS = TONS/ACRE

			PER CENT GOOD GROUND COVER								
			50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0
			COVER FACTOR									
SLOPE PER.CENT	SLOPE LENGTH	SLOPE-LENGTH FACTOR	.0700	.0550	.0420	.0320	.0240	.0180	.0130	.0100	.0070	.0050
0000	175.0	.8866-01	.2953	.2320	.1772	.1350	.1012	.7592-01	.5483-01	.4218-01	.2953-01	.2109-01
.000	175.0	.2361	.8250	.6482	.4950	.3772	.2829	.2121	.1532	.1179	.8250-01	.5893-01
.000	175.0	.4976	1.735	1.363	1.041	.7933	.5949	.4462	.3223	.2479	.1735	.1239
.000	175.0	.7636	3.042	2.422	1.849	1.409	1.057	.7926	.5724	.4403	.3082	.2202
.000	175.0	1.342	4.581	3.568	2.725	2.076	1.557	1.168	.8434	.6487	.4541	.3244
0.00	175.0	1.757	6.266	4.924	3.760	2.865	2.148	1.611	1.164	.8952	.6266	.4476
2.00	175.0	2.366	8.251	6.483	4.950	3.772	2.829	2.122	1.532	1.179	.8251	.5893
4.00	175.0	3.007	10.49	8.239	6.291	4.793	3.595	2.696	1.947	1.498	1.049	.7490
6.00	175.0	3.717	12.96	10.19	7.778	5.926	4.444	3.333	2.407	1.852	1.296	.9259

This table accounts for 85.1% of the entire Bar X Allotments and the Heber-Reno Sheep Driveway. The remaining soil units are on steep slopes (50%+) and/or rock outcroppings.

The USLE Analysis indicates that soil units 21 and 22 are full capacity areas. However the denudation of these riparian zones warrants a classification of potential capacity in order to protect fisheries and/or wildlife habitat (cover).

Soil unit 157 is located in the ponderosa pine type, often in isolated and inaccessible pockets. The unit does not produce enough forage to warrant a livestock grazing operation with reasonable management goals under sustained yield management.

III. Resource Description as Related to Grazing Use and Range Management

Geology and Terrain

The Bar X includes areas of rolling, gently undulating topography and areas of steep, rugged slopes and rock outcroppings. The lower elevation, gentle topography areas, provide most of the grazing capacity for livestock. Elevations range from 4,600 feet near the Ellinwood Ranch to 7,600 feet along the Mogollon Rim.

The lower woodland area soils are developed primarily from alluvium materials such as gravel, sand and silt. The soils in the southwestern portion of the allotment developed from granite and schist parent materials. Rock materials between the Mogollon Rim and Naegel Rim are predominately sandstone, limestone and shale.

Climate

The local climate on the Pleasant Valley Ranger District is characterized by mild summers and winters. The average annual precipitatio is 19.37 inches. The highest peak of effective growing season precipitation occurs during July through September. Spring moisture is important to a lesser degree during March through May. The month of June is normally dry and very warm. Weather records at the Pleasant Valley Ranger Station (see appendix) indicate that the precipitation average during the period July through September is 8.0 inches. Winter and spring moisture are very important in the physiological development of cool season grasses such as western wheatgrass (Agropyron smithii), muttongrass (Poa fendleriana), Kentucky bluegras (Poa pratensis), bottlebrush squirreltail (Sitanion hystrix), and plains lovegrass (Eragrostis intermedia). Important browse species such as mountain mahogany (Cercocarpus brevifloris) and ceanothus (Ceanothus spp.) rely on winter and spring moisture for leader growth

The moisture received during the summer is utilized most efficiently by warm season grass species such as sideoats grama (Bouteloua curtipendula), blue grama (B. gracilis), hairy grama (B. hirsuta), cane beardgrass (Andropogon barbinodis) and Aristida hamulosa.

Soils

Soils in the pinyon-juniper and grassland types have been adversely affected by the severe overstocking and mismanagement that has existed on the range. The excessive utilization of grass by livestock has resulted in a loss of plant vigor and grass plant die-off. Effective ground cover is currently less than the amount required to protect the soil due to overuse by cattle. As a result, the upper horizons of the soil have been eroded away in many areas exposing the "B" soil horizon which is high in clay content. As the clayey "B" horizon of the soil is exposed, the soil begins a churning action because of the "shrink and swell" characteristics of the soils.

Sheet, gullying and rill erosion is extensive on the allotment. Gully erosion is active on many areas of the Bar X. The lack of vegetative cover allows a large percentage of precipitation to run-off, rather than percolate into the soil. The overland flow of water has resulted in gully and rill formation down stream.

Vegetation

The plant associations as delineated on the range analysis map indicate 6 distinct vegetation types on the allotment: 1-Grassland, 5-Chaparral 6-Conifer, 7-Riparian, 9-Pinyon-Juniper, and 13-Oak Woodland.

The vegetative resource on the Bar X is depleted drastically in terms of forage production, plant density, desirable species composition and diversity. Historic overstocking, as well as current overstocking, have induced plant community retrogression.

Juniper Savannah

The pyric dis-climax plant community in the juniper woodland area appears to be a grassland savannah characterized by large scattered alligator junipers. The climax grass plant community associated with the alligator juniper (Juniperus deppeana) is a mixture of both cool and warm season species similar to the composition of the Pine Creek Range Study Plots and the Cherry Creek Watershed near Young. Sideoats grama appears to be the dominant species associated with plains lovegra blue grama, hairy grama, spike muhly (Muhlenbergia wrightii), and scattered plants of muttongrass, western wheatgrass and bottlebrush squirreltail.

Excessive livestock utilization has reversed the successional direction, resulting in a plant community dominated by blue and hairy grama. The decreaser species such as plains lovegrass and sideoats grama are commonly found in remnant stands within the canopy of cactus plants (Opuntia spp.) and absent in unprotected areas.

