

Appendix A1

Table A1. List and locations of studies used in meta-analysis.

Species	Ecosystem/study	Latitude	Longitude	Altitude
Brown bullhead	Anacostia River, MD - Fred Pinknew, USFWS, unpublished data	38.471	-77.053	20
Brown bullhead	Back River, MD - Fred Pinknew, USFWS, unpublished data	38.471	-77.053	20
Brown bullhead	Black Creek, WV - Hoffman et al. 1948	38.170	-80.445	960
Brown bullhead	Black River, OH - Baumann et al. 1990	41.234	-82.056	220
Brown bullhead	Candian Lakes - Scott and Crossman 1973	50.343	-93.285	380
Brown bullhead	Cayuga Lake, NY - Raney and Webster 1940	42.443	-76.444	280
Brown bullhead	Choptank River, MD - Fred Pinknew, USFWS, unpublished data	38.471	-77.053	20
Brown bullhead	Du Nord River, Canada - Phaneuf 1974	47.224	-65.564	140
Brown bullhead	Duck Pond, OH - Vicki Blazer, USGS, unpublished data	41.184	-82.073	240
Brown bullhead	Dunkirk Harbor, Lake Erie, OH - Vicki Blazer, USGS, unpublished data	42.293	-79.202	480
Brown bullhead	Eaton Reservoir, OH - Vicki Blazer, USGS, unpublished data	39.405	-84.412	200
Brown bullhead	Elbe River, Czechoslovakia - Hensel 1966	50.272	14.541	140
Brown bullhead	Elk Creek, OH - Vicki Blazer, USGS, unpublished data	39.292	-84.262	220
Brown bullhead	Goose Creek (Trib to Neuse) NC - Hightower et al. 1999	36.303	-76.374	0
Brown bullhead	Great Lakes Tributaries - PA Department of Environmental Protection	42.051	-80.075	180
Brown bullhead	Hancock Creek (Trib to Neuse) NC - Hightower et al. 1999	36.303	-76.374	0
Brown bullhead	Hungary - Saly 2005	46.521	19.291	100
Brown bullhead	Illinois River at Havana, IL - Richardson 1913	40.180	-90.034	140
Brown bullhead	La Motte Lake, Menominee Co, WI - Paruch 1979	44.565	-88.375	240
Brown bullhead	Lagoons, Lake Erie, OH - Vicki Blazer, USGS, unpublished data	41.294	-81.464	280
Brown bullhead	Lake Maxinkuckee, IN - Evermann and Clark 1920	41.116	-86.241	240
Brown bullhead	Lake Mendota, WI - Paruch 1979	43.062	-89.243	280
Brown bullhead	Lake Michigan, Green Bay, WI - Paruch 1979	44.324	-88.000	220

Brown bullhead	Lake Poygan, Winnebago Co, WI - Paruch 1979	44.082	-88.512	240
Brown bullhead	Lake Taupo, New Zealand - West et al. 2006	-38.473	175.532	520
Brown bullhead	Lake Washington, WA - Imamura 1975	47.393	-122.144	60
Brown bullhead	Lake Winnebago, WI - Paruch 1979	43.595	-88.256	300
Brown bullhead	Little Blackwater River (lower), MD - Fred Pinknew, USFWS, unpublished data	38.315	-76.021	0
Brown bullhead	Little Blackwater River (upper), MD - Fred Pinknew, USFWS, unpublished data	38.315	-76.021	0
Brown bullhead	Little Lake Butte des Morts, Winnebago Co, WI - Priegel 1966	44.041	-88.381	200
Brown bullhead	Little Lake Butte des Morts, Winnebago Co, WI44. - Priegel 1966	44.041	-88.381	200
Brown bullhead	Little River, OK - Finnell et al. 1956	34.521	-96.311	180
Brown bullhead	Long Point, Lake Erie, OH - Vicki Blazer, USGS, unpublished data	42.326	-80.022	160
Brown bullhead	Misery Bay, Lake Erie, OH - Vicki Blazer, USGS, unpublished data	42.084	-80.062	180
Brown bullhead	Monongahela River, WV - Redd 1970	39.334	-80.031	400
Brown bullhead	Muddy Creek, MD - Fred Pinknew, USFWS, unpublished data	38.583	-76.135	0
Brown bullhead	Muskellunge Lake, NY - Sinnot 1987	44.175	-75.414	200
Brown bullhead	Neabsco River, MD - Fred Pinknew, USFWS, unpublished data	38.403	-77.233	0
Brown bullhead	New York Lake - Carlander 1950	44.013	-74.362	560
Brown bullhead	Old Woman Creek, OH - Baumann et al. 1990	41.220	-82.303	240
Brown bullhead	Old Woman Creek, OH 2 - Vicki Blazer, USGS, unpublished data	41.220	-82.303	240
Brown bullhead	Ottawa River, Above Hawkesbury, Canada - Rubec and Qadri 1982	45.352	-75.033	60
Brown bullhead	Ottawa River, Below Hawkesbury, Canada - Rubec and Qadri 1982	45.303	-74.193	60
Brown bullhead	Ottawa River, Governor's Bay, Canada - Rubec and Qadri 1982	44.035	-76.355	60
Brown bullhead	Ottawa River, Hay Bay, Canada - Rubec and Qadri 1982	44.083	-77.003	80
Brown bullhead	Ottawa River, Upper Duck Island, Canada - Rubec and Qadri 1982	45.161	-74.043	40
Brown bullhead	Pond Zehun, Czechoslovakia - Frank 1955	48.352	15.126	860
Brown bullhead	Presque Isle, Lake Erie, OH - Vicki Blazer, USGS, unpublished data	42.084	-80.062	180
Brown bullhead	Quantico Creek, MD - Fred Pinknew, USFWS, unpublished data	38.322	-77.185	0
Brown bullhead	Red Haw Lake, IA - Carlander 1950	40.595	-93.162	320
Brown bullhead	River Tisza, Hungary - Saly 2005	47.235	21.051	80
Brown bullhead	Rock River, Dodge Co, WI - Paruch 1979	43.252	-88.381	280
Brown bullhead	Sandusky Bay, Lake Erie, OH - Vicki Blazer, USGS, unpublished data	41.291	-82.444	240
Brown bullhead	Sara's Cove, Lake Erie, OH - Vicki Blazer, USGS, unpublished data	42.071	-80.085	180
Brown bullhead	Severn River, MD - Fred Pinknew, USFWS, unpublished data	38.573	-76.264	0
Brown bullhead	Slocum Creek (Trib to Neuse) NC - Hightower et al. 1999	36.303	-76.374	0
Brown bullhead	South River, MD - Fred Pinknew, USFWS, unpublished data	38.541	-76.334	0
Brown bullhead	Strip Mine Lake, KS - Gash and Bass 1973	38.026	-97.242	440
Brown bullhead	Sugar Lake, OH - Vicki Blazer, USGS, unpublished data	40.443	-82.534	320

Brown bullhead	Tenmile Lake, OR - Carlander 1950	43.335	-124.085	100
Brown bullhead	Tuckahoe River, MD - Fred Pinknew, USFWS, unpublished data	38.516	-75.556	0
Brown bullhead	Tygart Valley Reservoir, WV - Redd 1970	39.160	-80.001	420
Brown bullhead	Upper Anacostia River, MD - Fred Pinknew, USFWS, unpublished data	38.471	-77.053	20
Brown bullhead	Upper Ottawa River, Canada - Rubec and Qadri 1982	47.063	-79.263	280
Brown bullhead	Waikato River, New Zealand - West et al. 2006	-37.272	175.086	160
Brown bullhead	White Clay Lake, Shawano Co., WI - Paruch 1979	44.480	-88.242	240
Brown trout	Australia - Carlander 1969	-23.311	146.343	320
Brown trout	Big Grizzly Creek, Plumas Co., CA, USA - Brown 1992	39.510	-120.266	1880
Brown trout	Brule River, WI, USA - Becker 1983	46.322	-91.352	380
Brown trout	Castle Lake, CA, USA - Carlander 1969	41.134	-122.226	1060
Brown trout	Cedar Run, PA, USA (Susquehanna River Dr.) - McFadden and Cooper 1962	41.312	-77.264	500
Brown trout	Center Stream, Coruh Basin, Turkey - Ozvarol et al. 2010	41.191	41.425	1640
Brown trout	Crystal Creek, NY, USA - Carlander 1969	44.162	-73.333	80
Brown trout	Estoraos River, NW Portugal - Maia and Valente 1999	41.460	-8.346	280
Brown trout	Firiz stream of the River Ceyhan, Turkey - Alp et al. 2005	36.593	35.191	0
Brown trout	Gudena River, Denmark - Alp et al. 2005	56.290	10.130	60
Brown trout	Horokiwai, New Zealand - Carlander 1969	-41.122	174.506	0
Brown trout	Kelyare River, Iran - Kheyrandish et al. 2010	35.520	52.013	1960
Brown trout	Kettle Creek, PA, USA (Susquehanna River Dr.) - McFadden and Cooper 1962	41.375	-77.355	500
Brown trout	Khojirood River, Iran - Kheyrandish et al. 2010	35.520	52.013	1960
Brown trout	Kocun Bogazi Stream, Coruh Basin, Turkey - Ozvarol et al. 2010	41.191	41.425	1640
Brown trout	Labruja River, NW Portugal - Maia and Valente 1999	41.095	-7.391	500
Brown trout	Lar River, Iran - Kheyrandish et al. 2010	35.520	52.013	1960
Brown trout	Logan River, UT, USA - Carlander 1969	41.281	-111.481	2080
Brown trout	MN USA - Carlander 1969	46.435	-94.411	400
Brown trout	MN streams USA - Carlander 1969	46.435	-94.411	400
Brown trout	Missouri River, MT, USA - Carlander 1969	47.491	-110.395	1200
Brown trout	New Zealand - Carlander 1969	-40.540	174.531	0
Brown trout	North WI, USA - Becker 1983	45.375	-89.244	500
Brown trout	Northern WI streams, USA - Avery and Hine 1985	46.225	-90.263	500
Brown trout	Norway - Carlander 1969	60.282	8.281	1200
Brown trout	Pajimiane River, Iran - Kheyrandish et al. 2010	35.520	52.013	1960
Brown trout	Poland River Life A - Carlander 1969	51.551	19.084	160
Brown trout	Poland River Life B - Carlander 1969	51.551	19.084	160
Brown trout	Reda River, Poland - Alp et al. 2005	54.362	18.200	180

