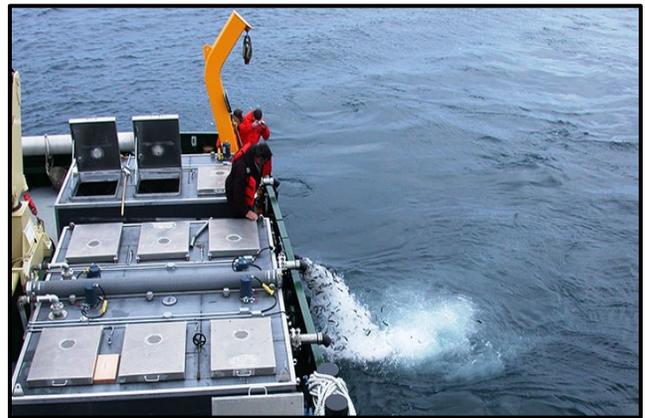




# U.S. Fish and Wildlife Service

## Summary of 2016 Lake Trout and Salmonid Stocking in Lake Michigan



### Green Bay Fish and Wildlife Conservation Office

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**"Working with partners to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people"**

## Summary

This summary provides a brief synopsis of salmonid stocking trends in Lake Michigan, and detailed information on 2016 lake trout stocking rates that are prescribed in *A Fisheries Management Implementation Strategy for the Rehabilitation of Lake Trout in Lake Michigan* (Dexter et al. 2011). A total of 10.63 million trout and salmon were stocked into Lake Michigan in 2016, the lowest number stocked since prior to 1972.

All stocking records used in this report were obtained from the Great Lakes Fishery Commission's fish stocking database that serves as a repository for federal, provincial, state, and tribal fish stocking events throughout Great Lakes waters. This database contains agency provided records dating back to the 1950's and is available online at: <http://www.glf.org/fishstocking/>. The content in the database is managed by the USFWS Green Bay Fish and Wildlife Conservation Office; contact Ryan Wehse ([ryan\\_wehse@fws.gov](mailto:ryan_wehse@fws.gov)) for more information.

**Lakewide salmonid stocking trends:**

**Chinook:** In 2016, 1.67 million Chinook were stocked in the lake, the lowest amount since the last lake wide stocking reduction in 2013. Since 2013 the annual average number of Chinook salmon stocked has been 1.76 million.

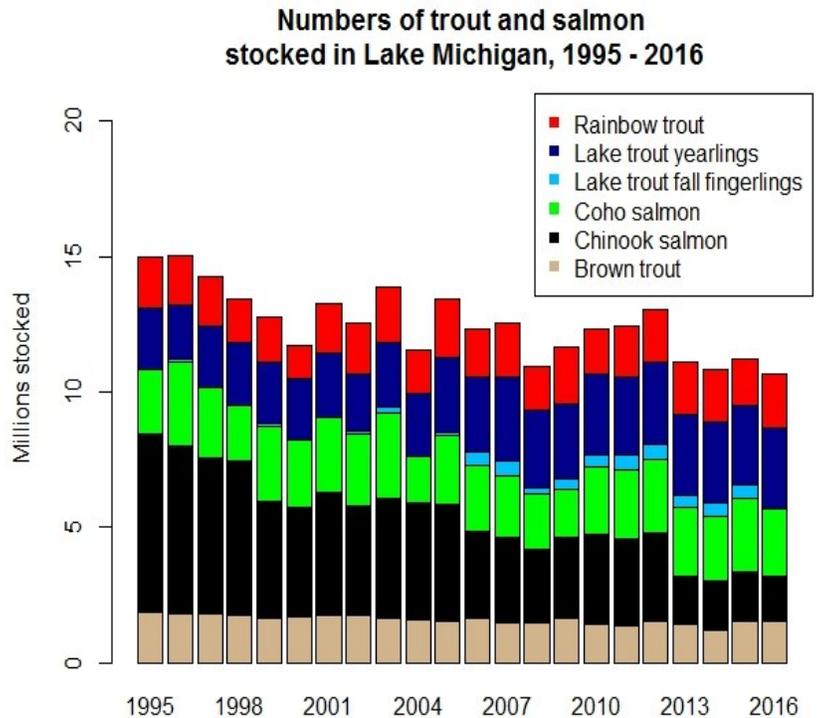
**Brown trout:** 1.51 million brown trout were stocked lakewide in 2016 which was 7% higher than the previous 5 year mean; more browns were stocked in Wisconsin waters by 20% of the previous 5 year mean, while browns dropped by 14% of the previous 5 year mean in Michigan waters.