The removal of 70%+ of the forage production each year by grazing has precluded the accumulation of the litter layer which is conducive to the mesic microclimate required by cool season species.

The juniper grass savannah was presumably maintained by wildfire prior to the 1880's. Fire has been virtually eliminated in the juniper type because of the lack of adequate fine fuels (grass) to carry a fire. A dense grass cover, which can compete vigorously, also provides protection from the encroachment of younger age classes of alligator juniper.

Sheet erosion is a severe problem on many sites. Overall range and soil condition trend is down. In the present state of degradation, many sites will no longer respond favorably to the removal of grazing alone, but will require a physical treatment or removal of the closed juniper canopy.

Grassland

The grassland plant community is dominated generally by blue and hairy grama with occasional occurrences of sideoats grama. Invader species such as sunflower (Helianthus spp.), Aster spp., broom snakeweed (Gutierrezia sarothrae), and small alligator juniper are usually present in the community. Trend is down on all of the grassland sites. Erosion in the form of gullying and sheet erosion is a problem. Pedestaling of grass plants and plant die-off is common. The lack of adequate vegetative cover has resulted in initiating and expanding of vertisol areas (churning soils).

Ponderosa Pine

The ponderosa pine type has been depleted severely by livestock overuse. Desirable grass species such as pine dropseed (Blepharoneuron tricholopis), Kentucky bluegrass, mountain muhly (Muhlenbergia montana bottlebrush squirreltail, and western wheatgrass have been greatly reduced. Although the primary cause of the grass community deterioration is grazing abuse, the effect of dense ponderosa pine (Pinus ponderosa) reproduction and protection from fire cannot be discounted in the process of range deterioration.

Ponderosa pine type - note the dense needle cast and sparse stand of dryland sedge (Carex spp.)

Chaparral

The chaparral type is typically dominated by turbinella oak (Quercus turbinella), emory oak (Q. emoryii) and mountain mahogany (Cercocarpus breviflorus). The understory, on sites not severely depleted by grazing is normally dominated by sideoats grama, Aristida spp. and blue grama. On slopes exceeding 50%, the soils appear to be of such a nature that a dense chaparral or brush cover is a necessity to prevent massive erosion. This type is a valuable resource for deer habitat and provides much of the winter diet for livestock. The chaparral zones on the Bar X are grazed excessively, resulting in trampling and trailing damage to the soil (soil displacement) and extreme hedging on the desirable browse.

Typical Chaparral on steep slopes below Naegelin Rim.

Oak Woodland

The oak woodland type shares many of the characteristics of the pinyo juniper type and the chaparral type. This plant community contains pinyon pine (Pinus edulis), alligator juniper, turbinella oak and is usually dominated by emory oak. Often the oak woodland type is found on cooler north facing slopes and deeper canyons. It is often associated with rocky, shallow soils. The understory should be composed many desirable grass species such as sideoats grama, Texas bluestem (Andropogon cirratus) and wolftail (Lycurus phleoides). Normally, th stony and steep characteristics of these sites generally provide prot tion from domestic livestock grazing. However, current overstocking forced cattle into these areas and drastically deteriorated the under story plant community leaving inadequate ground cover.

Riparian

The riparian type is found within the pine type and the woodland type On all sites where livestock have access, extreme utilization has resulted in extensive resource damage. Colcord Canyon, Naegelin Canyon Cherry creek, Haigler Creek and Pine Creek are all severely denuded b grazing. The riparian sites have the potential to be the most productive sites, if they have not been depleted beyond recovery. The soil resource inventory indicates that these sites have the potential to produce 1500-2000 pounds per acre. These areas are an extremely important element of wildlife habitat and fisheries. They are also important in terms of quality watershed.

At present, perennial grasses are nearly non-existant. Woody species are hedged severely and reproduction of desirable species is absent.

Wildlife

Extreme overuse of grass and browse on the Bar X and Heber-Reno Sheep Driveway has severely damaged the wildlife resource. Reduced herbage production, extensive severe erosion, soil compaction, and stream siltation are the results of overgrazing in the area. This damage has resulted in degradation of the quality habitat needed to sustain healthy, diverse wildlife populations.

Of the three primary needs of all wildlife species (food, water and cover), food and cover have been the most severely damaged. The excessive utilization of herbaceous vegetation by domestic livestock has reduced the herbaceous productivity of the forage resource which, in turn, has reduced the capability of the land to support viable populations of wildlife species that one would expect to find.

Erosion and compaction affect the ability of an area to produce herbaceous vegetation in two ways:

1) Without effective or adequate ground cover in the form of litter or vegetation, a drastic increase in water run-off is possible. Ground cover is necessary to catch, hold and slowly absorb rain drops to allow percolation through the soil and be available to plant roots.

2) Water moving over the ground surface (run-off) transports soil particles. As soil loss exceeds soil formation, site capability to produce herbaceous vegetation decreases.

The following list of wildlife species that should exist on the allotment and driveway indicates the dependency on herbaceous vegetation (directly or indirectly):

Mammalian Species - direct dependence

Rodents (moles, mice, rats, ground squirrels, chipmunks, etc.)
Black-tailed jack rabbit
Elk
Cottontail rabbit
Javelina
Whitetail deer - seasonally
Mule deer - seasonally

Mammalian Species - indirect dependence

Shrews	Blackbear
Raccoon	Ringtailed cat
Gray Fox	Coyote
Mountain Lion	Bobcat
Bats	Skunks

Avian Species - direct dependence

Morning dove	Scrubjay
Merriam's turkey	Raven and crow
Hummingbirds	Horned lark
Steller's jay	

Avian Species - indirect dependence

Roadrunners	Nighthawks
Swallows	Pinyon jay
Clark's nutcracker	

The fishery along Haigler Creek is damaged because of extreme livestock utilization of riparian vegetation and siltation resulting from upstream erosion. Desirable streamside vegetation that would provide shade, nutrients and habitat for insects is lacking. Desirable insects for trout such as May flies are quite scarce. Heavy silt deposition in the stream bed is detrimental to the spawning requirement of trout.

