SOUTH PLATTE PARK
AUGMENTATION PLAN—TREE STUDY
1992 Reevaluation

Submitted to
Centennial Water and Sanitation District
62 West Plaza Drive
Highlands Ranch, CO 80126

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INTRODUCTION

During the summer of 1991 a tree monitoring study was put in place in stands of cottonwood trees in the South Platte Park along the South Platte River. Adjacent to South Platte Park was a proposed well field to be installed by the Centennial Water and Sanitation District. The purpose of the study was to establish a record of the conditions of the cottonwood trees and stands prior to operation of the well field as well as to monitor changes (if any) in the trees and stands subsequent to the operation of the wells.

The wells were not to be put into operation until the fall of 1992. Thus an opportunity presented itself to gather data concerned with the changes in these stands from the summer of 1991 to the fall of 1992. Following is a report of the work done during 1992.

The reader is referred to the report submitted to the Centennial Water and Sanitation District in December 1991 entitled "South Platte Park Augmentation Plan—Tree Study" for a more complete background of the study.
SPRING RECONNAISSANCE

On May 12, 1992, after the trees had broken dormancy and "leafed out," a reconnaissance of the 30 study plots was made. The purpose of the reconnaissance was to determine if any major, obvious changes had occurred since the plots were measured in the summer of 1991. Generally, no obvious changes were noted. The plots had not been disturbed (no vandalism). The tags on the trees were still in place. However, the trees' growth in diameter indicated that the nails holding the tags must be pulled outward to allow for future growth. On two plots (P-8 and P-20) chicken wire had been wrapped around the base of the trees over the tags, and several tags were damaged.

On several plots (P-2, P-8, P-11) a number of small diameter trees had died since the 1991 measurements. On plot CP-8 a tree in the 6-8 inch DBH class had died.

Generally, the vigor of the stands in the spring of 1992 appeared to be lower than in the spring of 1991. The crowns appeared less dense, and the number of dead branches in the upper crowns appeared greater. This appearance of lower vigor in the cottonwood stands in the spring of 1991 may reflect the temperature event that occurred in late October 1991. The last weeks of October 1991 were unseasonably warm which slowed the trees' preparation for lower temperatures. On 30-31 October the temperature dropped about 70°F to below 20°F. Although
the temperature event of late October 1991 did not cause widespread mortality in the Park (as it did in the nearby urban areas), the trees were stressed resulting in a lower vigor in the trees in the spring of 1992.
LATE SUMMER REEXAMINATION

A reexamination of the 30 plots in the study was made on September 8 and 9, 1992. The trees were in full leaf, and the autumn change in leaf color and leaf fall had not occurred. Also, no pumping had taken place from the well fields. The purpose of the reexamination was to determine if changes in vigor of the cottonwood trees had taken place and to identify trees on the plots that had died since the 1991 measurement.

Tree vigor was evaluated by two conditions in the tree's crown: 1) the leaf complement in the tree's crown and 2) the presence of dead branches in the upper crown.

Both of these conditions are a reflection of the tree's vigor. A full complement of leaves and no dead branches in the upper crown indicate a healthy tree. A less than full complement of leaves in the tree's crown (after taking into account the influence of trees growing in stands) and dead branches in the upper crown (not mid or lower crown) indicates a stressed tree of lower vigor. During the reexamination each tree was observed to determine its status in relation to the two conditions. When possible within the time constraints, a count of the trees with dead branches in the upper crown and trees with less than full complement (LTFC) was made. However, when an exact count could not be made, an estimate of the percent of the trees on the plot with the condition was made. In
every estimated situation a conservative approach was used; that is, the reduction of leaf complement of the trees on the plot and the number of trees on the plot with dead branches are greater than the value indicated (stated as greater than (>) in the report).

Tree mortality since the 1991 measurement was noted. Each tree that died was identified by its number, its crown's position in the stand, and the cause of its death. All the tree mortality on the plots was caused by competition for light and growing space in the stand. Insects or disease did not account for any of the mortality on the plots.

The data collected during the 1992 reexamination were compared with the data collected in the 1991 study, and a judgment was made as to the relative vigor of the plot in 1992 in relation to 1991.