**Lake trout:** A total of 3.02 million lake trout yearlings were stocking in 2016; 2.97 million by the USFWS and 49,500 by the MIDNR. No fall fingerlings were stocked in 2016. The total number of yearlings stocked exceeded the Implementation Strategy interim 2.74 million target by 10.2%. Total lake trout yearling equivalence stocked in 2016 was 4.9% less than in 2015.

**Rainbow trout:** 1.97 million rainbows were stocked lakewide in 2016 with a 13 percent decrease of the previous 5 year mean in Wisconsin waters and a 5 percent increase of the previous 5 year mean in Michigan waters.

**Coho salmon:** Lakewide 2.49 million Coho were stocked in 2016, a 10 percent decrease from the total stocked in 2015.

Figure 1. Number of the primary species of trout and salmon stocked in Lake Michigan from 1995-2016. Chart data (in millions) are provided in the accompanying table below.



	BNT	CHS	COS	LAT.ff	LAT.y	RBT	Total
1995	1.88	6.55	2.40	0.00	2.26	1.88	14.97
1996	1.79	6.19	3.11	0.14	1.97	1.85	15.06
1997	1.80	5.74	2.62	0.00	2.24	1.86	14.27
1998	1.74	5.72	2.06	0.00	2.30	1.62	13.44
1999	1.65	4.32	2.76	0.07	2.27	1.68	12.77
2000	1.67	4.05	2.50	0.00	2.26	1.24	11.72
2001	1.75	4.52	2.77	0.00	2.38	1.85	13.26
2002	1.75	4.02	2.69	0.09	2.14	1.86	12.54
2003	1.65	4.42	3.12	0.25	2.35	2.08	13.88
2004	1.60	4.30	1.69	0.00	2.35	1.58	11.53
2005	1.52	4.31	2.56	0.14	2.75	2.17	13.45
2006	1.61	3.25	2.43	0.49	2.77	1.79	12.34
2007	1.47	3.17	2.27	0.52	3.10	2.00	12.54
2008	1.47	2.73	2.03	0.24	2.88	1.62	10.96
2009	1.63	3.02	1.75	0.41	2.77	2.07	11.64
2010	1.43	3.29	2.52	0.43	3.00	1.68	12.34
2011	1.34	3.22	2.57	0.53	2.93	1.83	12.41
2012	1.52	3.24	2.74	0.55	3.05	1.93	13.04
2013	1.44	1.76	2.55	0.42	3.02	1.91	11.09
2014	1.22	1.81	2.38	0.48	3.00	1.93	10.82
2015	1.54	1.79	2.76	0.46	2.99	1.69	11.18
2016	1.51	1.67	2.49	0.00	3.02	1.97	10.63

**Chinook Stocking Equivalence:** In 2016, 5.26 Chinook salmon equivalence were stocked, the lowest number on record since 1972.

Not all species are equivalent in terms of diet requirements, overlap with specific prey species, annual consumption, or consumption over their life span. “Chinook salmon equivalence” were developed in the 1980s for Lake Michigan as a way to compare potential prey fish consumption rates among species.