Brown trout	Rigcheshme River, Iran - Kheyrandish et al. 2010	35.520	52.013	1960
Brown trout	Scotland - Carlander 1969	56.292	4.124	0
Brown trout	Shaver Creek, PA, USA (Susquehanna River Dr.) - McFadden and Cooper 1962	40.400	-77.543	380
Brown trout	Shirinrood River, Iran - Kheyrandish et al. 2010	35.520	52.013	1960
Brown trout	Singerna River, Italy - Alp et al. 2005	43.384	11.595	440
Brown trout	Sirakonaklar Stream, Coruh Basin, Turkey - Ozvarol et al. 2010	41.191	41.425	1640
Brown trout	South Africa - Carlander 1969	-30.333	22.562	1100
Brown trout	South WI, USA - Becker 1983	43.252	-89.201	280
Brown trout	Southern Ontario, Canada - Scott and Crossman 1973	44.463	-78.504	260
Brown trout	Spruce Cereek, PA, USA (Susquehanna River Dr.) - McFadden and Cooper 1962	40.365	-78.082	300
Brown trout	Sweden Lakes - Carlander 1969	62.291	16.254	420
Brown trout	Sweden Rivers - Carlander 1969	62.456	16.150	260
Brown trout	Trovela River, NW Portugal - Maia and Valente 1999	41.095	-7.391	500
Brown trout	UK Freshwater - Carlander 1969	55.224	-3.261	380
Brown trout	UK Par - Carlander 1969	55.224	-3.261	380
Brown trout	UK Sea - Carlander 1969	55.314	1.551	0
Brown trout	Vade River, NW Portugal - Maia and Valente 1999	41.484	-8.185	280
Brown trout	Vebre River, France - Alp et al. 2005	42.463	1.432	1980
Brown trout	West Gallatin River, MT, USA - Carlander 1969	45.423	-111.131	2060
Brown trout	White River, WI, USA - Toshner and Manz 2008	46.321	-90.510	400
Brown trout	Yagli Stream, Coruh Basin, Turkey - Ozvarol et al. 2010	41.231	42.106	1800
Brown trout	Young Woman's Creek, PA, USA (Susquehanna River Dr.) - McFadden and Cooper 1962	41.251	-77.394	520
Common carp	Agrakhan Bay, Caspian Sea - http://www.caspianenvironment.org	40.003	53.161	100
Common carp	Akflehir Lake, Turkey - Alp and Balik 2000	38.251	42.484	2040
Common carp	Akflehir Lake, Turkey2 - Alp and Balik 2000	38.251	42.484	2040
Common carp	Akflehir Lake, Turkey3 - Alp and Balik 2000	38.251	42.484	2040
Common carp	Almus Lake, Turkey - Alp and Balik 2000	40.225	36.570	900
Common carp	Altonkaya Lake, Turkey - Alp and Balik 2000	41.166	35.263	420
Common carp	Apa Lake, Turkey - Alp and Balik 2000	37.221	32.294	1340
Common carp	Bafra Lake, Turkey - Alp and Balik 2000	41.343	35.534	860
Common carp	Beyflehir Lake, Turkey - Alp and Balik 2000	38.251	42.484	2040
Common carp	Beyflehir Lake, Turkey2 - Alp and Balik 2000	38.251	42.484	2040
Common carp	Beyflehir Lake, Turkey3 - Alp and Balik 2000	38.251	42.484	2040
Common carp	Beytepe Lake, Turkey - Alp and Balik 2000	39.525	32.443	980
Common carp	Biliuhe Reservoir, Dalian, China - Shuwei 1993	39.495	122.293	40
Common carp	Campaspe Irrigation Supply Channels, Australia - Brown et al. 2003	-20.154	145.572	500

Common carp	Chickamauga Lake, TN, USA - Carlander 1969	35.136	-85.044	220
Common carp	Clear Lake, IA, USA - Colvin et al. 2008	43.081	-93.225	360
Common carp	Danube River, SE Romania - Gheorghe et al. 2011	45.021	27.566	20
Common carp	Dongjiang River, China - Fuliang and Jun 1986	25.565	113.121	360
Common carp	Eber Lake, Turkey - Alp and Balik 2000	38.392	31.114	1680
Common carp	Eymir Lake, Turkey - Alp and Balik 2000	39.494	32.501	1020
Common carp	Ezirdir Lake, Turkey - Alp and Balik 2000	38.251	42.484	2040
Common carp	Ezirdir Lake, Turkey2 - Alp and Balik 2000	38.251	42.484	2040
Common carp	France - Carlander 1969	46.134	2.125	460
Common carp	Germany - Carlander 1969	51.096	10.271	280
Common carp	Grand Lake, OK, USA - Carlander 1969	36.360	-94.536	320
Common carp	Green Lake, Seattle, WA, USA - Mueller and Downen 2000	47.411	-122.196	60
Common carp	Guadalquivir River Delta, Spain - Fernandez-Delgado 1990	36.484	-6.193	0
Common carp	Gölcük Lake, Turkey - Alp and Balik 2000	37.124	30.074	1580
Common carp	Göhlisar Lake, Turkey - Alp and Balik 2000	37.065	29.360	1400
Common carp	Hafik Lake, Turkey - Alp and Balik 2000	39.525	37.052	1380
Common carp	Hirfanli Lake, Turkey - Alp and Balik 2000	39.161	33.312	1040
Common carp	Illinois River at Pool 5 - Christenson and Smith 1965	40.215	-90.012	140
Common carp	Illinois River at Pool 8 - Lubinski et al. 1984	40.215	-90.012	140
Common carp	Impounded Missouri River, W. KS, USA - Stucky and Klassen 1971	39.526	-95.014	240
Common carp	Iznik Lake, Turkey - Alp and Balik 2000	40.266	29.320	600
Common carp	Kegonsa Cove, WI, USA - Carlander 1969	42.575	-89.134	260
Common carp	Kyzylagach Bay, Caspian Sea - http://www.caspianenvironment.org/	40.003	53.161	100
Common carp	Köyceğiz Lake, Turkey - Alp and Balik 2000	38.575	35.144	1240
Common carp	Lake Chautauqua, Illinois River, IL, USA - Starrett and Fritz 1965	40.215	-90.012	140
Common carp	Lake Gariep, South Africa - Winker et al. 2010	-30.414	25.432	1400
Common carp	Lake St. Lawrence, Ontario, Canada - Swee and McCrimmon 1966	44.553	-75.063	100
Common carp	Laojianghe Lake, China - Weiming 1998	30.104	112.052	20
Common carp	Lower Waikato Region, New Zealand - Tempero et al. 2006	-37.202	-174.455	0
Common carp	Mamasan Lake, Turkey - Alp and Balik 2000	38.575	35.144	1240
Common carp	Manyas Lake, Turkey - Alp and Balik 2000	40.121	27.565	300
Common carp	Marmara Lake, Turkey - Alp and Balik 2000	38.365	27.590	560
Common carp	Marsh Lake, NE, USA - Coulter et al. 2008	42.182	-101.000	1000
Common carp	Mid-Murray River, Australia - Brown et al. 2005	36.000	145.000	0
Common carp	Mississippi River at Pool 19 - Lubinski et al. 1984	40.483	-91.066	200
Common carp	Mississippi River at Fountain City, WI, USA - Becker 1983	44.075	-91.431	260

