

POTENTIAL NATURAL VEGETATION
OF THE
TAYLOR RANCH AND VICINITY

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Introduction

The Taylor Ranch is located in the lower portion of Big Creek, a major tributary of the Middle Fork of the Salmon River in central Idaho. Vegetationally, at an elevation of 3835 feet, the ranch lies in the Rocky Mountain Pseudotsuga menziesii forest type. However, as in most mountainous areas, the steep and variable topography, along with the different soils, complicates the environment, causing a mosaic of different potential natural vegetation types. Various environmental forces continually tend to change the potential natural vegetation. The influencing environment is dynamic rather than static, causing the potential natural vegetation to be in an ever-changing, dynamic state. This present study was completed in the summer of 1975 and presents an estimate of what the natural vegetation would be if the area had not been altered by the influence of man.

Influencing Environmental Factors

Geomorphological Changes

The downward cutting and lateral meandering of Big Creek, the main stream that runs through the Taylor Ranch, causes most of the smaller tributaries to either cut or fill at a relatively faster rate than Big Creek. However, Rush Creek

is on the same gradient as Big Creek and consequently meanders back and forth in its narrow valley, alternately cutting and filling in the vicinity of the Taylor Ranch. Both Cliff Creek and Pioneer Creek in general have a steeper gradient than Big Creek and tend to be rapidly down cutting. However, a meander of Big Creek is rapidly cutting into the mouth of Cliff Creek, causing a steeper stream gradient with a faster downward cutting of the creek in Cliff Creek Canyon. At the same time, Big Creek is pulling away from the mouth of Pioneer Creek, causing it to fill and build a delta along Big Creek. These actions are resulting in a gradual lowering of the water table in Cliff Creek with no seasonal flooding and a raising of the water table along the delta of Pioneer Creek with potential flooding from high spring runoffs. The action of all the creeks in the narrow canyons produces rapid changes in cutting and filling action. This factor along with the heavy annual deposits of alluvial material is a major factor that controls the natural vegetation.

Climatic Changes

The present climatic pattern is suitable to maintaining a Pseudotsuga menziesii type forest on the relative mesic habitats in the area. However, short or long term variations from the normal climate have caused past changes in the vegetation. It is rapidly apparent that in the past there have been relatively short periods of time when the summer weather has been cooler and wetter than normal. This has allowed tree

seedlings to become established on the more xeric habitats in competition with various shrubs and grasses.

Wildlife and Domestic Stock Grazing

Grazing from both wildlife and domestic stock has caused some changes in the natural vegetation. Selective grazing has tended to change the composition of the meadow communities. Grazing trails and wallows create bare sites suitable for invading plants. Throughout the Taylor Ranch and vicinity, grazing has increased the presence of large numbers of annual and non-native forbs.

Man's Activities

Man's activities in the area have considerably altered the natural vegetation. The irrigation of several of the meadows has completely altered their vegetational composition. The cutting of trees has opened up the hillside forests, allowing other plants to dominate the community or created conditions favorable for invaders.

Potential Natural Vegetation Types

There are five potential natural vegetation types on the Taylor Ranch and its immediate vicinity. The main types are the Populus trichocarpa type, the Pseudotsuga menziesii-Physocarpus malvaceus type, the Agropyron spicatum-Balsamorhiza sagittata type, the Pseudotsuga menziesii-Agropyron spicatum type, and the Pseudotsuga menziesii-Calamagrostis type.

Populus trichocarpa Type

This type is located along the major streams in the area. It is found wherever the normal soil-water-plant relationship is altered by the presence of a nearby stream. High water tables can be found on both the cutting and filling side of the streams although the high water table is more prevalent on the filling side of the stream. This type will also be found in seeps along the base of the steep hillside to the south of Big Creek. The runway at the Taylor Ranch has a tendency to flood each year, with the subsequent deposition of fine materials. This yearly flooding, along with water seeps at the base of the canyon walls, would maintain the Populus trichocarpa type in the runway area.

This type is dominated by a forest consisting of Populus trichocarpa, Betula occidentalis, Alnus incana, and Salix spp. The thick understory consists of Rosa woodsii, Cornus stolonifera, Rubus parviflorus, Rubus leucodermis, Ribes hudsonianum, Amelanchier alnifolia, and Berberis repens. A sparse herb layer is dominated by Disporum trachycarpum, Galium asperrimum, Equisetum hymale, and Lonicera utahensis.

