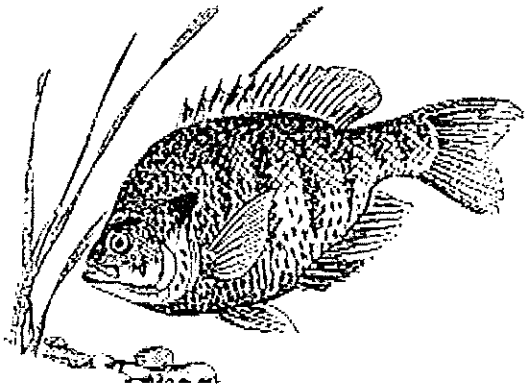
# CRYSTAL LAKE
# HILLENBRAND FISH AND WILDLIFE AREA

2001 Fish Management Report

Shawn A. Sapp
Asst. Fisheries Biologist



FISHERIES SECTION
INDIANA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
I.G.C. South, Room W273
402 W. Washington Street
Indianapolis, Indiana 46204

2002

# CRYSTAL LAKE
## HILLENBRAND FISH AND WILDLIFE AREA
Greene County

Fish Management Report
2001

## INTRODUCTION

Crystal Lake is located on Hillenbrand Fish and Wildlife Area near the town of Midland off of State Road 59 in Greene County, Indiana. The strip pit is 8 acres in size and has a maximum depth of 40 feet. The watershed is reclaimed surface mine land and the lake is fed primarily by surface run-off. Crystal Lake is owned and managed by the Division of Fish and Wildlife. Fishing access to Crystal Lake consists of a gravel boat ramp at the east end of the lake. Additionally, most of the shoreline is accessible to bank fishing. Electric motors are permitted on the lake, while outboard motors are not. A 14-inch minimum size limit on largemouth bass applies to Crystal Lake as well as all other lakes on Hillenbrand Fish and Wildlife Area.

Previous fisheries work on Crystal Lake included an initial fisheries survey in 1995. A total of 53 fish were collected. Fish sampled included bluegill, largemouth bass, and warmouth.

The present fisheries survey was conducted on June 11-12, 2001. The objective was to evaluate the status of the fishery and changes since the initial survey in 1995. Fish sampling effort consisted of night D.C. electrofishing (0.35 hours), and two gill nets and two trap nets set overnight. This report presents the results of the survey along with recommendations for future work.

## RESULTS AND DISCUSSION

Water chemistry parameters were normal for a strip pit in southern Indiana. Crystal Lake was thermally stratified at around 4 feet with oxygen concentrations adequate for game fish survival (5 ppm or more) from the surface to 12 feet. Water transparency, as measured with a Secchi disk, was 11.7 feet. The water was dark green in color. Water conductivity at Crystal Lake was 1,370 $\mu$S, limiting electrofishing effectiveness.

Submersed aquatic vegetation at the time of the survey collectively covered around 30 to 35 percent of the lake. Chara was the most abundant vegetation and covered approximately 30 percent of the lake's bottom. Coontail and Eurasian watermilfoil both comprised one percent of lake coverage and grew to a depth of 11 feet and 8 feet, respectively. Emergent vegetation included phragmites, broadleaf cattail, bulrush, and creeping water primrose. All emergent vegetation was found along the shoreline and covered, at the most, one percent of the lake.

Combined fish sampling effort produced a total of 203 fish representing four species and weighing an estimated 15.78 pounds. Bluegill were the most abundant species by number (88%) followed by largemouth bass (9%), warmouth (2%), and black crappie (less than 1%).

A total of 178 bluegill were collected with a combined weight of almost five pounds. Data from 10 of the largest bluegill were taken from anglers at the time of the survey. Bluegill ranged in size from 1.2 to 8.3 inches. Growth of bluegill was average for all age classes when compared to bluegill growth at similar pits. Bluegill from the 1999 and 2000 year classes were strong, combining for 86% of the bluegill collected. High conductivity attributed to the lack of larger fish in the catch.

The largemouth bass sample consisted of only 19 fish and collectively weighed over nine pounds. Largemouth bass ranged from 1.5 to 13.7 inches in length. Largemouth bass growth was average for age 1 and age 2 fish but above average for age 3 fish when compared to growth of largemouth bass at similar pits. No legal sized bass were collected in the sample; however, several 3-4 pound bass were observed while collecting vegetation transect data. As with the bluegill, highly conductive waters inhibited collection of larger bass.