A summary of the reexamination of each plot is on the following pages.
Plot 1 (9/8/92)

The stand vigor in 1992 is the same or a bit lower than in 1991. Over 50 percent of the trees showed leaf complement of less than would be found on stand-grown trees—an indication of less vigorous trees. Greater than 50 percent of the trees had dead branches in the upper crown—again a sign of less vigorous trees.

Only one tree (tree numbered 88) died over the past year.

No serious insect or disease conditions were found on the plot.

Plot 2 (9/8/92)

The stand vigor in 1992 is lower than in 1991. The high mortality rate of the past continued in 1992. About 15 percent of the trees died. Over three-quarters of the trees showed a leaf complement of less than would be found on stand-grown trees—an indication of less vigorous trees. More than one-half of the trees had dead branches in the upper crown—again a sign of less vigorous trees.

Nine trees (trees numbered 104, 130, 139, 142, 143, 147, 149, 154, and 159) died over the past year.

No serious insect or disease conditions were found.

Plot 3 (9/8/92)

The stand vigor in 1991 and 1992 appeared to be the same. All the trees in the stand had a complement of leaves typical of stand-grown trees. Five trees had dead branches in the upper crown—an increase of two since 1991.

No trees in the stand had died since the 1991 measurement.

No serious insect or disease conditions were found.
Plot 4 (9/8/92)

The stand vigor in 1991 and 1992 appeared to be the same. All the trees in the stand had a complement of leaves typical of stand-grown trees. Five trees had dead branches in the upper crown—an increase of one since 1991.

No trees in the stand died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot 5 (9/8/92)

The stand vigor in 1992 was lower than in 1991. Greater than one-half of the trees on the plot had leaf complements of less than would be found on stand-grown trees. Eight trees had dead branches in the upper crown—one more than in 1991.

One tree (tree numbered 31) died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot 6 (9/8/92)

Stand vigor appeared to be lower in 1992 than in 1991. Over one-half of the trees showed a leaf complement of less than would be found on stand-grown trees—an indication of less vigorous trees. Six trees had dead branches in the upper crown—the same number as counted in 1991.

No trees had died since the 1991 measurements.

No serious insect or disease conditions were found.
Plot 7 (9/8/92)

Stand vigor appeared to be lower in 1992 than in 1991. Over one-fourth of the trees showed a leaf complement of less than would be found on stand-grown trees—an indication of less vigorous trees. Nineteen trees had dead branches in the upper crown—two more than in 1991.

One tree (tree numbered 283) had died since the 1991 measurements.

No serious insect or disease conditions were found.

Plot 8 (9/8/92)

Stand vigor appeared to be lower in 1992 than in 1991. Over three-fourths of the trees showed a leaf complement of less than would be found on stand-grown trees. Over one-half of the trees had dead branches in the upper crown.

Ten trees (trees numbered 534, 541, 553, 555, 559, 564, 565, 566, 570, and 575) had died since the 1991 measurement. This amounts to 13 percent of the trees on the plot.

No serious insect or disease conditions were found.

Plot 9 (9/8/92)

Stand vigor appeared to be lower in 1992 than in 1991. Over one-third of the trees showed a leaf complement of less than would be found on stand-grown trees. Over one-half of the trees had dead branches in the upper crown.

One tree (tree numbered 428) had died since the 1991 measurement. However, a number of trees (± 7) are of such low vigor that they will die over winter.

No serious insect or disease conditions were found.
Plot 10 (9/8/92)

Stand vigor appeared to be lower in 1992 than in 1991. Over one-half of the trees showed a leaf complement of less than would be found on stand-grown trees. Over one-third of the trees had dead branches in the upper crown.

Two trees (trees numbered 923 and 928) had died since the 1991 measurement. Another tree (tree numbered 969) will die over winter.

No serious insect or disease conditions were found.

Plot 11 (9/8/92)

Stand vigor appeared to be lower in 1992 than in 1991. Over three-quarters of the trees showed a leaf complement of less than would be found on stand-grown trees. Greater than 60 percent of the trees had dead branches in the upper crown.

Four trees (trees numbered 360, 367, 368, and 388) had died since the 1991 measurement. This amounts to 7 percent of the trees on the plot.

No serious insect or disease conditions were found.

Plot 12 (9/8/92)

Stand vigor in 1991 was low and appeared to be lower in 1992. Greater than three-quarters of the trees showed a leaf complement of less than would be found on stand-grown trees. Over three-quarters of the trees had dead branches in the upper crown.