Pseudotsuga menziesii will invade into this type as the water table lowers and the soil becomes drier. The shrubs of the Pseudotsuga forests will also come in under the canopy of Populus trichocarpa, such as Physocarpus malvaceus, Acer glabrum, Prunus virginiana, and Symphoricarpos albus.

This type is unstable because of the fluctuations of the stream activity. The cyclic floods will continue to deposit fresh substrate material, allowing other plants to invade. However, the type will always be present along the streams and can be considered in its entirety to be stable.

Important Plants in the Populus trichocarpa Type

Trees

Populus trichocarpa
Betula occidentalis
Alnus incana
Salix spp.

Shrubs

Acer glabrum
Amelanchier alnifolia
Berberis repens
Cornus stolonifera
Philadelphus lewisii
Physocarpus malvaceus
Prunus virginiana
Ribes hudsonianum
Rosa woodsii
Rubus leucodermis
Rubus parviflorus
Sambucus coerulea
Spiraea beutifolia
Symphoricarpos albus

Graminoids

Agropyron spicatum
Calamagrostis canadensis
Elymus cinereus
Phalaris arundinacea, N
Poa palustris

Fern Allies

Equisetum hymale

Forbs

Arnica cordifolia
Astragalus reventus
Balsamorhiza sagittata
Castilleja pallescens
Crepis atrabarba
Disporum trachycarpum
Fragaria virginiana
Galium asperrimum
Galium triflorum
Lonicera utahensis
Osmorhiza chilensis
Potentilla glandulosa
Pyrola secunda
Silene menziesii
Smilacina racemosa

Plants occurring in the type resulting from overgrazing or other disturbances:

N = non-native introduced plant

Pseudotsuga menziesii-Physocarpus malvaceus Type

The Pseudotsuga menziesii-Physocarpus malvaceus type has the potential of occupying the largest percentage of the area on the Taylor Ranch. This type would occupy most of the north-facing slopes, the older river terraces, and the south-facing slopes that are well supplied with water. This type is similar to the one described by Daubenmire (1968) and Steele et al. (1975). The shrub layer is heavy, usually averaging 60-70% cover. Principal shrubs are Physocarpus malvaceus and Amelanchier alnifolia. Forbs are sparse under the dense tree and shrub canopy. The prevalent forbs are Cystopteris fragilis, Fragaria virginiana and Montia perfoliata.

An open phase of this type is common on steep north and south-facing talus slopes. Pseudotsuga menziesii appears above a spotty cover of Physocarpus malvaceus, Prunus virginiana, Amelanchier alnifolia, Philadelphus lewisii, Symphoricarpos albus, Ribes cereum, Acer glabrum, and Sambucus coerulea. Scattered dominant forbs and graminoids include Agropyron spicatum, Festuca idahoensis, Achillea millefolium, Cystopteris fragilis and Eriogonum heracleoides.

Intermingled in the Pseudotsuga menziesii-Physocarpus malvaceus type are open savannah-like small glades of Festuca idahoensis. The glades contain a few scattered Pseudotsuga menziesii. Festuca idahoensis covers up to 80% of the ground surface. Agropyron spicatum is present but never occupies

more than 5% of the area. Numerous forbs are present but always in low numbers. These small savannah areas are similar to a type described by Steele et al. (1975). Apparently this type occurs on drier areas within the Pseudotsuga menziesii-Physocarpus malvaceus type.

The typical Pseudotsuga menziesii stand in this type appears to be an all-aged stand because of a wide variety of sizes from small to large trees. However, an examination of the age/size relationships (Table 1) indicates that there is no correlation between age and size. All of the trees sampled in the stand under 70 centimeters (DBH) in size (except one) were established from 1882 to 1914. No trees could be found that were established after this time. This stand age structure indicates that most of the forests in the Pseudotsuga menziesii-Physocarpus malvaceus type are probably two or three-aged stands. A complete lack of evidence of past fires (burnt snags, charcoal in soil, etc.) rules out the possibility of these age structures being caused by large scale forest fires. The periods of better than normal growth, as indicated by wide growth rings in the very old trees, correspond to the establishment period of the younger trees. These two factors indicate the possibility that the forest tree regeneration occurred primarily during periods of more favorable climate, similar to the wetter and cooler summer of 1975.