Denuded riparian zone near Haigler Creek.

Selective, excessive grazing by livestock has eliminated cool season grass species in the woodland zone. Desirable cool season and warm season species in a mixture would provide the plant community diversity needed.

Watershed

One of the primary purposes for originally establishing the Tonto National Forest was for watershed protection. Protection of the water and soil resources is even more critical today than it was when the Tonto was established. In order to meet the tremendous demand for renewable resources, maintaining the soil in a productive condition is of the utmost importance. The necessity of providing high quality water for downstream aquatic life and human use cannot be overstated. Watersheds on the Tonto provide a major source of water supply for 1.4 million people in the Phoenix, metropolitan area. This water is utilized for domestic, agricultural, industrial, recreational and wildlife purposes. Protection of the soil and water resources on the Tonto was recently made top priority on the Forest. National policy provides direction that management activities of other resources must, in turn, protect the basic soil, water and geology resources.

Current Bar X conditions are a result of the excessive abuse and mismanagement of the grazing resource. Goals and direction given have not been met in terms of either protecting or improving the soil and water resources. Erosion and water pollution are prevalent on the Bar X.

The pinyon-juniper and riparian vegetation communities are suffering the worst damage. Soil loss in the form of sheet and gully erosion in the pinyon-juniper community is severe due to a lack of adequate vegetation cover. These losses exceed the losses that could be expected as a result of natural geologic processes. This is evident from the examination of areas protected from grazing such as the Pine Creek Range Study Plots and the Cherry Creek Watershed which have healed considerably with the exclusion of domestic livestock during the last 20 years. The riparian areas within the Bar X are currently in a deteriorated state. Two types of damage is occurring on these areas. First, the soil does not have adequate vegetative ground cover, consequently erosion is occurring. Secondly, the sediment from deteriorated lands upstream is degrading and polluting the aquati environment.

Although the pinyon-juniper and riparian communities are by far the most productive sites, the overuse of these areas will continue to reduce the effective vegetative cover (grass plant density) and increase topsoil loss, which will result in a loss or reduction in site productive capability.

Vegetative cover within Pine Creek Study Plot

Poor vegetative cover on Sheep Driveway under overgrazing by Bar X cattle and sheep.

RANGE & SOIL CONDITION AND TREND

The following summaries demonstrate overall allotment range condition trend in 1966 and 1975. The data is a summarization of the permanent range trend clusters on each individual allotment.

Bar X Allotment

The permanent transects were reread in May of 1975. The 1966 data was converted to the 6/69 BMR-B score card and the original data, converted data and the 1975 data is displayed on the Summary of Range Trend Data form.

Cluster #1 was located north and west of the Haigler Creek private land and C1T1 and C1T3 were destroyed during or after the juniper push. C1T2 was found and reread. Cluster #5 is in the pine type and not reread due to location. The area has no perennial grass or forage browse. The following is from the transect data:

3/9/66	3/9/66 to 6/69 *	1975 Data
C1 57↓ fair 68→ good	C1 73↓ good 62→ fair	C1 42↓ fair 38↓ poor
9C Bohi, Bocu, Erwr *	9C Bohi, Bocu, Erwr *data for C1T2 only	Bohi, Bogr. Erwr C1T1 and C1T3 dest
C2 39↓ poor+ 40↓ poor+	C2 45↓ fair 41↓ lowest fair	C2 40↓ fair 31↓ poor
9C Bohi, Bocu, ARIS	9C Bohi, Bocu, ARIS	
C3 35↓ poor 39↓ poor+	C3 40↓ poor 41↓ lowest fair	C3 34↓ poor 19↓ very poor
9C Bohi, Bocu, Erwr	9C Bohi, Bocu, Erwr	
C4 30↓ poor 39↓ poor+	C4 38↓ poor 39↓ poor	C4 39↓ poor 34↓ poor
9C Bohi, Bocu	9C Bohi, Bocu	
C5 36↓ poor 66→ good		
6A Bocu, Muem, Quem		

The transect data reflects the downward trend. The effect of the jun push is not reflected in improved range condition. C1, C2 and C4 are all in or near areas where juniper control has been accomplished.

The following is from the 1975 data:

C1 Not used due to T1 and T3 not being located. The area indicates very poor vigor, dead plants, thinning of vegetative sod, soil movement, loss of weeping lovegrass due to extreme use, and an abundance of annuals.

		1966	1975
C2	Hits on forage plants	61	51
	Hits on all plants	67	55
	Hits on litter	86	53
	Hits on bare soil	133	177
C3	Hits on forage plants	47	12
	Hits on all plants	47	12
	Hits on litter	32	25
	Hits on bare soil	131	197
C4	Hits on forage plants	37	37
	Hits on all plants	37	37
	Hits on litter	64	38
	Hits on bare soil	149	196

C5 Not reread due to location and lack of forage species.

C1T2 Annuals heavy. Soil movement. Dead plants. Utilization extreme. One to two inch leaves. No seed stalks on Bohi.

C2T1 Utilization extreme.

C2T2 Litter is cow droppings and roots of dead plants not an accumulation of past production. Very low production.

C2T3 Juniper resprout at 50' stake 20 ft east between 11-28 inches tall. Eight plants measured.

C3T1 Sheet erosion turning to rill and gully erosion. Dead Bohi plants.

C3T2 Utilization extreme. Vigor very poor. Plants pedestalled as much as two inches. Well developed erosion pavement.

C3T3 Rill erosion crossing tape at 58 to 80 and 87 to 100. Soil loss. Vigor very poor. Utilization extreme. Some dead plants. Very few plants remaining.

C4T1 Leaf height 1 to 2.5 inches. Bohi - no seed stalks. False alfalfa very abundant. Appears to be heavy invader.