Two trees (trees numbered 886 and 894) had died since the 1991 measurement.

No serious insect or disease conditions were found.
Plot 13 (9/9/92)

Stand vigor appeared to be lower in 1992 than in 1991. Over three-fourths of the trees had a leaf complement of less than would be found on stand-grown trees. Fifteen trees had dead branches in the upper crown.

One tree (tree numbered 720) had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot 14 (9/9/92)

Stand vigor appeared to be lower in 1992 than in 1991. Over three-quarters of the trees had a leaf complement of less than would be found on stand-grown trees. Sixteen trees on the plot had dead branches in the upper crown.

No trees had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot 15 (9/9/92)

Stand vigor in 1992 appeared to be the same as it was in 1991. Over one-half of the trees had a leaf complement of less than would be found on stand-grown trees. Nine trees on the plot had dead branches in the upper crown—one more than in 1991.

No trees had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot 16 (9/9/92)

The vigor of the stand in 1992 appeared to be the same as in 1991. This stand is growing on a very poor site. The age of the stand (in 1992) is 25 years,
and only one tree on the plot exceeded the five-inch diameter class. Eleven trees on the plot had leaf complements less than would be found on stand-grown trees. Four trees had dead branches in the upper crown.

No trees had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot 17 (9/9/92)

Stand vigor appeared to be lower in 1992 than in 1991. Over one-half of the trees had a leaf complement of less than would be found on stand-grown trees. Thirteen trees on the plot had dead branches in the upper crown.

One tree (one fork in clump numbered 815) had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot 18 (9/9/92)

Stand vigor experienced a sharp decline from 1991 to 1992. Ten trees had a leaf complement of less than would be found on stand-grown trees. This is an increase of nine since 1991. Seven trees had dead branches in the upper crown—an increase of six since 1991.

No trees had died since the 1991 measurement.

No serious insect or disease conditions were found.
Plot 19 (9/8/92)

Stand vigor appeared lower in 1992 than in 1991. Five trees had a leaf complement of less than would be found on stand-grown trees. Two trees had dead branches in the upper crown.

No trees had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot 20 (9/8/92)

Stand vigor appeared lower in 1992 than in 1991. Ten trees had a leaf complement of less than would be found on stand-grown trees. Three trees had dead branches in the upper crown.

No trees had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot 21 (9/8/92)

Stand vigor in 1991 was low and had declined over the past year. Over three-quarters of the trees had a leaf complement of less than would be found on stand-grown trees. Fourteen trees had dead branches in the upper crown.

Two trees (trees numbered 662 and 675) had died since the 1991 measurement.

No serious insect or disease conditions were found.
Plot CP-1 (9/8/92)

Stand vigor in 1992 was lower than in 1991. Six trees had a leaf complement of less than would be found on stand-grown trees. Seven trees had dead branches in the upper crown.

No trees had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot CP-2 (9/8/92)

Stand vigor was lower in 1992 than in 1991. Four trees had leaf complements of less than would be found on stand-grown trees. Four trees had dead branches in the upper crown.

No trees had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot CP-3 (9/8/92)

Stand vigor appeared to be the same in 1992 as it was in 1991. Five trees had leaf complements of less than would be found on stand-grown trees. Six trees had dead branches in the upper crown.

No trees had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot CP-4 (9/8/92)

Stand vigor appeared to be the same or a bit lower in 1992 than it was in 1991. Greater than one-quarter of the trees had leaf complements of less than
would be found on stand-grown trees. Fourteen trees had dead branches in the upper crown.

No trees had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot CP-5 (9/8/92)

Stand vigor appeared to be the same or a bit lower in 1992 than in 1991. Greater than one-quarter of the trees on the plot had leaf complements of less than would be found on stand-grown trees. Twelve trees had dead branches in the upper crown.

No trees had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot CP-6 (9/9/92)

Stand vigor appeared to be the same or a bit lower in 1992 than in 1991. More than one-quarter of the trees on the plot had leaf complements of less than would be found on stand-grown trees. Eighteen trees had dead branches in the upper crown.

