

CHRISNEY LAKE  
Spencer County  
2009 Fish Management Report

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2009

## EXECUTIVE SUMMARY

- Chrisney Lake is a shallow impoundment constructed in 1960 and is located 0.5 mi east of the Town of Chrisney. Angler access is good with a concrete boat ramp and 60% of the shoreline available for bank fishing. A golf course on the west side of the lake encompasses about 35% of the shoreline.
- A general fisheries survey was conducted from May 18 to 20, 2009. An aquatic vegetation survey was conducted on July 23.
- Submersed aquatic vegetation was dense and found at 96% of the littoral sampling sites.
- A total of 537 fish was sampled. Bluegill and gizzard shad were most abundant by number.
- Largemouth bass catch rates are half what they were in 2005; however, there are large individuals exhibiting good growth. Stock indices have increased substantially since 2005.
- Gill net catch rates are lower than what they should be due to fish being stolen from them.
- The Division of Fish and Wildlife should continue the biennial stocking of 160, 8.0 to 10.0 in channel catfish.
- Aquatic vegetation treatments should be conducted in the spring to reduce vegetation densities, which would improve bank fishing opportunities and reduce the potential for summer fish kills.
- The Town should submit a sediment removal application to the Division of Fish and Wildlife's Lake and River Enhancement biologist.
- A fisheries renovation should be conducted if the lake is dredged.

## INTRODUCTION

Chrisney Lake is an 18.8-acre impoundment located in Spencer county 0.5 mi east of the Town of Chrisney. The lake was constructed in 1960 and previously served as Chrisney's public water supply. Angler access is good. A concrete boat ramp is located near the dam and 60% of the shoreline is available for bank fishing. A golf course on the west side of the lake encompasses about 35% of the shoreline.

The 2005 survey revealed a decrease in largemouth bass catch rates but a better population of larger sized bass. This was due to the increase in gizzard shad abundance. It was recommended that channel catfish stockings continue and the Town of Chrisney submit a sediment removal application to the Division of Fish and Wildlife (DFW) Lake and River Enhancement (LARE) section.

## METHODS

A general survey was conducted on May 18 to 20, 2009. Some physical and chemical characteristics of the water were measured. Submersed aquatic vegetation was sampled on July 23 using guidelines written by the Indiana Department of Natural Resources (DNR) (2006).

Fish sampling effort consisted of 0.5 h of pulsed DC night electrofishing with two dippers, one trap net lift, and two experimental-mesh gill net lifts. The gill net catch rates are lower than what they should be, due to fish likely being stolen from the nets. All fish were measured to the nearest 0.1 in TL. Average weights were estimated by using Fish Management District 7 averages. Scale samples were taken from a subsample of game fish for age and growth analysis. Proportional stock density (PSD) and relative stock density (RSD) indices were used to evaluate the largemouth bass and bluegill populations (Anderson and Neumann 1996). The bluegill fishing potential index (BGFP) was used to evaluate the quality of the bluegill fishing (Ball and Tousignant 1996). All sampling was done in accordance with the DFW sampling guidelines (Shipman et al. 2001).

## RESULTS

Chrisney Lake is a shallow lake with a maximum depth of 14.0 ft. The lake was turbid with a secchi disk measurement of 3.4 ft. Dissolved oxygen was sufficient for fish survival to a

depth of 8.0 ft. The lake was at normal pool during the surveys.

Submersed vegetation was found at 96% of the littoral sites to a maximum depth of 12ft. One native species, coontail, and one non-native species, Eurasian watermilfoil, was collected. Coontail was the most frequently occurring (77%) with Eurasian watermilfoil occurring 43% of the time. Other aquatic plants observed were cattail spp., creeping water primrose, bulrush spp., buttonbush, and American pondweed.

A total of 537 fish, representing seven species, was sampled that weighed 131 lbs. Bluegill ranked first by number (38%) followed by gizzard shad (32%), redear sunfish (19%), and largemouth bass (9%). Gizzard shad ranked first by weight (35%) followed by largemouth bass (33%), redear sunfish (21%), and bluegill (5%). Other species sampled were channel catfish, black crappie, and warmouth. Yellow bullhead and golden shiner were sampled in 2005 but were absent in the current survey.

A total of 204 bluegill was sampled that weighed 7 lbs. They ranged in length from 1.0 to 7.5 in. The catch rates were 386.0/electrofishing h, 0/gill net lift, and 11.0/trap net lift. In 2005, catch rates were 1,384.0/electrofishing h, 3.0/gill net lift, and 51.0/trap net lift. Bluegill grew slow when compared to district averages. Bluegill averaged 5.7 in at age 4 and 6.0 in at age 5.

