A PLAN FOR IMPROVING HUNTER-FARMER RELATIONSHIPS BASED ON THE ORENCO GAME MANAGEMENT PROJECT

by

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Typed by Mrs. F. A. Williams
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Special thanks are extended Mr. Jay Long, Associate Professor in the Department of Fish and Game, for his critical reading of this thesis.

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The author is particularly grateful to Mrs. Williams for her patience and efficient service in preparing this paper in final typewritten form.
## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>The Problem</td>
<td>2</td>
</tr>
<tr>
<td>The Plan</td>
<td>8</td>
</tr>
<tr>
<td>History of the Plan</td>
<td>9</td>
</tr>
<tr>
<td>Important Provisions of the Pennsylvania Plan</td>
<td>10</td>
</tr>
<tr>
<td>Benefits to Farmers</td>
<td>12</td>
</tr>
<tr>
<td>Cooperation Wins</td>
<td>13</td>
</tr>
<tr>
<td>The Oregon Plan</td>
<td>13</td>
</tr>
<tr>
<td>The Field Rearing Project</td>
<td>20</td>
</tr>
<tr>
<td>Setting Up the Project</td>
<td>21</td>
</tr>
<tr>
<td>Feeding Program</td>
<td>24</td>
</tr>
<tr>
<td>Loss</td>
<td>27</td>
</tr>
<tr>
<td>Predation and Predator Control</td>
<td>32</td>
</tr>
<tr>
<td>Observations and Suggestions</td>
<td>35</td>
</tr>
<tr>
<td>Contact Work with Farms</td>
<td>40</td>
</tr>
<tr>
<td>The Hunting Season</td>
<td>44</td>
</tr>
<tr>
<td>The Post-Season Survey</td>
<td>50</td>
</tr>
<tr>
<td>Suggestions for Improving the Orenco Game Management Project</td>
<td>55</td>
</tr>
<tr>
<td>Conclusions</td>
<td>64</td>
</tr>
<tr>
<td>Literature Cited</td>
<td>66</td>
</tr>
</tbody>
</table>
LIST OF TABLES AND FIGURES

Table

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Land utilization in the United States, census years 1880-1945</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>Population figures for Oregon</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>Population figures for cities in Oregon</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Results of first weight check</td>
<td>26</td>
</tr>
<tr>
<td>5</td>
<td>Results of second weight check</td>
<td>27</td>
</tr>
<tr>
<td>6</td>
<td>Physical count at 20 days of age</td>
<td>29</td>
</tr>
<tr>
<td>7</td>
<td>Types of known loss (dead birds recovered) June 15 to September 6</td>
<td>32</td>
</tr>
<tr>
<td>8</td>
<td>Predators killed June 15 to September 6</td>
<td>33</td>
</tr>
<tr>
<td>9</td>
<td>Results of the hunting season on the Orenco Game Management Project</td>
<td>48</td>
</tr>
<tr>
<td>10</td>
<td>Results of the Orenco questionnaire</td>
<td>51</td>
</tr>
</tbody>
</table>

Figure

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>These signs were posted throughout the project</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>A view showing dispersal of brood coops on a field-rearing pheasant project</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>Two weeks old pheasant chicks feeding at the brood coop</td>
<td>22</td>
</tr>
<tr>
<td>4</td>
<td>Percentage of weekly loss by block</td>
<td>28</td>
</tr>
<tr>
<td>5</td>
<td>Weekly mortality graph</td>
<td>30</td>
</tr>
<tr>
<td>6</td>
<td>Aerial photograph of the Orenco Cooperative Farm-Game Management Area</td>
<td>42</td>
</tr>
<tr>
<td>7</td>
<td>An explanation of the Orenco Cooperative Farm-Game Management Project</td>
<td>43</td>
</tr>
<tr>
<td>8</td>
<td>Hunting with a dog conserves game by recovery of cripples</td>
<td>47</td>
</tr>
</tbody>
</table>
A PLAN FOR IMPROVING HUNTER-FARMER RELATIONSHIPS
BASED ON THE ORENCO GAME MANAGEMENT PROJECT

INTRODUCTION

The ever-increasing demand on our wildlife resources has resulted in problems heretofore receiving little attention from game managers, sportsmen, and farmers. Modern methods of farming, the increased interest in hunting, and demands from a recreation minded public are bringing pressure to bear on wildlife administrators throughout the nation.

"A classification of the available upland game habitat indicates that only approximately half of the six million acres of agricultural land in Oregon can be presently classified as suitable upland game habitat or productive of an annual surplus for harvest." (1,p.36)

The current rapid increase in population density and economic development in Oregon are hastening the day when maintenance of game populations will be no greater problem than providing access to private lands for public recreation. At the present time, a high percentage of the lands in the more popular upland game hunting areas are posted to prevent trespass or hunting, and landowners frequently refuse to cooperate in plans for the production of more game because of the many hazards encountered during hunting seasons.
The purpose of this paper is to report on the success of a method recently adopted by the Oregon State Game Commission to improve relationships between the hunter and the farmer and is based on the Orenco Game Management Project for 1949.

THE PROBLEM

One need only drive through a few miles of farming country to observe the presence of a great number of "No Hunting or No Trespassing" signs. The posting of farm land against trespassing was unusual a decade or so ago but has now become the standard practice of farmers who have tried but failed to find other satisfactory methods of protecting their property against the careless and vandalistic acts of a hunting public. One of the most urgent problems of game managers today is that of improving the relationship between the hunter, who is fast eliminating the areas at one time open to him for hunting, and the farmer, who is impatient with the abuses heaped upon himself and his property by a small percentage of the vast number of present day hunters. Let us look at both sides, weigh the evidence, and determine which party is to blame for this dilemma.

The role of the farmer in game management should be self-evident to anyone having the most vague understanding
of the subject. To him must be given credit for providing year-around food and shelter for most of our upland game species. His attitude toward this resource will determine the amount and availability of food and cover provided, and in turn, the amount and availability of game for harvest. The farmer does not own the game. This has been law since time immemorial. Since the movements of game cannot be controlled, ownership must fall to the state, and not the individual landowner. However, the role of custodian of the game belongs to the farmer whenever it remains upon his land. He has the power to harvest such game within the limits of the law, and likewise, the power to protect and prevent the killing of the same at his own discretion. The importance of his relation to game management, then, is clearly seen. An abundance or a scarcity of game, and whether-or-not that supply of game may be harvested, depends entirely upon the farmer's attitude toward wildlife in general, and more specifically, his relationship with the hunter.

The hunter may sympathize with the farmer's position as "game custodian" and thus cooperate to foster more friendly relationships, or he may take the attitude that since the farmer does not own the game, that he, the hunter, has just as much right to its harvest as anyone. Those hunters who thus reason usually make no effort to respect or protect the property and rights of those on whose land
they hunt, with the inevitable consequence of poor hunter-farmer relationship resulting. A large majority of hunters, on the other hand, have an understanding of the farmer's position and usually make an effort to maintain friendly relationships between the two groups. The particular code of ethics of these sportsmen usually include the following rules:

1. Always ask the landowner's permission before hunting.
2. Use gates whenever possible but always close them if originally found closed.
3. Never help yourself to produce.
4. Stay out of standing or unharvested grain.
5. Avoid fields containing livestock.
6. Do not hunt near buildings or shoot toward them.
7. Put out cigarettes - don't start a fire.
8. Cross fences only at fence posts - never ride down a fence.
9. Take the same care of the farmer's property as you would your own.
10. Thank the farmer after your hunt. Share your game with him. After all, he is responsible for it being there.

To the hunter who follows a set of standards similar to this, a "No Hunting or Trespassing" sign is not
necessarily taken literally. Courteously asking permission usually results in it being granted. Posting has become the farmer's only defense against an ever increasing horde of hunters, the actions of a few of which have molded resentment against all. No problem would exist if only all hunters would strive to treat the farmer with due respect for the role which he plays in game management.

Why has the problem become so acute in a period of only a few years? A look at the population trend in Oregon gives the answer. From 1920 to 1940 Oregon's population increased by 306,295 persons. Since 1940, the estimated increase is 49 percent. (4,p.301) This is an increase of some 840,240 persons since 1920 or more than double the total population at that time. This population increase has more than doubled the hunting pressure as distance from areas of high population is no longer a guarantee of freedom from such pressure during hunting seasons. With present day methods of clean farming, game has been squeezed into smaller and smaller areas of suitable habitat or has perished from lack of the same, or has been hunted so heavily where it does find habitat conditions suitable for survival that in many places breeding stock has become perilously low or decimated.