Warmouth and black crappie were the only other fish species collected. The warmouth ranged from 4.6 to 7.1 inches while the two crappie were 8.7 and 8.9 inches long.

## CONCLUSION AND RECOMMENDATIONS

Crystal Lake appears to have a balanced fishery. As with most small strip pits Crystal Lake has a small watershed that provides limited nutrient resources. Additionally, water conductivity at Crystal Lake was high; limiting electrofishing catch success of fishes. Despite the high conductivity adequate numbers of fish were collected in the survey through the use of other gear and angler catches to reach some general conclusions about the status of the fishery.

Growth of bluegill at Crystal Lake was found to be average when compared to bluegill growth at other area pits. The absence of age 4 fish may indicate variable recruitment but could also be contributed to angler selectivity in the harvest. Most of the larger bluegill in the sample were the result of angler catches and this age class may have been too small to interest anglers. Small bluegill (fish less than 3.5 inches) comprised the majority of the sample in the survey.

The largemouth bass population at Crystal Lake is adequate to provide predatory pressure of the prey species however, bass 14 inches or larger were not collected in the 1995 survey or the current survey. Growth of all age classes of bass was average or above average indicating the bass population was not stockpiled. Large sized bass were observed during the

current survey but avoided capture. Once again, water conductivity played a negative role in successful collection of bigger fish.

Black crappie were not found in the previous survey. Crappie likely gained access to Crystal Lake incidentally through anglers bait bucket or intentionally through stocking. At the current level crappie are not likely to become a management problem.

Submitted by: Shawn A. Sapp, Asst. Fisheries Biologist
Date: February 28, 2002

Approved by: Brian M. Schoenung, Fisheries Biologist

Approved by: 
Thomas M. Flatt, Fisheries Supervisor
Date: August 28, 2002

# LAKE SURVEY REPORT

Type of Survey: [ ] Initial Survey [X] Re-Survey

| Lake Name | County | Date of survey (Month, day, year) |
|---|---|---|
| Crystal Lake | Greene | 6/11 - 12/01 |
| **Biologist's Name** | | **Date of Approval (Month, day, year)** |
| Brian Schoenung, Shawn Sapp, and Jamie Smyth | | 8/28/02 |

## LOCATION

| Quadrangle Name | Range | Section |
|---|---|---|
| Linton | R7W | 19 |
| **Township Name** | **Nearest town** | |
| T8N | Midland | |

## ACCESSIBILITY

| State owned public access site | Privately owned public access site | Other access site |
|---|---|---|
| Northeast corner of lake | None | |

| Surface acres | Maximum depth | Average depth | Acre feet | Water level | Extreme fluctuations |
|---|---|---|---|---|---|
| 8 | 40 | 20 | 160 | Normal | Unknown |

Location of benchmark: Unknown

## INLETS

| Name | Location | Origin |
|---|---|---|
| None | Run-off | |
| | | |

## OUTLETS

| Name | Location |
|---|---|
| Unknown | West end |

Water level control:

| POOL | ELEVATION (Feet MSL) | ACRES |
|---|---|---|
| TOP OF DAM | | |
| TOP OF FLOOD CONTROL POOL | | |
| TOP OF CONSERVATION POOL | | |
| TOP OF MINIMUM POOL | | |
| STREAMBED | | |

**Bottom type**

- [ ] Boulder
- [X] Gravel
- [ ] Sand
- [ ] Muck
- [X] Clay
- [ ] Marl

Watershed use: Reclaimed mine land

Development of shoreline: None

Previous surveys and investigations

Spot-check survey 1995

| SAMPLING EFFORT AT CRYSTAL LAKE | | | | | |
|---|---|---|---|---|---|
| ELECTROFISHING | Day hours N/A | | Night hours 0.35 | | Total hours 0.35 |
| TRAP NETS | Number of traps 2 | | Number of Lifts 1 | | Total effort 2 |
| GILL NETS | Number of nets 2 | | Number of Lifts 1 | | Total effort 2 |
| ROTENONE | Gallons | ppm | Acre Feet Treated | SHORELINE SEINING | Number of 100 Foot Seine Hauls |