C4T2 Utilization extreme - all spring growth used. Every plant grazed. Some dead plants (no green up), others very poor vigor. Juniper push reseeding. Very poor vigor due to total utilization.

C4T3 Juniper resprout 6 to 12 inches high at 95 on tape.

Haigler Creek Allotment

The permanent transects were reread in May 1975 in conjunction with the production and utilization studies.

The Summary of Range Trend Data form was used to display the data. The 1964 data is shown in its original form and converted to the 6/69 BMR-B score card for easy comparison with the 1975 data.

1964 Data Using the 1964 Standards	1964 Data Converted to the 6/69 BMR-B Score Card	1975 Data Using 6/ BMR-B Score Card
3/10/64		5/9/75
C1 26↓ fair 21↓ fair-	C1 58↓ fair 32↓ poor	C1 37↓ poor 23↓ poor
1-Bocu, Bohi, Bogr	1-Bocu, Bohi, Bogr	Bohi, Bogr, Bocu
C2 25↓ fair 18↓ poor+	C2 36↓ poor 29↓ poor	C2 34↓ poor 14↓ very poor
9C-Bogr, Bocu, JUNI	9C-Bogr, Bocu, JUNI	Bogr, Bocu, Erwr,
C3 21↓ fair- 20↓ fair-	C3 33↓ poor 30↓ poor	C3 33↓ poor 17↓ very poor
9C-Bogr, JUNI, Erwr	9C-Bogr, JUNI, Erwr	JUNI, Bohi, Bogr

The transect data indicated the range to be deteriorating. The loss of perennial grass is not complete, however, the extremely poor vigor and loss of soil has adversely affected production. The recovery of the plant community should be possible in that sufficient plants remain for a seed source. Some areas show the die-off of plants has started. The extreme utilization on grass has forced the cattle to browse on oak and manzanita.

The following items indicate the primary changes from 1964 to 1975:

		1964	1975
C1	Hits on forage plants	38	22
	Hits on all plants	38	23
	Hits on litter	71	32
	Hits on bare soil	165	210
C2	Hits on forage plants	35	17
	Hits on all plants	58	49
	Hits on litter	69	36
	Hits on bare soil	143	166

Young Allotment

The permanent transects were reread in May, 1975 in conjunction with the Production and Utilization Studies. The Summary of Range Trend Data form is used to display the 1966 data in its original form and the 1966 data converted to the 6/69 BMR-B score card and the 1975 data using the same score card.

1966 Data Using 1966 Standards	1966 Data Converted to the 6/69 BMR-B Score Card	1975 Data Using 6/69 BMR-B Score Card
C1 42↓ fair 33↓ poor	C1 49↓ fair 41↓ lowest fair	C1 44↓ fair 25↓ poor
9C-Bohi, Bocu, Erwr	9C-Bohi, Bocu, Erwr	Bohi, Erwr, JUNI
C2 46↓ fair 39↓ poor+	C2 52↓ fair 42↓ poor+	C2 26↓ poor 27↓ poor
9C-Bohi, Bocu, Erwr	9C-Bohi, Bocu, Erwr	Bohi, Erwr, Bocu, JU

The rereading of the transects indicates the range is deteriorating rapidly. The following is from the 1975 data:

		1966	1975
C1	Hits on forage plants	69	56
	Hits on all plants	69	56
	Hits on litter	90	33
	Hits on bare soil	102	188
C2	Hits on forage plants	95	59
	Hits on all plants	96	60
	Hits on litter	36	36
	Hits on bare soil	123	165

C1T1 Annuals heavy - scattered perennial grass. Very low vigor.

C1T2 Poor vigor - sod clumps mostly dead plants - sheet erosion.

C1T3 Annuals - false alfalfa - no seed stalks - vigor poor.

C2 Downward trend. Soil movement. Dead plants starting to show. Large number of partly dead plants. Vigor very low.

Colcord Canyon Allotment

The permanent transects were reread June 25 and 26, 1975 in conjunction with the Production and Utilization Studies.

A Summary of Range Trend Data form is used to display the original 1964 data, the 1964 data converted to the present score card standard, and the 1975 transect data. The following is the rating for the 1964 data and the 1964 data converted to the 6/69 BMR-B score card and the 1975 data using the same score card:

1964 Data Using the 1964 Standards	1964 Data Converted to the 6/69 BMR-B Score Card	1975 Data Using 6 BMR-B Score Card
C1 12↓ poor	C1 45↓ fair	C1 12↓ very poor
23→ fair	23→ poor	17↓ very poor
C2 16↓ poor	C2 47↓ fair	C2 11↓ very poor
20→ fair	18→ very poor	11↓ very poor
6A Bogr, Bocu, ASTR	6A Bogr, Bocu, ASTR	

The results of the rereading of the transects indicated the range to be deteriorating at an accelerating rate. Specifically the following items indicate the nature and magnitude of the deterioration:

		1964	1975
C1	Hits on forage plants	6	2
	Hits on all plants	19	23
	Hits on litter	134	92*
	Hits on bare soil	127	171

*Litter is deadwood, roots of dead plants, leaves from oak, cattle droppings.

C2	Hits on forage plants	5	0
	Hits on all plants	22	11
	Hits on litter	75	66*
	Hits on bare soil	170	201

*See Litter from C1.

C1T2 The majority of the Bohi plants are dead. Of 33 Bohi recorded in 1964, 3 are alive. Of 10 Bocu recorded in 1964, 2 are alive

C1T3 The area is no longer range due to lack of forage, soil loss and erosion. 90% of plants recorded in 1964 are dead. Plants have pedestalled 1 to 3 inches then died. The soil held by the roots and pedestalling has washed away leaving dead plant roots on top of the ground.

C2T1 Roots are exposed, Bohi plants are dead or very weak in vigor. No seed stalks or grass litter is evident in entire area. All forage production has been taken.

C2T2 Dead plants and exposed roots evident. Soil is being washed away with a desert pavement forming.