The farm land of the United States makes up
Table 1. Land utilization in the United States, census years 1880-1945 (7, p. 527)

<table>
<thead>
<tr>
<th>Major Land uses</th>
<th>1880</th>
<th>1890</th>
<th>1900</th>
<th>1910</th>
<th>1920</th>
<th>1925</th>
<th>1930</th>
<th>1935</th>
<th>1940</th>
<th>1945</th>
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</thead>
<tbody>
<tr>
<td>Land In Farms</td>
<td></td>
<td></td>
<td>839</td>
<td>877</td>
<td>924</td>
<td>987</td>
<td>1058</td>
<td>1061</td>
<td>1142</td>
<td></td>
</tr>
<tr>
<td>Acres</td>
<td>Mil.</td>
<td>Mil.</td>
<td>Mil.</td>
<td>Mil.</td>
<td>Mil.</td>
<td>Mil.</td>
<td>Mil.</td>
<td>Mil.</td>
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<td>Mil.</td>
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<tr>
<td>Total land in farms</td>
<td>536</td>
<td>623</td>
<td>839</td>
<td>877</td>
<td>924</td>
<td>987</td>
<td>1058</td>
<td>1061</td>
<td>1142</td>
<td></td>
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<tr>
<td>Cropland</td>
<td>188</td>
<td>248</td>
<td>319</td>
<td>347</td>
<td>402</td>
<td>391</td>
<td>413</td>
<td>416</td>
<td>399</td>
<td>403</td>
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<tr>
<td>Cropland harvested</td>
<td>295</td>
<td>322</td>
<td>362</td>
<td>345</td>
<td>359</td>
<td>296</td>
<td>321</td>
<td>353</td>
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<td>40</td>
<td>47</td>
<td>54</td>
<td>120</td>
<td>78</td>
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</tr>
<tr>
<td>idle or fallow</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Pasture in farms</td>
<td>122</td>
<td>144</td>
<td>276</td>
<td>284</td>
<td>328</td>
<td>331</td>
<td>379</td>
<td>410</td>
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<td>529</td>
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<td>Plowable pasture</td>
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<td>109</td>
<td>99</td>
<td>111</td>
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<tr>
<td>Not plowable</td>
<td>186</td>
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<td>223</td>
<td>217</td>
<td>270</td>
<td>311</td>
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<td>Forest &amp; Woodland in</td>
<td>190</td>
<td>190</td>
<td>191</td>
<td>191</td>
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<tr>
<td>Pasture &amp; woodland</td>
<td>87</td>
<td>98</td>
<td>77</td>
<td>77</td>
<td>95</td>
<td>108</td>
<td>100</td>
<td>95</td>
<td></td>
<td></td>
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<tr>
<td>Not pastured</td>
<td>104</td>
<td>93</td>
<td>91</td>
<td>67</td>
<td>65</td>
<td>77</td>
<td>57</td>
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<td>Farmsteads, roads,</td>
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<td>41</td>
<td>53</td>
<td>57</td>
<td>58</td>
<td>38</td>
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<tr>
<td>wasteland &amp; other</td>
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<tr>
<td>land in farms</td>
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</tr>
<tr>
<td>Land not in farms</td>
<td>1369</td>
<td>1282</td>
<td>1066</td>
<td>1026</td>
<td>949</td>
<td>981</td>
<td>918</td>
<td>850</td>
<td>844</td>
<td>763</td>
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<td>Pasture &amp; grazing land 1</td>
<td>883</td>
<td>818</td>
<td>625</td>
<td>600</td>
<td>502</td>
<td>495</td>
<td>437</td>
<td>411</td>
<td>382</td>
<td>292</td>
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<tr>
<td>Forest land used</td>
<td>368</td>
<td>344</td>
<td>318</td>
<td>301</td>
<td>319</td>
<td>354</td>
<td>349</td>
<td>306</td>
<td>325</td>
<td>322</td>
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<tr>
<td>chiefly for producing</td>
<td></td>
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<td></td>
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<td>commercial timber 2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Other land outside</td>
<td>118</td>
<td>120</td>
<td>123</td>
<td>125</td>
<td>128</td>
<td>132</td>
<td>132</td>
<td>133</td>
<td>137</td>
<td>149</td>
</tr>
<tr>
<td>farms (cities, roads,</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>railroads, unused</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>wasteland, etc.) 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grand total land area</td>
<td>1905</td>
<td>1905</td>
<td>1905</td>
<td>1905</td>
<td>1905</td>
<td>1905</td>
<td>1905</td>
<td>1905</td>
<td>1905</td>
<td>1905</td>
</tr>
</tbody>
</table>

1. Pasture and grazing land not in farms consists of land used chiefly for pasture and includes open or non-forested pastures, and idle grassland in first decades, and arid woodland (pinon-juniper, chaparral), and shrub and brush pastures in all years.

2. Forest land outside of farms used chiefly for commercial timber excludes forested areas included in parks, wildlife refuges, military areas, recreation sites, and arid woodland and brushland used chiefly for pasture.

3. Other land outside of farms includes urban, industrial and residential areas outside farms, parks, wildlife refuges, military lands, roads, railroads, ungrazed desert, rock, swamp, and other unused and wasteland.
60 percent of total land areas. The remaining 40 percent is made up of land not in farms, such as pasture and grazing lands, forest land used chiefly for producing commercial timber, cities, roads, railroads, unused wastelands, etc. Very little of this 40 percent produces food and cover for upland game which group furnishes sport for more hunters than waterfowl and big game combined.

Table 2. Population figures for Oregon (4, pp. 300-301)

<table>
<thead>
<tr>
<th></th>
<th>1910</th>
<th>1920</th>
<th>1930</th>
<th>1940</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon Population*</td>
<td>672,765</td>
<td>783,389</td>
<td>953,786</td>
<td>1,089,684</td>
</tr>
<tr>
<td>Multnomah County</td>
<td>226,261</td>
<td>275,898</td>
<td>338,241</td>
<td>355,099</td>
</tr>
</tbody>
</table>

*Oregon's population is estimated to have increased 49 percent since 1940.

Table 3. Population figures for cities in Oregon (4, pp. 300-301)

<table>
<thead>
<tr>
<th>City</th>
<th>1920</th>
<th>1930</th>
<th>1940</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bend</td>
<td>5,415</td>
<td>8,848</td>
<td>10,021</td>
</tr>
<tr>
<td>Eugene</td>
<td>10,593</td>
<td>18,901</td>
<td>20,838</td>
</tr>
<tr>
<td>Klamath Falls</td>
<td>4,801</td>
<td>16,093</td>
<td>16,497</td>
</tr>
<tr>
<td>Medford</td>
<td>5,756</td>
<td>11,007</td>
<td>11,281</td>
</tr>
<tr>
<td>Portland</td>
<td>258,288</td>
<td>301,815</td>
<td>305,394</td>
</tr>
<tr>
<td>Salem</td>
<td>17,679</td>
<td>26,266</td>
<td>30,908</td>
</tr>
</tbody>
</table>

Two points in the hunter-farmer relationship problem, then, are clearly defined.

1. The farmer controls the game - its relative abundance and distribution.
2. An ever increasing demand exists for more game by a greater number of hunters who have an inherent right to share in its harvest. The following plan is presented as an experiment in the problem of improved game management through the fostering of better hunter-farmer relationship.

THE PLAN

The purpose of this project is to increase the production of upland game species through an intensive stocking program, improvement of habitat, and control of predators; and to provide for an orderly harvest of the surpluses of game produced by entering into cooperative agreements with landowners to assure public access, protect private property, and protect a nucleus of breeding stock of game birds on the area.

At the present time the access problem is not serious in Washington or other Willamette Valley counties as game birds have not been abundant and hunting pressure has not been heavy because of the scarcity of game and the authorization of very conservative hunting seasons. It is anticipated that this project will indicate the degree of management required to produce good hunting on a sustained yield basis, and that if good hunting can be provided, some arrangement will have to be made to protect the rights
of private landowners and assure access for the hunting public.

HISTORY OF THE PLAN

The need for providing more game for an increasing number of hunters has reached paramount proportions only in recent years. Prior to the great westward migration of the last decade, game was more abundant for a number of reasons. Fewer people demanded less from the land resulting in more game habitat. World War II called for greater agricultural production and thus resulted in more intensified land usage. All efforts were concentrated toward winning the war, causing a shortage of funds and personnel for wildlife management purposes. Following the war years, the rise in population and a greater demand for recreation increased the pressure on wildlife resources. Areas within easy access of centers of population abundance began to feel the burden of heavier hunting pressure. A proportionately greater number of trespass violations and damage complaints always accompanies an increased hunting pressure. Game populations may decrease to a point of exhaustion with a consequent clamoring by the hunters for more game, and a resultant posting of land by landowners to insure against further damage by thoughtless hunters.
Washington County illustrates such an area. The influx of hunters from Portland and other cities and towns during the fall hunting seasons exerts a heavy drain on the game population of that county. In searching for a plan to cope with these problems the logical place to look was to other states which have been facing this situation for many years. John McKean, then Chief Biologist in charge of Upland Game, now Chief of Game Operations, Oregon State Game Commission, reviewed the plans of other states facing similar problems and formulated a plan patterned after Pennsylvania's Cooperative Farm-Game Program (5, pp. 1-12).

