

ODFW AQUATIC INVENTORY PROJECT
OREGON PLAN FOR SALMON & WATERSHEDS
STREAM RESTORATION HABITAT REPORT

STREAM: Johnson Creek (NC38)
 BASIN: Necanicum River
 SURVEY TYPE: Pre and Post-Tx
 DATE: October 27, 2003
 REPORT PREPARED BY: Paul Jacobsen

The Johnson Creek restoration project extended approximately 1,000 meters, with about 475 meters of the project being monitored for pre- and post-treatment conditions. Fourteen habitat structures were created and 62 key pieces (according to the ODF Large Wood Placement Guide) were used. The intended goals of the project included increasing stream complexity, improved interaction with the floodplain, gravel retention, increased pool area, and enhanced salmonids spawning and rearing habitat. In the first seasons after restoration activities, large wood pieces, volume, and key pieces are increased as expected. Winter pool area is higher, summer riffle gravel is higher, and summer riffle fines are reduced.

| | ODFW | Benchmark | Winter Pre | Summer Pre | Winter Post | Summer Post | |
|----------------------------------|-----------|-------------|------------|------------|-------------|-------------|--|
| Habitat Variable | Desirable | Undesirable | 2/24/00 | 6/26/00 | 2/20/01 | 6/28/01 | |
| Reach # | | | | | | | |
| Pool Area | >35 | <10 | 13.8 | 15.7 | 16.9 | 9.0 | |
| Pool Frequency | 5-8 | >20 | 10.9 | 6.1 | 6.3 | 10.4 | |
| Residual Pool Depth | >0.5-1.0m | <0.2-0.5m | .38 | .34 | .42 | .39 | |
| Complex Pools/km | >2.5 | <1.0 | 7.4 | 4.8 | 4.2 | 3.3 | |
| Width/Depth Ratio | <15 | >30 | 15.3 | 12.9 | 11.2 | 9.7 | |
| Riffle Gravel % area | >35 | <15 | 60 | 32 | 50 | 52 | |
| Silt-Sand-Organic % | <12 | >25 | 26 | 24 | 28 | 19 | |
| Shade % | >70 | < 60 | | 98 | | 94 | |
| LWD - pieces/100m | >20 | <10 | 18.7 | 17.3 | 24.1 | 27.1 | |
| LWD - Volume/100m | >30 | <20 | 22.7 | 12.4 | 18.6 | 14.5 | |
| LWD - Key pieces/ 100m | >3 | <1 | 0.4 | 0.0 | 0.6 | 0.2 | |
| Riparian Conifers>20" dbh/1000ft | >300 | <150 | | 0 | | 81 | |
| Riparian Conifers>35" dbh/1000ft | >200 | <75 | | 0 | | 0 | |

COMMENTS:

There were no potential barriers to upstream fish migration in the surveyed length.

The crew noted five habitat structures.

**ODFW AQUATIC INVENTORY PROJECT
OREGON PLAN FOR SALMON & WATERSHEDS
STREAM RESTORATION HABITAT REPORT**

STREAM: Johnson Creek (NC-38)
BASIN: Necanicum River
SURVEY TYPE: Post-Tx
DATE: June 28, 2001
SURVEY CREW: Sean Allen, Rachel Werner
REPORT PREPARED BY: Paul Jacobsen
BASIN AREA: 2.1 km²
USGS MAPS: Tillamook Head
ECOREGION: Coast Range Sitka Spruce

GENERAL DESCRIPTION:

The Johnson Creek habitat survey extended 440 meters. The channel was alternately constrained by hillslopes and terraces in a broad valley floor. The average valley width index was 3.6 (range: 3.0 – 5.0). Land use for the reach was second growth (15-30 cm dbh) trees. The average unit gradient was 5.1 percent. Rapids (56%) and riffles (31%) dominated stream habitat. Gravel (40%) and cobble (28%) dominated stream substrate. Wood volume was low at 14.5 m³/100m.

COMMENTS:

There were no potential barriers to upstream fish migration in the surveyed length.
The crew noted several habitat structures during the survey.