The bluegill PSD increased from 6 (2005) to 11. The PSD range for a balanced bluegill population is 20 to 40 (Anderson and Neumann 1996). The RSD-7 and RSD-8 values were 1 and 0, which is similar to 2005. The BGFP index decreased slightly from 12 to 10 and still classified the fishery as “marginal.”

A total of 172 gizzard shad was sampled that weighed 46 lbs. They ranged in length from 5.3 to 12.8 in. Gizzard shad catch rates were 152.0/electrofishing h, 48.0/gill net lift, and 0/trap net lift. In 2005, shad catch rates were 330.0/electrofishing h, 106.5/gill net lift, and 6.0/trap net lift.

A total of 100 redear sunfish was sampled that weighed 27 lbs. They ranged in length from 2.3 to 9.1 in. Redear sunfish catch rates were 120.0/electrofishing h, 1.0/gill net lift, and 39.0/trap net lift. The 2005 catch rates were 212.0/electrofishing h, 3.0/gill net lift, and no redear were caught in trap nets. Redear grew slow when compared to district averages and averaged 7.9 in at age 5 and 8.5 in at age 6.

Fifty largemouth bass were sampled that weighed 43 lbs. They ranged in length from 3.8 to 19.0 in. Largemouth bass catch rates were 98.0/electrofishing h and 1.0/gill net lift. The 2005 catch rates (excluding age-0 largemouth bass) were 170.0/electrofishing h and 1.0/gill net lift. No bass were caught in trap nets. Bass growth was average and similar to 1993 and 2005 with lengths of 14.9 in at age 5 and 18.1 in at age 6.

The largemouth bass PSD increased from 23 (2005) to 51. The PSD range for a balanced largemouth bass population is 40 to 60 (Anderson and Neumann 1996). The RSD-14 increased from 7 (2005) to 22 and RSD-15 increased from 7 (2005) to 14.

Five channel catfish were sampled which was the same as in 2005. They ranged in length from 13.7 to 20.5 in. Catch rates would have been higher if fish were not stolen from the gill nets.

## DISCUSSION

Chrisney Lake has good fishing for largemouth bass and channel catfish. Larger bass are becoming more prevalent as a result of more available forage. Catch rates for channel catfish were low in 2005 and 2009 indicating good utilization by anglers. Channel catfish seldom have successful recruitment in small reservoirs making stockings necessary to maintain a fishable population. The biennial channel catfish stockings should continue.

Chrisney Lake's fishery has undergone substantial changes since the first survey in 1993 and has acquired characteristics of a typical gizzard shad lake. Gizzard shad are known to negatively affect panfish populations and young bass by competing for food resources. This results in stunted bluegill and a low density bass population with big bass. Chrisney exhibits these traits. Chrisney Lake has changed from an excellent bluegill fishery with poor bass fishing to a marginal panfish lake with good bass fishing.

Large densities of coontail and Eurasian watermilfoil are present which makes bank fishing difficult and has potential to cause summer fish kills. High nutrient input from the watershed allows for accelerated growth of aquatic vegetation. When large densities of vegetation begin to die, bacteria will take up oxygen to break down the plant material. As a result, oxygen levels decrease to levels below what fish can survive. Treatment is recommended in the spring in order to reduce these vegetation densities, allow for improved bank fishing

opportunity, and to prevent a potential fish kill. For more information on herbicide applications the Town of Chrisney should contact the district fisheries biologist. The DFW does not provide herbicides or applicators.

As mentioned in the 2005 report, Chrisney Lake exhibits excessive sediment loading, particularly in the shallow southern third of the lake. The Town of Chrisney should submit a sediment removal application to the LARE section. Funding for approved LARE projects is done on a cost-share basis. For questions and more information on submitting LARE proposals, a LARE biologist can be reached at 317-233-1484. Dredging the lake would reduce the risk of a summer fish kill and extend the longevity of the lake.

It would be ideal timing for a fishery renovation if the Town of Chrisney decides to dredge the lake. A fish toxicant would be applied to the lake after dredging and before the lake refilled to kill all the fish. The lake would be restocked with bluegill, largemouth bass, redear sunfish, and channel catfish by the DFW after the renovation. Fishing greatly improves after renovations allowing fish biomass to be comprised of sport fish instead of gizzard shad. The DFW would be responsible for all the costs of the fish renovation and restocking. The lake should not be renovated if it is not dredged due to the high probability of fish kills.