A review of this program follows:

**Important provisions of the Pennsylvania Plan (5, pp. 1-12)**

Existing provisions of law and regulations adopted by the Commission with respect to Cooperative Farm-Game Projects are briefly summarized:

1. **Project Area.** A contiguous group of farms and their accompanying woodlots, suitable for the protection and propagation of small game, make up a project area. Each such area must contain at least 1,000 acres and, tentatively, not in excess of 20,000 acres.

2. **Agreement.** To become a Cooperator, the owner or person in legal control of a suitable farm executes an agreement by which the hunting rights only are made available to the Game Commission for five years or more. A clause in the agreement provides for its continuation thereafter unless either the Cooperator or the Commission advises the other of desire for discontinuance.

3. **Cancellation of Agreements.** The Commission may cancel any agreement under the following conditions:

   a. Upon sixty days written notice to the lessor, when in the judgment of the Commission the use of the lands is no longer needed or desired.
b. In case the owner desires to sell the property and the sale cannot be consummated subject to said agreement, provided the Executive Director of the Commission is satisfied the principal object of such sale is not to convert to private use hunting rights which have been made more valuable through utilization of the property for the purposes herein stipulated.

c. In case the lessor becomes dissatisfied with the project and files a written request to the Director for such cancellation.

4. Safety Zones. Hunting for or disturbing game, or discharging deadly weapons within 150 yards of occupied dwellings or other used farm buildings is illegal except by specific permission of the owner or tenant thereof. The Commission posts notices to this effect around such buildings within the prescribed distance, or furnishes signs for this purpose to Cooperators. The penalty for violating the Safety Zone Law is $25 and costs of prosecution.

5. Refuges. Refuges, or game retreat areas, generally only a few acres in size, are established for protection of game. No hunting by anyone at any time is permitted therein. Refuge areas are also invariably selected in conjunction with the Cooperator concerned; are surrounded by a single strand of wire or other well-defined line; and posted. Penalty for violating the refuge law is $25.

6. Public Hunting. Not more than one-third of each project area may be set apart as safety zones and refuges, and the other two-thirds or more must remain open to lawful public hunting. The landowner's right to hunt without a license under certain legal restrictions on his own and adjoining farms, except within a refuge, remains unchanged.

7. Trapping. Any Cooperator may retain control over trapping of fur-bearing animals and predators by suitable reservation in the written agreement, should that be his wish.

8. Removal of Surplus Game. Surplus game or fur-bearing animals, should there be a surplus, may be trapped, removed and transferred from project areas, including refuges, by an agent appointed by the Commission. Cooperators are given the opportunity of becoming such an agent and are then paid a prearranged price for each animal trapped and turned over in good condition to the Game Protector. This provides an opportunity for earning extra money at a time when farm work is not pressing.
9. Game Stocking. Special consideration is given project areas when bobwhite quail, ringneck pheasants, or cottontail rabbits are available from the Commission's propagation farms or elsewhere. Overstocking, of course, is avoided.

10. Raising Game. Cooperators may, if they wish, raise ringneck pheasants from day-old chicks furnished from the Commission's game farms and, currently, are furnished five pounds of starting mash per chick and paid $1.00 per each bird raised in good condition to 12 weeks of age. This provision provides an opportunity for increasing farm revenues.

Benefits to Farmers

(a) Protection to life and property through patrolling and enforcement of law by Game Protectors, paid by the Commission, especially when project areas are being hunted.

(b) Signs are posted around Safety Zones. Other signs are posted on project areas warning hunters not to do any unlawful act.

(c) Each Cooperator is given a free subscription to the Commission's monthly publication, "The Pennsylvania Game News".

(d) Excess grains, harvested or uncut, are purchased for game food.

(e) Farmers and members of their families and employees, can earn extra money by raising certain game birds; by selling their excess products to sportsmen; and by accepting work when farm duties permit.

(f) Cooperators are supplied advice on soil conservation and other profitable farm practices. Since this involves proper use and care of the land, it is well to keep in mind that the conservation farming measures listed below aid in controlling erosion, conserving moisture, and increasing crop and wildlife yields:

- Contouring
- Contour strip cropping
- Diversion channels
- Crop rotation
- Cover crops
- Drainage
- Sod waterways
- Pasture improvement and development

Management of odd areas for wildlife
Green manuring
Perennial hay production
Field and gully planting
Wildlife hedge planting
Wildlife woodland
Border planting
Windbreak planting
Woodland harvesting
Woodland improvement cuttings
Pond Management

(g) The Commission may aid in the utilization of waste spots by furnishing various species of young vines, shrubs, and trees which provide food and cover for wildlife, including insect-devouring birds so beneficial to farmers.

Cooperation Wins

The Game Commission hopes eventually to expand this program to as much as 1,000,000 acres. Farmers should discuss the plan with one another and perhaps hold open discussions at grange meetings. If owners or persons in legal control of more than 1,000 acres of contiguous farms are willing to give the plan further consideration, advise the Game Commission at Harrisburg or the local Game Protector.

THE OREGON PLAN

Having had no previous experience with Cooperative Farm-Game programs in Oregon, Mr. McKean decided to adopt the Pennsylvania plan in its basic entirety. Preliminary contact was made in the general area lying just west of Orenco, Washington County, Oregon, and including farms with a total area of some 3,000 acres. Reports from the Game Commission's district agent, James Negley, showed a very sparse population of ringneck pheasants in this area. A site was chosen on which to locate a pheasant field rearing project, and contact work with the farmers for establishing a Cooperative Farm-Game program was carried on simultaneously with the rearing project. Following
Figure 1. These signs were posted throughout the project.

Figure 2. A view showing dispersal of brood coops on a field-rearing pheasant project site.
is a breakdown of the schedule adhered to and an outline of the Plan.

**Work Assignments and Schedule of Activities**

The project was initially established by the upland game management department and other phases of the program, such as improvement of habitat and control of predators, was to be undertaken by the respective departments responsible for these activities after a plan for such developments and operations was prepared.

The District Agent was in direct charge of the project but was provided an assistant who resided on the area during the summer of 1949 and, who, in turn, received additional assistance during the hunting season.

The following schedule of procedures was followed in developing the project:

**May 1 to June 20:**

1. Initial contact of landowners for opinions of proposed project and willingness to cooperate.

2. Intensive predator control through trapping and poisoning of detrimental or offending mammals.¹

3. Preparation for field rearing of pheasants.
   - b. Setting up equipment.

---

¹. Intensive local predator control is necessary on field-rearing sites. It must not be assumed that this policy is adopted by the Game Commission on a state-wide basis.
June 20 to August 6:

Field rearing of pheasants was carried on during this period as outlined in instructions for that activity. (2, pp. 1-6)

The coops, feed, and water and a few brood hens were left on the project area until September 1 to prevent too rapid dispersal of pheasants, which normally occurs at the age of six to seven weeks. During this period the pheasants required little attention other than protection from predators and poachers. This protection was better provided by holding the birds in a small area rather than allowing them to disperse at an early age.

The man assigned as project caretaker operated traps and maintained constant vigilance against predators during the summer months.

August 6 to September 15:

The caretaker assigned to the project prepared a cover map of the area, and with the assistance of the District Agent and respective department heads, a tentative management plan was prepared for the development of habitat, control of predators, and control of hunting on the area.

This management plan was based upon the following conditions:

1. At least two-thirds of the game management
project area to be open to public hunting
during the upland game bird season.

2. Up to one-fourth of the area to be closed to
hunting for the protection of farm buildings,
livestock, and vulnerable crops.

3. Up to five percent of the area in State game
refuges to be leased and developed by the
Game Commission to provide the necessary
food, cover, and water for game birds and
serve as inviolate sanctuaries for game
species throughout the year.

The plan was to include the following items:

1. A thorough evaluation of the habitat and game
populations before the area was developed.
   a. A cover map of the area including crops,
      cover, available water, etc.
   b. A thorough census of the area including
      all game and non-game species present,
      location of quail coveys, etc.

2. Designation of tentative safety zones and refuge
areas within the tract.
   a. Refuge areas to be low value agricultural
      lands which could be leased at a reason-
      able rate and developed specifically for
      the protection and production of game.
b. Safety zones to be tentatively indicated but to be altered at the request of cooperating landowners.

3. Designation of desirable potential sites outside of planned refuges for improvement of habitat through planting of cover, crops, food crops, or development of water. These improvements to be discussed with landowners at the time of agreement and not to be initiated without the consent of owners.
   a. Developments to be indicated in color on cover map.