One tree (tree numbered 642) had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot CP-7 (9/9/92)

Stand vigor in 1991 was low and appeared the same in 1992. Ten trees on the plot had leaf complements of less than would be found on stand-grown trees. All (19) of the trees on the plot had dead branches in the upper crown.
One tree (tree numbered 609) had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot CP-8 (9/9/92)

Stand vigor was low in 1991 and appeared to be the same in 1992. More than three-quarters of the trees on the plot had leaf complements of less than would be found on stand-grown trees. All (20) trees had dead branches in the upper crown.

Three trees (trees numbered 972, 974, and 984) had died since the 1991 measurement.

No serious insect or disease conditions were found.

Plot CP-9 (9/9/92)

Stand vigor was low in 1991 and appeared to be the same in 1992. Greater than three-quarters of the trees on the plot had leaf complements of less than would be found on stand-grown trees. All (31) of the trees on the plot had dead branches in the upper crown.

Two trees (trees numbered 589 and 582) had died since the 1991 measurement.

No serious insect or disease conditions were found.
On the plots adjacent to the well field (21 plots), five maintained the same vigor in 1992 as they had in 1991. This number is 24 percent of the total. Sixteen plots or 76 percent had lower vigor in 1992. These results were based on direct comparisons of the number of trees on the plots that showed a less than full complement of leaves in the crown and dead branches in the upper crown in the 1992 and 1991 examinations. However, the extent of the change in vigor is greater than what is reflected in the actual numbers. That is to say, the percentage of the reduced leaf complement in the tree’s crown in 1992 was actually greater than the reduction shown in 1991, using the 80 percent of full complement as a base. Also, the trees that showed dead branches in the upper crown in 1992 had a greater number of dead branches than did these same trees in 1991. These observations bear out impressions of stand vigor gained during the spring reconnaissance in May 1992. The reduction in stand vigor can be ascribed to the sudden temperature drop in late October 1991.

Four of the check plots showed the same vigor conditions in 1992 as in 1991; two showed a reduction in tree vigor in 1992. Three of the check plots had low vigor in 1991 and continued as low-vigor stands in 1992.

In addition, 42 trees (35 trees in the plots adjacent to the well field and 7 trees on the check plots) had died since the 1991 measurement. This amounts to a 4.4 percent mortality rate on the plots adjacent to the well field and a 3.3 percent mortality rate on the check plots. Also, 80 percent of the trees occur on the plots adjacent to the well field, and 83 percent of the mortality occurred on these plots. In addition, 20 percent of the trees occur on the check plots, and 17 percent of the mortality occurred on these plots.
RECOMMENDATIONS

The monitoring of the plots should be continued into the next growing season. A spring reconnaissance should be done soon after leaf-out in 1993. A reexamination early in the summer again should be conducted. This reexamination should be more comprehensive than the one conducted in the fall of 1992. Individual trees should be examined for health and vigor. The individual plot data, such as collected in 1991, need not be redone.

Monitoring of the groundwater wells should be done when the pumps are in operation. The draw-down when the pumps are in operation and the recharge time when the pumps are shut down should be recorded. Pumping, if possible, should be limited to time when the trees are dormant. Also, if possible, the drawdown should not exceed 12 feet.
FIELD DATA SHEETS
**CASD - SPP Tree Study**
(Periodic Re-examination of Plots)

<table>
<thead>
<tr>
<th>Plot Number</th>
<th>Date</th>
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<tr>
<td>1</td>
<td>9/8/92</td>
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</table>

**Health of Stand**

- **Leaf appearance**: > 1/4 of trees had leaf complement ≤ 65% (< 80% field complement)
- **Branch appearance**: 7/12 of trees had dead branches in upper crown
- **Disease**: None
- **Insects**: None

**Current Mortality of Plot Trees**
(Tree number, Crown position, Cause)

1. 88 (almost dead) *competition*

| 2. |
| 3. |
| 4. |
| 5. |
| 6. |
| 7. |
| 8. |
| 9. |
| 10. |

**Remarks**
CwSD - SFP Tree Study
(Periodic Re-examination of Flots)

Plot Number 2  Date 9/8/92

Health of Stand

Leaf appearance  > 3/4 of trees had leaf complement
LTFC (< 80% of full complement)

Branch appearance
7 1/2 trees with dead branches in upper crown
Disease: None

Insects: None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. 164  OT  Competitor
2. 180  OT  
3. 139  OT  
4. 142  Int.  
5. 143  OT  
6. 147  Int.  
7. 149  OT  
8. 154  OT  
9. 159  OT  
10.  