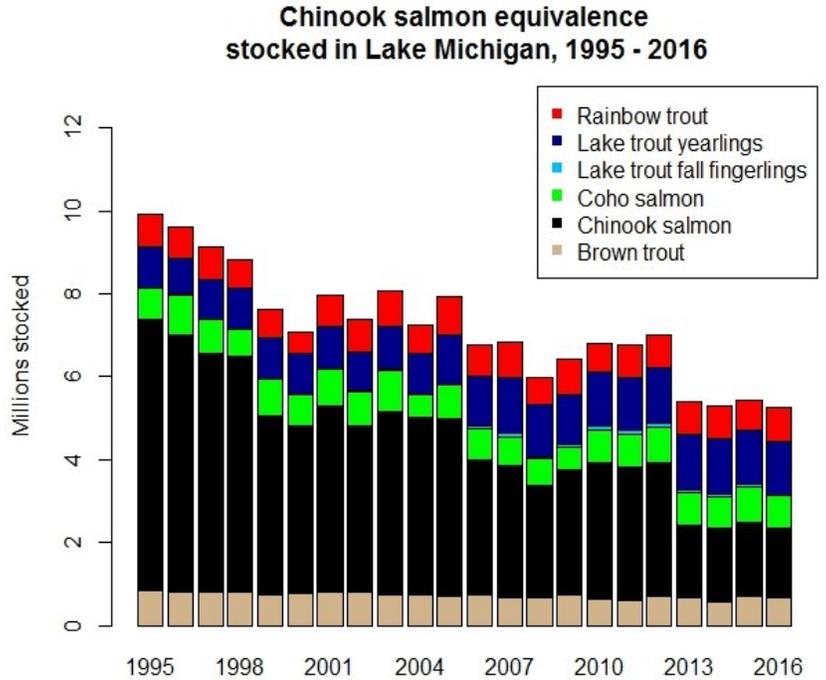
Then conversion values for each species stocked are as follows:

- 3.2 for Coho salmon
- 2.4 for rainbow trout
- 2.3 for yearling lake trout
- 5.8 for fall fingerling lake trout
- 2.2 for brown trout.

For example, the consumption potential of one Chinook salmon stocked is equal to 2.4 stocked rainbow trout. The Chinook equivalence of all trout and salmon stocked in a given year is equal the total number of each species stocked divided by its conversion factor.

The Lake Michigan Committee converts the number of all trout and salmon stocked to Chinook salmon equivalence to evaluate the total consumption potential of all species stocked and to allocate stocking among the different species.

Figure 2. Numbers of Chinook salmon equivalence for the primary species of trout and salmon stocked in Lake Michigan from 1995-2016. Chart data (in millions) are provided in the accompanying table below.



1995	0.85	6.55	0.75	0.00	0.98	0.78	9.92
1996	0.81	6.19	0.97	0.02	0.86	0.77	9.63
1997	0.82	5.74	0.82	0.00	0.97	0.78	9.13
1998	0.79	5.72	0.64	0.00	1.00	0.67	8.83
1999	0.75	4.32	0.86	0.01	0.99	0.70	7.64
2000	0.76	4.05	0.78	0.00	0.98	0.52	7.09
2001	0.79	4.52	0.86	0.00	1.04	0.77	7.98
2002	0.80	4.02	0.84	0.02	0.93	0.78	7.37
2003	0.75	4.42	0.98	0.04	1.02	0.87	8.08
2004	0.73	4.30	0.53	0.00	1.02	0.66	7.24
2005	0.69	4.31	0.80	0.02	1.20	0.90	7.92
2006	0.73	3.25	0.76	0.08	1.20	0.74	6.78
2007	0.67	3.17	0.71	0.09	1.35	0.83	6.82
2008	0.67	2.73	0.63	0.04	1.25	0.67	6.00
2009	0.74	3.02	0.55	0.07	1.20	0.86	6.44
2010	0.65	3.29	0.79	0.07	1.31	0.70	6.81
2011	0.61	3.22	0.80	0.09	1.27	0.76	6.76
2012	0.69	3.24	0.86	0.10	1.32	0.80	7.02
2013	0.66	1.76	0.80	0.07	1.31	0.79	5.39
2014	0.55	1.81	0.74	0.08	1.30	0.80	5.30
2015	0.70	1.79	0.86	0.08	1.28	0.71	5.42
2016	0.69	1.67	0.78	0.00	1.31	0.82	5.26

**Lake trout tagging and stocking locations:**

Per the *Implementation Strategy*, roughly 2/3 of the lake trout are stocked offshore in 1<sup>st</sup> Priority areas for rehabilitation efforts. These areas include reefs within the Northern Refuge (West Beaver, East Beaver, and Charlevoix Reef Complex groupings) and the Southern Refuge. The remaining 1/3 are stocked in 2<sup>nd</sup> Priority nearshore areas to support both recreational fisheries and rehabilitation efforts (Map 1).

In 2016, 1.51 million lake trout were stocked in the Northern 1<sup>st</sup> Priority sites and 0.74 million yearlings in the Southern Refuge 1<sup>st</sup> Priority sites. Nearshore areas (2<sup>nd</sup> Priority) received an additional 0.71 million yearlings. Lake trout stocking data showing locations, strains, and CWT numbers are provided in Table 2.