REACH 1

T5N-R10W-S23SE

REACH 1

Valley and Channel Summary

Valley Characteristics (Percent Reach Length)

| <u>Narrow Valley Floor</u> | | <u>Broad Valley Floor</u> | |
|----------------------------|---|---------------------------|-----|
| Steep V-shape | 0 | Constraining Terraces | 100 |
| Moderate V-shape | 0 | Multiple Terraces | 0 |
| Open V-shape | 0 | Wide Floodplain | 0 |

Valley Width Index avg: 3.6 range: 3.0-5.0

Channel Morphology (Percent Reach Length)

| <u>Constrained</u> | | <u>Unconstrained</u> | |
|--------------------|-----|----------------------|---|
| Hillslope | 0 | Single Channel | 0 |
| Bedrock | 0 | Multiple Channel | 0 |
| Terrace | 0 | Braided Channel | 0 |
| Alt. Terrace/Hill | 100 | | |
| Landuse | 0 | | |

Channel Characteristics

| <u>Type</u> | <u>Length(m)</u> | <u>Area (m2)</u> | <u>Dry Units</u> |
|-------------|------------------|------------------|------------------|
| Primary | 440 | 1,697 | 0 |
| Secondary | 175 | 265 | 1 |

Channel Dimensions (m)

| <u>Wetted</u> | | <u>Active</u> | | <u>Floodprone</u> | <u>First Terrace</u> |
|---------------|------|---------------|-----|-------------------|----------------------|
| Width | 3.2 | Width | 5.4 | 9.4 | 11.1 |
| Depth | 0.20 | Height | 0.6 | 1.3 | 1.4 |
| | | W:D ratio | 9.7 | Entrenchment | 1.8 |

Stream Flow Type: LF Water Temp: 11.0-11.0°C
 Avg. Unit Gradient: 5.1% Habitat Units/100m: 7.8

Riparian, Bank, and Wood Summary

| | <u>Primary</u> | <u>Secondary</u> |
|----------------------|----------------|------------------|
| Land Use: | ST | |
| Riparian Vegetation: | M15 | |

Bank Condition and Shade

| <u>Bank Status</u> | <u>Percent Reach Length</u> | <u>Shade (% of 180)</u> |
|--------------------|-----------------------------|-------------------------|
| Actively Eroding | 4% | Reach avg: 94% |
| Undercut Banks | 10% | Range: 86-100 |

Large Woody Debris

| | <u>Total</u> | <u>Total/100m</u> |
|---------------------------------------|--------------|-------------------|
| All pieces ($\geq 3m \times 0.15m$) | 119 | 27.1 |
| Volume (m ³) | 64 | 14.5 |
| Key pieces ($\geq 10m \times 0.6m$) | 1 | 0.2 |

REACH 1

T5N-R10W-S23SE

REACH 1

HABITAT DETAIL

| Habitat Type | Number Units | Total Length (m) | Avg Width (m) | Avg Depth (m) | Total Area (m ²) | Large Boulders (#>0.5m) | Substrate Percent Wetted Area | | | | | |
|---------------------|--------------|------------------|---------------|---------------|------------------------------|-------------------------|-------------------------------|-----------|-----------|-----------|-----------|----------|
| | | | | | | | S/O | Snd | Grvl | Cbbl | Bldr | Bdrk |
| POOL-ISOLATED | 1 | 4 | 1.8 | 0.50 | 7 | 0 | 15 | 40 | 30 | 10 | 5 | 0 |
| POOL-LATERAL SCOUR | 9 | 64 | 2.3 | 0.43 | 152 | 0 | 13 | 30 | 41 | 15 | 1 | 0 |
| POOL-STRAIGHT SCOUR | 1 | 5 | 3.4 | 0.55 | 18 | 1 | 10 | 20 | 45 | 20 | 5 | 0 |
| PUDDLED CHANNEL | 1 | 15 | 2.3 | 0.10 | 33 | 0 | 10 | 5 | 25 | 60 | 0 | 0 |
| RAPID/BOULDERS | 12 | 275 | 5.1 | 0.15 | 1,100 | 20 | 3 | 6 | 23 | 35 | 32 | 2 |
| RIFFLE | 10 | 173 | 2.2 | 0.09 | 381 | 2 | 6 | 13 | 52 | 23 | 7 | 0 |
| RIFFLE W/ POCKETS | 4 | 66 | 3.4 | 0.21 | 232 | 1 | 3 | 12 | 52 | 24 | 9 | 0 |
| STEP/COBBLE | 7 | 11 | 2.8 | 0.06 | 33 | 0 | 4 | 9 | 44 | 36 | 8 | 0 |
| STEP/LOG | 3 | 2 | 3.7 | 0.13 | 6 | 0 | 2 | 7 | 47 | 38 | 7 | 0 |
| Total: | 48 | 614 | 3.2 | 0.20 | 1,962 | 24 | Avg: 6 | 14 | 40 | 28 | 12 | 0 |