Table 1. Age and size relationship of smaller Pseudotsuga trees in the Pseudotsuga menziesii-Physocarpus malvaceus type. These age/size relationships were taken in an undisturbed stand located on a steep, north-facing slope, east of the Taylor Ranch.

Diameter at Breast Height in Centimeters	Age in years (taken 2 feet above base)	Estimated Tree Height in Meters
7	73	3
10	61	5
10	68	4
11	65	8
15	85	8
16	76	10
20	63	11
23	61	15
25	72	34
33	85	37
36	76	40
38	61	34
40	77	36
41	93	41
43	88	35
51	148	42
66	83	48
87	250+	53
93	250+	57

Periods of good growth on the two largest trees were indicated by a series of wider than normal growth rings from 1900-1918.

Important Plants in the Pseudotsuga menziesii-Physocarpus
malvaceus Type

Plants normally occurring in the undisturbed closed phase of this type. The percent cover is given for understory plants that have a significant coverage in this type.

Trees

Pseudotsuga menziesii

Shrubs

Amelanchier alnifolia (10% cover)

Berberis repens

Physocarpus malvaceus (70% cover)

Ribes cereum

Rosa woodsii

Spiraea beutifolia

Symphoricarpos albus

Ferns

Cystopteris fragilis

Forbs

Fragaria virginiana

Montia perfoliata

Additional plants occurring in the open phases of this type.
Open phase resulting from natural environmental situations
or from man-caused disturbances.

Shrubs

Acer glabrum
Artemisia tridentata, I
Philadelphus lewisii
Prunus virginiana
Sambucus coerulea

Graminoids

Agropyron spicatum
Agrostis palustris
Bromus tectorum, N
Elymus cinereus
Festuca idahoensis (80% cover in natural openings)
Koeleria cristata
Poa palustris
Poa pretensis
Stipa comata

Forbs

Achillaea millefolium	Lithospermum ruderales
Astragalus utahensis	Sedum stenopetalum
Balsamorhiza sagittata	Sisymbrium loeselii
Collomia macrocalyx, I	Tragopogon porrifolius
Erigeron divergens	
Erigeron gracilis	
Eriogonum strictum	
Hackelia deflexa	
Hieracium cynoglossoides	
Lactuca pulchella	

N = non-native introduced plant

I = invader or increaser caused by disturbances

Bunchgrass Type

Occupying the steep, south-facing slopes can be found an Agropyron spicatum-Balsamorhiza sagittata type (Figure 1). This type is normally confined to slopes with deep soils. The determination of the species that would naturally occur in this type is difficult because of the heavy overgrazing throughout the area by stock and wildlife (Figure 2). Agropyron spicatum appears to dominate the type with a cover of from 50 to 70%. Balsamorhiza sagittata usually is the other major dominant. At higher elevations Lupinus sericeus is a conspicuous dominant along with Agropyron spicatum and Balsamorhiza sagittata. On cooler or moister slopes Festuca idahoensis also occurs as a major dominant with Agropyron and Balsamorhiza.

Scattered in occasional locations throughout this type are shrub species normally found in the Pseudotsuga menziesii-Physocarpus malvaceus type. These shrubs are Philadelphus lewisii, Prunus virginiana, and Ribes cereum. The occasional presence of these shrubs along with the occasional occurrence of isolated Pseudotsuga menziesii indicate that with a slight shift in the climate, this type may revert over to one of the Pseudotsuga menziesii-dominated types (Figure 3).

On steep slopes with shallow rocky soils and rock outcrops, Cercocarpus ledifolius is nearly always associated with the bunchgrasses Agropyron spicatum and Festuca idahoensis (Figure 4). Hall (1973) considers these Cercocarpus ledifolius

to be a separate type. This type may also be similar to the Pseudotsuga menziesii-Cercocarpus ledifolius habitat type as classified by Steele et al (1975).

On most of the locations in this type Agropyron spicatum is clearly the dominant plant. However, in areas that have had heavy grazing by domestic stock, Artemisia tridentata, Bromus tectorum and Antennaria umbrinella have taken over the sites (Figure 5).