| PHYSICAL AND CHEMICAL CHARACTERISTICS | |
|---|---|
| Color: Dark green | Turbidity: 11 Feet 8 Inches (SECCHI DISK) |
| Alkalinity (ppm)*: Surface: 188.1 Bottom: 872.1 | pH: Surface: 8.4 Bottom: 7.0 |
| Conductivity: 1,370 µS | Air temperature: 95 °F |
| Water chemisty GPS coordinates: N 39.11792 | W 87.23486 |

| TEMPERATURE AND DISSOLVED OXYGEN (D.O.) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | DEGREES (°F) | D.O. (ppm) | DEPTH (FEET) | DEGREES (°F) | D.O. (ppm) | DEPTH (FEET) | DEGREES (°F) | D.O. (ppm) |
| SURFACE | 81.3 | 9.8 | 36 | 50.0 | 0.3 | 72 | | |
| 2 | 79.7 | 10.0 | 38 | 50.0 | 0.3 | 74 | | |
| 4 | 72.5 | 10.2 | 40 | 50.0 | 0.3 | 76 | | |
| 6 | 70.3 | 8.7 | 42 | | | 78 | | |
| 8 | 69.3 | 8.9 | 44 | | | 80 | | |
| 10 | 68.2 | 7.5 | 46 | | | 82 | | |
| 12 | 63.5 | 8.2 | 48 | | | 84 | | |
| 14 | 59.4 | 0.4 | 50 | | | 86 | | |
| 16 | 55.9 | 0.4 | 52 | | | 88 | | |
| 18 | 53.4 | 0.4 | 54 | | | 90 | | |
| 20 | 52.2 | 0.3 | 56 | | | 92 | | |
| 22 | 51.3 | 0.3 | 58 | | | 94 | | |
| 24 | 50.9 | 0.3 | 60 | | | 96 | | |
| 26 | 50.7 | 0.3 | 62 | | | 98 | | |
| 28 | 50.5 | 0.3 | 64 | | | 100 | | |
| 30 | 50.4 | 0.3 | 66 | | | | | |
| 32 | 50.2 | 0.3 | 68 | | | | | |
| 34 | 50.2 | 0.3 | 70 | | | | | |

| COMMENTS |
|---|
| Smith Root box settings: 530V, 9.5 amps. Two booms with one wire dropper per boom. |
| |
| |

*ppm-parts per million

| COMMON SPECIES OF AQUATIC PLANTS AT CRYSTAL LAKE | | | |
|---|---|---|---|
| COMMON NAME OF PLANT | SCIENTIFIC NAME OF PLANT | DEPTH FOUND | PERCENT OF LAKE COVERED |
| FLOATING | | | |
| Filamentous algae | | To 1' | <1 |
| | | | |
| EMERGENT | | | |
| Broadleaf cattail | Typha latifolia | Shoreline | 1 |
| Bulrush | Scirpus spp. | Shoreline | 1 |
| Creeping water primrose | Jussiaea repens | To 1' | <1 |
| Phragmites | Phragmites phragmites | Shoreline | 10 |
| | | | |
| SUBMERSED | | | |
| Chara | Chara spp. | To 13' | 30 bottom |
| Coontail | Ceratophyllum demersum | To 11' | 1 |
| Eurasian watermilfoil | Myriophylum spicatum | To 8' | 1 |
| Leafy pondweed | Potamogeton foliosus | To 4' | <1 |
| Sago pondweed | Potamogeton pectinatus | To 6' | <1 |
| Small pondweed | Potamogeton pusillus | To 4' | <1 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Comments:
Several 3-4 pound largemouth bass were observed while sampling vegetation transects. Chara covers entire littoral zone.