Remarks
SDD - SPP Tree Study
(Periodic Re-examination of Flots)

Plot Number 3 Date 9/8/9

Health of Stand

Leaf appearance
FC or TTC of Stand Tree

Branch appearance
Two trees had dead branches in upper crown

Disease

Insects

Current Mortality of Plot Trees
(Tree number, Crown position, cause)
No current mortality

1.
2.
3.
4.
5.
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7.
8.
9.
10.

Remarks
**CWSD - SPP Tree Study**  
(Periodic re-examination of Flots)

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<th>Plot Number</th>
<th>Date</th>
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<tr>
<td>4</td>
<td>9/8/92</td>
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</table>

**Health of Stand**

**Leaf appearance**  
FC or LT FC of stand trees

**Branch appearance**

- Few trees with dead branches
- Disease: None

**Insects**  
None

**Current Mortality of Plot Trees**  
(Tree number, Crown position, Cause)

- No current mortality

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</table>

**Remarks**

CWSD - SPP Tree Study
(Periodic Re-examination of Plots)

Plot Number 5  Date 9/19/92

Health of Stand

Leaf appearance
1/2 trees with leaf complement & TEC (< 80%)

Branch appearance
Right trees with dead branches in upper crown

Disease

Insects

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. 31  OT  Competition

2.

3.

4.

5.

6.

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8.

9.

10.

Remarks
Four trees with very open crowns (along trail)
**CWSD - SPP Tree Study**  
*(Periodic re-examination of Plots)*

<table>
<thead>
<tr>
<th>Plot Number</th>
<th>Date</th>
<th>Health of Stand</th>
<th>Leaf appearance</th>
<th>Branch appearance</th>
<th>Disease</th>
<th>Insects</th>
<th>Current Mortality of Plot Trees</th>
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<tbody>
<tr>
<td>6</td>
<td>9/6/92</td>
<td>Healthy</td>
<td>7/8 trees with LTTC (&lt; 80% of full complement)</td>
<td>6 trees with dead branches</td>
<td>None</td>
<td>None</td>
<td>No current mortality</td>
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</table>
CWSO - SPP Tree Study
(Periodic Re-examination of Plots)

Plot Number 7  Date 9/8/92

Health of Stand

Leaf appearance
7 1/4 trees with LFC (< 80% of full complement)

Branch appearance
19 trees with dead branches in upper crown

Disease
None

Insects
None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. 288  CT Competition

2.

3.

4.

5.

6.

7.

8.

9.

10.

Remarks
GWSD - SPP Tree Study
(Periodic Re-examination of Flots)

Plot Number 8  Date 9/8/92

Health of Stand

Leaf appearance: 3/4 lives, with TFC (≤ 80% of full complement)

Branch appearance: 7½ lives, with good

Disease: None

Insects: None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

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<tr>
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<td>2.</td>
<td>564</td>
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<td>365</td>
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<td>4.</td>
<td>366</td>
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<td>539</td>
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<td>7.</td>
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<td>8.</td>
<td>553</td>
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<td>9.</td>
<td>541</td>
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<tr>
<td>10.</td>
<td>534</td>
<td>OT</td>
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</table>

Remarks:
Stand of low vigor
CWSD - SPP Tree Study
(Periodic re-examination of Flots)

Plot Number 9
Date 9/8/62

Health of Stand

Leaf appearance 7/12 Trees with LTFC
(< 80% of full complement)

Several trees showed stress in upper
crown (yellowing leaves)

Branch appearance

7/12 of trees with dead branches in upper crown

Disease none

Insects none

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. 4/28 OT Competition

Remarks A number of trees (17) are of such low vigor they will
die over-winter.
CWSD - SPF Tree Study
(Periodic Re-examination of Plots)

Plot Number: 10  Date: 9/8/92

Health of Stand

Leaf appearance: 7 ½ with LTFC (LSB)
of full complement. Six trees showed
stress in upper crown—following leaves.

Branch appearance: 7 ½ trees with dead
branches in upper crown.

Disease: None

Insects: None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. 923 OT Competition
2. 928 OT
3.
4.
5.
6.
7.
8.
9.
10.

