

HABITAT TYPES
of the
TENDERFOOT CREEK EXPERIMENTAL FOREST

by
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Appendix B

Objective

In May 1974, a review draft of the Forest Habitat Types of Montana (Pfister et al. 1974) was released for use by Forest Service personnel and others requiring a method of ecosystem classification as a means to stratify forest environments in Montana. With the use of this review draft in mind, an objective was outlined to develop a vegetation map of the Tenderfoot Creek Experimental Forest (TCEF), southeast of Great Falls.

Purpose

The purpose of this mapping effort was to develop a logical breakdown of the TCEF into those vegetative components that might have a direct bearing on any studies that may eventually be installed. This map will hopefully provide insight for more definitive data interpretation and eventual application of study results elsewhere.

Mapping Methods

A. Field methods

A topographic map comprising the entire Tenderfoot Creek Experimental Forest area was made by combining two U.S.G.S. 7½' maps. The two maps used were Bubbling Springs and Belt Park Butte. Additional maps and aerial photos were obtained from the Belt River Ranger District and Harold Haupt at the Moscow Forestry Sciences Laboratory. Five days were allocated for the field work.

The roads on the Forest were driven and a mileage log kept of the changes in habitat types and associated ecotones. Short walks were also taken away from the roads to help determine the extent of the habitat types. After all possible observations had been made from the roads, line transects were walked using compass bearings; again, notes were taken on the ecotones and habitat types encountered. These transects can be seen in Figure 1. On the southern half of the Forest (south of Tenderfoot Creek) these transect lines mostly ran north and south, between Tenderfoot Creek on the north and the road which runs near the southern boundary of the Forest. Two transects were also taken parallel to Tenderfoot Creek, across the flow of the water sheds. The northern half of the TCEF was traversed along the lines of the drainage patterns of the creeks feeding into Tenderfoot Creek that have been assigned numbers 6, 4, and 2. The small portion of land that protrudes on the eastern edge of the Forest was covered by walking from Onion Park ENE to the road that goes into Harley Park. In addition to these transects, notes were taken on several short hikes up slope at various points from Tenderfoot Creek.

The transects, for the most part, followed compass bearings and were related to positions on the map by altimeter readings and the number of paces

walked between habitat types. Many times a known reference point on the topographic map did not match up with the altitude given by the altimeter. In these cases, the topographic map was given the benefit of the doubt, and the altimeter readjusted. The disturbances of the weather at that particular time may have been affecting the altimeter.

B. Office methods

As mentioned previously, the Bubbling Springs and Belt Park Butte quadrangle maps were pieced together for use in the field. The portion of the resulting map that encompassed the TCEF was enlarged and reproduced for use in drawing the final habitat type map. The contour interval on this map is 40 feet.

The mileage notes of changes in habitat types were transferred to the contour map using the mileage scale given on the map. The two trails marked on the map were also used as reference points to delineate ecotones. Most of the acreage on the Forest, however, was mapped through use of the transects that were hiked. For each transect the habitat types encountered were marked on the map. The distance between each change in habitat type was estimated from the change in altitude (if any), the contour intervals, and the number of paces that had been walked since the previous habitat type change. Due to the relatively gentle terrain it is felt that the consistency of the length of the paces was quite constant. Lines were then drawn between the transects, connecting the points where the habitat types seemed to change, all the while keeping the topographic patterns of that particular area in mind.

In some areas of the Forest, a fairly broad transition was evident between the ABLA/VASC and ABLA/VAGL types. These problem areas were not gradual ecotones, but rather mosaics of the two types occurring in an intricate pattern, apparently reflecting microsites. These were mapped as an ABLA/VASC-ABLA/VAGL mosaic.

The habitat types and miscellaneous types were planimetered to obtain an estimate of acreages by watersheds, as shown in Table 1.

Description of Forest Habitat Types

Four forest habitat types are present on the Tenderfoot Creek Experimental Forest (see Figure 2). These are the Abies lasiocarpa/Vaccinium scoparium (ABLA/VASC), Abies lasiocarpa/Vaccinium globulare (ABLA/VAGL), Abies lasiocarpa/Calamagrostis canadensis (ABLA/CACA), and Abies lasiocarpa-Pinus albicaulis/Vaccinium scoparium (ABLA-PIAL/VASC) habitat types. Besides these four climax types, a portion of the Forest keys to the Pinus contorta/Vaccinium (PICO/VASC) community type. In this case, however, the community type is attributable to the ABLA/VASC habitat type because of the extensive and continuous presence of Abies regeneration and old growth throughout the Forest.