Common carp	Mogan Lake, Turkey - Alp and Balik 2000	39.466	32.475	1020
Common carp	Monona Lake, WI, USA - Carlander 1969	43.042	-89.212	260
Common carp	Murray River, Australia - Vilizzi and Walker 1999	-34.415	142.131	60
Common carp	Ogden Bay Bird Refuge, Utah, USA - McConnell 1952	41.103	-112.175	1240
Common carp	Okoboji Lake, IA, USA - Carlander 1969	43.230	-95.082	420
Common carp	Pelican Lake, NE, USA - Coulter et al. 2008	42.314	-100.402	880
Common carp	Prien, LA, USA - Carlander 1969	30.105	-93.163	0
Common carp	Shkondra Lake, Albania - Kolaneci et al. 2010	42.102	19.195	480
Common carp	Süleyman Lake, Turkey - Alp and Balik 2000	40.121	27.565	300
Common carp	Turkmenian Bay, Caspian Sea - http://www.caspianenvironment.org/	40.003	53.161	100
Common carp	Tödürge Lake, Turkey - Alp and Balik 2000	39.526	37.355	1500
Common carp	Unimpounded Missouri River, W. KS, USA - Stucky and Klassen 1971	39.526	-95.014	240
Common carp	Volga River, Russia - http://www.caspianenvironment.org/	48.115	46.070	0
Common carp	Wisconsin River, Juneau Co, WI - Becker 1983	43.503	-89.561	240
Common carp	Xin'anjiang Reservoir, China - Sifa et a. 1990	29.334	118.561	280
Common carp	Çavufucu Lake, Turkey - Alp and Balik 2000	39.460	32.474	1020
Flathead catfish	Alabama River, AL - Kwak et al. 2006	32.211	-86.322	32
Flathead catfish	Altamaha River, GA - Kwak et al. 2006	31.561	-82.182	32
Flathead catfish	Big Black River, MS - Kwak et al. 2006	32.524	-89.580	33
Flathead catfish	Big Blue River, KS - Kwak et al. 2006	39.411	-96.376	39
Flathead catfish	Black Warrior River, AL - Kwak et al. 2006	33.264	-87.222	33
Flathead catfish	Bluestone Reservoir, WV - Kwak et al. 2006	37.355	-80.534	37
Flathead catfish	Boomer Lake, OK - Kwak et al. 2006	36.091	-97.035	36
Flathead catfish	Cape Fear River, NC - Kwak et al. 2006	34.221	-78.041	34
Flathead catfish	Coachella Canal, CA - Kwak et al. 2006	33.421	-116.083	33
Flathead catfish	Colorado River, CO-AZ - Kwak et al. 2006	36.571	-111.242	37
Flathead catfish	Coosa River, AL - Kwak et al. 2006	32.361	-86.150	32
Flathead catfish	Des Moines River, IA - Kwak et al. 2006	41.301	-93.242	41
Flathead catfish	Edisto River, SC - Kwak et al. 2006	34.036	-81.045	34
Flathead catfish	Flint River, GA - Kwak et al. 2006	31.405	-84.011	31
Flathead catfish	Fox River, Winnebago Co, WI - Paruch 1979	44.136	-88.506	44
Flathead catfish	Grand Lake (Main Body), OK - Kwak et al. 2006	36.323	-94.552	36
Flathead catfish	Grand Lake (Neosho Arm), OK - Kwak et al. 2006	36.323	-94.552	36
Flathead catfish	Great Pee Dee River, SC - Kwak et al. 2006	33.380	-79.093	33
Flathead catfish	Kansas River (Reach 1), KS - Makinster and Paukert 2008	39.030	-94.491	39
Flathead catfish	Kansas River (Reach 2), KS - Makinster and Paukert 2008	38.582	-95.063	39

Flathead catfish	Kansas River (Reach 3), KS - Makinster and Paukert 2008	39.041	-95.325	39
Flathead catfish	Kansas River (Reach 4), KS - Makinster and Paukert 2008	39.044	-96.455	39
Flathead catfish	Kansas River, KS - Kwak et al. 2006	38.582	-95.132	39
Flathead catfish	Kaskaskia River, IL - Lyall 1933	38.072	-89.542	38
Flathead catfish	Lake Carl Blackwell, OK - Kwak et al. 2006	36.081	-97.131	36
Flathead catfish	Lake Wilson, AL - Marshall et al. 2009	34.483	-87.272	34
Flathead catfish	Lewis and Clark Reservoir, SD - Knecht et al. 2008	42.505	-97.423	43
Flathead catfish	Little River and Long Cane, SC - Kwak et al. 2006	33.513	-78.381	34
Flathead catfish	Lower Wabash river, IN-IL - Donabauer 2009	39.205	-87.321	39
Flathead catfish	Lumber River, NC - Kwak et al. 2006	34.235	-78.576	34
Flathead catfish	Middle Wabash River, IN - Donabauer 2009	40.591	-85.202	41
Flathead catfish	Milford Reservoir, KS - Kwak et al. 2006	39.062	-96.555	39
Flathead catfish	Minnesota River, MN - Kwak et al. 2006	47.572	-96.115	48
Flathead catfish	Mississippi River, IA - Schoumacher 1968	42.393	-90.454	42
Flathead catfish	Mississippi River, IA-IL - Kwak et al. 2006	41.312	-90.281	41
Flathead catfish	Mississippi River, IA-IL2 - Barnickol and Starrett 1951	41.312	-90.281	41
Flathead catfish	Mississippi River, IL - UMRCC 1946	39.596	-91.275	40
Flathead catfish	Mississippi River, IL-MO - Kwak et al. 2006	39.596	-91.275	40
Flathead catfish	Mississippi River, Near Festus, MO 1991 - Jones and Noltie 2007	38.133	-90.213	38
Flathead catfish	Mississippi River, Near Festus, MO 1996 - Jones and Noltie 2007	38.133	-90.213	38
Flathead catfish	Missouri River (channelized), NE - Morris et al. 1970	41.232	-97.071	41
Flathead catfish	Missouri River (unchannelized), NE - Morris et al. 1970	41.232	-97.071	41
Flathead catfish	Missouri River, MO - Kwak et al. 2006	39.144	-93.205	39
Flathead catfish	Missouri River, NE - Kwak et al. 2006	41.232	-97.071	41
Flathead catfish	Neosho River, KS - Kwak et al. 2006	37.044	-95.041	37
Flathead catfish	Neuse River, NC - Kwak et al. 2006	35.262	-77.372	35
Flathead catfish	Norris Reservoir, TN - Kwak et al. 2006	36.134	-84.050	36
Flathead catfish	Northeast Cape Fear River, NC - Kwak et al. 2006	34.593	-78.384	35
Flathead catfish	Ocmulgee River, GA - Kwak et al. 2006	32.453	-83.360	32
Flathead catfish	Richardson Lake, MN - Davis 1985	45.093	-94.262	45
Flathead catfish	Rio Grande River - Kwak et al. 2006	27.300	-99.305	27
Flathead catfish	Saint Joseph River, MI - Daugherty and Sutton 2005	41.581	-86.214	42
Flathead catfish	Salt River, AZ - Young and Marsh 1990	33.390	-111.112	33
Flathead catfish	Salt River, MO - Kwak et al. 2006	39.345	-91.202	39
Flathead catfish	Satilla River, GA - Sakaris et al. 2006	30.582	-81.432	31
Flathead catfish	Tallahatchie River, MS - Kwak et al. 2006	34.283	-89.402	34