HABITAT SUMMARY

| Habitat Group | No. Units | Total Length (m) | Avg Width (m) | Avg Depth (m) | Wetted Area (m ²) | Percent | Large Boulders Number | Boulders #/100m ² |
|-------------------|-----------|------------------|---------------|---------------|-------------------------------|---------|-----------------------|------------------------------|
| Dammed & BW Pools | 1 | 4 | 1.8 | 0.50 | 7 | 0.38 | 0 | 0.0 |
| Scour Pools | 10 | 69 | 2.4 | 0.45 | 170 | 8.66 | 1 | 0.6 |
| Glides | 0 | 0 | - | - | 0 | 0.00 | 0 | 0.0 |
| Riffles | 14 | 239 | 2.5 | 0.13 | 613 | 31.23 | 3 | 0.5 |
| Rapids | 12 | 275 | 5.1 | 0.15 | 1,100 | 56.07 | 20 | 1.8 |
| Cascades | 0 | 0 | - | - | 0 | 0.00 | 0 | 0.0 |
| Step/Falls | 10 | 13 | 3.1 | 0.08 | 38 | 1.95 | 0 | 0.0 |
| Dry | 1 | 15 | 2.3 | 0.10 | 33 | 1.70 | 0 | 0.0 |

POOL SUMMARY

| | | |
|---------------------------------------|--------------|-------------|
| All Pools | <u>Total</u> | <u>#/Km</u> |
| | 11 | 17.9 |
| Pools ≥1m deep: | 0 | 0.0 |
| Complex pools (LWD pieces ≥3): | 2 | 3.3 |
| Pool Frequency (channel widths/pool): | 10.4 | |
| Residual pool depth (avg) | 0.39m | |

STREAM SUMMARY

JOHNSON CREEK POST-TX (#38)

| Number Units | Total Length (m) | Avg Width (m) | Avg Depth (m) | Total Area (m ²) | Substrate Percent Wetted Area | | | | | | Total Large Boulder |
|-----------------|------------------------|---------------------|---------------------|------------------------------------|----------------------------------|------|------|------|------|------|---------------------------|
| | | | | | S/O | Sand | Grvl | Cbbl | Bldr | Bdrk | |
| 48 | 614 | 3.2 | 0.20 | 1,962 | 6 | 14 | 40 | 28 | 12 | 0 | 24 |

Wetted Area

| Habitat Group | (m ²) | Percent |
|-----------------|-------------------|---------|
| Scour Pool | 170 | 8.7 |
| Backwater Pools | 7 | 0.4 |
| Glide | 0 | 0.0 |
| Riffle | 613 | 31.2 |
| Rapid | 1,100 | 56.1 |
| Cascade | 0 | 0.0 |
| Step | 38 | 2.0 |
| Dry | 33 | 1.7 |

REACH 1

RIPARIAN ZONE VEGETATION SUMMARY

REACH 1

Summary of Riparian Zone (0-30m) (3 transects)

| | |
|---------------------------------|-----|
| Total hardwoods/1000 ft | 549 |
| Total conifers/1000 ft | 610 |
| Total conifers >20" dbh/1000 ft | 81 |
| Total conifers >35" dbh/1000 ft | 0 |