C2T3 Litter is from trees. Dead plants evident. Total utilization of all production that cattle can reach.

IV. History of Use

The Bar X Ranch is comprised of four grazing allotments, Bar X, Haigler Creek, Young and Colcord Canyon. The allotments were combined into one unit and are managed as one operation.

The current term permit, dated May 5, 1976, is for a total of 468 adult cattle and all of the natural increase yearlings for 10 months.

Prior to 1977, the permittee had 10 horses on the allotment yearlong under Free Use Permit.

The Bar X Allotment has been stocked above the estimated capacity as far back as the District records go. The 1940-41-42 inspections indicate the stocking too high. Non-use for 60 head was taken in 1940. 1941 additional non-use was taken. In 1946 Ranger Turner notes: Juniper invasion with range in fair condition except for pine type and Dry Creek area north of ranch house. Inspection in 1949 by Nelson and Casanova listed watershed conditions poor, trend down and vigor of forage species poor. Casanova and Brown recommended a 50% reduction in December 1950. The allotment was transferred to the Bar X Cattle Co. in 1959. The preference remained 188 C.Y.L. plus N.I.

The following are notes from past inspections:

1940 Inspections by Kirby, Stewart, indicated the allotment over-
1941 stocked. Non-use was recommended and 60 head taken in 1940.
1942 Inspection reports with reference to the pine type states. "(the pine type)....is fast going out of the picture so far as grazing of domestic livestock is concerned."

1949 Inspection by Nelson and Casanova listed conditions of watershed as poor and trend down. Condition and vigor of forage species is poor. Allotment is over stocked. Stock numbers needed reduction by 50%.

1953 Inspection emphasized need for distribution. Area around
1954 headquarters over used.

1955 Inspection by Pfefferle - Utilization of key species satisfactory in winter unit but over used on rest of allotment. Forage in pine type-browse; grass very poor vigor and on the downgrade. Erosion is serious. Area north of Chamberlain Trail overgrazed.

1960 Inspection by Reynolds - forage production below average.

1966 Allotment Analysis - In the past 5 years 8 to 10 inches of soil has washed down against the Clay Springs Wildlife Plot fence.

The Colcord Canyon Allotment was added to the Bar X, Haigler Creek, and Young Allotments in 1969. The estimated capacity was for 35 cattl for 4 months, however the full preference of 35 C.Y.L. was transferrec bringing the term permit to its present numbers.

The Colcord Canyon Allotment has been used as yearlong range for many years. It has been recognized that the area was not carrying the preference yearlong. Private land carried some use until this land was subdivided. Attempts to convert to seasonal use were tried from time to time. The Forest Supervisor's letter of December 16, 1947 stated: "Indications at present are that an appreciable reduction will have to be made, and undoubtedly the permit would be changed fron a yearlong to a seasonal basis." The Forest Supervisor's memo dated March 29, 1948 indicated a 50% reduction, and as this was still undoubtedly far above the grazing capacity, a close check would be required on the allotment. A further reduction might have to be made.

T.L. Meredith obtained the term permit for 20 C.Y.L. plus N.I. to June 1 in 1948. Because of a misunderstanding between Meredith and the Forest Service, a permit for 25 head was issued on a trial basis in 1949.

The permit was converted in 1955 from 25 C.Y.L. plus N.I. to 6/1 to a permit for 35 cattle yearlong. A transfer to L. Cline, G. Cline and E. Stephens in 1953 was for 35 C.Y.L.

The past range condition obtained from the range inspection records is listed as follows:

1946 Total non-use for two years. Slight improvement.

1949 Condition of forage poor, trend down. Preference reduced by 12 head in 1948.

1953 Utilization of forage is complete.

1954 Utilization light on east side of Colcord Canyon. Heavy on west side.

1955 Soil in and around Sheep Pen Flat in the process of fairly severe erosion.

1965 Estimated capacity - 140 AUM.

The history of use on the Haigler Creek Allotment dates back to 1915 with a preference for 25 cattle & 6 hogs. The permit was gradually increased over the years until in 1929 Gillette held a permit for 100 C.Y.L. This number was in effect until 1934, when the permit was reduced by 19 head. In 1962 the permit was transferred to the Bar X Ranch with a preference of 82 C.Y.L. plus N.I. to 10/31.

Inspection reports dating back to 1940 all state the allotment is either completely utilized or over utilized with downward trends. Stewart in 1942 recommended a 50% reduction in use. Casanova in 1949 recommended a reduction of 75%. Pfefferle confirmed the need in 1954.

Range condition from past range inspection records is listed as follows:

1966 Allotment Analysis. Inspection reports dating back to 1940. All state that each year the allotment is being eith completely utilized or over-utilized. Heavy utilization occurs especially in the area known as the "Pocket".

1942 Report by Stewart recommended 50% non-use for several years.

1949 Report by Casanova recommended a reduction of 75%.

1954 Report by Pfefferle, "It is doubtful whether the allotment should carry the full preference".

The Young Allotment was transferred to the Bar X Ranch in 1961. The Haigler Creek Allotment was added to the operation in 1962. The addition of the Colcord Canyon Allotment in 1969 brings the present operation up to date.

The earliest record of the Young Allotment lists a preference of 203 cattle. Inspections by Ranger Stewart in 1940-41-42 all state severe over grazing. Stewart recommended a 50% reduction. An inspection by Turney states in 1945 and 46 there was a heavy loss of sod on the summer units around Young. The permittees were found to be 960 AUM

in trespass during 1946. Casanova recommended a reduction of 75% due to poor range condition and severe erosion occurring on the allotment. The allotment was reduced in size in 1953 when the Young Sisters and F.L. Waldrip divided the partnership. The allotment remains the same after this date with a permit for 163 C.Y.L. plus N.I. to 10/31. Inspections in 1953, 1954, and 1955 all show distribution poor with the private land and south end of the allotment and the Sheep Driveway carrying the cattle. This use was recognized as severe with damage to the range. Distribution is listed as poor in 1956, 1957, and 1959. The Young Allotment was transferred to the Bar Ranch in 1961 with full preference.

