1984 Cropland Management Plan
Squaw Creek National Wildlife Refuge

I. Introduction

The croplands program on Squaw Creek National Wildlife Refuge is conducted under cooperative farming agreements with four local farmers. The cooperative agreements which are renegotiated annually provide for the equivalent of a 66 2/3 percent--33 1/3 percent share basis, with the cooperator receiving the larger share. The refuge share is taken as standing corn and winter wheat. All costs of seed, fertilizers, cultivation, etc. are borne by the cooperator. The refuge does not furnish any agricultural equipment and in effect, the croplands program costs only administrative and supervisory time to the government.

The 1983 crop was affected adversely by summer drought conditions. Many areas were also damaged by flooding from two heavy thunderstorms in late June which dumped nearly seven inches of rain in 24 hours on the north end of the refuge. At the same time, however, only about one-half an inch of rain fell on the south end of the refuge. A summary of crop yields which were much below normal is given in the following table:

<table>
<thead>
<tr>
<th>Cooperator</th>
<th>Acres</th>
<th>Average Yield</th>
<th>Acres</th>
<th>Average Yield</th>
<th>Refuge Share (Corn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maley*</td>
<td>163</td>
<td>28</td>
<td>178</td>
<td>78</td>
<td>77.3 6,029</td>
</tr>
<tr>
<td>Tenney**</td>
<td>129.4</td>
<td>36</td>
<td>115</td>
<td>55</td>
<td>78.4 4,313</td>
</tr>
<tr>
<td>Loucks</td>
<td>52</td>
<td>34</td>
<td>52.4</td>
<td>105</td>
<td>27.7 2,908</td>
</tr>
<tr>
<td>Whipple</td>
<td>7</td>
<td>24</td>
<td>12</td>
<td>70</td>
<td>5.1 358</td>
</tr>
<tr>
<td></td>
<td>351.4</td>
<td>32</td>
<td>357.4</td>
<td>74</td>
<td>188.5 13,608</td>
</tr>
</tbody>
</table>

*14 acres corn and 23 acres soybeans deer damaged not included.
**Less 5 acres soybeans and 10 acres corn deer damaged.

II. 1984 Cropland Management Plan

Essential elements of the 1984 Cropland Management Plan are listed in the special conditions which are appended as the last page of this plan. These are the special conditions which will be a part of all Cooperative Agreements.

Total cropland at the refuge will be about 770 acres. Twenty-six acres has been drill seeded to winter wheat. The remaining acreage will be planted half in corn and half in soybeans (followed by aerially seeded winter wheat).
A field planted to corn last year will be followed this year by soybeans and wheat. Similarly, a field seeded to soybeans and wheat last year will be followed this year by corn. This two year rotation will provide approximately 400 acres of green browse and 190 acres of unharvested corn for refuge use annually.

A factor in cropland management at Squaw Creek is the control of insect problems associated with corn production. Corn rootworm and cutworm are the two major problems. We believe that the present two year crop rotation will reduce insect problems to acceptable levels; however, we do intend to monitor the insect situation closely and make adjustments to the cropland management plan if necessary. This rotation was used in 1982 and 1983 and no problems were encountered.

The twenty-six acres of drilled winter wheat will be harvested. All other wheat crops will be plowed under in the spring as a green manure crop. Aerially sown wheat has a low production potential (caused by lack of fertilization and damage from geese grazing on the shallowly rooted seedlings) and allowing wheat to mature would not contribute to refuge wildlife objectives.

The cooperative agreements provide for approximately a 66 2/3 percent--33 1/3 percent sharing basis with the cooperators receiving the larger share. All costs of seed, fertilizers, cultivation, etc. are borne by the cooperators. Since soybeans have low value to wildlife, most refuge shares will be in equivalent amounts of corn. Cooperators will receive credit in corn to cover costs of seeding wheat. During 1982 and 1983 the value of shares was computed based on yields and crop prices. As a result of that process, the refuge received about half of the corn crop as its share of the harvest. That process involved a considerable amount of time to keep track of all yields and created some inconveniences to cooperators in getting harvesting completed. In order to streamline the division of shares, in 1984 wherever equal acreages of corn and soybeans are involved, the refuge share will be one-half the corn acreage. This is being tried on an experimental basis with the main benefit being reduced administrative time for the refuge.

Refuge corn will not be shred until after the fall waterfowl migration. Some corn will be shred during severe winter weather in order to provide grain for resident wildlife.