In 2016, the FWS stocked 2.97 million lake trout yearlings in first and second priority sites, with an additional 49,500 by the Michigan DNR in non-priority tributaries connected to Lake Michigan.

Since 2010 all stocked lake trout have been marked with an adipose clip and a coded wire tag (CWT) was implanted in the fish's snout. For yearling lake trout a unique CWT code was used for each lake trout strain, and stocking location. All 1<sup>st</sup> Priority sites have distinct CWT's as do all 2<sup>nd</sup> priority sites within each statistical district. The current tagging scheme was designed to facilitate analysis of the better performing strains and stocking locations from subsequent recoveries in assessment surveys, and commercial and recreational fisheries.

Map 1. First and 2nd priority areas as described in *A Fisheries Management Implementation Strategy for the Rehabilitation of Lake Trout in Lake Michigan* (Dexter et al. 2011). Northern and Southern Refuges are indicated with shading and the gray lines subdivide the lake into statistical districts.

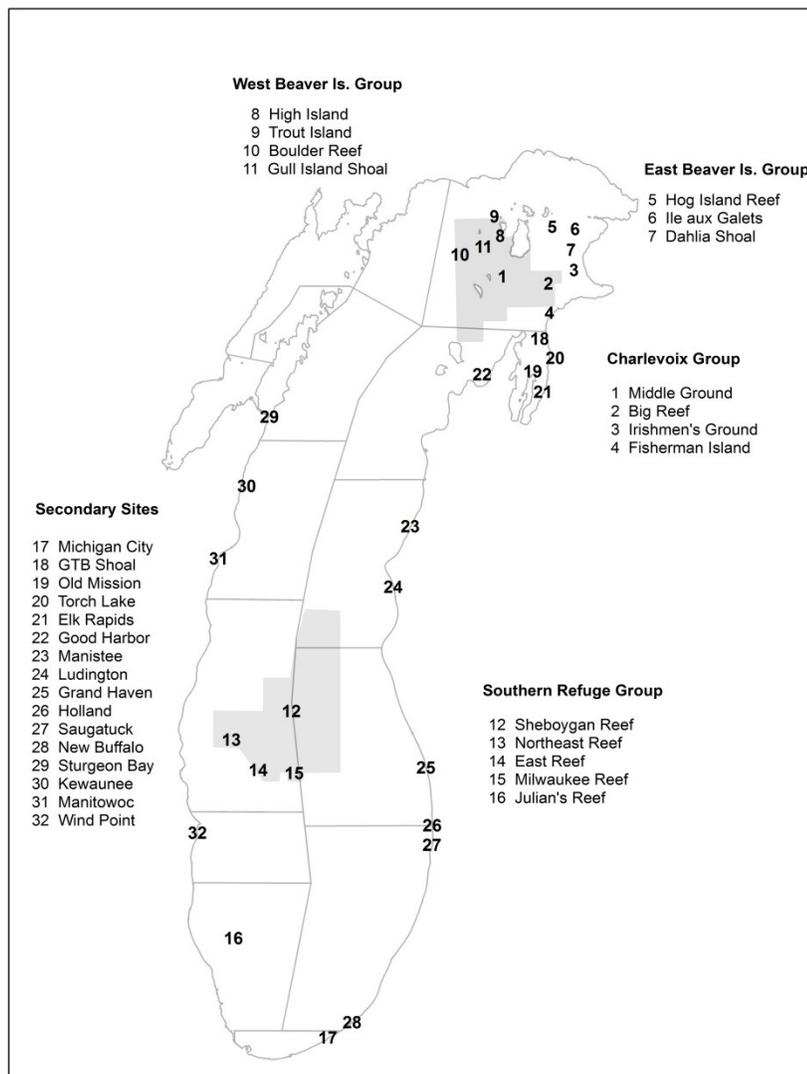


Table 2. Total number of USFWS lake trout yearlings (Y) and fall fingerlings (FF) stocked in each priority stocking area within Lake Michigan in 2016. Strains stocked include Lewis Lake (LLW), Parry Sound (HPW), Seneca Lake (SLW), and Klondike Reef (SKW).