4. Designation of unoccupied quail covey ranges and potential habitat for other game species.
   a. Locations to be indicated on cover map.

5. Outline of predator control program required to control excessive losses by predation.

6. Estimate of manpower required for all proposed activities and developments on an annual basis by months.
   a. Posting and patrolling
   b. Habitat improvement
   c. Predator control
   d. Stocking
   e. Miscellaneous activities
September:

After the management plan had been tentatively prepared, all landowners within the proposed area were contacted, advised of the proposed plan, and requested to sign an agreement which would give the Game Commission control of hunting on their land.

At the time of agreement, final designation of safety zones, refuges, and habitat improvement plans were made and the original management plan altered to comply with the desires of the landowners.

After all agreements had been signed, the project area was posted.

October:

During the month of October the area was constantly patrolled to prevent pre-season shooting and to continue predator control measures.

Water developments had been made earlier to encourage the natural spread of the young pheasants and pole traps were established adjacent to these watering points to aid in checking avian predation.

An intensive census of the area was conducted at weekly intervals during the month prior to the opening day of pheasant season.

Hunting Season:

The pheasant season for the project ran concurrent
with the general Washington County season and four patrolmen were assigned to the area to obtain information and prevent violations. The season opened Friday noon, October 21, and it was anticipated that the heaviest hunting pressure would be from opening time through Sunday evening. Following Sunday evening, the patrolling force was reduced to one man for the duration of the open season. Patrolmen were instructed to obtain the following information:

1. Approximate number of hunters using area daily.
2. Number and residence of hunters checked.
3. Number of hours hunted.
4. Number of birds bagged.
   a. Marked birds.
   b. Age class of unmarked birds.
5. Reaction of hunters to project.

Certain deviations from the plan as originally outlined were necessary as the work progressed. This was to be expected as unforeseen problems, not anticipated on paper, are usually revealed by actual field work.

THE FIELD REARING PROJECT

The field rearing of pheasants on the Orenco Game Management Area was carried out according to normal procedure for this type project (2, pp.1-6). Following is an
account of the program by various activities.

Setting up the Project:

Coops were hauled from the Eugene Game Farm and placed in position at the field rearing site several days in advance of the arrival of the brood stock. The caretaker arrived at the project far enough in advance of the arrival of the birds to prepare the coops to receive them. This consisted of aligning the coops in rows, leveling the ground under each coop, placing litter in each coop, and mowing paths through the cover in front of and behind each row of coops to facilitate travel by the caretaker in caring for the birds.

A total of 2,706 chicks was received over a three day period beginning June 20. All but 150 chicks had been toe-clipped at the game farms for identification purposes during and after the hunting season. The right middle toe was removed at the first joint above the terminal end.

Cutting back the beaks of brood hens has been found to be a useful tool to inhibit brood hens in the killing of pheasant chicks. This practice, put into effect at the Eugene Game Farm in the setting pens at the time of the last dusting of the hens prior to hatching of the pheasant chicks, resulted in 100 percent elimination of pheasant chick killing at hatching time and cut down killing in the brood coops to a point where it was insignificant. Only
Figure 3. Two weeks old pheasant chicks feeding at the brood coop.
a few hens received at the project had not been beak-clipped and this operation was performed at the time the hens were placed in the brood coops.

Sand has been used successfully as litter in brood coops for many seasons. However, heretofore, this has consisted of course, river-washed sand which, when eaten by the chicks, served as grit. The sand available at Hillsboro was a fine mason sand with a high sparkle which attracted the attention of the chicks immediately.

On the second day one chick was found with what seemed to be a plugged vent. On the third day nine were found. Considering the large number of chicks, no particular cause for alarm was felt. The third day, however, produced thirty-nine dead chicks with plugged vents and Mr. Dickinson, Superintendent of the Eugene Game Farm, who was "project advisor", was informed that the chicks were picking up the fine sand and that, instead of remaining in the gizzard and serving as a grinding agent, it was passing through the intestines, mixing with the feces, and forming a solid plug just inside the vent. These chicks were unable to pass this plug and died within a short time. A concrete sand of courser texture was ordered and the litter replaced as quickly as possible. One coop was isolated and used as a hospital where special attention was given sick chicks, but once the chick's vent became
plugged, all that was tried was of little or no avail.

This second supply of sand also contained a high percentage of fine particles and the first litter had already exacted a heavy toll. The actual counted loss from vent plugging was 210 chicks. After-effects on the remaining chicks were inestimable. This may be one reason for the disparity of size so noticeable throughout the growing season.

**Feeding Program:**

An attempt was made on this project to determine the effects of different types of feed on rearing success. The project was divided into four parts, called blocks, and a different mixture of feed fed in each. At the beginning it was realized that, because of free movement of the chicks, any check on weight or uniformity would not be entirely accurate. However, intermingling of pheasant chicks is limited somewhat the first week or two to those coops bordering the block boundaries and since this early period of development determines the "start" the chick gets, it was believed that a reasonably accurate check would result.

Normal procedure was followed initially. About four hours after the chicks were received, they were let into the feed compartments of the individual coops where a small amount of pheasant starter mash had been placed on the feed
boards. In block one, this was a 28 percent protein game farm mash; block three, 24 percent protein Purina Turkey Starter; and block four, 30 percent protein Purina Game Bird ration.

On the second day, the following mixtures were placed in the large compartments of the feed boxes:

**Block one.** One part 28 percent protein game farm mash, one part 28 percent protein pheasant starter mash, and one part three-way chick scratch.

**Block two.** One part 24 percent protein game farm mash, one part 24 percent protein pheasant starter mash, and one part three-way chick scratch.

**Block three.** Two parts 24 percent protein Purina Turkey Starter, and one part three-way chick scratch.

**Block four.** One part 30 percent protein Purina Game Bird ration, and one part three-way chick scratch.

After a few days it was found that in block four the chicks were eating the "crumbles" and leaving the scratch. This mixture was changed to two parts 30 percent protein Purina Game Bird ration and finally, three parts Purina Game Bird ration to one part three-way chick scratch until both ingredients were cleaned up simultaneously. Feed boards were left in the feed compartments until it was certain that chicks were feeding from the boxes.
From the beginning, it was observed that the chicks in blocks one, three, and four fed heartily while those in block two were very reluctant to feed. This tendency was very pronounced for the duration of the growing period. The Standard 24 percent protein game farm mash had an unpleasant tankage odor and pieces of rock salt the size of a pin head and larger were found in the mash.

Although the three different mixtures in blocks one, three, and four were eaten with the same readiness, weight checks showed a difference in results.

Table 4. Results of first weight check

<table>
<thead>
<tr>
<th>Block No.</th>
<th>Age</th>
<th>No. of Birds</th>
<th>Total Weight</th>
<th>Ave. Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18 days</td>
<td>30</td>
<td>3 lb. 2 oz.</td>
<td>1.66 oz.</td>
</tr>
<tr>
<td>2</td>
<td>18 days</td>
<td>30</td>
<td>3 lb. 1 oz.</td>
<td>1.63 oz.</td>
</tr>
<tr>
<td>3</td>
<td>18 days</td>
<td>30</td>
<td>4 lb. 2 oz.</td>
<td>2.20 oz.</td>
</tr>
<tr>
<td>4</td>
<td>18 days</td>
<td>30</td>
<td>4 lb. 0 oz.</td>
<td>2.13 oz.</td>
</tr>
</tbody>
</table>

The average weight of chicks in blocks one and two were approximately the same; the average weight of chicks in block three compared favorably with those in block four.

The second check revealed that chicks in blocks three and four were 68 percent heavier than those in blocks one and two. Chicks in blocks three and four were also darker in color and more uniform in size.
Table 5. Results of second weight check

<table>
<thead>
<tr>
<th>Block No.</th>
<th>Age</th>
<th>No. of Birds</th>
<th>Total Weight</th>
<th>Ave. Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25 days</td>
<td>30</td>
<td>3 lb. 12 oz.</td>
<td>2.00 oz.</td>
</tr>
<tr>
<td>2</td>
<td>25 days</td>
<td>30</td>
<td>3 lb. 14 oz.</td>
<td>2.07 oz.</td>
</tr>
<tr>
<td>3</td>
<td>25 days</td>
<td>30</td>
<td>6 lb. 8 oz.</td>
<td>3.47 oz.</td>
</tr>
<tr>
<td>4</td>
<td>25 days</td>
<td>30</td>
<td>6 lb. 8 oz.</td>
<td>3.47 oz.</td>
</tr>
</tbody>
</table>

A comparison of the percentage of chick loss or death in the different blocks is very significant. All losses were taken into consideration. There appears to be a close correlation between the percentage of loss and the type of feed. It is evident that the nourishment or lack of nourishment received from these various feeds was a determining factor in the rate of growth, development, and loss in the four blocks.