Average number of trees in a 5-meter wide band

| Diameter class (cm) | Zone 1 0-10 meters | | Zone 2 10-20 meters | | Zone 3 20-30 meters | | Zones 1-3 0-30 meters | |
|-------------------------|-----------------------|----------|------------------------|----------|------------------------|----------|--------------------------|----------|
| | Conifer | Hardwood | Conifer | Hardwood | Conifer | Hardwood | Conifer | Hardwood |
| 3-15cm | 0.3 | 2.3 | 0.7 | 0.0 | 0.3 | 1.0 | 1.3 | 3.3 |
| 15-30cm | 1.3 | 2.7 | 1.7 | 0.3 | 2.0 | 1.0 | 5.0 | 4.0 |
| 30-50cm | 0.3 | 1.3 | 0.3 | 0.0 | 1.7 | 0.0 | 2.3 | 1.3 |
| 50-90cm | 0.0 | 0.3 | 0.7 | 0.0 | 0.7 | 0.0 | 1.3 | 0.3 |
| >90cm | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total/100m ² | 2.0 | 6.7 | 3.3 | 0.3 | 4.7 | 2.0 | 3.3 | 3.0 |

Canopy closure and ground cover

| | Zone 1 0-10 meters | | Zone 2 10-20 meters | | Zone 3 20-30 meters | |
|------------------|-----------------------|--|------------------------|--|------------------------|--|
| | (%) | | (%) | | (%) | |
| Canopy closure | 38 | | 42 | | 71 | |
| Shrub cover | 5 | | 8 | | 8 | |
| Grass/forb cover | 49 | | 83 | | 80 | |

Predominant landform in each zone

| | Zone 1 0-10 meters | | Zone 2 10-20 meters | | Zone 3 20-30 meters | |
|-------------------|-----------------------|----|------------------------|----|------------------------|----|
| | Hillslope | 33 | | 67 | | 83 |
| High terrace | 50 | | 17 | | 17 | |
| Low terrace | 0 | | 0 | | 0 | |
| Floodplain | 0 | | 0 | | 0 | |
| Wetland/meadow | 0 | | 0 | | 0 | |
| Stream channel | 0 | | 0 | | 0 | |
| Roadbed/Railroad | 17 | | 17 | | 0 | |
| Riprap | 0 | | 0 | | 0 | |
| Surface slope (%) | 24 | | 48 | | 48 | |

Summary of Riparian Zone (0-30m) for all reaches (3 transects)

Summary of riparian zone (0-100ft) extrapolated to 1,000 feet along stream

| | |
|---------------------------------|-----|
| Total hardwoods/1000 ft | 549 |
| Total conifers/1000 ft | 610 |
| Total conifers >20" dbh/1000 ft | 81 |

Average number of trees in a 5-meter wide band

| <u>Diameter</u> <u>class (cm)</u> | <u>Zones 1-3</u> | |
|--------------------------------------|------------------|-----------------|
| | <u>Conifer</u> | <u>Hardwood</u> |
| 3-15cm | 1.3 | 3.3 |
| 15-30cm | 5.0 | 4.0 |
| 30-50cm | 2.3 | 1.3 |
| 50-90cm | 1.3 | 0.3 |
| >90cm | 0.0 | 0.0 |