Flathead catfish	Tallapoosa River, AL - Kwak et al. 2006	32.306	-85.533	32
Flathead catfish	Tennessee River, AL - Kwak et al. 2006	35.043	-85.164	35
Flathead catfish	Texas Reservoirs, TX - Munger et al. 1994	31.575	-99.480	32
Flathead catfish	Upper Gila River, AZ - Young and Marsh 1990	33.091	-111.513	33
Flathead catfish	Upper Wabash River, IN-MI - Donabauer 2009	41.255	-84.451	41
Flathead catfish	Verde River, AZ - Kwak et al. 2006	34.460	-112.023	34
Flathead catfish	Verdigris River, KS - Kwak et al. 2006	37.036	-95.373	37
Flathead catfish	Wabash River, IN - Columbo 2007	40.472	-85.504	40
Flathead catfish	Watts Bar Reservoir, TN - Kwak et al. 2006	35.460	-84.402	35
Largemouth bass	Aliceville Reservoir, AL, USA - Summarized in Rypel 2010	33.144	-88.172	60
Largemouth bass	Applegate Pond, CA, USA - Summarized in Carlander 1969	39.020	-120.584	1160
Largemouth bass	Ardmore City Lake, OK, USA - Summarized in Carlander 1969	34.093	-96.583	200
Largemouth bass	Auburn Lake, Auburn, AL, USA - Summarized in Carlander 1969	32.364	-85.285	120
Largemouth bass	Back Bay, VA, USA - Summarized in Carlander 1969	36.360	-75.573	0
Largemouth bass	Badin Lake, NC, USA - Summarized in Carlander 1969	35.242	-80.066	120
Largemouth bass	Bear Creek Reservoir, AL, USA - Summarized in Rypel 2010	34.182	-87.395	220
Largemouth bass	Beaver Reservoir AR, USA - Summarized in Carlander 1969	36.205	-93.553	420
Largemouth bass	Big Sage River, CA, USA - Summarized in Carlander 1969	41.394	-120.404	1360
Largemouth bass	Blewett Falls Lake, NC, USA - Summarized in Carlander 1969	35.011	-79.534	100
Largemouth bass	Bob White Lake, IA, USA - Summarized in Carlander 1969	40.421	-93.235	280
Largemouth bass	Brody's Lake, PA, USA - Summarized in Carlander 1969	41.101	-75.313	560
Largemouth bass	Brown's Lake, WI, USA - Summarized in Carlander 1969	42.413	-88.135	240
Largemouth bass	Bull Shoals Reservoir, AR, USA - Summarized in Carlander 1969	36.296	-92.461	200
Largemouth bass	Canton Lake, OK, USA - Summarized in Carlander 1969	36.076	-98.364	380
Largemouth bass	Carl Blackwell Lake, OK, USA - Summarized in Carlander 1969	36.081	-97.131	280
Largemouth bass	Catawba Lake, NC, USA - Summarized in Carlander 1969	34.555	-79.331	40
Largemouth bass	Center Hill Lake, TN, USA - Summarized in Carlander 1969	35.594	-85.426	560
Largemouth bass	Cherokee Lake, TN, USA - Summarized in Carlander 1969	36.164	-83.214	420
Largemouth bass	Chickasaw Lake, OK, USA - Summarized in Carlander 1969	34.120	-97.051	240
Largemouth bass	Claiborne Reservoir, AL, USA - Summarized in Rypel 2010	31.365	-87.331	100
Largemouth bass	Claremore Lake, OK, USA - Summarized in Carlander 1969	36.201	-95.343	180
Largemouth bass	Claytor Lake, VA, USA - Summarized in Carlander 1969	37.032	-80.365	700
Largemouth bass	Clear Lake, IA, USA - Summarized in Carlander 1969	43.065	-93.252	360
Largemouth bass	Clearwater Reservoir, MO, USA - Summarized in Carlander 1969	37.094	-90.482	160
Largemouth bass	Coast Lake, OR, USA - Summarized in Carlander 1969	44.144	-123.332	200
Largemouth bass	Coffeeville Reservoir, AL, USA - Summarized in Rypel 2010	31.453	-88.075	20

Largemouth bass	Colorado River, CA, USA - Summarized in Carlander 1969	32.545	-114.276	220
Largemouth bass	Cowan's Gap Lake, PA, USA - Summarized in Carlander 1969	39.595	-77.553	180
Largemouth bass	Crab Orchard Lake, IL, USA - Summarized in Carlander 1969	37.433	-89.081	140
Largemouth bass	Cumberland Reservoir, KY, USA - Summarized in Carlander 1969	36.532	-85.026	320
Largemouth bass	Dale Hollow Lake, TN, USA - Summarized in Carlander 1969	36.352	-85.171	360
Largemouth bass	Day Lake, WI, USA - Summarized in Carlander 1969	46.112	-90.543	460
Largemouth bass	Dealey's Lake, TX, USA - Summarized in Carlander 1969	33.401	-97.006	200
Largemouth bass	Deer Ridge Reservoir, MO, USA - Summarized in Carlander 1969	40.105	-91.494	160
Largemouth bass	Delaware, USA - Summarized in Carlander 1969	38.544	-75.314	0
Largemouth bass	Doe's Run, KY, USA - Summarized in Rypel 2010	37.554	-86.104	220
Largemouth bass	Douglas Reservoir, TN, USA - Summarized in Carlander 1969	36.003	-83.203	340
Largemouth bass	East Lake, IA, USA - Summarized in Carlander 1969	42.312	-92.225	260
Largemouth bass	East Ocoola Lake, IA, USA - Summarized in Carlander 1969	41.020	-93.444	280
Largemouth bass	Elephant Butte Reservoir, NM, USA - Summarized in Carlander 1969	33.154	-107.096	1400
Largemouth bass	Ella Ewing Reservoir, MO, USA - Summarized in Carlander 1969	40.203	-92.001	200
Largemouth bass	Eucha Lake, OK, USA - Summarized in Carlander 1969	36.212	-94.532	340
Largemouth bass	Fall River Lake, KS, USA - Summarized in Carlander 1969	37.393	-96.042	320
Largemouth bass	Falls Lake, NC, USA - Summarized in Carlander 1969	36.014	-78.431	120
Largemouth bass	Fern Ridge Lake, OR, USA - Summarized in Carlander 1969	44.052	-123.174	100
Largemouth bass	Ferndale Lake, TX, USA - Summarized in Carlander 1969	32.566	-95.044	100
Largemouth bass	Flora Lake, WI, USA - Summarized in Carlander 1969	46.105	-89.392	520
Largemouth bass	Folsom Lake, CA, USA - Summarized in Carlander 1969	38.435	-121.083	40
Largemouth bass	Fontana Lake, NC, USA - Summarized in Carlander 1969	35.264	-83.434	760
Largemouth bass	Foot's Pond, IN, USA - Summarized in Carlander 1969	38.075	-87.560	140
Largemouth bass	Fort Gibson Lake, OK, USA - Summarized in Carlander 1969	35.533	-95.155	160
Largemouth bass	Fort Smith Lake, AR, USA - Summarized in Carlander 1969	35.401	-94.084	100
Largemouth bass	Francis Case Lake, SD, USA - Summarized in Carlander 1969	43.231	-99.071	560
Largemouth bass	Frankin Pond, OK, USA - Summarized in Carlander 1969	34.599	-83.475	420
Largemouth bass	Ft. Randall Lake, Post-Impoundment, SD, USA - Summarized in Carlander 1969	43.062	-98.361	440
Largemouth bass	Ft. Randall Lake, Pre-Impoundment, SD, USA - Summarized in Carlander 1969	43.062	-98.361	440
Largemouth bass	Gavin's Point Lake, SD, USA - Summarized in Carlander 1969	42.514	-97.291	460
Largemouth bass	George Lake, WI, USA - Summarized in Carlander 1969	45.363	-89.195	500
Largemouth bass	Glenville Lake, NC, USA - Summarized in Carlander 1969	35.042	-78.536	60
Largemouth bass	Grand Lake, OK, USA - Summarized in Carlander 1969	36.360	-94.536	320
Largemouth bass	Grassy Pond, IN, USA - Summarized in Carlander 1969	39.175	-87.344	160
Largemouth bass	Great Salt Lake, OK, USA - Summarized in Carlander 1969	36.432	-98.105	380