The following are notes from past inspections:

1940 Inspections by Stewart states southwestern portion severely
1941
1942 overgrazed. Stewart recommended 50% reduction.

1946 Inspection by Turney in 1945 and 46. There was a heavy los of sod on summer units. Vigor was low. Trespass of 960 AU

1950 Casanova recommended 75% reduction - severe erosion.

1953
1954 Pfefferle states distribution poor.
1955

1956 Pfefferle - distribution poor.

1957 R. Reynolds - distribution very poor.

1959 R. Reynolds - distribution fair.

1962 McSloy showed southwest half heavily utilized. Little new growth. Seed production little or nil. Sunflower and indian alfalfa in abundance.

The allotments have been under study for many years both as separate units and as a combined unit. In 1967 the Forest Service and permitte agreed that a reduction in numbers was needed, and that a management plan was required.

It was decided the term permit would be for 433 C.Y.L. plus 150 yearlings to 3/31, plus 40 yearlings to 10/31. All private land would be placed under a private land permit to carry 110 yearlings from 4/1 to 10/31. The non-use was to be voluntary for 8 years rather than a reduction in the term permit.

The non-use agreement was evidently dropped when the permit was transferred to the current permittee, Glenn Hamilton in 1973.

V. Actual Use Records

	Actual Use (Paid & Free Use) AUM	Comments
1958	7850	120 AUM Free Use
1959	7045	" "
1960	7861	" "
1961	7961	" "
1962	7982	" "
1963	8204	" "
1964	8104	" "
1965	8248	" "
1966	7098	" "
1967	7242	" "
1968	6754	" "
1969	6440	" "
1970	6275	" "
1971	6081	" "
1972	6422	" "
1973	6485	" "
1974	4648	"and 14 AUM's Unautho
1975	4769	"and 389 AUM's Unautho
1976	6365	120 AUM's Free U
1977	6485	" "

Unauthorized use apparently occurred in 1974 as well as 1975, with action being taken. Livestock shipping records indicate that unauthorized use occurred prior to 1975 without detection.

VI. Management Goals and Objectives

The Tonto National Forest range resource goals, which reflect the recommended R.P.A. Goals, emphasize a program which will 1) bring the range resource under proper stocking, 2) correct unsatisfactory watershed conditions, and 3) provide forage without impairing land productivity to the extent benefits are commensurate with costs.

Long term goals for the 4 allotments comprising the Bar X are as follows:

1. Reverse the downward trend in range condition.
2. Meet the physiological growth requirements of desirable range forage species to improve range condition.
3. Improve and enhance wildlife habitat.
4. Improve aquatic habitat along perennial streams.
5. Improve deteriorated watershed condition through increased litter accumulation, grass plant density and reduction in soil compaction by livestock trampling and raindrop impact.
6. Improve soil condition by controlling soil erosion and arrest the expansion of vertisol activity through an increase in litter and vegetative cover.

Management objectives:

1. Increase desirable forage production from the current average of 200 pounds per acre to 600 pounds per acre (300%).
2. Increase desirable forage plant density and effective vegetation ground cover in critical areas within the juniper and grassland type from the current 20% (veg. + litter) to 40% (veg. + litter).
3. Regenerate desirable riparian vegetation, both woody and herbaceous species, along major streams and drainages.
4. Arrest the expansion of vertic soils and allow possible reclamation of existing vertic areas (Soil Unit 68).
5. Improve desirable browse vigor and allow browse seedlings to establish.
6. Provide herbaceous cover and food for indigenous wildlife.
7. Improve plant community composition by allowing desirable cool season and warm season grass species to become established.

VII. Management Alternatives

The management alternatives will, as a minimum, provide for the utilization of the productive potential of the land. Each will be evaluated by determining whether the alternative will meet the management objectives and goals.

1. Close the Bar X, Haigler Creek, Young and Colcord Allotments to Grazing.

This alternative will reverse the downward trend in range condition, allow for an increase in effective vegetative cover, provide improved wildlife habitat and watershed conditions in the most timely and efficient manner.

The soil survey data indicates that under current management and stocking, effective ground cover has been reduced sufficiently to allow soil loss in excess of 5 tons per acre. This erosive condition is quite extensive and is found on virtually all soils with few exceptions.

At present, the Bar X Allotments contain a total of 742 acres of Full Capacity range. Three catagories of grazing capability are outlined in the Allotment Analysis Handbook R3-1978.

These acres are located primarily in Soil Unit 68 which contains 30% Udorthentic Chromusterts (Vertic Soils) and are essentially barren. This fragile soil condition warrants an allowable use percentage of 20% in order to provide potential for improved plant vigor and litter accumulation. The estimated capacity for the Bar X, incorporating soils data and the Production-Utilization data from the 1973-75 study, is 30 AUM's. Grazing 30 AUM's on the Bar X is neither physically nor economically feasible. The Full Capacity areas are widely scattered over the Bar X which has a gross area of 30,208 acres. Implementing the indicated stocking rate of 30 AUM's will, in effect, close the Bar X to grazing.

After an extended period of closure to grazing, when adequate ground cover is present to hold soil loss to an acceptable level, the areas currently classified as Potential Capacity (PC) range could be reclassified as Full Capacity (FC) range. This would allow the range to be opened to livestock grazing at a predetermined rate.

2. Graze the Bar X with numbers and season of use specified by the Production-Utilization Studies.

This alternative entails allocating capacity on those areas determined to be Potential Capacity and No Capacity areas. Select of this alternative involves the risk of failing to reduce soil lc to an acceptable level (2 tons per acre on most soils).

This alternative requires development and on-the-ground implementation of an intensive grazing management system which goes beyond meeting the physiological growth requirements of the existing grass plants. Actual forage utilization must be low enough to provide opportunities for grass seedling establishment, litter accumulation and an overall increase in desirable forage plant density.