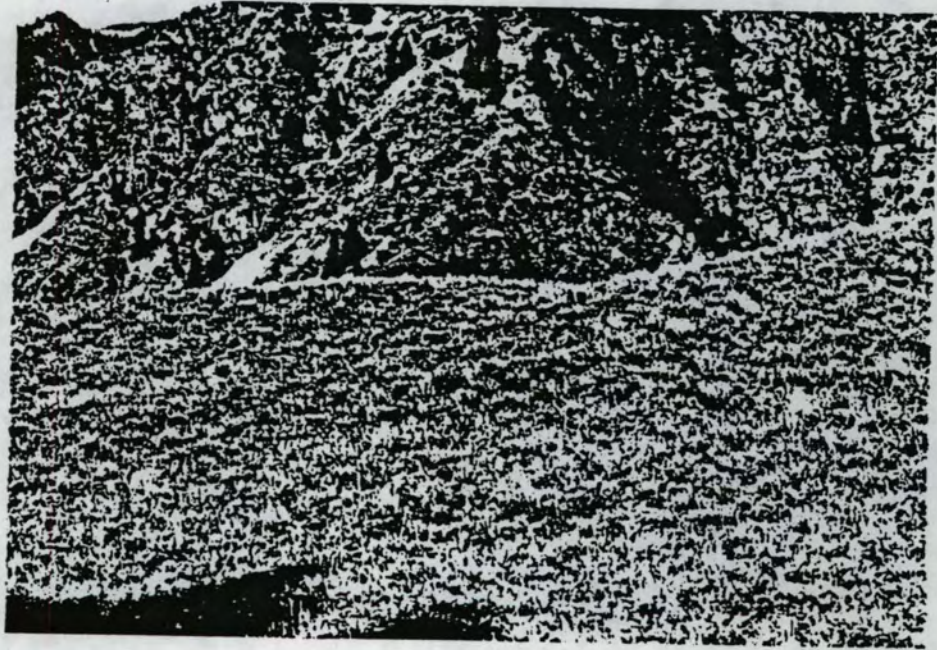


Figure 1

Relatively undisturbed Agropyron spicatum-Balsamorhiza sagittata type.



Figure 2

Grazing trails on steep hillside above Taylor Ranch,
Agropyron-Balsamorhiza type.



Figure 3

Pseudotsuga menziesii invading Agropyron-Balsamorhiza
type.

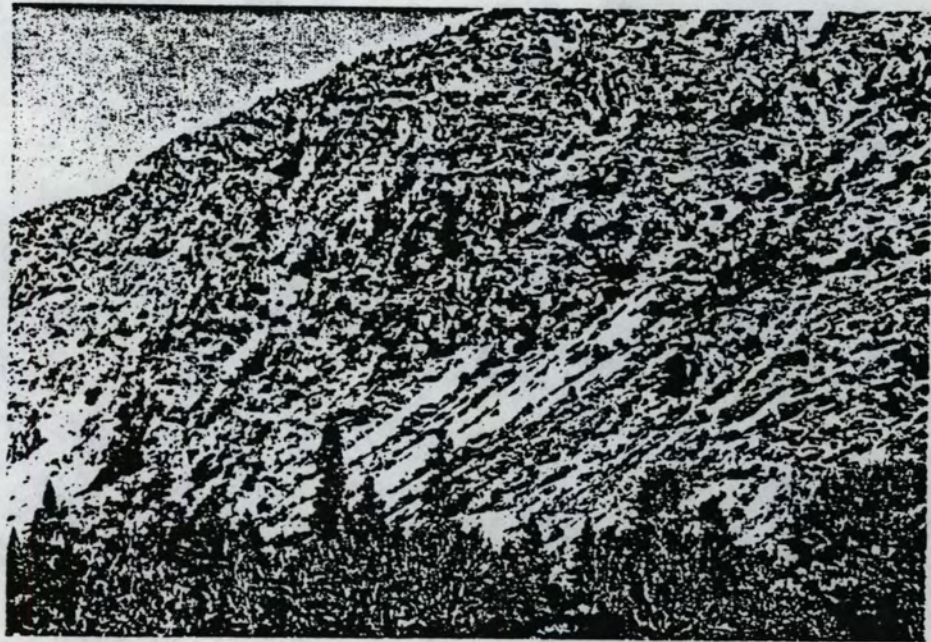


Figure 4

Steep rocky slopes above Taylor Ranch covered by Agropyron-Balsamorhiza type along with scattered Cercocarpus ledifolius.