Largemouth bass	Green Valley Lake, IA, USA - Summarized in Carlander 1969	41.062	-94.234	380
Largemouth bass	Greenbriar Lake, TX, USA - Summarized in Carlander 1969	32.190	-95.221	120
Largemouth bass	Harris Reservoir, AL, USA - Summarized in Rypel 2010	33.155	-87.281	140
Largemouth bass	Havasu Lake, CA, USA - Summarized in Carlander 1969	34.285	-114.244	540
Largemouth bass	Henry Sever Reservoir, MO, USA - Summarized in Carlander 1969	40.003	-91.584	160
Largemouth bass	Herrington Lake, KY, USA - Summarized in Carlander 1969	37.452	-84.421	300
Largemouth bass	Heyburn Lake, OK, USA - Summarized in Carlander 1969	35.571	-96.181	200
Largemouth bass	Hickory Lake, NC, USA - Summarized in Carlander 1969	35.482	-81.164	280
Largemouth bass	Hiwassee Lake, OK, USA - Summarized in Carlander 1969	34.563	-83.452	440
Largemouth bass	Hiwassee Reservoir, TN/NC, USA - Summarized in Carlander 1969	35.101	-84.174	500
Largemouth bass	Horseshoe Lake, IL, USA - Summarized in Carlander 1969	38.421	-90.053	180
Largemouth bass	Idelwind Lake, TX, USA - Summarized in Carlander 1969	30.424	-94.556	40
Largemouth bass	Ike Lake, IA, USA - Summarized in Carlander 1969	41.190	-93.104	240
Largemouth bass	Illinois River, OK, USA - Summarized in Rypel 2010	35.501	-94.501	200
Largemouth bass	James Lake, NC, USA - Summarized in Carlander 1969	35.392	-81.194	260
Largemouth bass	Jo Shelby Reservoir, MO, USA - Summarized in Carlander 1969	39.474	-92.135	220
Largemouth bass	Johnson Sawk Trail Lake, IL, USA - Summarized in Carlander 1969	41.194	-89.532	240
Largemouth bass	Jones Bluff Reservoir, AL, USA - Summarized in Rypel 2010	32.104	-86.351	60
Largemouth bass	Jordon Reservoir, AL, USA - Summarized in Rypel 2010	32.380	-86.180	40
Largemouth bass	KY Streams, USA - Summarized in Carlander 1969	37.502	-84.161	340
Largemouth bass	Kentucky Lake, KY, USA - Summarized in Carlander 1969	36.533	-88.101	140
Largemouth bass	Keomah Lake, IA, USA - Summarized in Carlander 1969	41.173	-92.322	240
Largemouth bass	Kerr Lake, NC, USA - Summarized in Carlander 1969	36.072	-81.155	360
Largemouth bass	Kitty Hawk Lake, NC, USA - Summarized in Carlander 1969	36.035	-75.422	0
Largemouth bass	Lake Alma, OH, USA - Summarized in Carlander 1969	39.084	-82.305	220
Largemouth bass	Lake Bracciano, Italy - Marinelli et al. 2007	42.070	12.140	340
Largemouth bass	Lake Chicamba, Mozambique - Weyl and Hecht 1999	-19.072	33.062	640
Largemouth bass	Lake Manyame, Zimbabwe - Beamish et al. 2005	-17.491	30.332	1220
Largemouth bass	Lake Meander, OH, USA - Summarized in Carlander 1969	41.070	-80.483	320
Largemouth bass	Lake Naivasha, Kenya - Britton et al. 2010	-0.484	36.163	1840
Largemouth bass	Lake Naivasha, Kenya, 1936 - Summarized in Carlander 1969	-0.484	36.163	1840
Largemouth bass	Lake Rathbun, IA, USA - Summarized in Carlander 1969	40.515	-92.593	280
Largemouth bass	Lake Shorenji, Japan - Summarized in Lorenzoni et al. 2002	34.360	136.066	800
Largemouth bass	Lake Trasimeno, Italy - Summarized in Lorenzoni et al. 2002	43.075	12.054	260
Largemouth bass	Lake Vesuvius, OH, USA - Summarized in Carlander 1969	38.373	-82.373	220
Largemouth bass	Lake Yate, New Caladonia - Summarized in Lorenzoni et al. 2002	-22.093	166.504	860

Largemouth bass	Lake of the Ozarks, MO, USA - Summarized in Carlander 1969	37.565	-92.474	340
Largemouth bass	Lawtonka Lake, OK, USA - Summarized in Carlander 1969	34.445	-98.300	300
Largemouth bass	Little Bear Creek Reservoir, AL, USA - Summarized in Rypel 2010	34.263	-87.563	260
Largemouth bass	Little River, OK, USA - Summarized in Rypel 2010	35.161	-97.271	320
Largemouth bass	Little Wall Lake, IA, USA - Summarized in Carlander 1969	42.161	-93.382	320
Largemouth bass	Loch Alpine Ponds, MI, USA - Summarized in Carlander 1969	42.202	-83.491	200
Largemouth bass	Logan Martin Reservoir, AL, USA - Summarized in Rypel 2010	33.305	-86.150	160
Largemouth bass	Lookout Shoals Lake, NC, USA - Summarized in Carlander 1969	35.461	-81.055	280
Largemouth bass	Louisiana Ponds, USA - Summarized in Carlander 1969	31.144	-92.084	0
Largemouth bass	Loveland Lake, CA, USA - Summarized in Carlander 1969	32.471	-116.463	760
Largemouth bass	Lucchetti Reservoir, Puerto Rico - Neal 2003	18.054	-66.520	580
Largemouth bass	MA Reclaimed Ponds, USA - Summarized in Carlander 1969	41.550	-70.424	0
Largemouth bass	Maccamaw Lake, NC, USA - Summarized in Carlander 1969	34.191	-78.300	0
Largemouth bass	Magos Reservoir, Portugal - Godinho and Ferreira 1993	39.000	-8.410	100
Largemouth bass	Martin Reservoir, AL, USA - Summarized in Rypel 2010	32.425	-85.535	120
Largemouth bass	McBride Lake, IA, USA - Summarized in Carlander 1969	41.474	-91.330	200
Largemouth bass	Micjah Pond, MA, USA - Summarized in Carlander 1969	41.551	-70.415	0
Largemouth bass	Miller Lake, MN, USA - Summarized in Carlander 1969	46.434	-92.421	320
Largemouth bass	Millers Ferry Reservoir, AL, USA - Summarized in Rypel 2010	32.056	-87.220	40
Largemouth bass	Millerton Lake, CA, USA - Summarized in Carlander 1969	37.001	-119.413	740
Largemouth bass	Mississippi River, IL, USA - Summarized in Carlander 1969	39.572	-91.265	180
Largemouth bass	Mississippi River, MN, USA - Summarized in Carlander 1969	44.470	-92.571	260
Largemouth bass	Missouri River, IA, USA - Summarized in Carlander 1969	42.095	-96.200	320
Largemouth bass	Mitchell Reservoir, AL, USA - Summarized in Rypel 2010	32.493	-86.284	60
Largemouth bass	Montedoglio Reservoir, Italy - Summarized in Lorenzoni et al. 2002	43.362	12.034	480
Largemouth bass	Mt. Island Lake, NC, USA - Summarized in Carlander 1969	35.210	-80.572	180
Largemouth bass	Murphy Flowage, WI, USA - Summarized in Carlander 1969	45.343	-91.303	340
Largemouth bass	Nantahala Lake, NC - Summarized in Carlander 1969	35.106	-83.396	760
Largemouth bass	Norris Reservoir, TN, USA - Summarized in Carlander 1969	36.134	-84.050	320
Largemouth bass	North Fork and Flyod's River, KY, USA - Summarized in Carlander 1969	38.004	-85.415	160
Largemouth bass	North New Jersey State, USA - Summarized in Carlander 1969	41.006	-74.293	260
Largemouth bass	Nottoway River, NC, USA - Summarized in Rypel 2010	36.324	-76.551	0
Largemouth bass	Noxon Rapids Lake, MT, USA - Summarized in Carlander 1969	47.574	-115.440	1100
Largemouth bass	OR Ponds (Central), USA - Summarized in Carlander 1969	43.481	-120.332	1500
Largemouth bass	OR Ponds (East), USA - Summarized in Carlander 1969	44.144	-123.332	200
Largemouth bass	OR Ponds (Northeast), USA - Summarized in Carlander 1969	45.401	-117.174	1280

Largemouth bass	OR Ponds (South), USA - Summarized in Carlander 1969	42.145	-120.524	1600
Largemouth bass	OR Ponds (West), USA - Summarized in Carlander 1969	44.144	-123.332	200
Largemouth bass	Oahe Lake, SD USA - Summarized in Carlander 1969	44.494	-100.406	500
Largemouth bass	Oconee, Ocmulgee and Altamaha Rivers, GA, USA - Summarized in Carlander 1969	31.215	-81.590	0
Largemouth bass	Ogeechee River, GA, USA - Summarized in Rypel 2010	32.484	-82.102	60
Largemouth bass	Onized Lake, IL, USA - Summarized in Carlander 1969	38.560	-90.106	120
Largemouth bass	Oostanula River, GA, USA - Summarized in Rypel 2010	34.246	-85.022	240
Largemouth bass	Pearl River, MS, USA - Summarized in Rypel 2010	32.464	-89.070	140
Largemouth bass	Pego do Altar Reservoir, Portugal - Godinho and Ferreira 1993	38.253	-8.231	40
Largemouth bass	Point A Reservoir, AL, USA - Summarized in Rypel 2010	31.220	-86.311	80
Largemouth bass	Potomac River, MD, USA - Summarized in Carlander 1969	38.133	-76.506	0
Largemouth bass	Potter Pond, CA, USA - Summarized in Carlander 1969	37.254	-122.096	520
Largemouth bass	Punch Lake, WI, USA - Summarized in Carlander 1969	45.590	-89.431	480
Largemouth bass	Quabbin Lake, MA, USA - Summarized in Carlander 1969	42.214	-72.181	200
Largemouth bass	Ramsey Lake, IL, USA - Summarized in Carlander 1969	39.094	-89.076	160
Largemouth bass	Red Haw Lake, IA, USA - Summarized in Carlander 1969	40.595	-93.162	320
Largemouth bass	Red Hills Lake, IL, USA - Summarized in Carlander 1969	38.434	-87.501	140
Largemouth bass	Reinings Lake, PA, USA - Summarized in Carlander 1969	41.324	-75.185	460
Largemouth bass	Reuter Pond, CA, USA - Summarized in Carlander 1969	37.254	-122.096	520
Largemouth bass	Rhode Islands Ponds, USA - Summarized in Carlander 1969	41.345	-71.284	0
Largemouth bass	Rhodhiss Lake, NC, USA - Summarized in Carlander 1969	35.466	-81.284	260
Largemouth bass	Ridge Lake, IL, USA - Summarized in Carlander 1969	39.241	-88.092	160
Largemouth bass	Rock Creek, OK, USA - Summarized in Rypel 2010	34.502	-96.073	180
Largemouth bass	Rocket Plant Lake, OK, USA - Summarized in Carlander 1969	36.194	-94.143	360
Largemouth bass	Rod and Gun Club Lake, OK, USA - Summarized in Carlander 1969	34.133	-97.082	240
Largemouth bass	Santa Clara Reservoir, Portugal - Godinho and Ferreira 1993	39.175	-7.235	440
Largemouth bass	Santeetlah Lake, NC, USA - Summarized in Carlander 1969	35.212	-83.514	820
Largemouth bass	Satilla River, GA, USA - Summarized in Rypel 2010	31.191	-82.320	40
Largemouth bass	Savannah River, Site 1, GA, USA - Summarized in Rypel 2010	32.051	-81.011	0
Largemouth bass	Savannah River, Site 2, GA, USA - Summarized in Rypel 2010	32.051	-81.011	0
Largemouth bass	Shawnee Lake, OK, USA - Summarized in Carlander 1969	35.243	-96.540	300
Largemouth bass	Singletary Lake, NC, USA - Summarized in Carlander 1969	34.350	-78.271	0
Largemouth bass	Sipsey River, AL, USA - Summarized in Rypel 2010	33.073	-87.541	60
Largemouth bass	Snowden Pond, MD, USA - Summarized in Carlander 1969	39.031	-76.485	0
Largemouth bass	South African Lake - Summarized in Carlander 1969	-30.333	22.562	1100
Largemouth bass	South New Jersey State, USA - Summarized in Carlander 1969	39.336	-74.561	0