Within each h.t. there are stands of different age classes. These different age groups occur intermittently throughout the Forest and were not recorded as stand units because of the inherent inaccuracy that would result from the scant data. However, many trees were increment-bored and the ages found in the habitat types were recorded.

Other Vegetation Types or Land Types

The following four inclusion types are not mapped on the habitat type map. I was instructed not to map these types at this time since they can be picked off the aerial photos and because of time limitations. Thus, although a given habitat type (h.t.) may look quite contiguous throughout its extent on the h.t. map, rocky portions or parks and meadows may actually be present.

a) Talus slopes -

These slopes are a prominent feature of the southern perimeter of the Forest, mainly within the ABLA/VASC h.t.. These areas are mapped on the soils map as "T".

b) Rock outcrops -

Rock outcrops are scattered primarily along Tenderfoot Creek, and may also be found occasionally in other portions of the Forest. They are found primarily within the ABLA/VAGL h.t. and are evident on the aerial photos. On the soils map, these areas are represented as "6B" and "6F".

c) Grassland parks -

These parks are found mainly on southern exposures in the ABLA/VASC h.t., and can be found on the soils map mainly within the areas designated as "7B", "2F", and "8B".

d) Wet meadows -

These are small areas, with high water tables and dominated by Carex. The broader expanses of the ABLA/CACA h.t. usually include these meadows.

I. Abies lasiocarpa/Vaccinium scoparium h.t.
(Alpine fir/whortleberry)

This is the most abundant habitat type found on the TCEF. It occurs on nearly all aspects. Generally, on south-facing slopes, it is found between 7100 and 7800 feet elevation. On northerly slopes it extends from about 7200 to 7600 feet elevation. The type occupies nearly all the variations in topography within its elevational range on the Forest, from broad ridges to gentle slopes to fairly steep slopes. (Most of the steeper topography on the TCEF is below 7000 feet elevation.)

Two phases of this habitat type are found on the TCEF, these being the Vaccinium scoparium phase and the Thalictrum occidentale phase. However, these two phases have not been delineated on the map, but are combined in the ABLA/VASC h.t. designation. Early in the field survey the Thoc phase appeared to be the major phase of the ABLA/VASC type on the TCEF. The major indicator on the TCEF for this phase, the most moist of the two, is the presence of Viola orbiculata (an alternate indicator plant). As the survey progressed, however, it was noted that this alternate indicator plant was found nearly everywhere in the habitat type, even on dry, southerly slopes and other dry

sites. It is felt that Viola orbiculata is not a good indicator for the Thoc phase on the TCEF. This is not to say that the two phases do not exist on the Forest. But with the overall presence of Viola orbiculata, and thus the uncertain boundaries of the phases, the decision was made to map the h.t. as one unit.

Much of the area designated as ABLA/VASC also has scattered patches of Vaccinium globulare. Generally, this extends upwards, from about 7200 feet on most aspects.

Several age-classes of timber are found in the ABLA/VASC type. These age-classes are scattered through the type, with a given age-class sometimes encompassing only a few acres and surrounded by another age-class. Pinus contorta is usually the dominant species, with age-classes of 75±yr., 80±yr., 90±yr., 100±yr., 150±yr., and 220±yr. The oldest age class was found only on the easternmost tip of the Forest, at the head of Tenderfoot Creek. Abies lasiocarpa is mostly in the pole and sapling stage and under the canopy of the older Pinus trees, but there are portions (west of Onion Park) of the Forest where the type is near climax, with 150±yr. Abies and Picea. Except for the eastern tip of the TCEF, where Picea is 220±years old, the Picea age-classes are very young and the numbers of individual trees very sparse.

II. Abies lasiocarpa/Vaccinium globulare h.t.
(Alpine fir/blue huckleberry)

Below about 7100 feet on south-facing slopes and 7200 feet on north-facing slopes, ABLA/VAGL is the prevalent climax type. It extends downward to the lowest Forest boundary on the west at 6100 feet elevation, and is bordered on its upper limits by ABLA/VASC or the mosaic of ABLA/VASC and ABLA/VAGL. ABLA/VAGL seems to occur on most aspects of well-drained slopes within its elevational range on the Forest. Although Abies lasiocarpa is the apparent climax species the type is dominated by Pinus contorta, with young Picea scattered underneath. Vaccinium scoparium is often the dominant undergrowth species, with V. globulare nevertheless being well represented.