Figure 5

Potential Agropyron-Balsamorhiza type dominated by Artemisia tridentata.

Important Plants in the Agropyron spicatum-Balsamorhiza sagittata Type

Plants normally occurring in undisturbed areas.

Graminoids

Agropyron spicatum (70% cover)

Festuca idahoensis (5% cover)

Forbs

Balsamorhiza sagittata (20% cover)

Additional plants occurring in this type because of over-grazing of domestic stock and wildlife. All plants are increasers (I) or non-native introduced plants (N).

Shrubs

Artemisia tridentate, I

Graminoids

Bromus tectorum, N

Koeleria cristata, I

Stipa comata, I

Forbs

Achillea millefolium, I

Artemisia umbrinella, I

Apocynum androsaemilifolium, I

Astragalus conjunctus, I

Astragalus utahensis, I

Castilleja pallescens

Chaenactis douglasii, I

Cirsium undulatum, I
Collomia grandiflora, I
Collomia linearis, I
Cymopterus terebinthinus, I
Erigeron divergens, I
Eriogonum heracleoides, I
Eriogonum strictum, I
Gilia aggregata, I
Hackelia deflexa, I
Lactuca pulchella, I
Lithospermum ruderale, I
Phacelia linearis, I
Polygonum confertiflorum, I
Sisymbrium altissimum, I
Sisymbrium loeselii, I
Tragopogon porrifolius, N

Pseudotsuga menziesii-Agropyron spicatum Type

On sites environmentally intermediate between the moister cooler Pseudotsuga menziesii-Physocarpus malvaceus type and the warmer drier Agropyron spicatum-Balsamorhiza type can be found a type consisting of widely spaced Pseudotsuga with an Agropyron spicatum and Balsamorhiza sagittata understory. Extensive undisturbed stands of this type occur on the lower slopes and older river terraces in other locations in the Big Creek drainage. At the present time undisturbed stands of this type cannot be found near the Taylor Ranch. With heavy overgrazings, annual and unpalatable forbs have replaced the Agropyron and Balsamorhiza.

Important Plants in the Pseudotsuga menziesii-Agropyron
spicatum Type

Plants normally occurring in undisturbed areas.

Trees

Pseudotsuga menziesii (Widely spaced but abundant)
Pinus ponderosa (rare occurrence)

Shrubs

Artemisia tridentata (occasional in a few locations)
Symphoricarpos albus

Graminoids

Agropyron spicatum (50-70% coverage in undisturbed areas)
Festuca idahoensis

Forbs

Achillaea millifolium
Balsamorhiza sagittata (10-40% coverage in undisturbed areas)
Chaenactis douglasii
Crepis accuminata
Phacelia hastata

Additional plants resulting from heavy grazing in this type.

N = non-native introduced plants

I = invader or increaser resulting from grazing

Shrubs

Artemisia tridentata, I
Artemisia tripartita, I
Chrysothamnus nauseosus, I

Graminoids

Agrostis alba, N
Elymus cinereus, I
Koeleria cristata, I
Poa paulustris
Stipa comata, I
Stipa richardsoni, I

Forbs

Erigeron divergens
Tragopogon porrifolius
Astragalus conjunctus
Medicago lupulina
Castilleja thompsonii
Collomia linearis
Rumex acetosella
Lithospermum ruderale
Hieracium cynoglossoides
Solidage missouriensis
Astragalus utahensis
Aposynum androsaemifolium
Achillea millefolium
Erigeron speciosus
Erigeron gracilis

Pseudotsuga menziesii-Calamagrostis rubescens Type

This type is located in one north-facing cove on the Raylor Ranch. The type is very common at higher elevations throughout the northern Rocky Mountain region (Daubenmire, 1968; Pfister et al., 1974; Steele et al., 1975). Pseudotsuga forms a solid canopy layer with Calamagrostis almost completely dominating the understory.