Largemouth bass	Spavinaw Lake, OK, USA - Summarized in Carlander 1969	36.213	-95.004	260
Largemouth bass	Sportsman's Lake, IL, USA - Summarized in Carlander 1969	38.270	-90.015	140
Largemouth bass	St. Mary's Lake, OH, USA - Summarized in Carlander 1969	40.315	-84.264	280
Largemouth bass	Sterling Price Reservoir, MO, USA - Summarized in Carlander 1969	39.240	-92.503	240
Largemouth bass	Strike Lake, ID, USA - Summarized in Carlander 1969	42.586	-115.544	1160
Largemouth bass	Subprison Lake, OK, USA - Summarized in Carlander 1969	34.280	-96.033	180
Largemouth bass	Sutherland, CA, USA - Summarized in Carlander 1969	38.020	-121.182	20
Largemouth bass	Texas Pond 52, USA - Summarized in Carlander 1969	31.581	-99.541	500
Largemouth bass	Thayer Lake, IA, USA - Summarized in Carlander 1969	41.012	-94.036	340
Largemouth bass	Three Forks Ponds, MT, USA - Summarized in Carlander 1969	45.534	-111.323	1860
Largemouth bass	Tillery Lake, NC, USA - Summarized in Carlander 1969	35.144	-80.054	100
Largemouth bass	UT Ponds, USA - Summarized in Carlander 1969	39.192	-111.054	2120
Largemouth bass	Universidade do Vale de Rio dos Sinos Reservoir, Sao Leopoldo, Brazil - Schulz and Leal 2005	-29.454	-51.091	420
Largemouth bass	Upper Bear Creek, AL, USA - Summarized in Rypel 2010	34.163	-87.411	220
Largemouth bass	Upper Wood Lake, PA, USA - Summarized in Carlander 1969	41.454	-75.163	380
Largemouth bass	Vale Cobrao Reservoir, Portugal - Godinho and Ferreira 1993	39.423	-7.433	380
Largemouth bass	Vandalia Reservoir, MO, USA - Summarized in Carlander 1969	39.224	-91.243	220
Largemouth bass	Verdigris River, OK, USA - Summarized in Rypel 2010	36.236	-95.313	180
Largemouth bass	Verdigris Tribs, OK, USA - Summarized in Rypel 2010	36.236	-95.313	180
Largemouth bass	Wakado Reservoir, MO, USA - Summarized in Carlander 1969	39.005	-91.543	220
Largemouth bass	Wappapello Reservoir, MO, USA - Summarized in Carlander 1969	36.564	-90.183	80
Largemouth bass	Weiss Reservoir, AL, USA - Summarized in Rypel 2010	34.122	-85.381	180
Largemouth bass	Wheeler Reservoir, AL, USA - Summarized in Rypel 2010	34.416	-87.084	180
Largemouth bass	White Oak Reservoir, TN, USA - Summarized in Carlander 1969	35.541	-84.192	260
Largemouth bass	Willamette Valley, OR, USA - Summarized in Carlander 1969	44.043	-123.125	100
Largemouth bass	Wilson Reservoir, AL, USA - Summarized in Rypel 2010	34.484	-87.302	180
Largemouth bass	Windhaven Lake, TX, USA - Summarized in Carlander 1969	29.414	-95.414	0
Largemouth bass	Wintergreen Lake, MI, USA - Summarized in Carlander 1969	42.235	-85.231	280
Largemouth bass	Wister Lake, OK, USA - Summarized in Carlander 1969	34.556	-94.454	440
Largemouth bass	Woods Lake, TN (Post-Impoundment), USA - Summarized in Carlander 1969	35.183	-86.034	300
Largemouth bass	Woods Lake, TN (Pre-Impoundment), USA - Summarized in Carlander 1969	35.183	-86.034	300
Northern snakehead	AR, USA - Lee Holt, Personal Communication	35.120	-91.495	40
Northern snakehead	Aksay-Kuvandarya Lakes, Kazakhstan - Summarized in Dukravets and Machulin 1978	45.184	61.486	40
Northern snakehead	Amu Darya Delta, Aral Basin, Iran/Turan - Summarized in Dukravets 1992	44.063	59.405	40
Northern snakehead	Amur Basin, Bolon, Russia - Summarized in Dukravets and Machulin 1978	49.495	136.283	20
Northern snakehead	Amur Basin, Yelabug Settlement, Russia - Summarized in Dukravets and Machulin 1978	50.340	137.082	0

Northern snakehead	Amur River, Russia - Amanov 1974	50.263	133.395	740
Northern snakehead	Aydar-Arnasay Lakes, Uzbekistan - Summarized in Dukravets and Machulin 1978	40.535	66.454	980
Northern snakehead	Baoan Lake, China - Congxin et al. 1997	30.141	114.433	20
Northern snakehead	Chandar'inskoye Reservoir, Russia - Summarized in Dukravets 1992	55.180	56.433	120
Northern snakehead	Chimkurgan Reservoir, Uzbekistan - Amanov 1974	38.564	66.233	480
Northern snakehead	Chimkurgan Reservoir, Uzbekistan2 - Summarized in Dukravets 1992	38.564	66.233	480
Northern snakehead	Huanghua Lake, China - Wu et al. 1999	38.202	117.164	0
Northern snakehead	Kamyshlybash Lakes, Kazakhstan, 1972 - Summarized in Dukravets and Machulin 1978	46.114	61.465	60
Northern snakehead	Kamyshlybash Lakes, Kazakhstan, 1974 - Summarized in Dukravets and Machulin 1978	46.114	61.465	60
Northern snakehead	Karauzyskiye Lake, Lower Syr Darya, Aral Basin - Summarized in Dukravets 1992	46.114	61.465	60
Northern snakehead	Net Lake, China - Zhang et al. 1999	29.503	115.133	300
Northern snakehead	Potomac River, MD, USA - Odenkirk and Owens 2007	38.240	-77.166	40
Northern snakehead	Potomac River, MD, USA Site 2 - Gascho Landis 2011	38.240	-77.166	40
Northern snakehead	Poyang Lake, China - Hong-You et al. 2008	29.090	116.130	0
Northern snakehead	Tasutkol'skoye Reservoir of the Chu River, Kazakhstan - Summarized in Dukravets 1992	42.563	74.593	2360
Northern snakehead	Temirbek Reservoir, Talas River - Summarized in Dukravets 1992	49.432	52.545	0
Northern snakehead	Wanghu Lake, China - Xunpu 1999	29.515	115.205	300

References

- Alp, A. and Balik, S. 2000. Growth conditions and stock analysis of the carp (*Cyprinus carpio*, Linnaeus 1758) population in Golhisar Lake. - Turk. J. Zool. 24: 291–304.
- Alp, A. et al. 2005. Age, growth and diet composition of the resident brown trout, *Salmo trutta macrostigma* Dumeril 1858, in Firniz Stream of the River Ceyhan, Turkey. – Turk. J. Vet. Anim. Sci. 29: 285–295.
- Amanov, A. A. 1974. Morphology and mode of life in the Amur snakehead (*Ophiocphalu argus warpachowskii*) in Chimkurgan Reservoir. – J. Ichthyol. 14: 713–717.
- Avery, E. and Hine, R. L. 1985. Sexual maturity and fecundity of brown trout in central and northern Wisconsin streams. – Wisconsin Dept of Nat. Resour. Tech. Bull. 154.
- Barnickol, P. G. and Starrett, W. C. 1951. Commercial and sport fishes of the Mississippi River between Caruthersville, Missouri, and Dubuque, Iowa. – Illinois Nat. Hist. Surv. Bull. 25: 263–350.
- Beamish, C. et al. 2005. Age, growth and reproduction of largemouth bass, *Micropterus salmoides*, in lake Manyame, Zimbabwe. – Afr. Zool. 40: 63–69.
- Becker, G. C. 1983. Fishes of Wisconsin. – Univ. of Wisconsin Press.
- Britton, J. R. et al. 2010. Is the fast growth of an equatorial *Micropterus salmoides* population explained by high water temperature? – Ecol. Freshwater Fish 19: 228–238.
- Brown, C. J. 1992. Standing stocks of fishes in sections of big grizzly creek, Plumas County, 1991. – State of California, Dept of Fish and Game.