INDIANA DIVISION OF FISH AND WILDLIFE

AQUATIC VEGETATION FORM

Body of Water: Crystal Lake Code: _____ Date: 06/12/01 Page: 1 of 1

Data recorder, crew: Brian Schoenung, Shawn Sapp, and Jamie Smyth

| | | AQUATIC VEGETATION TRANSECT NUMBER (enter % of transect for each species found) | | | | |
|---|---|---|---|---|---|---|
| Common Name | Code | Transect #1 | Transect #2 | Transect #3 | Transect #4 | Transect #5 |
| Chara | 22 | 100 % | 50 % | 100 % | 100 % | |
| Coontail | 29 | 20 % | | | | |
| Eurasian watermilfoil | 39 | 80 % | 50 % | <1 % | 10 % | |
| Filamentous algae | 40 | 10 % | 2 % | 2 % | <1 % | |
| Phragmites | 79 | <1 % | | <1 % | | |
| Sago pondweed | 91 | <1 % | <1 % | | 3 % | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Max. Depth of Vegetation | | 8 feet | 9 feet | 8 feet | 17 feet | |
| GPS Coordinate Shore | | N 39.11994<br>W 87.23172 | N 39.11928<br>W 87.23233 | N 39.11889<br>W 87.23464 | N 39.11708<br>W 87.23519 | N<br>W |
| GPS Coordinate Lakeward | | N 39.11975<br>W 87.23208 | N 39.11933<br>W 87.23244 | N 39.11872<br>W 87.23433 | N 39.11711<br>W 87.23333 | N<br>W |

| Common Name | Code | Transect #6 | Transect #7 | Transect #8 | Transect #9 | Transect #10 |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Max. Depth of Vegetation | | | | | | |
| GPS Coordinate Shore | | N<br>W | N<br>W | N<br>W | N<br>W | N<br>W |
| GPS Coordinate Lakeward | | N<br>W | N<br>W | N<br>W | N<br>W | N<br>W |

| ADDITIONAL SPECIES FOUND | | | | | |
|---|---|---|---|---|---|
| Common Name | Code | Comments | Common Name | Code | Comments |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments: _____

| SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT AT CRYSTAL LAKE | | | | | |
|---|---|---|---|---|---|
| *COMMON NAME OF FISH | NUMBER | PERCENT | LENGTH RANGE (inches) | WEIGHT** (pounds) | PERCENT |
| Bluegill | 178 | 87.7 | 1.2 - 8.3 | 4.79 | 30.4 |
| Largemouth bass | 19 | 9.4 | 1.5 - 13.7 | 9.64 | 61.1 |
| Warmouth | 4 | 2.0 | 4.6 - 7.1 | 0.54 | 3.4 |
| Black crappie | 2 | 0.1 | 8.7 - 8.9 | 0.81 | 5.1 |
| TOTAL | 203 | | | 15.78 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

*Common names of fishes recognized by the American Fisheries Society.

** Weights derived from district averages

## NUMBER, PERCENTAGE, WEIGHT, AND AGE OF BLUEGILL AT CRYSTAL LAKE

| TOTAL LENGTH (inches) | NUMBER COLLECTED | PERCENT OF FISH COLLECTED | AVERAGE WEIGHT* (pounds) | AGE OF FISH | TOTAL LENGTH (inches) | NUMBER COLLECTED | PERCENT OF FISH COLLECTED | AVERAGE WEIGHT* (pounds) | AGE OF FISH |
|---|---|---|---|---|---|---|---|---|---|
| 1.0 | 2 | 1.1 | ** | 0 | 19.0 | | | | |
| 1.5 | 64 | 36.0 | ** | 1 | 19.5 | | | | |
| 2.0 | 35 | 19.7 | 0.01 | 1 | 20.0 | | | | |
| 2.5 | 32 | 18.0 | 0.01 | 2 | 20.5 | | | | |
| 3.0 | 22 | 12.4 | 0.02 | 2 | 21.0 | | | | |
| 3.5 | 8 | 4.5 | 0.03 | 2,3 | 21.5 | | | | |
| 4.0 | 3 | 1.7 | 0.04 | 3 | 22.0 | | | | |
| 4.5 | | | | | 22.5 | | | | |
| 5.0 | | | | | 23.0 | | | | |
| 5.5 | | | | | 23.5 | | | | |
| 6.0 | 1*** | 0.6 | 0.15 | Not aged | 24.0 | | | | |
| 6.5 | 1*** | 0.6 | 0.19 | 5 | 24.5 | | | | |
| 7.0 | 4*** | 2.2 | 0.24 | 5 | 25.0 | | | | |
| 7.5 | 4*** | 2.2 | 0.30 | 5,6 | 25.5 | | | | |
| 8.0 | 1*** | 0.6 | 0.37 | 6 | 26.0 | | | | |
| 8.5 | 1*** | 0.6 | 0.45 | 6 | TOTAL | 166 | | | |
| 9.0 | | | | | | | | | |
| 9.5 | | | | | | | | | |
| 10.0 | | | | | | | | | |
| 10.5 | | | | | | | | | |
| 11.0 | | | | | | | | | |
| 11.5 | | | | | | | | | |
| 12.0 | | | | | | | | | |
| 12.5 | | | | | | | | | |
| 13.0 | | | | | | | | | |
| 13.5 | | | | | | | | | |
| 14.0 | | | | | | | | | |
| 14.5 | | | | | | | | | |
| 15.0 | | | | | | | | | |
| 15.5 | | | | | | | | | |
| 16.0 | | | | | | | | | |
| 16.5 | | | | | | | | | |
| 17.0 | | | | | | | | | |
| 17.5 | | | | | | | | | |
| 18.0 | | | | | | | | | |
| 18.5 | | | | | | | | | |