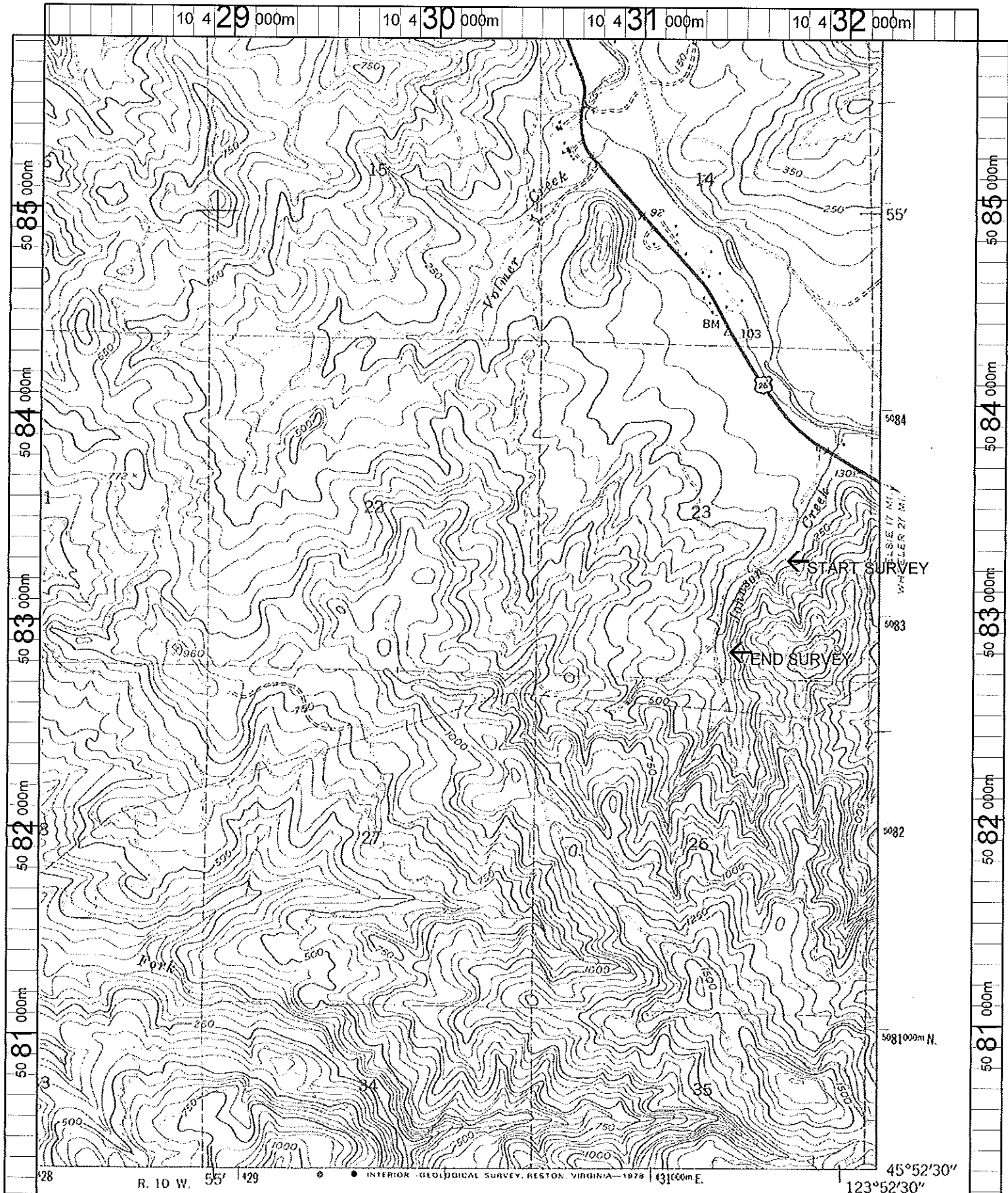
RIPARIAN ZONE VEGETATION

Reach 1

Reach 1

VEGETATION DETAIL

| Unit | Side | Zone | Surface | Slope | Cover (percent) | | | | Diameter class (cm) | | | | | Notes |
|------|------|------|---------|-------|-----------------|-------|-------|----------|---------------------|-------|-------|-------|-----|------------|
| | | | | | Canopy | Shrub | Grass | | 3-15 | 15-30 | 30-50 | 50-90 | >90 | |
| 25 | LF | 1 | HS | 44.0 | 80 | 5 | 95 | Conifer | 0 | 1 | 0 | 0 | 0 | |
| | | | | | | | | Hardwood | 0 | 4 | 0 | 0 | 0 | ALDER |
| 25 | LF | 2 | HS | 120.0 | 75 | 5 | 95 | Conifer | 0 | 1 | 0 | 0 | 0 | |
| | | | | | | | | Hardwood | 0 | 0 | 0 | 0 | 0 | |
| 25 | LF | 3 | HS | 85.0 | 80 | 5 | 80 | Conifer | 0 | 1 | 3 | 0 | 0 | |
| | | | | | | | | Hardwood | 0 | 0 | 0 | 0 | 0 | FIR |
| 25 | RT | 1 | HT | 10.0 | 80 | 20 | 80 | Conifer | 0 | 1 | 1 | 0 | 0 | |
| | | | | | | | | Hardwood | 0 | 2 | 0 | 0 | 0 | SWORD FERN |
| 25 | RT | 2 | RB | 15.0 | 50 | 5 | 50 | Conifer | 0 | 1 | 0 | 0 | 0 | |
| | | | | | | | | Hardwood | 0 | 0 | 0 | 0 | 0 | |
| 25 | RT | 3 | HS | 40.0 | 40 | 20 | 80 | Conifer | 0 | 1 | 0 | 0 | 0 | |
| | | | | | | | | Hardwood | 0 | 0 | 0 | 0 | 0 | |
| 36 | LF | 1 | HT | 5.0 | 60 | 5 | 95 | Conifer | 0 | 0 | 0 | 0 | 0 | |
| | | | | | | | | Hardwood | 1 | 1 | 0 | 1 | 0 | |
| 36 | LF | 2 | HS | 44.0 | 60 | 0 | 100 | Conifer | 0 | 0 | 0 | 0 | 0 | |
| | | | | | | | | Hardwood | 0 | 0 | 0 | 0 | 0 | |