#### RECOMMENDATIONS

- The DFW should continue the biennial stocking of 160, 8.0 in channel catfish.
- Aquatic vegetation treatments should be conducted in the middle of May.
- The Town of Chrisney should submit a sediment removal application to the DFW-LARE section.
- A fisheries renovation should be conducted if the lake is dredged.

#### LITERATURE CITED

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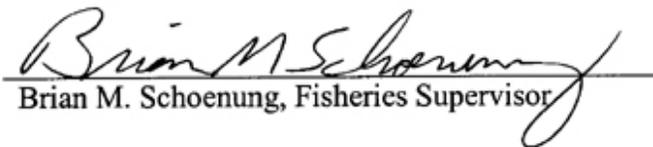
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Submitted by: Aaron M. McAlexander, Fisheries Naturalist Aide  
Date: September 17, 2009

Approved by: Daniel P. Carnahan, Fisheries Biologist

Approved by:   
Brian M. Schoenung, Fisheries Supervisor

Date: December 18, 2009

**APPENDIX**  
Fisheries Survey Data

# LAKE SURVEY REPORT

Type of Survey	<input type="checkbox"/> Initial Survey	<input checked="" type="checkbox"/> Re-Survey
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Lake Name Chrisney Lake	County Spencer	Date of survey (Month, day, year) May 18 to 20, 2009
Biologist's name Aaron McAlexander, Dan Carnahan		Date approved (Month, day, year) December 18, 2009

LOCATION		
Quadrangle Name Chrisney	Range 6W	Section 12
Township Name 6S	Nearest Town Chrisney	

ACCESSIBILITY					
State owned public access site		Privately owned public access site City owned concrete boat ramp		Other access site	
Surface acres 18.8	Maximum depth 11	Average depth 6	Acre feet 112.8	Water level 430	Extreme fluctuations None
Location of benchmark Unknown					

INLETS		
Name Surface runoff	Location	Origin

OUTLETS			
Name Water intake for Town of Chrisney	Location Middle of dam		
Water level control Earthen dam			
POOL	ELEVATION (Feet MSL)	ACRES	Bottom type <input type="checkbox"/> Boulder <input type="checkbox"/> Gravel <input type="checkbox"/> Sand <input checked="" type="checkbox"/> Muck <input type="checkbox"/> Clay <input type="checkbox"/> Marl
TOP OF DAM	440		
TOP OF FLOOD CONTROL POOL			
TOP OF CONSERVATION POOL	430		
TOP OF MINIMUM POOL			
STREAMBED			

Watershed use 35% Golf course, 35% woodland, 30% agriculture
Development of shoreline 35% shoreline is a golf course
Previous surveys and investigations General surveys in 1993 and 2005.

SAMPLING EFFORT					
ELECTROFISHING	Day hours		Night hours		Total hours
			0.5		0.5
TRAP NETS	Number of traps		Number of Lifts		Total effort
	1		1		1 overnight lift
GILL NETS	Number of nets		Number of Lifts		Total effort
	2		1		2 overnight lifts
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

PHYSICAL AND CHEMICAL CHARACTERISTICS			
Color		Turbidity	
Brown		3 Feet 5 Inches (SECCHI DISK)	
Alkalinity (ppm)*		pH	
Surface: 51.3 Bottom: 68.4		Surface: 7.2 Bottom: 7.2	
Conductivity:		Air temperature:	
157 micromhos		70 °F	
Water chemistry GPS coordinates:			
N 38.01224906		W -87.02391199	

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	69.6	8.3	36			72		
2	69.4	8.2	38			74		
4	69.4	8.2	40			76		
6	69.4	6.9	42			78		
8	67.1	4.6	44			80		
10	63.3	1.4	46			82		
12	58.4	0.2	48			84		
14 (Bottom)	56.6	0	50			86		
16			52			88		
18			54			90		
20			56			92		
22			58			94		
24			60			96		
26			62			98		
28			64			100		
30			66					
32			68					
34			70					

COMMENTS
Fish stolen out of gill nets.