| ELECTROFISHING CATCH | 468.6 /hr | GILL NET CATCH | 0.5 /lift | TRAP NET CATCH | 1.5 /lift |
|---|---|---|---|---|---|

* Average weights derived from district averages.

** Less than 0.01 pound.

*** Data taken from anglers catch.

## NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS AT CRYSTAL LAKE

| TOTAL LENGTH (inches) | NUMBER COLLECTED | PERCENT OF FISH COLLECTED | AVERAGE WEIGHT* (pounds) | AGE OF FISH | TOTAL LENGTH (inches) | NUMBER COLLECTED | PERCENT OF FISH COLLECTED | AVERAGE WEIGHT* (pounds) | AGE OF FISH |
|---|---|---|---|---|---|---|---|---|---|
| 1.0 | | | | | 19.0 | | | | |
| 1.5 | 1 | 5.3 | ** | 0 | 19.5 | | | | |
| 2.0 | | | | | 20.0 | | | | |
| 2.5 | | | | | 20.5 | | | | |
| 3.0 | | | | | 21.0 | | | | |
| 3.5 | | | | | 21.5 | | | | |
| 4.0 | | | | | 22.0 | | | | |
| 4.5 | 2 | 10.5 | 0.04 | 1 | 22.5 | | | | |
| 5.0 | | | | | 23.0 | | | | |
| 5.5 | | | | | 23.5 | | | | |
| 6.0 | 1 | 5.3 | 0.09 | 1 | 24.0 | | | | |
| 6.5 | | | | | 24.5 | | | | |
| 7.0 | | | | | 25.0 | | | | |
| 7.5 | | | | | 25.5 | | | | |
| 8.0 | | | | | 26.0 | | | | |
| 8.5 | 1 | 5.3 | 0.26 | 2 | TOTAL | 19 | | | |
| 9.0 | 2 | 10.5 | 0.31 | 2 | | | | | |
| 9.5 | 1 | 5.3 | 0.37 | 2 | | | | | |
| 10.0 | 2 | 10.5 | 0.43 | 2 | | | | | |
| 10.5 | 1 | 5.3 | 0.51 | 2 | | | | | |
| 11.0 | 2 | 10.5 | 0.58 | 2 | | | | | |
| 11.5 | 1 | 5.3 | 0.67 | 2 | | | | | |
| 12.0 | 1 | 5.3 | 0.77 | 3 | | | | | |
| 12.5 | 1 | 5.3 | 0.88 | 3 | | | | | |
| 13.0 | 1 | 5.3 | 1.02 | 3 | | | | | |
| 13.5 | 2 | 10.5 | 1.18 | 3 | | | | | |
| 14.0 | | | | | | | | | |
| 14.5 | | | | | | | | | |
| 15.0 | | | | | | | | | |
| 15.5 | | | | | | | | | |
| 16.0 | | | | | | | | | |
| 16.5 | | | | | | | | | |
| 17.0 | | | | | | | | | |
| 17.5 | | | | | | | | | |
| 18.0 | | | | | | | | | |
| 18.5 | | | | | | | | | |

| ELECTROFISHING CATCH | 54.3 /hr | GILL NET CATCH | 0.0 /lift | TRAP NET CATCH | 0.0 /lift |
|---|---|---|---|---|---|

* Average weights derived from district averages.