Remarks: Tree number 969 is almost
dead (very low vigor)
CWSO - SPP Tree Study
(Periodic re-examination of plots)

Plot Number II Date 9/8/92

Health of Stand

Leaf appearance > 3/4 Trees with D. E. (≤ 80% of full compliment)

Branch appearance 760% of trees with dead branches in upper crown

Disease None

Insects None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. 360 Cut Competition
2. 367 OT
3. 368 OT
4. 388 OT
5. 
6. 
7. 
8. 
9. 
10. 

Remarks
GWSD - SPP Tree Study
(Peiodic Re-examination of Plots)

Plot Number 12 Date 9/8/92

Health of Stand

Leaf appearance
7 3/4 of trees with LFC
(< 80% of full complement)

Branch appearance
7 3/4 of trees with dead
branched in upper crown

Disease none

Insects none

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. 888 01 Competition
2. 874 01
3.
4.
5.
6.
7.
8.
9.
10.

Remarks
Low vigor stand
GWD - SPP Tree Study  
(Periodic re-examination of Flots)

Plot Number 13  Date 9/14/2

Health of Stand

Leaf appearance:  3/4 of trees with LTR  
(> 80% of full complement)

Branch appearance: 15 trees with dead branches

Disease: None

Insects: None

Current Mortality of Plot Trees  
(Tree number, Crown position, Cause)

1. 720  OT  Completion

Remarks
CWSD - SPP Tree Study
(Periodic Re-examination of Plots)

Plot Number 14 Date 9/9/92

Health of Stand

Leaf appearance >3/4 of the trees with LTFC
(<50% of full complement)

Branch appearance
10 trees with dead branches in upper crown

Disease none

Insects none

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. No current mortality

2.

3.

4.

5.

6.

7.

8.

9.

10.

Remarks Low vigor stand
Plot Number 10 Date 9/9/92

Health of Stand

Leaf appearance: 7 1/2 the tree with LTFC (< 80% of full complement)

Branch appearance: nine trees on plot worst dead branches in upper crown.

Disease: none

Insects: none

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

no current mortality

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Remarks
CWSD - SPP Tree Study
(Periodic Re-examination of Plots)

Plot Number 16 Date 9/94

Health of Stand

Leaf appearance
11 trees on plot with LIF
(< 80% of full complement)

Branch appearance
3 trees with dead branches
in upper crown

Disease
None

Insects
None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

no current mortality

1.

2.

3.

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10.

Remarks
Two trees with green paint spots
and no cagel
CWSD - SPP Tree Study
(Periodic Re-examination of Flots)
Plot Number 17 Date 9/19/92

Health of Stand

Leaf appearance  > ½ trees with 2/3 FFC (< 80% of full complement)

Branch appearance
13 trees with dead branches

Disease

Insects

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. 815 (SE fork on clump of three)

2. CD Congestion

3.

4.

5.

6.

7.

8.

9.

10.

Remarks
Plot Number 18 Date 9/19/92

Health of Stand

Leaf appearance
10 Trees with LTF (≤ 80% of Full Complement)

Branch appearance
7 Trees with dead branches in the upper crown

Disease none

Insects none

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

No current mortality

Remarks
CWSD - SPP Tree Study
(Periodic re-examination of Plots)

Plot Number 19 Date 9/8/92

Health of Stand

Leaf appearance: 5 trees with DTFC (< 80% of full complement)

Branch appearance: 2 trees with dead branches in upper crown

Disease: None

Insects: None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. No Current Mortality

2.

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9.

10.

Remarks: 
CWSD - SPP Tree Study
(Periodic Re-examination of Plots)

Plot Number 20 Date 9/8/92

Health of Stand

Leaf appearance: 10 trees with LTEC
(280% of full complement)

Branch appearance: 3 trees with dead branches in upper crown

Disease: none

Insects: none

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

No current mortality

1.
2.
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7.
8.
9.
10.