\*ppm-parts per million

### Occurrence and Abundance of Submersed Aquatic Plants

<b>Lake:</b> Chrisney Lake	<b>Secchi (ft):</b> 2.5	<b>SE Mean Species / Site:</b> 0.13
<b>Date:</b> 7/23/2009	<b>Littoral Sites w/Plants:</b> 25	<b>Mean Natives / Site:</b> 0.77
<b>Littoral Depth (ft):</b> 12.0	<b>Number of Species:</b> 2	<b>SE Mean Natives / Site:</b> 0.08
<b>Littoral Sites:</b> 29	<b>Max. Species / Site:</b> 2	<b>Species Diversity:</b> 0.46
<b>Total Sites:</b> 30	<b>Mean Species / Site:</b> 1.20	<b>Native Diversity:</b> 0.00

<u>Species</u>	<u>Frequency of Occurrence</u>	<u>Score Frequency</u>				<u>Dominance</u>
		<u>0</u>	<u>1</u>	<u>3</u>	<u>5</u>	
Coontail	76.7	23.3	50.0	16.7	10.0	30.0
Eurasian watermilfoil	43.3	56.7	30.0	6.7	6.7	16.7

**Other species noted:** American pondweed, bullrush spp., buttonbush, cattail spp., creeping water primrose



**NUMBER, PERCENTAGE, WEIGHT, AND AGE OF BLUEGILL**

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	12	5.9	0.01	1	19.0				
1.5	50	24.5	0.01	1	19.5				
2.0	38	18.6	0.01	1	20.0				
2.5	18	8.8	0.01	1	20.5				
3.0	29	14.2	0.02	1,2	21.0				
3.5	17	8.3	0.03	2	21.5				
4.0	7	3.4	0.05	2,3	22.0				
4.5	7	3.4	0.07	3	22.5				
5.0	9	4.4	0.09	3,4	23.0				
5.5	8	3.9	0.13	3,4,5	23.5				
6.0	5	2.5	0.17	5,7	24.0				
6.5	3	1.5	0.22	6	24.5				
7.0					25.0				
7.5	1	0.5	0.34	7	25.5				
8.0					26.0				
8.5					TOTAL	204			
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	386.0/h	GILL NET CATCH	0.0/lift	TRAP NET CATCH	11.0/lift
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**NUMBER, PERCENTAGE, WEIGHT, AND AGE OF REDEAR SUNFISH**

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					19.5				
2.0	2	2.0	0.01	1	20.0				
2.5	3	3.0	0.02	1	20.5				
3.0					21.0				
3.5					21.5				
4.0	3	3.0	0.05	2	22.0				
4.5	2	2.0	0.07	2	22.5				
5.0					23.0				
5.5	7	7.0	0.13	3	23.5				
6.0	11	11.0	0.17	3	24.0				
6.5	17	17.0	0.22	3,4	24.5				
7.0	14	14.0	0.27	4,5	25.0				
7.5	16	16.0	0.33	5	25.5				
8.0	11	11.0	0.40	5,6,7	26.0				
8.5	11	11.0	0.48	5,6,7	TOTAL	100			
9.0	3	3.0	0.57	6,7					
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	120.0/h	GILL NET CATCH	1.0/lift	TRAP NET CATCH	39.0/lift
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**NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS**

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	2	4.0	3.95	6
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5	1	2.0	0.03	1	21.5				
4.0	3	6.0	0.03	1	22.0				
4.5	3	6.0	0.04	1	22.5				
5.0	3	6.0	0.06	1	23.0				
5.5					23.5				
6.0	2	4.0	0.10	1,2	24.0				
6.5					24.5				
7.0					25.0				
7.5					25.5				
8.0					26.0				
8.5	2	4.0	0.28	2	TOTAL	50			
9.0	1	2.0	0.33	3					
9.5	2	4.0	0.39	2,3					
10.0	3	6.0	0.46	2,3					
10.5	1	2.0	0.53	3					
11.0	5	10.0	0.62	3,4					
11.5	4	8.0	0.71	3,4,5					
12.0	5	10.0	0.80	3,4					
12.5	3	6.0	0.91	3,4					
13.0	2	4.0	1.02	4,5					
13.5	1	2.0	1.15	4					
14.0	2	4.0	1.31	5					
14.5	1	2.0	1.47	4					
15.0									
15.5	1	2.0	1.88	6					
16.0									
16.5									
17.0									
17.5	1	2.0	2.77	5					
18.0	2	4.0	3.19	5					
18.5									

ELECTROFISHING CATCH	98.0/h	GILL NET CATCH	1.0/lift	TRAP NET CATCH	0.0/lift
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**BLUEGILL AGE-LENGTH KEY**

Length group (in)	Total number	Sub-sample	AGE							
			1	2	3	4	5	6	7	
1.0	12	5	12							
1.5	50	3	50							
2.0	38	5	38							
2.5	18	4	18							
3.0	29	6	5	24						
3.5	17	5		17						
4.0	7	5		3	4					
4.5	7	5			7					
5.0	9	6			8	1				
5.5	8	6			1	3	4			
6.0	5	5				1	3			1
6.5	3	3						3		
7.0										
7.5	1	1								1
Totals	204	59	123	44	20	5	7	3		2