Important Plants in the Pseudotsuga menziesii-Calamagrostis rubescens Type

Trees

Pseudotsuga menziesii

Shrubs (total coverage of shrubs less than 5%)

Amelanchier alnifolia

Berberis repens

Ribes cereum

Rosa woodsii

Spiraea betulifolia

Graminoids

Calamagrostis rubescens (80% cover in natural stands)

Festuca idahoensis (10% cover in natural stands)

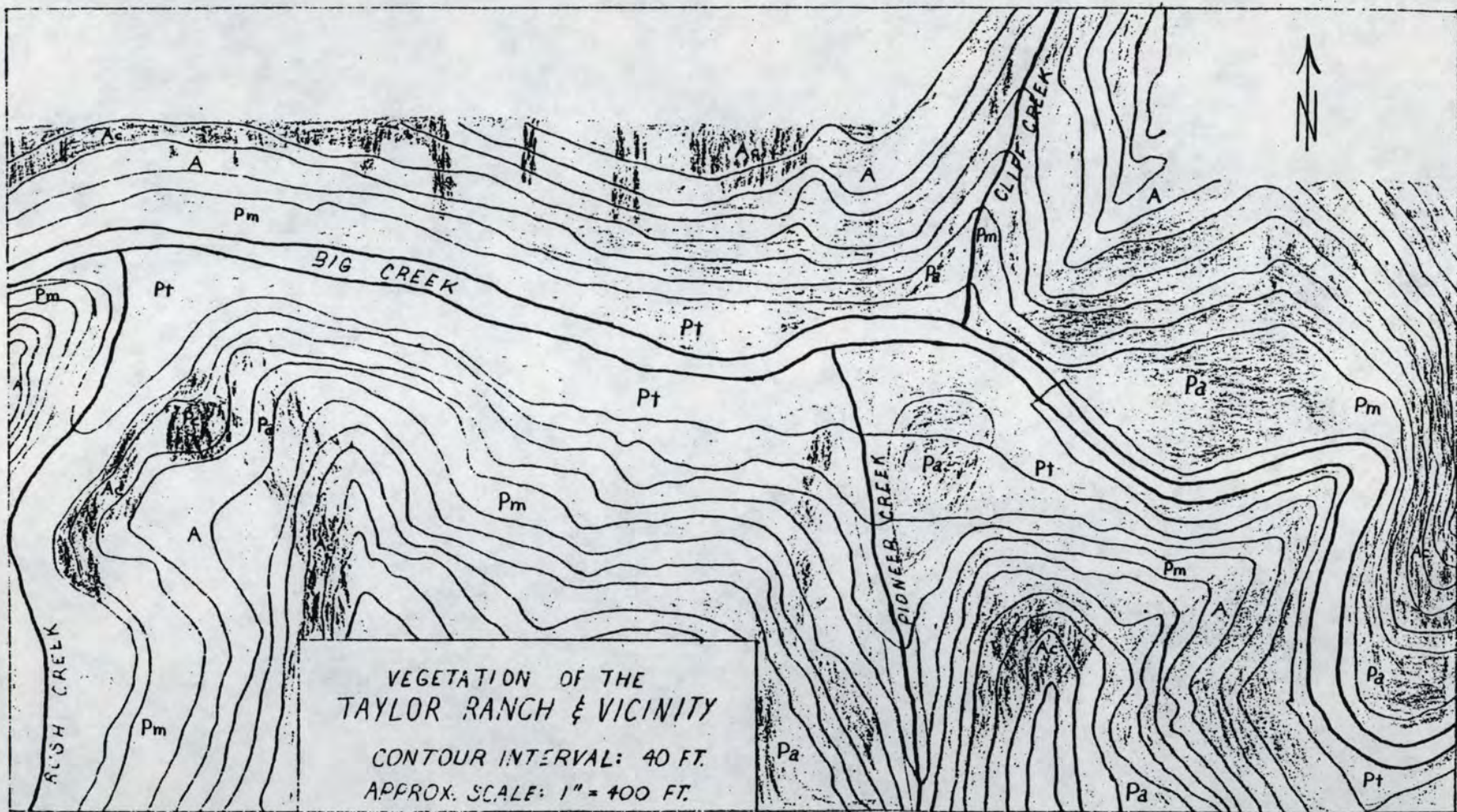
Forbs

Arnica cordifolia (10% cover in natural stands)