**Loss:**

The method employed to record loss was to pick up each day all dead chicks found and subtract from the number on hand. A physical count was made when the chicks were twenty days old. This was accomplished by penning the chicks up at night and counting them as they were released the next morning. At this age, all the chicks returned to the hens to be brooded as the nights were rather cool. The check was 100 percent accurate.
Figure 4. Percentage of weekly loss by block.
Table 6. Physical count at 20 days of age

<table>
<thead>
<tr>
<th>Original Number of Chicks</th>
<th>2,706</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known Loss</td>
<td>597</td>
</tr>
<tr>
<td>Balance by Record</td>
<td>2,109</td>
</tr>
<tr>
<td>Actual Balance by Count</td>
<td>1,760</td>
</tr>
<tr>
<td>Unknown Loss</td>
<td>349</td>
</tr>
<tr>
<td>Total Loss Known and Unknown</td>
<td>946</td>
</tr>
</tbody>
</table>

The difference between the known loss and the actual count showed a shortage of 349 birds. What happened to them? It is believed that this shortage can be attributed to three principal causes listed below in the order of their importance.

1. **Drifting away from the project.** At two weeks of age chicks were found 150 yards from the nearest coop. Cover adjacent to the project was dense and chicks wandering only a short distance away could easily become lost and fall prey to predators or chill and die. At three weeks of age, one chick was found at 6 A.M. in a wheat field 225 yards from the nearest coop in a very weakened condition. It died after being returned to one of the brood hens. Drift across a well traveled public road near the area was heavy. Several road kills were recorded. There were no natural barriers to prevent drift and a few minutes of travel carried the chicks into unfamiliar territory and out of hearing range of the brood hens where the possibility of finding their way back was minimized.
Figure 5. Weekly mortality graph.
2. **Predation.** Ground predators were plentiful in the project vicinity when the chicks were young. House cats and weasels were numerous and the latter, especially difficult to control because of their elusive nature, took a heavy toll before concentrated effort thinned them out. Later, after the chicks reached the age of approximately four weeks, hawks became an increasing problem and the loss from this source was exceedingly high. Shooting and trapping accounted for 84 predators from June 15 to September 6, of which, 34 were hawks. Such a concentration of young pheasants possessing little wariness seemed to draw raptors. These predators became increasingly more numerous despite a concentrated effort at control.

3. **Weak or sick chicks dying in dense cover near at hand where they were never found.** Before pheasant chicks reach two or three weeks of age their bodies are so small that, when dead, they seem to dry up and have very little odor. Blending in with the color of grass and weeds as they do, many, no doubt, died in cover near the coops and were never found. A great many chicks suffering from plugged vents, which left them in a weakened condition, probably wandered into nearby cover and were too weak to return to the coops.

Only the one physical count was made as the chicks, soon after the age of three weeks, became too wild to pen up and began roosting outside the coops at night.
Table 7. Types of known loss (dead birds recovered)
June 15 to September 6

<table>
<thead>
<tr>
<th>Type of Loss</th>
<th>Number Lost</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accidents</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Butt</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Coryza</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Plugged Vent.</td>
<td>210</td>
<td>337</td>
</tr>
<tr>
<td>Predation</td>
<td></td>
<td>86</td>
</tr>
<tr>
<td>Weasel Kills.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Hawk Kills.</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Trampling by brood hens¹</td>
<td>127</td>
<td>127</td>
</tr>
<tr>
<td>Unknown</td>
<td>264</td>
<td>264/837</td>
</tr>
</tbody>
</table>

Predation and Predator Control:

An intensive predator control program must be carried on concurrent with a field rearing project. The type of cover adjacent to the project site will determine the population density and species of predators. An area where water is plentiful will attract and hold such ground predators as mink and raccoon which follow water courses

¹ Many cases of trampling are probably due to other causes. Chicks that die in the hen compartment of the coop are usually walked over by the brood hen and therefore appear to have been trampled to death.
at night in quest of food. Wooded areas, with or without water, are attractive to raptors.

Table 8. Predators killed June 15 to September 6

<table>
<thead>
<tr>
<th>Method of Control</th>
<th>Species Taken</th>
<th>Number</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>By Pole Trap</td>
<td>Hawks</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cooper's Hawk</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sharp-shinned Hawk</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sparrow Hawk</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Red-tailed Hawk</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Owls</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Barn Owl</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Great Horned Owl</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Short-eared Owl</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Long-eared Owl</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>By Cat Traps</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>By Steel Traps</td>
<td>Weasel</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>House Cat</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skunk</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gray Digger</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>By Poison</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>By Gun</td>
<td>Hawks</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cooper's Hawk</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sharp-shinned Hawk</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sparrow Hawk</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Red-tailed Hawk</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Goshawk</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marsh Hawk</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td>.24</td>
</tr>
<tr>
<td></td>
<td>House Cat</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Gray Digger</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Weasel</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Stray Dog</td>
<td>1</td>
<td>.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>84</td>
<td>84</td>
</tr>
</tbody>
</table>
Trapping of the vicinity before the project was set up measurably reduced the foxes in this area. No fox sign was seen by the caretaker throughout the duration of the rearing period. House cats, although numerous, were easily controlled by trap and gun. Weasels were active from the day the chicks were turned out of the brood coops but after four were taken, no further "known" loss occurred from this source. The lack of natural water near the project probably accounts for the fact that no known loss was credited to mink or raccoon.

As the chicks matured, hawks were attracted to the rearing site and became serious predators. Bordered, as it was, by a dense willow thicket on one side and a wooded swale on the other, the area afforded excellent cover for avian predators. Because of their bird eating habits, Cooper's and Sharp-shinned hawks were the greatest offenders. One person stalking either of these species finds himself up against a very wary opponent. Pole traps were successful to some degree against hawks and very much so against owls. Conceded, that as a general rule, the Buteos and some Falcons are beneficial as regards food habits, all species must be killed at game bird rearing sites as they readily acquire a lust for preying on young chicks daily.
Observations and Suggestions:

1. Cutting back the upper beak at the time of last dusting prior to hatching of pheasant chicks will greatly curtail killing of chicks by brood hens.

2. Toe-clip all chicks at the game farms as this allows time for bleeding to stop before chicks arrive at the project. The brood hen is less inclined to peck at the chick’s toes after bleeding ceases.

3. Check with local sources well in advance of setting up a project to determine availability of proper sand for litter. Use of a fine mason sand for litter will result in serious loss from vent plugging.

4. Leave sufficient space between feed boxes and watering fountains and the sides of coops to enable young chicks to pass between freely. Failure to do so will result in chicks squeezing between the two, remaining there, and chilling to death.

5. Each day, when feeding and watering, move the feed box and fountain first to one side one day and to the other side the following day the width of each container respectively. This will allow the litter under the containers to dry daily and prevent mold from forming.

6. Trapping of weasels should be carried out concurrent with other trapping on the proposed project site well in advance of setting up the project.
7. All poisoned bait put out by trappers should be picked up when trapping is finished.

8. When expensive chemicals are added to drinking water, put only that amount of water into fountains that will be consumed over a twenty-four hour period.

9. Feeding checks should be run either at the farms where the birds are prevented from mingling or by using the same type feed on an entire project and comparing the results with other projects following different feeding programs.

10. The 30 percent protein Purina Game Bird ration contains too much fine mash. The larger crumbles are taken while the mash is left.

11. Brood hens should be fed a more balanced diet. Wheat alone does not meet this requirement. Six hens found dead were extremely emaciated and it is suspected that they were suffering from malnutrition. Several others became poor and listless, this condition being accompanied by a loss of broodiness. Chicks seldom frequented these coops and failed to return to them at night. This results in a concentration of chicks at night to favorite brood hens where the problem of overcrowding and consequent trampling or chilling of some chicks becomes acute. A check of coops just before dark when the chicks were two to three weeks of age found 82 in one
coop. Surpluses must be redistributed to other coops.

12. When the hen and chicks were first put into the coops, a handful of wheat was placed in one corner of the hen compartment. Instead of settling down and hovering the chicks, this feed attracted some hens, and they began pecking and scratching at the grain. This practice should be discontinued as the hens all have an opportunity to feed on the morning when they are removed from the setting coops and should need no feed until the following day.

13. Two sets of instructions were issued to the caretaker, one from the Chief Biologist of Upland Game, and the other from the game farm superintendent. These two sets should be consolidated in order to eliminate contradictions and duplications and prevent confusion in the mind of the caretaker.

14. After chicks reach six weeks of age, it is no longer necessary to move them at night from coops where they concentrate. At this age some chicks are roosting outside the coops and many of those roosting inside are not being hovered by the hen.