- Brown, P. et al. 2005. Population biology of carp (*Cyprinus carpio* L.) in the mid-Murray River and Barmah Forest Wetlands, Australia. – Mar. Freshwater Res. 56: 1151–1164.
- Brown, P. et al. 2003. Carp population biology in Victoria. – Mar. Freshwater Res. Inst., Dept of Primary Studies, 56, Snobs Creek.
- Carlander, K. D. 1969. Handbook of freshwater fishery biology, Vol. 1. – Iowa State Univ. Press.
- Christenson, L. M. and Smith, L. L. 1965. Characteristics of fish populations in upper Mississippi River backwater areas. – Circular 212. US Dept of the Interior, Fish and Wildlife Service. Washington DC.
- Colombo II, R. E. 2007. Demographics and the ecological role of the channel catfish (*Ictalurus punctatus*) in commercially exploited and unexploited reaches of the Wabash River with implications for the flathead catfish (*Pylodictis olivaris*). – Southern Illinois Univ., p. 195.
- Colvin, M. E. et al. 2008. A proposed simulation model to predict the effects of common carp and zebra mussels in shallow lake ecosystems. – Poster for Iowa Water Conference.
- Congxin, X. et al. 1997. The structure of catch and growth characteristics of chinese snakehead fish (*Channa argus*) in Baoan Lake. – J. Huazhong 1997-04.
- Coulter, D. P. et al. 2008. Common carp (*Cyprinus carpio*) population characteristics and recruitment in two Nebraska sandhill lakes. – Trans. Nebraska Acad. Sci. 31: 35–41.
- Daugherty, D. J. and Sutton, T. M. 2005. Population abundance and stock characteristics of flathead catfish in the lower St. Joseph River, Michigan. – N. Am. J. Fish. Manage. 25: 1191–1201.
- Davis, R. A. 1985. Evaluation of flathead catfish as a predator in a Minnesota Lake. – Minnesota Dept Nat. Resour., Div. of Fish and Wildlife 384.

- Donabauer, S. B. 2009. Population dynamics of flathead, channel, and blue catfish in the Wabash River.
- Dukravets, G. M. 1992. The Amur snakehead, *Channa argus warpachowskii* in the Talas and Chu River drainages. – J. Ichthyol. 32: 147–151.
- Dukravets, G. M. and Machulin, A. I. 1978. The morphology and ecology of the Amur snakehead, *Ophiocephalus argus warpachowskii*, acclimatized in the Syr Dar'ya Basin. – J. Ichthyol. 18: 203–208.
- Evermann, B. W. and Clark, H. W. 1920. Lake Maxinkuckee. – Indiana Dept of Conservation 1: 1–60.
- Fernández-Delgado, C. 1990. Life history patterns of the common carp, *Cyprinus carpio*, in the estuary of the Guadalquivir River in south-west Spain. – Hydrobiologia 206: 19–28.
- Finnell, J. C. et al. 1956. The fishery resources of the Little River system, McCurtain County, Oklahoma. – Oklahoma Fish. Res. Lab. Rep. 55: 1–82.
- Frank, S. 1955. Príspevek k. biológii sumecká amerického (*Ameiurus nebulosus* Le Sueur 1819). – Vestník Československé Zoologické Společnosti Acta Soc. Zool. 19: 62–81.
- Fuliang, Y. and Jun, C. 1986. Study on the population dynamics of carp (*Cyprinus carpio* L.) in the Dong Jiang river with reference to the problem of its maximum sustained yield. – Acta Hydrobiol. Sin. 1986-02.
- Gascho Landis, A. M. et al. 2011. Individual growth and reproductive behavior in a newly established population of northern snakehead (*Channa argus*), Potomac River, USA. – Hydrobiologia 661: 123–131.
- Gash, S. L. and Bass, J. C. 1973. Age, growth and population structures of fishes from acid and alkaline strip-mine lakes in southeast Kansas. – Trans. Kansas Acad. Sci. 76: 39–50.

- Gheorghe, D. C. et al. 2011. The growth characteristics of common carp (*Cyprinus carpio*) in the northern part of the small island of Braila Natural Park. – Int. J. Bioflux Soc. 4: 154–158.
- Godinho, F. and Ferreira, M. 1993. Age and growth of *Micropterus salmoides* Lacepede in four Southern Portuguese reservoirs. – Actas VI Congreso Espanol de Limnologia, Granada Mayo de 1993 1993: 425–432.
- Hensel, K. 1966. Age and growth rate of the brown bullhead (*Ictalurus nebulosus* Le Sueur, 1819) in backwaters of the inundation area of the river Elbe in Czechoslovakia. – Acta Fac. Rerum Nat. Univ. Comeninae Zool. 13: 171–191.
- Hightower, J. E. et al. 1999. Effects of contaminated sediments on brown bullhead age structure, growth, and condition in a North Carolina Tidal Creek. – In: Irwin, E. R. et al. (eds), Catfish 2000: Proc. Int. Ictalurid Symp. Am. Fish. Soc., pp. 161–172.
- Hoffman, C. H. and Surber, E. W. 1948. Effects of an aerial application of wettable DDT on fish and fish-food organisms in Black Creek, West Virginia. – Trans. Am. Fish. Soc. 75: 48–58.
- Hong-You, Y. et al. 2008. Studies on age and growth of *Ophiocephalus argus* in Poyang Lake. – Life Sci. Res. 12: 91–94.
- Imamura, K. K. 1975. Life history of the brown bullhead, *Ictalurus nebulosus* (Lesueur), in Lake Washington. – Univ. of Washington, p. 78.
- Jones, B. D. and Noltie, D. B. 2007. Flooded flatheads: evidence of increased growth in Mississippi River *Pylodictis olivaris* (Pisces: Ictaluridae) following the Great Midwest Flood of 1993. – Hydrobiologia 592: 183–209.
- Kheyrandish, A. et al. 2010. Age and growth of brown trout (*Salmo trutta*) in six rivers of the southern part of the Caspian Basin. – Am. J. Anim. Vet. Sci. 5: 8–12.
- Knecht, G. et al. 2008. Annual fish population surveys on Lewis and Clark Lake, South Dakota. p. 67.

- Kolaneci, V. et al. 2010. Some biological properties of two Cyprinid fishes living in Shkodra Lake. – BALWOIS 2010: 1–6.
- Kwak, T. J. et al. 2006. Age, growth, and mortality of introduced flathead catfish in Atlantic Rivers and a review of other populations. – N. Am. J. Fish. Manage. 26: 73–87.
- Lorenzoni, M. et al. 2002. Growth and reproduction of largemouth bass (*Micropterus salmoides* Lacépède, 1802) in Lake Trasimeno (Umbria, Italy). – Fish. Res. 56: 89–95.
- Lubinski, K. S. et al. 1984. Age structure and analysis of carp populations in the Mississippi and Illinois Rivers. – Illinois Nat. Hist. Surv. Rep. Project 3-383-R.
- Lyall, W. C. 1933. A survey of the fishery of the Kaskaskia River. – Illinois Nat. Hist. Surv. Bull. 20: M–123.
- Maia, C. F. Q. and Valente, A. C. N. 1999. The brown trout *Salmo trutta* L. populations in river Lima catchment. – Limnetica 17: 119–126.
- Marinelli, A. et al. 2007. Diet and reproduction of largemouth bass in a recently introduced population, Lake Bracciano (central Italy). – Bull. Fr. Pêche Pisciculture: 53–68.
- Marshall, M. D. et al. 2009. Age and growth variability between sexes of three catfish species in Lake Wilson, Alabama. – N. Am. J. Fish. Manage. 29: 1283–1286.
- McConnell, W. J. 1952. The opercular bone as an indicator of age and growth of the carp, *Cyprinus Carpio* Linnaeus. – Trans. Am. Fish. Soc. 81: 138–149.
- McFadden, J. T. and Cooper, E. L. 1962. An ecological comparison of six populations of brown trout (*Salmo trutta*). – Trans. Am. Fish. Soc. 91: 53–62.