Fragaria vesca

Lactuca pulchella

Potentilla arguta



Return to the Natural Wilderness Vegetation

The five potential natural habitat vegetation types have occurred in their natural state on the Taylor Ranch before the disturbances caused by the influx of man in the area. Heavy grazing on the bunchgrass and open forest types have completely altered the vegetation composition of the area. The cutting of timber in the Pseudotsuga forests has resulted in a large increase in the amount and types of shrub cover. Large areas of the Populus trichocarpa type have been completely altered by complete removal of the forest vegetation in order to convert the areas to open pasture.

Most of the Taylor Ranch area would quickly start the successional return to the natural climax habitat types upon the cessation of man's activities.

Populus trichocarpa Type

The disturbed areas in this type, such as the runway and irrigated pastures, would very rapidly be reinvaded by the trees and shrubs that are prevalent in this type. The high soil moisture content and periodic siltation by the spring runoff floods created a favorable environment for the establishment and growth of these species. In fact, shrubs and trees presently are invading the runway and pastures and must be cut back each year.

Pseudotsuga menziesii-*Physocarpus malvaceus* Type

This type on the Taylor Ranch has had heavy grazing and timber cutting. However, *Pseudotsuga* at the present time are continually becoming established in the disturbed areas. If these areas were left alone, the *Pseudotsuga* would slowly re-establish a moderate canopy cover with the shrub species such as *Physocarpus malvaceus* assuming their climax balance between the tree canopy and the environment.

Pseudotsuga menziesii-*Calamagrostis* Type

This type occurs on a very small area on the Taylor Ranch and has had very little destructive disturbance and is presently near its natural climax state.

Pseudotsuga menziesii-Agropyron spicatum Type

This type is located on the drier soils of the Pseudotsuga series. In the vicinity of the Taylor Ranch it is intermediate between the Pseudotsuga menziesii-Physocarpus malvaceus type and the Agropyron spicatum types. The potential areas where this type has occurred have been completely altered by very heavy overgrazing or conversion to irrigated pastured fields. In contrast to the other Pseudotsuga types, these areas will not quickly return to their natural potential vegetation because of the severity of the sites and difficulty of natural or artificial revegetation. Heavy grazing of this type by the indigenous elk herds will also continue and hinder the rate of return to the natural potential type.

If irrigation was stopped on the northeast horse pasture, the area would probably be invaded by nonpalatable forbs such as Apocynum androsaenifolium, Astragalus utahensis, Tragopogon porrifolius, Erigeron speciosus and others. In order to hasten the return of this area to its natural potential vegetation, it would be helpful to seed in dryland grasses and possibly plant occasional ponderosa pine (Pinus ponderosa). After this, if grazing could be held to a minimum, Agropyron would become established. Pseudotsuga would occasionally become established in favorable years or on relatively more favorable microsites.

Agropyron spicatum-*Balsamorhiza sagittata* Type

Most of this type on or near the Taylor Ranch is in fairly good condition and will remain in its natural state. However, any change in the grazing intensity of the areas by the indigenous elk herds will alter the type. An increase in grazing will cause the cover of Agropyron and Balsamorhiza to decrease and other plants to increase, such as Bromus tectorum, Stipa comata, and Collomia macrocalyx.

Other areas of this type are presently dominated by Artemisia tridentata as a result of heavy grazing. These areas should be dominated by Agropyron. With a complete cessation of grazing or moderate wildlife grazing, the area should return slowly to its original composition. Control of the sage brush by chemicals or fire followed by seeding of Agropyron should hasten the return of these areas to their natural potential vegetation.

The Cercocarpus ledifolius phase of this type has not been significantly altered by man's activities and is close to its natural potential state.

Conclusions

The vegetation at the Taylor Ranch and vicinity can be divided into five natural vegetation types. The vegetation has been completely altered on a portion of the ranch. Most of the present vegetation would rapidly revert back to the potential natural vegetation upon the cessation of man's activities. However, on the drier habitats, south aspects, and well-drained river terraces, the vegetation types will continue to be dominated by non-native introduced plants or native invaders and increasers resulting from the recent disturbances.