**Project Subject/Title: Oak shelterwood – Beaver Brook Wildlife Area.**
**County: Washburn**
**TRS: T38N R12W sec**

**Contact Person: Jim Halvorson, 715-635-4081**
**Type of Prescription: Oak site preparation**
**Year Initiated: 1980**

**Abstract/Prescription:**
In 1981 this study was initiated to evaluate oak regeneration following various site preparation techniques. The stand was harvested in the winter of 1980 to a residual BA of 70 sq.ft. All non-oak species were cut or girdled (aspen and basswood) including saplings. Four site preparation methods were used on 5 acres each: broadcast burn followed by a second and third burn, one year apart; blade scarification with a crawler tractor; hand seeding with various treated seeds after scarification; and discing.

**Results/Discussion/Recommendations:**
- The burn – seedling numbers fluctuated, competition is likely if not followed by sequential burns. Additional sunlight helps seedlings
- Blade scarification – seedling do not survive long…intense competition from hardwood species. Not a highly recommended application.
- Hand seeding – did not work well. Also low survival of seedlings and competition intense
- Discing- not a high density stocking but it remained constant (a separate clearcut area with discing proved successful)…In a follow up regen survey this still proves to be the successful site treatment at this area.
- Some of these areas were on the drier side of the AVDe habitat type

**Site/Conditions:**
**Habitat Type:AVDe/AA**
**Cover type: Red Oak**

**See full report**

Beaver Brook Wildlife Area - Oak Study

Study Area:

Cut in winter 1980 Residual BA 70
All non-oak species were cut or girdled (Aspen & Basswood including saplings.
Summer 1980 - brush piled (rabbitat).

To date four techniques are being monitored for Oak regeneration as follows:

1. Burn Area 5 acres

1983 - First broadcast burn (May)
1986 - Second burn (May)
1986 - September stocking, very few Oak seedlings 3% stocking (millacre)
1987 - 25% stocking (313 T/AC)
1988 - 20% stocking (250 T/AC)
1989 - 50% stocking (2567 T/AC)
1990 - 36% stocking (720 T/AC)
1991 - 35% stocking (550 T/AC)
1992 - 3RD BURN

10/92 UNIT 1 - 35% 550 T/A
97 " - 50% 1250 T/A
10/92 UNIT 2 - 13% 217 T/A
1ST BURN 53% 2700 T

1998 4TH BURN

Seedling numbers fluctuate and don't seem to survive long. Competition is again mounting, another burn is likely in conjunction with removal of additional overstory. The additional sunlight should help seedling development.

2. Scarified 5 AC

1982 - Blade scarified with a crawler tractor. 60 - 70% of the area exposed to mineral soil.
1986 - September, 44% stocked (millacre) 711 T/AC all plots taken on scarified areas.
1987 - 26% stocked 316 T/AC
1988 - 43% stocked 700 T/AC
1989 - 40% stocked 700 T/AC
1990 - 53% stocked 2200 T/AC
1991 - 15% stocked 308 T/AC

Seedlings do not survive long. The number present represent new seedlings (1 yr. old). Intense competition from hardwood saplings allows very little sunlight to the forest floor. Although the site prep. held for several years, controls on competition outside the scarified swaths were not employed. This technique does not have much potential, recommend applying a different technique

3. Seeding

1984 - Seeding plots established within scarified area using 3 methods. A - treated seed & seed cone, B - treated seed, C - untreated seed.

| | | | |
|---|---|---|---|
| 1985 - | A 58% | B 58% | C 33% |
| 1986 - | A 49% | B 49% | C 32% |
| 1987 - | A 41% | B 45% | C 31% |

Measurements on this study have been discontinued, as it has been shown that collection of acorns and incorporation into the soil by hand will work. Survival and growth of these seedlings was hindered again by intense sapling competition. Seed treated with rodent repellant (thiram) had better results. The seed cones used in this trail did not improve survival and actually hindered height growth.

4. Disking 3 AC

1984 - Fesco disk operated hydraulically on back of a crawler tractor. Double disked in October during acorn drop.
1985 - 55% stocked (millacre) 1450 T/AC
1986 - 67% stocked (millacre) 1167 T/AC
1987 - 61% stocked 1222 T/AC

Half of this site (1.5 AC) clearcut in fall 1988

| | Clearcut | Shelterwood |
|---|---|---|
| 1988 | 40% stocked (400 T/AC) | 40% stocked (1100 T/AC) |
| 1989 | 63% stocked (2000 T/AC) | 62% stocked (2385 T/AC) |
| 1990 | 65% stocked (1500 T/AC) | 50% stocked (875 T/AC) |
| 1991 | 65% stocked (1478 T/AC) | 62% stocked (1846 T/AC) |

Although not a high number of seedlings, the level of stocking has remained constant. Incorporation of the acorns during disking appeared to be important in obtaining these seedlings. The following 4 years showed very little height growth, perhaps because the shelterwood crown closure was too high. Following the clearcut in 1988, seedling were slow to respond but in 1991 were between 1-2' tall. Under the remaining shelterwood seedlings still are struggling to reach the 1 foot height. Additional seedlings were also noted in the skid trails from logging that occurred in fall 1988. This clearcut area lacks the heavy competition found in adjacent study areas thus increasing chances for seedling development. This disked site falls into the dry end of AVDE sites, where as the blade scarified area is AA. This disked site has shown the most promise thus far and if it continues to respond favorably, the remaining 1.5 ac will be addressed for clearcutting as well.

Control Area

| | |
|---|---|
| 1986 - 53% stocked (millacre) | 866 T/AC ( 1/2 white oak) |
| 1987 - 50% stocked | 1000 T/AC (Or 285, Ow 715) |
| 1988 - 67% stocked | 1933 T/AC (Or 867, OW 1067) |
| 1989 - 70% stocked | 1600 T/AC (Or 600, Ow 1000) |
| 1990 - 80% stocked | 2100 T/AC (Or 1000, Ow 1100) |
| 1991 - 89% stocked | 3222 T/AC (Or 2222, Ow 1000) |

The shelterwood was applied to this area in 1980, and has since had no treatment. It lies on the fringe of the study and falls into the dry side of AVDE habitat. It contains more White Oak in the overstory and less intense understory competition. Pre-treatment conditions indicate adequate numbers of seedlings already present before shelterwood cutting. Much of this is older regeneration, some 2 feet tall. The fact that Oak seedlings are maintained with little effort suggests that on these habitat types, regeneration to Oak is the best alternative and could be achieved at little expense.

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