** Less than 0.01 pound.

| Species | YEAR | NUMBER OF | BACK CALCULATED LENGTH (inches) AT EACH AGE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Bluegill | CLASS | FISH AGED | I | II | III | IV | V | VI | VII | VIII |
| Intercept=0.8 | 2000 | 10 | 1.4 | | | | | | | |
| Crystal Lake | 1999 | 12 | 1.4 | 2.2 | | | | | | |
| | 1998 | 4 | 0.4 | 2.0 | 3.2 | | | | | |
| | | | | | | | | | | |
| | 1996 | 5 | 1.4 | 2.1 | 3.5 | 5.5 | 6.6 | | | |
| | 1995 | 3 | 1.5 | 2.2 | 3.5 | 5.3 | 6.7 | 7.6 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | AVERAGE LENGTH | | 1.4 | 2.1 | 3.4 | 5.4 | 6.7 | 7.6 | | |
| | NUMBER AGED | | 34 | 24 | 12 | 8 | 8 | 3 | | |

| Species | YEAR | NUMBER OF | BACK CALCULATED LENGTH (inches) AT EACH AGE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Largemouth bass | CLASS | FISH AGED | I | II | III | IV | V | VI | VII | VIII |
| Intercept=0.8 | 2000 | 3 | 3.7 | | | | | | | |
| Crystal Lake | 1999 | 9 | 4.0 | 8.1 | | | | | | |
| | 1998 | 5 | 4.9 | 9.2 | 12.0 | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | AVERAGE LENGTH | | 4.2 | 8.6 | 12.0 | | | | | |
| | NUMBER AGED | | 17 | 14 | 5 | | | | | |

## GPS LOCATION OF SAMPLING EQUIPMENT AT CRYSTAL LAKE

| GILL NETS | | | | TRAP NETS | | | | ELECTROFISHING | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | N | 39.11694 | W 87.23547 | 1 | N | 39.11964 | W 87.23233 | 1 | N | | W |
| | N | 39.00086 | W 87.23478 | 2 | N | 39.11703 | W 87.23675 | | N | | W |
| 2 | N | 39.11853 | W 87.23483 | 3 | N | | W | 2 | N | | W |
| | N | 39.11889 | W 87.23422 | 4 | N | | W | | N | | W |
| 3 | N | | W | 5 | N | | W | 3 | N | | W |
| | N | | W | 6 | N | | W | | N | | W |
| 4 | N | | W | 7 | N | | W | 4 | N | | W |
| | N | | W | 8 | N | | W | | N | | W |
| 5 | N | | W | 9 | N | | W | 5 | N | | W |
| | N | | W | 10 | N | | W | | N | | W |
| 6 | N | | W | 11 | N | | W | 6 | N | | W |
| | N | | W | 12 | N | | W | | N | | W |
| 7 | N | | W | 13 | N | | W | 7 | N | | W |
| | N | | W | 14 | N | | W | | N | | W |
| 8 | N | | W | 15 | N | | W | 8 | N | | W |
| | N | | W | 16 | N | | W | | N | | W |
| 9 | N | | W | 17 | N | | W | 9 | N | | W |
| | N | | W | 18 | N | | W | | N | | W |
| 10 | N | | W | 19 | N | | W | 10 | N | | W |
| | N | | W | 20 | N | | W | | N | | W |
| 11 | N | | W | | | | | 11 | N | | W |
| | N | | W | | | | | | N | | W |
| 12 | N | | W | | | | | 12 | N | | W |
| | N | | W | | | | | | N | | W |
| 13 | N | | W | | | | | 13 | N | | W |
| | N | | W | | | | | | N | | W |
| 14 | N | | W | | | | | 14 | N | | W |
| | N | | W | | | | | | N | | W |
| 15 | N | | W | | | | | 15 | N | | W |
| | N | | W | | | | | | N | | W |
| 16 | N | | W | | | | | 16 | N | | W |
| | N | | W | | | | | | N | | W |
| 17 | N | | W | | | | | 17 | N | | W |
| | N | | W | | | | | | N | | W |
| 18 | N | | W | | | | | 18 | N | | W |
| | N | | W | | | | | | N | | W |
| 19 | N | | W | | | | | 19 | N | | W |
| | N | | W | | | | | | N | | W |
| 20 | N | | W | | | | | 20 | N | | W |
| | N | | W | | | | | | N | | W |