15. The policy of removing all coops and brood hens at the end of six to eight weeks is not sound. By this time some birds have dispersed of their own will. However, the majority still remain in the project vicinity and are
not yet independent. Especially, in an area where natural sources of water are lacking, this supply should not be removed so suddenly. The larger birds move out first while the smaller ones remain near the project. Leaving a few coops and hens with feed and water will satisfy the needs of these smaller birds until they become more self-sufficient. Furthermore, once vigilance has been relaxed, hawks become increasingly more bold and abundant and can seriously decimate the flock remaining in the area.

16. Some means of inculcating wariness and a sense of fear into field reared birds is highly recommended. Intensified working of these birds with leashed dogs aids in scattering them and producing this desired wildness. However, such a method should be governed by some sort of plan, as birds should be driven to areas of suitable habitat. Indiscriminate training by dog owners scatters the birds over too wide an area. Some dog owners exercise no control over their dogs which are allowed to capture the young birds with death or crippling resulting.

17. Where natural water is scarce or lacking, and artificial developments are established to encourage drift, at least one pole trap should be placed near each such development.

18. The caretaker should maintain an orderly camp as this reflects either credit or discredit on the Game Commission. Put up a toilet, dig a pit for burning trash,
mash and place all cans in a container, and keep the area policed at all times.

19. All other specifications having been satisfied for a potential project area, it is recommended that the actual field rearing site be chosen with these points in mind:

a. A natural water supply for convenience sake and to encourage drift.

b. Travel lanes such as fence rows leading away from the site.

c. Sufficient low cover to provide a retreat from intense heat and low-flying raptors.

d. The absence of tall trees or wooded areas within a radius of several hundred yards from the site; thus cover will not be provided for avian predators.

e. A site far enough removed from public roads to insure against drift across the area and resultant road kills.

f. A site far enough removed from occupied farm dwellings to insure against damage to garden crops by the young pheasants.
CONTACT WORK WITH FARMERS

Contact work with farmers was carried out by the project caretaker after the birds had reached an age of six weeks, by which time they required less attention.

The first requirement was a map clearly defining the boundaries of the project area and showing individual farms. This problem was solved when it was learned that the County Agent's Office had aerial photographs of the county. The source of supply for these photographs was ascertained and those including the project area were ordered. These photographs were of large enough scale to serve as cover maps.

A total of 33 landowners were included in the area under management and it was necessary to contact each one individually to explain the purpose of the program and request that he sign the agreement. Each farmer's land was pointed out to him on the aerial photograph and a decision was made concerning the posting of refuges.

A deviation from the plan used by Pennsylvania was decided upon by Mr. McKeen at this point. Rather than have two different types of closures, safety zones and auxiliary refuges, these two were combined and posted as "State Game Refuges". This plan was not readily acceptable to some of the landowners as they disliked the idea of being denied the privilege of hunting on all of their own land. This
point will be discussed in greater detail later.

Basically the plan was endorsed with enthusiasm by the great majority of those landowners within the project area. Some were indifferent; one party owning a small acreage offering no game habitat refused to cooperate on the grounds that pheasants destroyed his garden every year. Another farmer was not in favor of increasing the number of pheasants for the same reason, but signed the agreement because all of his neighbors endorsed the program. Of the 33 major landowners, 100 percent signed the agreement to establish a cooperative farm-game program.

Those areas including occupied farm buildings, pastures with livestock, wooded areas lying adjacent to dwellings, orchards, and freshly seeded fields were posted as Game Refuges. These were to be inviolate areas.

Posting of the refuge areas followed. Using the aerial photograph, which now contained an overlay showing proposed refuge areas, as a guide, regulation state game refuge signs were posted around all refuge areas. These were spaced close enough together to eliminate the possibility of anyone entering a refuge between two signs without being able to observe their presence. Where trees and fence posts were available, signs were nailed to them. Where no such method was accessible, one-inch angle iron
Figure 6. Aerial photograph of the Orenco Cooperative Farm-Game Management Area.

COOPERATIVE FARM GAME MANAGEMENT AREA
Orenco  Oregon

Closed Area
EXPLANATION OF ORENCO COOPERATIVE FARM-GAME PROJECT

Dear Hunter:

The aerial photograph on the back of this letter shows an area in the vicinity of Orenco, Oregon, on which the Oregon State Game Commission and the landowners are participating in a cooperative farm-game project. This area comprises some 8,000 acres of pheasant habitat developed to provide an improved upland game hunting area and, at the same time, to protect the rights and property of the landowner.

This plan provides that certain portions of each owner's property will be set aside as inviolate refuge areas no hunting will be permitted. In the remainder of the project area, the owners have agreed to permit hunting on their lands. In addition, landowners are cooperating in a program to increase the number of game birds on the area by permitting the Game Commission to develop water, cover and food for game birds on their lands and to stock the area with artificially propagated and trapped game birds.

This summer approximately 8,000 pheasants were raised on this area and allowed to disperse as they become mature. This stocking program was preceded and followed by an intensive predator control campaign which took a heavy toll of foxes, weasels, hawks and olds from the area.

The principal objectives in this plan are to increase the production of game through the cooperative efforts of both the landowners and the Game Commission and to bring about, through the cooperation of sportsmen, an orderly harvest of surpluses in a manner that will provide the maximum of recreation for hunters with a minimum of hazard for landowners.

This brief explanation has been prepared to inform the sportsmen and other interested parties of the purposes of this farm-game project and the conditions under which it may be used. In general, the project lies between the Sunset Highway and the town of Orenco. The closed areas are shown in color on the aerial photograph and are also plainly posted on the ground. This should enable hunting parties to plan their hunting routes with a minimum of confusion. Some of these refuges were established for the sole purpose of protecting game but most of them are dual-purpose closures that will protect farm buildings, pastures, orchards, and other valuable property as well as game.

The landowners' agreement to permit hunting does not release the hunters' obligation to ask for permission to hunt and show appreciation for the landowners' effort to provide more recreation on his land.

The open season for pheasants on this project will extend from noon, October 21 to October 26, 1949, inclusive, and the hunters are allowed a bag limit of 2 cocks pheasants per day or 6 during the entire season. It shall be unlawful to kill hen pheasants or quail on this area this year. It is imperative that sportsmen recognize the importance of hen pheasants because they are the seed for future pheasant crops on this land and future hunting will be in direct proportion to the number of hens that are available to produce broods in future nesting seasons.

Hunters or dogs will not be permitted within the refuge areas with the exception that it will be permissible to retrieve dead or badly crippled birds from refuges if the hunter leaves his gun at the refuge boundary and has his dog on a leash.

This project is an experiment and its success or failure may influence future programs for upland game management in Oregon.

Your earnest cooperation in respecting the rights of the landowners and in obeying the game laws will be greatly appreciated.

Sincerely yours,

C. A. Lockwood
State Game Director

A GOOD SPORTSMAN WILL --

--RESPECT THE LANDOWNERS' RIGHTS AND PROTECT HIS PROPERTY
--OBSERVE THE GAME LAWS AND REPORT ALL VIOLATIONS
--BE VERY CAREFUL WITH HIS GUN
--PROTECT PHEASANT HENS
--NOT ENTER REFUGES

OREGON STATE GAME COMMISSION
posts were driven into the ground and the signs bolted to them. A total of 259 signs was required to post all refuges.

The caretaker lived on the field rearing site. At the conclusion of the contact work and refuge posting, all coops were removed and returned to the Eugene Game Farm. Water developments and pole traps were left in place to be checked periodically until hunting season opened.

THE HUNTING SEASON

The open season for pheasants on the project ran concurrent with the general county open season and extended from noon, October 21, to October 26, 1949, inclusive, hunters being allowed a bag limit of two cock pheasants per day or six during the entire season.

Four patrolmen were assigned to the area to collect data for future management. Special instructions were as follows: (3,p.1)

Men assigned to the Orenco project during the 1949 season are to enforce game laws and refuges, protect private properties, and record information from hunters.

Enforcement of Game Laws:

With the exception of one man who will patrol roads in a car, all men will operate as hunters, mixing with hunting parties and observing their behavior.

In the event a party is observed killing or possessing protected game, such as hen pheasants or
quail, the person's gun and birds are to be taken as evidence and the person cited in to the Hillsboro justice court at the nearest time.

All birds checked will be recorded on the back of the hunter's license.

Protection of Private Property:

It may be assumed that refuges protect most vulnerable property; however, hunters can cause damage by walking across recently seeded fields and by riding down or cutting fences. Any person observed cutting fences or other similar acts should be taken to the landowner involved and every effort made to assist the landowner in obtaining a complaint and prosecuting the case.

Hunters may not enter refuges with gun or dog.

Information:

Agents will begin a thorough check of hunters after the first hour or two of hunting to determine:

Hunter success:
- Hunters in party
- Number of hours hunted by party
- Dog?

Birds killed:
- Toe clipped
- Wing banded
- Unmarked
  - Old, young

Birds crippled and lost (hunter's statement)

Other items that may need clarification will be handled on the ground through Richard Scherzinger, who will be in charge of patrol activities on this project.