- Morris, L. A. et al. 1971. The flathead catfish in unchannelized and channelized Missouri River, Nebraska. – Nebraska Game and Parks Commission
- White Papers, Conference Presentations and Manuscripts.
- Mueller, K. W. and Downen, M. R. 2000. 1999 Green Lake surveys: aspects of the biology of common carp with notes on the warmwater fish community. – Washington Dept of Fish and Wildlife.
- Neal, J. W. 2003. Live fast die young: on the growth and mortality of largemouth bass in Puerto Rico. – N. Carolina State Univ.
- Odenkirk, J. and Owens, S. 2007. Expansion of a northern snakehead population in the Potomac River system. – Trans. Am. Fish. Soc. 136: 1633–1639.
- Ozvarol, Z. A. B. et al. 2010. Intrabasin variation in growth and condition of brown trout (*Salmo trutta*) inhabited Coruh Basin, Turkey. – J. Anim. Vet. Adv. 19: 2445–2454.
- Paruch, W. 1979. Age and growth of Ictaluridae in Wisconsin. – Univ. of Wisconsin Stevens Point.
- Phaneuf, C. 1974. Croissance, reproduction et nourriture de la barbotte brune, *Ictalurus nebulosus* (Le Sueur), de la Riviere du Nord, Quebec. – Univ. Montreal.
- Priegel, G. R. 1966. Age-length and length-weight relationships of bullheads from Little Lake Butte Des Morts, 1959. – Wisconsin Conserv. Dep. Res. Plan. Div. Res. Rep. 17: 1–6.
- Raney, E. C. and Webster, D. A. 1940. The food and growth of the young of the common bullhead, *Ameiurus nebulosus nebulosus* (Le Sueur) in Cayuga Lake, New York. – Tran. Am. Fish. Soc. 69: 205–209.
- Redd, B. L. 1970. Growth of the brown bullhead, *Ictalurus nebulosus* (Le Sueur), related to acid mine water pollution. – West Virginia Univ., p.

Richardson, R. E. 1913. Observations on the breeding habits of fishes at Havana, Illinois, 1910 and 1911. – Bull. Illinois State Lab. Nat. Hist. 9:

405–416.

Rubec, P. J. and Qadri, S. U. 1982. Comparative age, growth, and condition of brown bullhead, *Ictalurus nebulosus*, in sections of the Ottawa River,

Canada. – Can. Field Nat. 96: 6–18.

Rypel, A. 2010. River impoundment and sunfish growth. – River Res. Appl.

Sakaris, P. C. et al. 2006. Comparison of native and introduced flathead catfish populations in Alabama and Georgia: growth, mortality, and

management. – N. Am. J. Fish. Manage. 26: 867–874.

Saly, P. 2005. A fekete es barna torpeharcza novekedese az elso harom eletevben. – J. Hung. Hydrol. Soc. 85: 118–119.

Schoumacher, R. 1968. Some observations on flathead catfish in the Mississippi River bordering Iowa. – Trans. Am. Fish. Soc. 97: 65–66.

Schulz, U. H. and Leal, M. E. 2005. Growth and mortality of black bass, *Micropterus salmoides* (Pisces, Centrarchidae; Lacapède, 1802) in a

reservoir in southern Brazil. – Braz. J. Biol. 65: 363–369.

Scott, W. B. and Crossman, E. J. 1973. Freshwater fishes of Canada. – Bull. Fish. Res. of Canada.

Shuwei, L. Z. Y. 1993. Studies on the growth characteristics of common carp (*Cyprinus carpio*) and crucian carp (*Carassius auratus*) in Biliuhe

Reservoir and its utilization in fishery. – J. Dalian Fish. Univ. 1993-Z1.

Sifa, L. et al. 1990. The yield and growth of major fish species in a large Chinese Reservoir. – Asian Fish. Sci. 185: 185–196.

Sinnot, T. J. 1987. Population biology of the brown bullhead (*Ictalurus nebulosus* Lesueur). – J. Freshwater Ecol. 4: 225–234.

- Starrett, W. C. and Fritz, A. W. 1965. A biological investigation of the fishes of Lake Chautauqua, Illinois. – Illinois Nat. Hist. Surv. Bull. 29: 1–104.
- Stucky, N. P. and Klassen, H. E. 1971. Growth and condition of carp and the river carpsucker in an altered environment in western Kansas. – Trans. Am. Fish. Soc. 2: 276–282.
- Swee, N. P. and McCrimmon, H. R. 1966. Reproductive biology of the carp, *Cyprinus carpio* L., in Lake St. Lawrence, Ontario. – Trans. Am. Fish. Soc. 95: 372–380.
- Tempero, G. A. T. W. et al. 2006. Age composition, growth, and reproduction of koi carp (*Cyprinus carpio*) in the lower Waikato region, New Zealand. – N. Z. J. Mar. Freshwater Res. 40: 571–583.
- Toshner, S. and Manz, C. 2008. Biological and social dynamics of the White River brown trout fishery, 2003-2005. – Wisconsin Dept Nat. Resour., Fish. Manage. Rep. 153.
- Upper Mississippi River Conservation Committee. 1946. Second progress report of the technical committee for fisheries. - Upper Mississippi River Conservation Committee Report.
- Vilizzi, L. and Walker, K. F. 1999. Age and growth of the common carp, *Cyprinus carpio*, in the River Murray, Australia: validation, consistency of age interpretation, and growth models. – Environ. Biol. Fish. 54: 77–106.
- Weiming, Z. J. F. Q. W. 1998. Study of the population dynamics of common carp in Laojianghe Lake, a breed resources pool of four main kinds of chinese carps. – J. Huazhong Agricultural 1998-04.

- West, D. W. et al. 2006. Cumulative impacts assessment along a large river, using brown bullhead catfish (*Ameiurus nebulosus*) populations. – Environ. Toxicol. Chem. 25: 1868–1880.
- Weyl, O. L. F. and Hecht, T. 1999. A successful population of largemouth bass, *Micropterus salmoides*, in a subtropical lake in Mozambique. – Environ. Biol. Fishes 54: 53–66.
- Winker, H. et al. 2010. Validating and corroborating the deposition of two annual growth zones in asteriscus otoliths of common carp *Cyprinus carpio* from South Africa's largest impoundment. – J. Fish Biol. 77: 2210–2228.
- Wu, L. et al. 1999. Age and growth of snakehead fish (*O. argus*) in Huanghua Lake. – J. Jilin Agric. Univ. 22: 94–96.
- Xunpu, Z. et al. 1999. Studies on age and growth of *Channa argus* in the Wangu Lake. – Acta Hydrobiol. Sin. 1999-06.
- Zhang, X. P. et al. 1999. Net lake age and growth of *Channa argus*. – Aquat. Biol.: 1-5.

Table A2. ANCOVA model coefficients, standard errors (SE) and p-values. Note that all models were run with native populations as the reference categorical variable and should be interpreted as such.

Species	Model values	Intercept	Log age	Precip	Temp	Pop type	Log age × precip	Log age × mean temp	Log age × pop type
Largemouth bass	coefficient	13.322	421.831	0.229	6.339	15.897	-0.465	1.620	-39.653
	SE	12.954	21.630	0.103	0.848	7.463	0.178	1.455	12.935
	p	0.304	< 0.0001	0.026	< 0.0001	0.033	0.009	0.266	0.002
Northern snakehead	coefficient	193.369	647.511	0.049	-1.242	-19.856	-1.261	-0.064	-51.131
	SE	27.278	50.833	0.261	1.730	26.714	0.473	3.129	47.853
	p	< 0.0001	< 0.0001	0.850	0.474	0.459	0.009	0.984	0.287
Brown bullhead	coefficient	10.843	296.534	0.958	3.633	-33.300	-0.968	-0.059	30.803
	SE	19.638	35.368	0.270	1.502	11.306	0.479	2.429	20.416
	p	0.581	< 0.0001	0.000	0.016	0.003	0.044	0.981	0.132
Brown trout	coefficient	86.117	475.167	-0.123	1.068	35.735	-1.219	-4.006	115.043
	SE	46.054	76.086	0.280	2.732	25.804	0.472	4.781	43.791
	p	0.063	< 0.0001	0.662	0.696	0.167	0.010	0.403	0.009
Common carp	coefficient	36.647	611.590	0.393	4.173	124.691	-0.346	-2.395	-190.588
	SE	34.922	46.904	0.352	2.825	21.230	0.438	3.744	28.704
	p	0.294	< 0.0001	0.265	0.140	< 0.0001	0.431	0.523	< 0.0001
Flathead catfish	coefficient	-134.080	974.249	2.206	-0.967	66.169	-3.027	-0.008	101.659
	SE	51.234	57.133	0.494	4.193	35.306	0.683	5.110	41.634
	p	0.009	< 0.0001	< 0.0001	0.818	0.061	< 0.0001	0.999	0.015