The dominant Pinus contorta are of three main age-classes. These age-classes are 100±yr., 125±yr., and 150±yr. There is Pinus regeneration scattered underneath the older trees. Abies lasiocarpa is scattered underneath all the age-classes of Pinus, also, although the Abies is usually fairly young (less than 50 years).

III. Abies lasiocarpa/Calamagrostis canadensis h.t.
(Alpine fir/bluejoint)

Most of the stream bottoms on the Forest are of this habitat type. ABLA/CACA follows these stream bottoms without usually extending upwards onto the adjacent slopes. However, in several places the type becomes more extensive, presumably on seep areas, and forms meadowlike pockets of irregular form and occurrence. Invariably these sites are quite wet and occupy swales in the headwater areas of the subdrainages of Tenderfoot Creek. The forest type is characterized by Calamagrostis canadensis and Senecio triangularis being well represented, along with the presence of many other wet-site forbs and grasses.

Again, Pinus contorta is often the dominant tree species, especially in the upper reaches of the drainages. It is found in age-classes of 80±yr. and 150±yr. The 150±yr. class is found variably with a dense understory of young Abies lasiocarpa and Picea, or a sparse understory of these two species. Older Abies and Picea are also found in the overstory in near-climax conditions. In these instances the few Pinus that may be present are old and decaying.

IV. Abies lasiocarpa-Pinus albicaulis/Vaccinium scoparium h.t.
(Alpine fir-Whitebark pine/whortleberry)

This habitat type, of relatively small acreage, occurs only in the north-east section of the Forest where it occupies the southerly-facing slopes above 7800 feet. It is bordered on its lower boundaries by ABLA/VASC. Pinus albicaulis is well-represented and is generally more than 150 years old, with some Pinus contorta present of the same age class. All-aged Abies lasiocarpa are scattered throughout the type and would seem to be the climax species. Vaccinium scoparium is the dominant indicator plant, although very dry patches were found that had virtually no hearty species of undergrowth growing on them.

Miscellaneous

An interesting, and possibly significant, feature of the TCEF is the scarcity of pseudotsuga menziesii. During the field work, only two trees of this species were found. One was an 18-inch d.b.h. stunted veteran at 6400 feet elevation along Tenderfoot Creek at the mouth of watershed #5. The other was 3 feet tall at an elevation of 7430 feet, on the southern boundary of the Forest in section 11. Stephen Arno, Plant Ecologist at the Forestry Sciences Laboratory in Missoula, suggests that the "red belt" phenomenon--severe frost, temperature fluctuations, and winter dessication--may be responsible for preventing Pseudotsuga from growing here. The lack of a sufficiently close seed source for Pseudotsuga may also be a limiting factor. This species does occur elsewhere at 6000 to 7000 feet in the Little Belt Mountains.

It is common to find individual Pinus contorta trees with fire scars from one or two wildfires. Apparently these stands have experienced ground fires that did not kill the trees! More than one age class of Pinus contorta was represented abundantly in many of the stands, suggesting that ground fires have given rise to Pinus contorta reproduction. However, the even-age structure of some Pinus communities here indicates that some wildfires did destroy the trees, making way for a new stand. The ground fires may partially explain the scarcity of Abies and Picea understories in portions of the Forest.

Wildlife was much in evidence while walking through the TCEF. Several elk and deer were seen, along with numerous groups of pellet droppings. Squirrels, woodpeckers, hawks, and other small game were seen, also.

Natural Area Recommendation

During the field sampling I was requested to consider a possible natural area designation for one of the watersheds. My recommendation for a natural area would be watershed #5. This watershed contains all of the habitat types

described in this report except the ABLA-PIAL/VASC h.t. ABLA/VASC is the h.t. with the most acreage, but ABLA/VACL is abundant, also. The ratio of each habitat type in the watershed is approximately that over the entire Forest. Elevations range from 6400 feet to 7400 feet. Topography ranges from the gentlest slopes found on the TCEF to almost the steepest. The drainage pattern of this watershed is fairly simple, with no apparent extensive seep areas.

The existing stands are dominated by Pinus contorta, with age-classes as mentioned earlier in this report for each habitat type. This watershed also has some areas of near-climax vegetation. The adjacent watershed, #3, is very suitable for use as comparable unit for studies. These two watersheds are similar in size, aspects, slopes, habitat types, water drainage and flow, and stand structures.