The possibility exists that the refuge share of corn produced under the proposed plan might be surplus to the needs of waterfowl on some years. During certain years this food might be readily consumed during the spring migration; however, in some years waterfowl may utilize other food sources or bypass the refuge possibly resulting in a surplus of corn. Shredded corn if not consumed can create a problem of volunteer corn in the next years soybean crop. While this problem may be overcome by the use of herbicides, we do plan to monitor wildlife consumption in order to preclude this problem if possible. We plan to shred corn in accordance with the rate of consumption. If the event that any surplus corn is remaining at the end of spring migration, it could be harvested and sold. Cooperators would be reimbursed for harvest costs by receiving a share of the harvested crop. Also, if a problem should develop with
volunteer corn in soybeans, cooperators will be allowed an increased crop share to compensate for additional herbicide applications. This adjustment, if necessary, will be made on a case by case basis after the full extent of the problem can be assessed.

III. Relationship to Objectives

Cropland activities on Squaw Creek National Wildlife Refuge compliment several programs. Included in these are:

A. Waterfowl Program

(1) Compliments natural food sources produced on the refuge. As shown in Table 2, croplands production potentially supports approximately 1,634,000 goose use days annually. The refuge's share of standing corn will not be shred until after the fall migration. Therefore, the majority of goose usage of corn will occur during the spring migration.

(2) Refuge winter wheat plantings help reduce goose depredations on winter wheat on adjacent private lands prior to the fall waterfowl season. All winter wheat is consumed during the fall migration.

B. Migratory and Resident Bird and Mammal Populations

(1) Cropland activities provide habitat diversity and edge effect which contributes to wildlife diversity on the refuge.
   (a) 301 species of birds have been recorded on the refuge and 106 species nest here.
   (b) Pheasant populations on the refuge are higher than any comparable area of northwest Missouri.

(2) The white-tailed deer population on the refuge fluctuates between 200 and 300 animals; grain serves as a food source for the deer during the winter months.

   Observations during the winters of 1982 and 1983 indicate that roughly half of the grain in unharvested corn fields is consumed by resident wildlife (primarily deer) during the winter. Flocks of blackbirds also glean large amounts of corn from refuge fields, at times.

C. Interpretation and Recreation

All items in A and B above contribute to the refuge's interpretive and recreational program.
Table 2. Potential use days of croplands by geese

<table>
<thead>
<tr>
<th>Crop*</th>
<th>Acres</th>
<th>lbs/acre</th>
<th>Pounds</th>
<th>Food Rqmts.</th>
<th>Potential Use Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn Harvested</td>
<td>185</td>
<td>400</td>
<td>74,000</td>
<td>0.5</td>
<td>148,000</td>
</tr>
<tr>
<td>Unharvested</td>
<td>185</td>
<td>2,800**</td>
<td>518,000</td>
<td>0.5</td>
<td>1,036,000</td>
</tr>
<tr>
<td>Wheat</td>
<td>400</td>
<td>1,125</td>
<td>450,000</td>
<td>1.0</td>
<td>450,000</td>
</tr>
<tr>
<td>Total</td>
<td>770</td>
<td>1,042,000</td>
<td></td>
<td></td>
<td>1,634,000</td>
</tr>
</tbody>
</table>

*Soybeans were not included in the table as our observations show that waterfowl use other food sources to the almost total exclusion of soybeans. The winter wheat so designated consists of green browse, not grain.

**The amount of unharvested corn per acre available for geese was based on an average yield of 100 bushels per acre and the assumption that resident wildlife will consume half the corn prior to the spring migration.
Special Conditions:

1) Approximately fifty percent of acreage will be planted to corn and fifty percent to soybeans (followed by wheat) as shown on the attached map. Crop shares will be divided as follows:

   a) Whenever half of acreage is in corn and half is in soybeans, the cooperator's share of the crop will be all soybeans and half of the corn yield. The refuge's share will be half of the corn yield (left standing) plus cooperators will be responsible for aerially seeding to winter wheat. Wheat seeding rate will be three bushels per acre and will be done about September 15.

   b) In the event of uneven crop acreages or crops other than soybeans and corn, these additional acreages (acreages other than that amount that is half corn and half soybeans) will be divided on a two-thirds cooperator to one-third refuge share. Cooperators would still be responsible for aerially seeding any soybean fields to winter wheat as described above but would be reimbursed for costs incurred through an increased share of the harvest.

2) Cooperators will consult with the assistant refuge manager prior to initiation of harvests.

3) Only approved pesticides and herbicides may be utilized on refuge fields. Cooperators must read and strictly comply with all label instructions.

4) Harvested corn fields may be shred during the fall but no fall tillage of fields will be conducted.

5) Cooperators will not store or leave any equipment on the refuge.

6) In the event of problems with volunteer corn in soybeans as a result of last year's crop program, an adjustment will be made in crop shares to compensate cooperators for additional expenses involved.