No publicity was given to this project in order to prevent a concentration of hunters in the area. However, word had been passed around and Friday noon saw a horde of hunters take to the field. Shooting was extremely heavy.
from the opening minute of season. This was unfortunate as many hunters bagged their two cocks and left the area before being checked.

A pre-season census of the area revealed that many birds had moved completely out of the area where the heaviest hunting pressure was anticipated. On the evening of October 20, 150 game farm reared, wing-banded cocks were released on the area to determine percentage of return. Likewise, on the evening of October 22, 128 more were released.

The weather was a factor working against the efficiency of patrolmen both Saturday and Sunday forenoon. A heavy blanket of dense fog lay in the valley limiting visibility to about 100 yards. This presented a hazard to hunters in the field, probably resulted in hens being shot in case identity was not positive, and resulted in the patrolmen failing to check many hunters. The latter point is reflected in the figures from the field checking. As a result of these circumstances, and after much deliberation, it was decided that a correction factor should be applied to the data obtained in order to gain a reasonably accurate picture of the hunting pressure. Mr. McKeon was on the area the entire weekend and agreed that the figures compiled probably represented no greater than half the actual hunting pressure.
Figure 8. Hunting with a dog conserves game by recovery of cripples.
Table 9. Results of the hunting season on the Orenco Game Management Project

<table>
<thead>
<tr>
<th>Date</th>
<th>No. of Hunters</th>
<th>Hours Hunted</th>
<th>Birds Killed</th>
<th>Dogs</th>
<th>Crippling Losses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Toe</td>
<td>Wing</td>
<td>Native</td>
</tr>
<tr>
<td>10/21</td>
<td>284</td>
<td>703</td>
<td>62</td>
<td>72</td>
<td>38</td>
</tr>
<tr>
<td>10/22</td>
<td>126</td>
<td>323</td>
<td>24</td>
<td>22</td>
<td>10</td>
</tr>
<tr>
<td>10/23</td>
<td>94</td>
<td>282</td>
<td>4</td>
<td>68</td>
<td>0</td>
</tr>
<tr>
<td>10/24</td>
<td>28</td>
<td>56</td>
<td>2</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>10/25</td>
<td>62</td>
<td>154</td>
<td>10</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>10/26</td>
<td>28</td>
<td>70</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Totals</td>
<td>622</td>
<td>1588</td>
<td>102</td>
<td>180</td>
<td>48</td>
</tr>
</tbody>
</table>

These figures show that the average hunter spent 2.55 hours in the field and killed .53 pheasant. Theoretically then, in order to kill one pheasant, one hunter would be required to spend over five hours in the field.

Portland hunters were the most numerous, making up 43 percent of the total. Residents of Hillsboro represented 42 percent of the total number of hunters, with nine percent coming from Beaverton. One party from Corvallis hunted the area.

The general consensus of opinion among hunters rated the program as a very worthwhile undertaking and revealed that hunting in the project area had improved immeasurably.

Most hunters found the number of hens to be very low. This fact is unfortunate as the future crop of wild
birds is dependent upon the number of hens available for spring breeding purposes.

At seven weeks of age, it is estimated that 1500 young pheasants were at large in the field rearing vicinity, yet during the hunting season, only 102 of these birds were bagged by hunters. Observations by patrolmen during the hunting season confirm the belief that only a fraction of these 1500 birds remained on the Game Management area. By October 21, the project reared birds were found to have spread far beyond the boundaries of the cooperative project. To the north, they were found to have spread a distance of over one mile beyond the project boundary; to the east, one-fourth of a mile; to the south, also, about one-fourth of a mile beyond the boundary; and to the west, pheasants had drifted into the Hillsboro airport property and were observed there on several different occasions in a flock numbering 30 or 40 birds.

The original plan called for holding the majority of the birds within a few hundred yards of the rearing site, without discouraging natural drift, until just prior to hunting season, when they would be systematically scattered to areas of good cover within the project boundary. This plan failed because of the unrestricted amount of harassment the birds received from enthusiastic dog trainers.
This influx of dog trainers was not anticipated and no measure was taken to control it with the result that most of the birds were "dogged" completely out of the project area.

No effort was made to measure the number of project reared birds killed outside the area. The kill statistics, therefore, do not present a true index to the number of field reared birds surviving up to the hunting season.

THE POST-SEASON SURVEY

Those farmers participating in the cooperative program were interviewed during the month of December, 1949 to determine the success of the project from the landowner's viewpoint. Of the 33 landowners participating, 21 were contacted. Those not contacted could not be found at home. Table 10 summarizes the results of the questionnaire.

Most of the landowners agreed that this program had increased the number of game birds on their property.

The only damage complaint was that some tall clover had been knocked down by dogs on a long leash. This, of course, could only have happened before the hunting season, and although probably not understood as such, was actually a problem between the landowner and the dog trainer, as only one professional dog trainer was sponsored by the Commission and he obtained permission from the landowners
before working his dogs on their property.

Table 10. Results of the Orenco questionnaire

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Undecided</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Has program increased number of game birds on your property?</td>
<td>17</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2. Was your property damaged by hunters?</td>
<td>1</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>3. Have game birds caused damage to your crops?</td>
<td>4</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>4. Would you prefer that all hunters ask permission to hunt on your property?</td>
<td>11</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>5. Are you in favor of continuing this project?</td>
<td>19</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6. Would you be in favor of introduction of the eastern Cottontail rabbit on your lands?</td>
<td>9</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>7. Did you notice an increase in the number of hunters over the 1948 season?</td>
<td>14</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

Four complaints of damage by pheasants were received. Of these, three were damage to gardens. Near the rearing site one garden was visited frequently by young pheasants. These birds caused considerable damage. The other two gardens were only slightly molested.
Cooperator__________________________________________

Date Contacted_____________________________________

1. Has program increased number of game birds on your property?_____________________________________

2. Was your property damaged by hunters?________________________

3. Have game birds caused damage to your crops?________

4. Would you prefer that all hunters ask permission to hunt on your property?________________________

5. Are you in favor of continuing this project?______

6. Would you be in favor of introduction of the Eastern Cottontail rabbit on your lands?_______________

7. Did you notice an increase in the number of hunters over the 1948 season?_____________________

8. Suggestions for future contact for hunting or management of game?_________________________________
The majority of landowners prefer that hunters ask permission to hunt. This is a very natural reaction and is according to law in Oregon. It was understood by the farmers that, under the circumstances, permission would not necessarily be asked by the hunters to use that land not posted as refuge.

With one exception, the cooperating landowners were in favor of continuing the program. The one farmer who objected is not a sports-minded individual. He probably would have no serious objection, however, as he entered into the agreement originally because it was favorable to his neighbors.

Such surveys are very helpful in determining the reaction of farmers to proposals by the Game Commission. Note the reaction to the sixth question. Some sportsmen's groups have suggested introducing the Eastern Cottontail rabbit (Sylvilagus floridanus) into the Willamette Valley. Obviously, such a step could not be taken without the approval of the majority of landowners.

Most farmers noticed a decided increase in the number of hunters using the area compared with 1948. This was to be expected in view of the fact that the project attracted considerable local interest and many persons visited the rearing site.

Space was provided on the questionnaire for any
Suggestions from the landowners concerning the program. Some of the comments are listed below.

1. "Pheasants were too tame during the hunting season." Experienced hunters recognized the "flush" of a wild bird from that of the wing-banded game farm reared cocks.

2. "Dog trainers are a nuisance. They go into refuges before and after hunting season. We would like to have them kept off."

3. "Out-of-season hunting is prevalent." A deputy warden patroled the area several weeks before hunting season, but found it difficult to apprehend deliberate violators.

4. "I'm in favor of the program but would like to see more refuges." This was a problem on the particular area under management. Since so much of the area had been plowed by the opening of the hunting season, had much more refuge been set aside, there would have been no place to hunt.

5. "I suggest the Game Commission set an area aside for kids to hunt in." This is a worthwhile suggestion but is rather impractical on an area the size of the one
now under management.

6. A complaint about driving on farm property is a matter to be taken up between the landowner and the offending hunter. This might occur regardless of the circumstances.

These are but a few of the comments and suggestions offered by the landowners. It might be well to weigh them to determine their value to future management plans for this area.

One interesting and encouraging fact was brought to light by this program. In order to facilitate control during hunting seasons, the area was limited in size to afford maximum ease of patrol. Roads border most of the area. Consequently, only those landowners within the border of this system of roads were asked to participate in this experiment. Several landowners outside the area have contacted representatives of the Game Commission and expressed a desire to participate in the program. This is a good sign. It shows that farmers are interested in game management when the results are worthwhile.