Remarks
CWSD - SPP Tree Study
(Periodic re-examination of Plots) 659 - 697

Plot Number 21 Date 9/8/42

Health of Stand

Leaf appearance: > 3/4 Trees with LTF (Less than 80% of full complement)

Branch appearance: 1/4

Disease: None

Insects: None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. 662 OT Competition
2. 675 OT

Remarks


Plot Number: CP-1  Date: 9/8/72

Health of Stand

Leaf appearance: 6 trees with LTFC
(< 80% of full complement) Several trees with stress - Crown (yellow leaves)

Branch appearance: 7 trees with lead branches in upper Crown

Disease: None

Insects: None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. No Current Mortality
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 

Remarks: Tree # 335 missing tag.
CWSD - SPP Tree Study
(Periodic re-examination of Plots)

Plot Number CP-2 Date 9/8/92

Health of Stand

Leaf appearance
1. Trees with LTFC (< 80% of full compliment)
2. Trees with disease crowns (yellow leaves)

Branch appearance
4. Trees with dead branches

Disease

Insects

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

No current mortality

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Remarks

Tree #318 has missing tag.
CWS&D - SPP Tree Study
(Periodic re-examination of Plots)

Plot Number CP-3 Date 9/4/7

Health of Stand

Leaf appearance 5 Trees with L.T.F.C.

Branch appearance 6 Trees with dead branches in upper crown.

Disease None

Insects None

Current Mortality of Plot Trees
(Tree number, crown position, cause)

1. No current mortality

2.

3.

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10.

Remarks
Plot Number: CP-4  Date: 9/192

Health of Stand:

- Leaf appearance: > 1/4 of trees with LTFC ( < 80% of full complement)
- Branch appearance: 14 trees with dead branches in upper crown
- Disease: None
- Insects: None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

No current mortality

1.
2.
3.
4.
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10.

Remarks
# CWSD - SPP Tree Study

(Periodic Re-examination of Plots)

## Plot Number
19.5

## Date
9/1/92

## Health of Stand

<table>
<thead>
<tr>
<th>Leaf appearance</th>
<th>Branch appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/14 of tree with LTFC (&lt;=80% of full complement)</td>
<td>12 trees on plot with dead branches in upper crown</td>
</tr>
</tbody>
</table>

## Disease
None

## Insects
None

## Current Mortality of Plot Trees

(Tree number, Crown position, Cause)

<table>
<thead>
<tr>
<th>No.</th>
<th>Current Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
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<tr>
<td>3.</td>
<td></td>
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<td>4.</td>
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<td>5.</td>
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<td>7.</td>
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<td>8.</td>
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<td>9.</td>
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<tr>
<td>10.</td>
<td></td>
</tr>
</tbody>
</table>

## Remarks


GWSD - SPP Tree Study
(Periodic re-examination of plots)

Plot Number CP-6 Date 9/9/92

Health of Stand

Leaf appearance 7/8 of tree with LIFE (80% of full complement)

Branch appearance 18 trees with dead branches in upper crown

Disease None

Insects None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. 642 OT Competition

2.

3.

4.

5.

6.

7.

8.

9.

10.

Remarks
CWSD - SPP Tree Study
(Periodic re-examination of plots)

Plot Number CP-7 Date 9/19

Health of Stand

Leaf appearance: 10 trees with LTB (< 80% of full complement)

Branch appearance: All (19) trees on plot had dead branches in upper crown.

Disease: None

Insects: None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. 609 Int. Competition

2.

3.

4.

5.

6.

7.

8.

9.

10.

Remarks: Lower Roger Island
## CWSD - SPP Tree Study
### (Periodic re-examination of Flots)

**Plot Number:** CP 8
**Date:** 9/9/72

### Health of Stand

- **Leaf appearance:** 73% of the tree with LTFC (< 80% of full complement)
- **Branch appearance:** All (20) trees with dead branches in upper crown

### Disease
- None

### Insects
- None

### Current Mortality of Plot Trees

<table>
<thead>
<tr>
<th>Tree Number</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>974</td>
<td>Cut</td>
</tr>
<tr>
<td>972</td>
<td>Cut</td>
</tr>
<tr>
<td>984</td>
<td>CD</td>
</tr>
</tbody>
</table>

### Remarks
- Low vigor stand
Plot Number CP-9 Date 9/9/92

Health of Stand

Leaf appearance 7 3/4 of tree with LTIC
(> 80% of full complement)

Branch appearance All trees (31) dead with
dead branches in upper crown

Disease None

Insects None

Current Mortality of Plot Trees
(Tree number, Crown position, Cause)

1. 589 OT Competition
2. 582 Cnt
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 

Remarks Low vigor stand