This alternative will contain some non-structural range improvement work such as broadcast burning of 2278 acres to maintain grassland-savannah and juniper control on 574 acres.

Summary of Cost/Benefit Analysis of the Alternatives

The actual C/B Analysis Sheet for alternatives 2 and 5 are located the appendix.

	Alternative 1	Alternative 2
Capital Investments	None	54,800*
$ Benefits	N/A	14,100**
Net Present Worth	N/A	-40,700
Benefit/Cost Ratio	0/0	.26/1.00
Cost Effective	Yes	No

*2278 acres burned - 3.00 per acre
**sustain 120 AUM's from year 6-20. AUM value $5.00 @ 10% discount interest rate.

Proposed Management System

The proposed management system to be implemented on the Bar X is a variation of the Santa Rita Three Pasture System. The system provides for spring-summer rest two years out of three. Research at the Santa Rita Experimental Range near Tucson indicates that this system will provide the fastest range condition improvement and provide opportunities to provide rest for pastures during non-structural range improvements.

Since the Bar X, Haigler Creek, Colcord and Young Allotments have more than an adequate number of fences and pastures, several units have been combined to provide three major grazing units of similar grazing capacity. These units are combined as follows:

Unit #1 - Bar X, Oxbow, West Hole and +Y
Unit #2 - Grasshopper, Windmill
Unit #3 - Dry Creek, Round Mountain, Steer

In the process of combining pastures and forming major grazing units, several livestock management benefits are provided. Each major grazing unit is composed of at least two pastures which will allow management alternatives such as bull pastures, weaning pastures, etc.

The proposed system of management would follow the following grazing schedule:

	Year (1)		Year (2)		Year (3)		Year (4)	
Unit	Spring Summer	Winter	Spring Summer	Winter	Spring Summer	Winter	Spring Summer	Winter
#1	Graze	Rest	Rest	Graze	Rest	Rest	Graze	Rest
#2	Rest	Graze	Rest	Rest	Graze	Rest	Rest	Graze
#3	Rest	Rest	Graze	Rest	Rest	Graze	Rest	Rest

The proposed system of management will not produce the positive benefits needed unless stocking is drastically reduced. If an adjustment in numbers is prolonged over time, another system may be needed in the interim period.

The proposed grazing system will accomodate several types of livestock management alternatives such as a cow-calf operation, a yearling operation (seasonally) or a cow-calf-yearling operation with only minor adjustments in livestock movement dates.

Non-structural range improvement on the Bar X is drastically limited by soil sensitivity and erosion hazard. Any proposed treatment of the range cannot cause significant soil disturbance. Pushing or bulldozing juniper, chaining, cabling, or soil sacrification for seedir are all major disturbances which cannot be tolerated. Vegetation manipulation will have to be limited to the following items: broadcast burning in the juniper and oak type upon accumulation of enough fuel to carry fire, broadcast burning in the grassland areas to maintain the grassland type, herbicidal treatment (by hand) of alligator juniper, and broadcast seeding.

Pasture division fences are adequate along the present alignment and will need some heavy maintenance. The maintenance requirement needs fc each existing range improvement is delineated on the 2200-5's, Range Improvement Condition.

[illegible]-5 (P[illegible]) I N V E N T O R Y & M A I N T E N A N C E R E S P O N S I B I L I T Y

TONTO	SP (12)	01-23-7[illegible]	PERMITTEE NAME
PLEASANT VALLEY RD (5)	ALLOTMENT NO. 01	ALLOTMENT NAME	Bar X

N A M E	K I N D	IMP.NO.	UNITS	A S S I G N M E N T *
*GRANITE TANK	DAM/RESVOR	000621	12	OK-
*RUTH TANK	DAM/RESVOR	000622	8	OK
STEVE TANK	DAM/RESVOR	000623	10	OK
HAEGELIN DRIFT FEN	FENCE, AT	000627	2.3	Needs trees removed from fence
*MCINTURE II	TRICK TANK	000633		Needs pipe reconnected & wl escape ramp intro[illegible]
BUTTES CORRAL	CORRAL	000638		OK
ROUND [illegible] CORRAL	CORRAL	000639		OK
SHEEP TRAIL TOP FC	FENCE, AT	000640	1.2	Routine Mt. needed
BAR X RANCH CP FEN	FENCE, ARF	004006	5.5	Routine Mtc
BAR X HAIGLER FEN	FENCE, ARF	004030	6.0	Routine Mtc
BIG STOCK TANK	DAM/RESVOR	004038	8	OK
GRASS HOPPER TANK	DAM/RESVOR	004039	10	Spillway needs repair w/gabions & rip rap
COLCORD MTN SPRING	SPRING, DEV	004040		not developed
DRY CREEK SPRING	SPRING, DEV	004041		not functioning
DRY CREEK TROUGH	SPRING, DEV	004042		" "
BAR X STOCK TANK	DAM/RESVOR	004043	8	OK- some spillway work needed to stop cutting

[illegible] INVENTORY & MAINTENANCE RESPONSIBILITY

[illegible] OF (12) 01-25-7[illegible] PERMITTEE NAME

PLEASANT VALLEY RD (5) ALLOTMENT NO. 61 ALLOTMENT NAME Bar X

NAME	KIND	IMP. NO.	UNITS	ASSIGNMENT *
JEDY STOCK TANK	DAM/RESVOR	004045	8	Some spill way work needed
NAEGELINCANCORRAL	CORRAL	004046		not functioning
SEASONALDRIFTFEN	FENCE, AT	004047	2.1	needs heavy repair
BARCOPASTUREFEN	FENCE, AT	004048	1.1	ok - routine mtc
DRIFT FENCE 1	FENCE, AT	004049	1.2	ok " "
DRIFT FENCE 2	FENCE, AT	004050	1.1	ok " "
DRIFT FENCE 3	FENCE, AT	004051	.4	OK " "
BARX FORESTBDY FEN	FENCE, NFB	004052	1.5	OK " "
BARX HEBER RENOFEN	FENCE, APF	004053	5.0	OK " "
NAEGELINCANYONTANK	DAM/RESVOR	009522	8	?
*MCINTURE TANK	DAM/RESVOR	004805	8	OK.
*GLASSCOCK TANK	DAM/RESVOR	004806	8	Needs Spillway Repair
WALDRUP TANK	DAM/RESVOR	004807	8	" " "
LOST SALT SPRING	SPRING, DEV	009523		Needs to be cleaned