1975

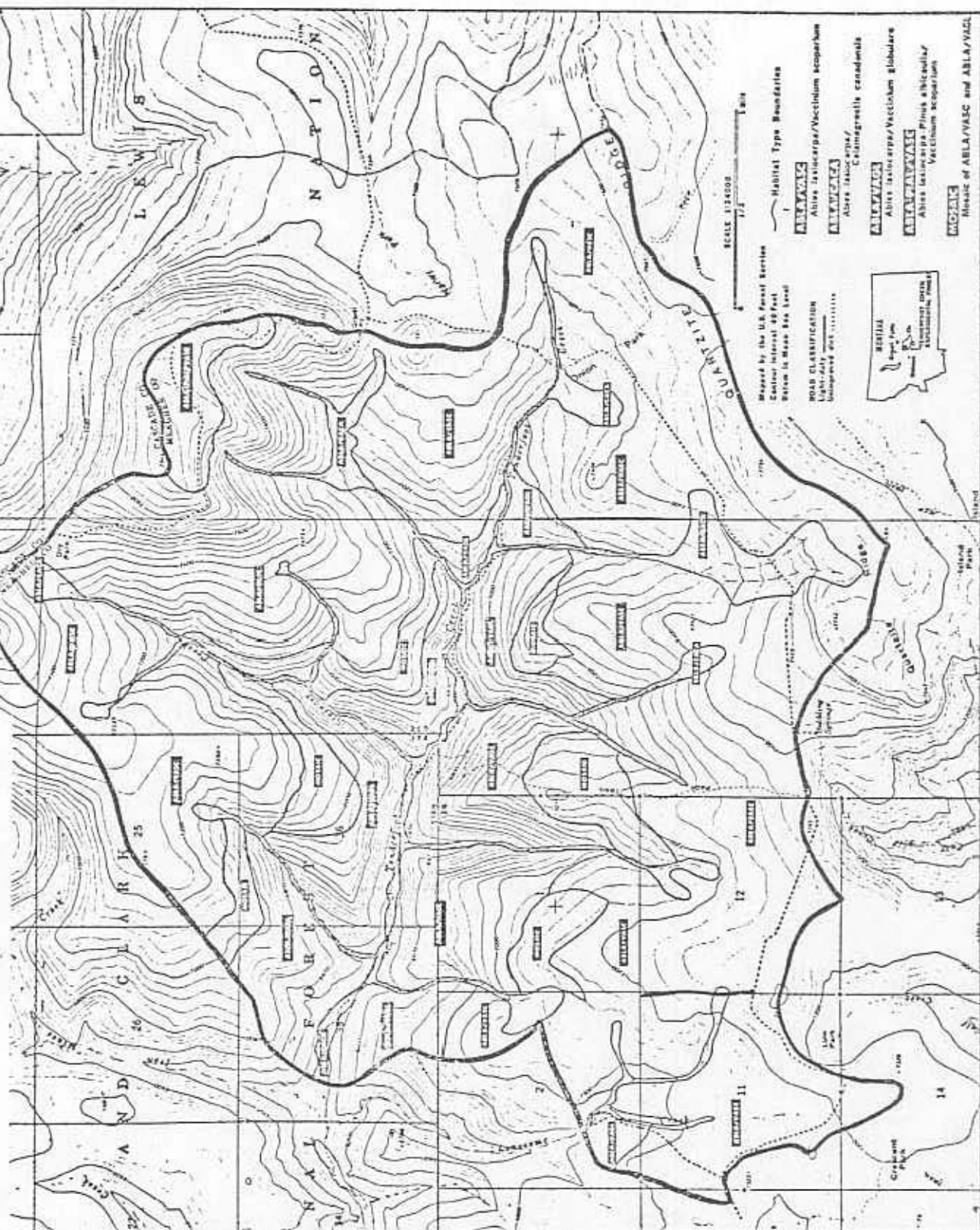


Transect Lines

Figure 3: Delineated Subdrainages
TENDERFOOT CREEK EXPERIMENTAL FOREST
LEWIS & CLARK NATIONAL FOREST
MONTANA
1975



**TENDERFOOT CREEK EXPERIMENTAL FOREST
HABITAT TYPES
LEWIS AND CLARK NATIONAL FOREST
MONTANA
1975**



**Figure 2.
Habitat Types**