Priority and Group Area	Stocking Site	Grid	Number Stocked	Strain	Life-Stage	CWT No.	Off/on shore
First Priority							
Northern Refuge							
West Beaver Group	Boulder Reef	413	41,138	HPW	Y	640806	Off
	Boulder Reef	413	41,222	LLW	Y	640815	Off
	Boulder Reef	413	41,218	SLW	Y	640807	Off
	Gull Island Shoal	413	41,207	HPW	Y	640804	Off
	Gull Island Shoal	413	41,450	LLW	Y	640820	Off
	Gull Island Shoal	413	41,261	SLW	Y	640811	Off
	High Island	314	41,291	HPW	Y	640801	Off
	High Island	314	41,482	LLW	Y	640817	Off
	High Island	314	41,290	SLW	Y	640810	Off
	Trout Island	314	40,997	HPW	Y	640802	Off
	Trout Island	314	41,148	LLW	Y	640816	Off
	Trout Island	314	41,433	SLW	Y	640809	Off
Northern Refuge							
East Beaver Group	Dahlia Shoal	417	69,000	HPW	Y	640821	Off
	Dahlia Shoal	417	68,500	LLW	Y	640826	Off
	Dahlia Shoal	417	68,800	SLW	Y	640825	Off
	Hog Island Reef	317	69,000	HPW	Y	640630	Off
	Hog Island Reef	317	68,500	LLW	Y	640828	Off
	Hog Island Reef	317	69,000	SLW	Y	640827	Off
	Ile aux Galets	317	69,000	HPW	Y	640823	Off
	Ile aux Galets	317	69,300	LLW	Y	640829	Off
	Ile aux Galets	317	69,000	SLW	Y	640822	Off
Northern Refuge							
Charlevoix Group	Big Reef	516	41,264	HPW	Y	640805	Off
	Big Reef	516	40,966	LLW	Y	640814	Off
	Big Reef	516	40,973	SLW	Y	640808	Off
	Irishmen's Ground	517	41,328	HPW	Y	640798	Off
	Irishmen's Ground	517	41,168	LLW	Y	640819	Off
	Irishmen's Ground	517	41,196	SLW	Y	640799	Off
	Middle Ground	514	41,113	HPW	Y	640803	Off
	Middle Ground	514	41,219	LLW	Y	640813	Off
	Middle Ground	514	41,052	SLW	Y	640812	Off
<b>First Priority</b>							
<b>Northern Refuge Subtotal</b>			1,485,516		Y		

Southern Refuge

	Julian's Reef	2403	61,570	LLW	Y	640789	Off
	Julian's Reef	2403	61,550	SLW	Y	640876	Off
	Northeast Reef	1803	207,400	SKW	Y	640835	Off
	Northeast Reef	1803	103,120	SLW	Y	640832	Off
	Sheboygan Reef	1706	309,780	SLW	Y	640791	Off
	<b>First Priority</b>						
	<b>Southern Refuge Subtotal</b>		743,420		Y		

Second Priority Areas

IN	Michigan City	2707	41,329	LLW	Y	640818	On
MM4	Elk Rapids	816	93,900	LLW	Y	640784	Off
MM4	GTB Shoal	716	54,000	LLW	Y	640784	Off
MM4	Old Mission	716	79,200	LLW	Y	640784	Off
MM4	Torch Lake	716	91,300	LLW	Y	640784	Off
MM5	Good Harbor	814	102,900	SLW	Y	640830	Off
MM5	Point Betsie	911	101,796	LLW	Y	640831	Off
MM6	Ludington CGS	1410	39,373	LLW	Y	640785	On
MM6	Manistee Harbor	1210	42,303	LLW	Y	640785	On
WM3	Sturgeon Bay CGS	905	50,760	SLW	Y	640790	On
WM4	Kewaunee Harbor	1104	15,660	SLW	Y	640790	On
WM6	Wind Point Shoal	2102	25,657	SLW	Y	640790	On
	<b>Secondary Zone Subtotals</b>		738,178		Y		

Non Priority Areas

MM7	Grand Haven	1911	12,500	SE	Y	640783	On
MM8	New Buffalo	2708	12,500	SE	Y	640783	On
MM8	Lake Macatawa	2111	24,500	SE	Y	640783	On
	<b>Non Priority Subtotals</b>		49,500				
	<b>All Zones Total Stocked</b>		3,016,614		Y		