AGE-LENGTH KEY SUMMARY						
Age	Number	Mean			Lower 95%CI	Upper 95%CI
		TL	Var	SE		
1	123	1.9	0.58	0.07	1.8	2.1
2	44	3.5	0.10	0.05	3.4	3.6
3	20	4.9	0.20	0.10	4.7	5.1
4	5	5.7	0.15	0.17	5.4	6.0
5	7	6.0	0.07	0.10	5.8	6.2
6	3	6.8	0.00	0.00	6.8	6.8
7	2	7.0	1.13	0.75	5.5	8.5

**REDEAR SUNFISH AGE-LENGTH KEY**

Length group (in)	Total number	Sub-sample	AGE							
			1	2	3	4	5	6	7	
2.0	2	2	2							
2.5	3	3	3							
3.0										
3.5										
4.0	3	3		3						
4.5	2	2		2						
5.0										
5.5	7	5			7					
6.0	11	6			11					
6.5	17	5			3	14				
7.0	14	5				8	6			
7.5	16	4					16			
8.0	11	5					4	4		2
8.5	11	5					4	2		4
9.0	3	3						1		2
Totals	100	48	5	5	21	22	30	7		8

AGE-LENGTH KEY SUMMARY						
Age	Number	Mean			Lower 95%CI	Upper 95%CI
		TL	Var	SE		
1	5	2.6	0.08	0.12	2.3	2.8
2	5	4.5	0.08	0.12	4.2	4.7
3	21	6.2	0.12	0.07	6.0	6.3
4	22	6.9	0.06	0.05	6.8	7.0
5	30	7.9	0.22	0.08	7.7	8.0
6	7	8.5	0.15	0.14	8.2	8.8
7	8	8.7	0.14	0.13	8.5	9.0

**LARGEMOUTH BASS AGE-LENGTH KEY**

Length group (in)	Total number	Sub-sample	AGE						
			1	2	3	4	5	6	
3.5	1	1	1						
4.0	3	3	3						
4.5	3	3	3						
5.0	3	2	2						
5.5									
6.0	2	2	1	1					
6.5									
7.0									
7.5									
8.0									
8.5	2	2		2					
9.0	1	1			1				
9.5	2	2		1	1				
10.0	3	3		2	1				
10.5	1	1			1				
11.0	5	5			3	2			
11.5	4	4			2	1	1		
12.0	5	4			1	3			
12.5	3	3			2	1			
13.0	2	2				1	1		
13.5	1	1				1			
14.0	2	2					2		
14.5	1	1				1			
15.0									
15.5	1	1							2
16.0									
16.5									
17.0									
17.5	1	1					1		
18.0	2	2					1	1	
18.5									
19.0	2	1							1
Totals	50	47	11	6	12	11	6	4	

AGE-LENGTH KEY SUMMARY						
Age	Number	Mean			Lower 95%CI	Upper 95%CI
		TL	Var	SE		
1	11	4.8	0.47	0.21	4.4	5.2
2	6	9.0	2.28	0.62	7.8	10.2
3	12	11.3	1.22	0.32	10.6	11.9
4	11	12.5	1.14	0.33	11.9	13.2
5	6	14.9	6.57	1.05	12.8	17.0
6	4	18.1	2.73	0.83	16.5	19.8

**GPS LOCATION OF SAMPLING EQUIPMENT**

GILL NETS			TRAP NETS			ELECTROFISHING		
1	N 38.010405	W -87.023659	1	N 38.010808	W -87.022456	1	N 38.008814	W -87.023772
	N	W	2	N	W		N 38.012015	W -87.022820
2	N 38.011460	W -87.023211	3	N	W	2	N 38.011606	W -87.022827
	N	W	4	N	W		N 38.010353	W -87.024018
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				11	N	W
12	N	W				12	N	W
	N	W				12	N	W
13	N	W				13	N	W
	N	W				13	N	W
14	N	W				14	N	W
	N	W				14	N	W
15	N	W				15	N	W
	N	W				15	N	W
16	N	W				16	N	W
	N	W				16	N	W
17	N	W				17	N	W
	N	W				17	N	W
18	N	W				18	N	W
	N	W				18	N	W
19	N	W				19	N	W
	N	W				19	N	W
20	N	W				20	N	W
	N	W				20	N	W