SUGGESTIONS FOR IMPROVING THE ORENCO GAME MANAGEMENT PROJECT

This program was an experiment designed to increase wildlife, improve its environment, and foster friendly relationships between the landowner, who is custodian of our
game and fish, and the hunters, who harvest the surplus. The first test has been successful in that it has not been rejected by landowners and hunters, for whose interests it was designed, but has been received with enthusiasm by both parties. Such a plan has been demonstrated to function with a high degree of success in other states and it can work to great advantage for both wildlife and the public in Oregon. Basically, the plan as set-up now is sound, but there are points that need change and improvement.

Such a program as this is a long-range undertaking. The desired results cannot be accomplished in one or even two years. A sustained effort will be required on the part of conservationists before the two major parties concerned learn their parts and perform them satisfactorily.

It would be well to review all of the plans of other states participating in Cooperative Farm-Game Programs and experiment with the salient features of each until all of the flaws have been removed.

It is with this idea in mind that the following observations are enumerated.

1. Many of the landowners participating in this program were reluctant to cooperate because of the fact that the agreement, as it is now in effect, denies them the privilege of hunting on some parts of their own
property. Under the provisions of the present agreement, all properties subject to potential damage from hunters, such as areas around farm buildings, freshly seeded crop lands, orchards, pastures, and the like, are posted as refuges. This, it is granted, brings under protection those properties most likely to suffer damage from hunters, but at the same time, prohibits the farmer also from hunting on these areas.

From the Oregon State Game Commission Bulletin the following quotation is taken from the article, Progress Report on Habitat Improvement: (6,p.3) "Experience elsewhere has shown that not much effort is forthcoming unless the landowner is offered an economic incentive." In the case of this program, it is believed, that an incentive in terms of dollars and cents is not necessary, but that one in terms of better hunting will pay dividends. Most of the farmers in the project are hunters. If any one farmer was so inclined, he could refuse to participate in a cooperative program, post his land against trespass, and enjoy the benefits from an increased supply of game resulting from the adjacent Cooperative Farm-Game Program.

Under the present provisions of the Oregon program, the farmer is offered no incentive except that of having his property protected, which he can very well do himself. His own land is incorporated into a public hunting ground
where he must compete with a horde of other hunters for the game present. This may well lead to law violation on his part as the temptation is very great to "knock off" a pheasant or two in his own back yard which is used as a State Game Refuge. It is a known fact that this happened on the Orenco project during the 1949 hunting season.

Pennsylvania's plan provides the answer to this problem by combining these vulnerable properties into "Safety Zones" distinct and separate from refuges. Such zones are posted against trespass by any and all persons except those to whom the landowner grants specific permission. A safeguard against those persons caught hunting on these Safety Zones who claim to have had permission, would be a requirement, specified in the agreement, to obtain permission from the landowner before entering such zones in the pursuit of game.

In conjunction with such a plan it is suggested that some means of identification be provided in order that a more convenient method of checking may be had on those hunters to whom permission is granted to hunt "safety zones". Large, bright colored badges pinned on the back of these hunters would be visible at a distance and distinguish those who had obtained permission from those who had failed to do so. Inexpensive badges could be furnished landowners. A few would be adequate for each
farmer as the number of hunters on "safety zones" at one time would be small.

Patrolmen could check those seen on "safety zones" from the road and be saved the task of entering refuges to determine if permission had been obtained. It could be assumed, thereafter, that anyone hunting a "safety zone", other than the landowner, who was not identified by the possession of a badge, did not obtain permission. This system would reduce the number of patrolmen required to adequately cover the project. Furthermore, fewer patrolmen would be required, thus reducing expenses, by establishing a headquarters within the project boundary, equipped with a telephone, where complaints of damage or law violations could be reported.

Such an arrangement should not be looked upon as the granting of special privileges to one group and as being discriminatory against another. Inviolate refuges would still be established which would furnish a sanctuary for the purpose of preserving a future breeding stock.

This arrangement would certainly be looked upon with more favor than the present one. More respect would be shown by hunters and landowners alike for the "Refuge". This brings to mind the remark of one landowner to the effect that, "It seems rather ridiculous to post my house, barn, and garden as a State Game Refuge".
Another advantage of the "Safety Zone" system can be illustrated by a question asked by one of the participating farmers. In this particular case, one of his large stubble fields had been posted as a refuge. He asked, "Does this field remain as a refuge the year around? What about hunting there during dove season or duck season?" The agreement, having been drawn up to cover a five year period, necessitated posting of refuges with durable metal signs nailed to trees, fence posts, and fastened to metal posts driven into the ground. The property owner was not authorized to remove these signs, in fact, he would have been violating the law to do so. Consequently, unless he contacted the Game Commission after pheasant season and requested that the signs be removed until the following open season on pheasants, he could not lawfully hunt on that land. Had this field been posted as a safety zone, however, there would have been no question in his mind. It is common knowledge that refuges are inviolate areas. Posting of all vulnerable property as refuges has created doubt and confusion in the minds of landowners and made the job of selling this program difficult.

It is firmly believed, therefore, that it would be advantageous to the policy of the Game Commission and eliminate any reluctance on the part of landowners to
participate in Cooperative Farm-Game programs if the plan of both "Safety Zones" and "State Game Refuges" were adopted instead of continuing with the present system.

2. Contact of landowners within a proposed game management area should be carried out during the winter season when the farmer's work is slack. At this season chores are less demanding of his time and more consideration and thought can be given to the Commission's proposals. The representative assigned to contact landowners should be prepared to answer all questions concerning previous projects, laws effecting refuges, and any game management query. For the benefit and enlightenment of those landowners entering into a Cooperative Farm-Game program, a pamphlet should be prepared explaining the plan. At the time of agreement it might be advisable to present each landowner with an excerpt of the laws governing Game Refuges.

3. Providing that the Pennsylvania plan of Safety Zones was adopted, the agreement would of necessity need wording. As it now reads, the following changes should be made based upon recommendations from participating landowners:

   a. One landowner requests that the line reading, "The location of refuge areas may be changed as necessity demands", 
should contain, in addition, a clause to the effect that, "Posted areas should be subject to change at the suggestion or recommendation of the landowner for the protection of unharvested or freshly seeded crops, livestock or poultry, home sites or barn lots".

b. The clause, "The State Game Commission agrees to post the entire area, etc."] should be modified to read, "The Game Commission agrees to post the refuges, etc.", as it was decided that posting of those areas on which hunting was to be permitted would be too expensive and lead to confusion.¹

4. If experience on the Orenco project is an indication of hunting pressure on future projects, some plan must be formulated for limiting the number of hunters using the area each day.

5. It should be understood by cooperating landowners that the Game Commission does not sponsor or give

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¹ Maps containing instructions were distributed to each participating farmer and, had all hunters asked permission, they would have been furnished one of these maps indicating closed and open areas. (See Fig. 6)
specific permission for owners to train their dogs within the project. One professional dog trainer was given permission to train his dogs on the field-reared birds. This was a controlled experiment in instilling a natural fear into the birds and moving them to areas of suitable habitat. After the caretaker had left the rearing sight it was overrun with countless enthusiastic amateur dog owners who had little control over their dogs. Reports of birds being caught by these dogs and crippled or killed were frequent. Provisions should be made to prevent the occurrence of this situation in the future.

6. If the Orenco project is continued as stated in the Refuge Agreement, it might be advisable to include more territory in the project. By the opening day of pheasant season so many fields had been plowed that only small strips of cover were available to the birds and these areas suffered tremendous pressure from the hunters. Under such circumstances, the chance of hens being shot and danger to hunters increases immeasurably.

7. As pertains to the checking of bags and licenses during hunting season by patrolmen, and where there is an excellent opportunity for some hunters to kill their limits, take them home, and return for more hunting, absolute control can be had over such persons by entering the time on the back of the hunting license each time the
individual is checked. This should be done in ink.

CONCLUSIONS

The present day trend in agricultural methods coupled with ever-increasing pressure on our wildlife resources has created problems in game management that cannot be solved by "letting nature take her course". Much of our farm land that once supported an abundance and variety of game is now so intensely cultivated that it is denuded of all but the most meager wildlife habitat, or has been exhausted of its fertility until it fails to support either wildlife or man. A bountiful supply of game can no longer be considered as incidental to land use. It must be provided for and managed just as any farm crop is cultivated and harvested.

Sportsmen are clamouring for more game while an increasing number of farms are being posted, "No Hunting Allowed". Thus we witness the growing need for cooperation between these two groups to solve the problems of each. Properly executed, Cooperative Farm-Game programs will help remedy this situation. Results, however, will not be evident at once. Such a program requires time, salesmanship ability, and hard work. The rewards of a sustained endeavor will be gratifying.
It is hoped that the foregoing treatise will shed some light on the problems that have originated as a result of Oregon's first experiment with a Cooperative Farm-Game program.
LITERATURE CITED