* Located on Heber-Reno Sheep Driveway- Bar X permittee is not required to repair unless utilized by Bar X cattle

FS-5 CPO INVENTORY & MAINTENANCE RESPONSIBILITY

TONTO NF (12) 01-23-78 PERMITEE NAME

PLEASANT VALLEY RD (5) ALLOTMENT NO. 81 ALLOTMENT NAME

NAME	KIND	INP.NO.	UNITS	ASSIGNMENT
PEDLAKE YOUNG FEN	FENCE, ARF	P04072	3.0	Needs wire stretched & some corner posts with minor
GENTRY-TN YOUNGFEN	FENCE, ARF	P04087	3.0	" " " " " " " "
ROTATION YOUNG FEN	FENCE, ARF	P04431	.5	OK - routine maintenance
YOUNG PV FEN	FENCE, ARF	00P100	6.5	" " "
MARTIN TANK	DAM/RESVOR	004433	8	OK - some spillway work needed
MEXICAN TANK	DAM/RESVOR	004434	10	OK - ~~xxx~~ maintained in 1977 (cleaned
BUTTES WELL	WELL, WINDM	004435	20	OK.
DEEP FENCE 1	FENCE, AT	004436	1.2	OK - routine maintenance
YOUNG BOY FEN 1	FENCE, ARF	004437	1.0	OK - " "
YOUNG BOY FEN 2	FENCE, ARF	004438	4.5	OK - " "
YOUNG PETER FEN 1	FENCE, ARF	004439	3.5	OK - " "
YOUNG PETER FEN 2	FENCE, ARF	004440	2.5	OK - " "

2200-5 CPO INVENTORY & MAINTENANCE RESPONSIBILITY

TONTO NF (12) 01-25-78 PERMITTEE NAME

PLEASANT VALLEY RD (5) ALLOTMENT NO. 67 ALLOTMENT NAME

NAME	KIND	IMP.NO.	UNITS	ASSIGNMENT *
LOST SALT TANK	DAM/RESVOR	004011	8	This improvement is located in the pine type. Forage resource has been virtually eliminated of value for livestock management. - Good condition
DIVISION FENCE 1	FENCE, AI	004012	1.2	Needs heavy maintenance - wire replacement and ROW clearance
DIVISION FENCE 2	FENCE, AI	004013	1.8	" " " " " "
COLCORD BAR X FEN	FENCE, ABF	004014	5.0	" " " " " "
COLCORD HAIGLERFEN	FENCE, ABF	004015	4.0	" " " " " "
COLCORD BRANCHFEN	FENCE, ABF	004021	1.5	" " " " " "

2200-5 (6/1) INVENTORY & MAINTENANCE RESPONSIBILITY

TO:TO A.F (12) 01-23-78 PERMITEE NAME

PLEASANT VALLEY RD (5) ALLOTMENT NO. 75 ALLOTMENT NAME

NAME	KIND	IMP.NO.	UNITS	ASSIGNMENT *
BAR X HAIGLER FEN	FENCE, ADF	004030	6.0	Needs wire stretched, stays & some posts
HAIGLER 13PANCHFEN	FENCE, ADF	004022	7.0	" " " " " "
HAIGLER FILLINGFEN	FENCE, ADF	004023	2.0	some new wire needed, stays & replace
HAIGLER MARSH FEN	FENCE, ADF	004029	1.0	OK - routine mtc. needs
OX BOW STOCK TANK	DAM/RESVOR	004031	8	OK - Located in NC area - not needed mgmt.
JAKE STOCK TANK	DAM/RESVOR	004032	8	ok-
OXBOWINSTOCKTANK	DAM/RESVOR	004033	8	ok - Located in NC area -
FILLINGSTOCKTANK	DAM/RESVOR	004034	8	ok-
CROSSYSTOCKTANK	DAM/RESVOR	004035	8	OK
DRIFT FENCE 1	FENCE, AI	004036	1.0	OK - Routine maintenance needed
DRIFT FENCE 2	FENCE, AI	004037	1.2	OK - " " "

PLEASANT VALLEY RD (5) ALLOTMENT NO. 109 ALLOTMENT Hoser-Reno Check

NAME	KIND	IMP. NO.	UNITS	ASSIGNMENT
PARSON HEBER FEN	FENCE, ANF	#00009	2.5	OK- routine mtc.
D W HEBER FEN	FENCE, ANF	#00016	5.0	OK - routine mtc.
BARN HEBER RESERVE	FENCE, ANF	#00053	5.0	OK - routine mtc
YOUNG HEBER FEN 1	FENCE, ANF	#00039	3.5	OK- routine mtc.
YOUNG HEBER FEN 2	FENCE, ANF	#00040	2.5	OK- routine mtc.
PINE CREEK WELL	WELL, WINDM	00035	30	OK- maintained in 1977 but needs trough & ditch for pond runoff water
PINE CREEK TANK	STORAGE, WA	00036		OK-
WALNUT CR WELL	WELL, WINDM	00037	28	OK- needs wire stretched around material
WALNUT CR STORAGE TK	STORAGE, WA	00038		OK-
DRIFT FENCE 1	FENCE, ANF	00049	3.5	OK- needs routine mtc.
HEBER POT FEN	FENCE, ANF	00050	1.0	OK - " " "
HEBER FOREST FEN	FENCE, ANF	00051	2.0	OK - " " "