| 36 | LF | 3 | HS | 60.0 | 65 | 5 | 85 | Conifer | 0 | 1 | 0 | 1 | 0 | |
| | | | | | | | | Hardwood | 3 | 0 | 0 | 0 | 0 | |
| 36 | RT | 1 | RB | 30.0 | 5 | 0 | 25 | Conifer | 0 | 0 | 0 | 0 | 0 | |
| | | | | | | | | Hardwood | 0 | 0 | 0 | 0 | 0 | |
| 36 | RT | 2 | HS | 35.0 | 65 | 40 | 60 | Conifer | 1 | 0 | 1 | 1 | 0 | |
| | | | | | | | | Hardwood | 0 | 0 | 0 | 0 | 0 | |
| 36 | RT | 3 | HS | 29.0 | 80 | 20 | 40 | Conifer | 0 | 0 | 0 | 0 | 0 | |
| | | | | | | | | Hardwood | 0 | 0 | 0 | 0 | 0 | |
| 45 | LF | 1 | HS | 37.0 | 0 | 0 | 0 | Conifer | 0 | 0 | 0 | 0 | 0 | |
| | | | | | | | | Hardwood | 6 | 0 | 0 | 0 | 0 | |
| 45 | LF | 2 | HS | 59.0 | 0 | 0 | 95 | Conifer | 0 | 0 | 0 | 1 | 0 | |
| | | | | | | | | Hardwood | 0 | 0 | 0 | 0 | 0 | |
| 45 | LF | 3 | HS | 60.0 | 85 | 0 | 95 | Conifer | 0 | 1 | 2 | 1 | 0 | |
| | | | | | | | | Hardwood | 0 | 0 | 0 | 0 | 0 | |
| 45 | RT | 1 | HT | 20.0 | 0 | 0 | 0 | Conifer | 1 | 2 | 0 | 0 | 0 | |
| | | | | | | | | Hardwood | 0 | 1 | 4 | 0 | 0 | |
| 45 | RT | 2 | HT | 12.0 | 0 | 0 | 100 | Conifer | 1 | 3 | 0 | 0 | 0 | |
| | | | | | | | | Hardwood | 0 | 1 | 0 | 0 | 0 | |
| 45 | RT | 3 | HT | 12.0 | 75 | 0 | 100 | Conifer | 1 | 2 | 0 | 0 | 0 | |
| | | | | | | | | Hardwood | 0 | 3 | 0 | 0 | 0 | |



Name: TILLAMOOK HEAD
 Date: 1/10/2002
 Scale: 1 inch equals 2000 feet

Location: 10 430313 E 5082994 N
 Caption: JOHNSON CREEK RESTORATION SITE -
 NECANICUM BASIN