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Electronic Supplementary Material
This supplementary material has not been peer reviewed.

Title: **What do we really know about the impacts of one of the 100 worst invaders in Europe? A reality check**

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Excel file of supplementary Table S1 can be requested by E-Mail: anouk.nguyen@unibas.ch

Supplementary Table S1: Literature review
Supplementary Table S2: Impacts on Yellow perch *Perca flavescens*

scientific name	common name	reference	title	subgroup of papers	life stage	function	"importance" of the s	goby life stage	location	country	water system	additional info on samples	salinity	depth	Min. / Max. Me	distance to shore	season/months	season/month	years of study	year when effect we	arrival of gob	reference round goby	round goby dens	method (data aquisit	method (data aquisition)	sample method	direct effects	index / value additional info	anticipated (future) effects
Percy fluviatilis	Yellow perch	Dunton 2006	Behavioral interactions between not applicable		juvenile (about 60 mm TL)				Lake Erie	USA	lake						2003/2004		2002/2004		n/a	May		fall experiment	hard choice + habitat choice	behavioral observations	ANOVA	no interspecific interaction	no other competitors; differing habitat preference and food resour
Micropterus dolomieu	Smallmouth bass	Thompson & Smien 2014	Diet shift response in round goby vertebrate > 1 study	eggs	prey	native		small < 65 mm, large ≥ 6	Lake Erie	USA	lake	western part of lake	fresh	shallow <2 m and de n/a			27 June to 5 July	28 June to 5 July	2011		n/a	n/a	n/a	field	trotlines + seine net + otter trawl	stomach content			food item	0.13 %N, percent number of each item, 0.20 %V, percent volume of each item, 5,00
Platichthys flesus	European flounder	Karlson et al 2007	Indications of competition between vertebrate, only	adults?	predator	under management	n/a		Lake Michigan	USA	lake	Bauser Archipelago, northern part	fresh	not applicable	n/a	n/a	2003		2003, compared with	2010		2006	Kavanagh et al. 2005 2010 round goField		boat surveys	observations			food item	a significant shift in foraging by foraging range expansion could be
Platichthys flesus	European flounder	Karlson et al 2007	Indications of competition between vertebrate, only	1 year-reviewed relevant study	prey				Lake Michigan	USA	lake	Bauser Archipelago, northern part	fresh	not applicable	n/a	n/a	May - July		2010, compared with	2010		2006	Clapp et al Lake Michigan wide fished			surveys + monitoring + regurgitated food + length + bioenergetic modeling		food item	table 3	most common prey item, decline may have the potential to con
Perca fluviatilis	Yellow perch	Schipbower 2011	What do Ponto-Caspian Gobiidae not applicable		juvenile (> 95 mm TL)				Rhine	Netherlands	river	Delta	fresh				2003/2004		2003/2004		early 1990s				field	several fishing methods	stomach content				urea when food was present. Low food amount + low agressions in
Gasterosteus aculeatus	Threespine stickleback	Schipbower 2011	What do Ponto-Caspian Gobiidae not applicable		prey				Rhine	Netherlands	river	Delta	fresh												field	several fishing methods	stomach content				urea when food was present. Low food amount + low agressions in
Gasterosteus aculeatus	Threespine stickleback	Schipbower 2011	What do Ponto-Caspian Gobiidae not applicable		prey				Rhine	Netherlands	river	Delta	fresh												field	several fishing methods	stomach content				urea when food was present. Low food amount + low agressions in
Neogobius melanostomus	Round goby	Wandell 2001	The food and feeding of the invertebrates > 1 study		adult				Lake Erie	USA	lake	western part of lake	fresh												field	several fishing methods	stomach content				competition for Bythotrephes, Polyps negative effect on Flounder and
Micropterus dolomieu	Smallmouth bass	Dennhart et al 2004a	Round Goby Predation on Smallm vertebrate > 1 study	eggs	prey	angling fish	n/a		Lake Erie	USA	lake	Bass Islands, Western Lake Erie	fresh	2-4m	n/a		early May-June		1999–2001		1993		Charlestons high density		in situ experiment	food choice (unwanted catch-and-re	visual, visual and video observation	Beast coffee food item				goby can consum Negative effects on reproductio no entire nest could be consumed
Neogobius melanostomus	Round goby	Wandell 2001	The food and feeding of the invertebrates		prey				Lake Michigan	USA	lake	Door Peninsula east of Green Bay		Cranston Lagoon										field	seine net + otter trawl	stomach content				competition for Bythotrephes, Polyps negative effect on Flounder and
Ameiurus nebulosus	Brown bullhead	Dennhart et al 2004a	Round Goby Predation on Smallm vertebrate > 1 study	eggs	prey	angling fish	n/a		Lake Erie	USA	lake	Bass Islands, Western Lake Erie	fresh	2-4m	n/a		early May-June		1999–2001		1993		Charlestons high density		in situ experiment	food choice (unwanted catch-and-re	visual, visual and video observation	Beast coffee food item				goby can consum Negative effects on reproductio no entire nest could be consumed
Ameiurus nebulosus	Brown bullhead	Dennhart et al 2004a	Round Goby Predation on Smallm vertebrate > 1 study	eggs	prey				Lake Erie	USA	lake	Bass Islands, Western Lake Erie	fresh	2-4m	n/a		early May-June		1999–2001		1993		Charlestons high density		in situ experiment	food choice (unwanted catch-and-re	visual, visual and video observation	Beast coffee food item				goby can consum Negative effects on reproductio no entire nest could be consumed
Micropterus salmoides	Largemouth bass	Turobinski et al 2010	Round Goby Zhengbiolus molinosa vertebrate > 1 study	n/a	prey				St. Lawrence River	Canada	river	Lac Saint-Louis		Bay of Quinte, sampled two locatio fresh			transects: 1.5-3 m, 3 mean temp appe to several methods		May-Oct./Nov.	May-Oct./Nov.	2004/2005	2004/2005		lower bay 1999, upper bay 2	31.2 L/Nm2 lower bay,	field		line + minnow trap + seine net	stomach content		bioenergetic-model data		53% of stomachs contained goby, 88% of stomach biomass were goby
Micropterus dolomieu	Smallmouth bass	Turobinski et al 2010	Round Goby Predation on Smallm vertebrate > 1 study	n/a	prey				St. Lawrence River	Canada	river	Lac Saint-Louis													field		scuba + gillnet + minnow trap	stomach content		comparison preferred food organisms	abundance + diversity of small gastropods negatively correlates with gobby density
Micropterus salmoides	Largemouth bass	Turobinski et al 2010	Round Goby Zhengbiolus molinosa vertebrate > 1 study	n/a	prey				St. Lawrence River	Canada	river	Lac Saint-Louis, southern Lake Michigan												in situ experiment	food choice					abundance + diversity of small gastropods negatively correlates with gobby density
Esox lucius	Northern pike	Karpé et al 2010	Diet shift response in round goby vertebrate > 1 study		69–106&L mean 671±111 mm TL	predator	native	n/a	St. Lawrence River	Canada	river	Lake St. Pierre	fresh	At mean water discharge of 20°C			August-October (27.6–2.10.)		2007		2007		2006 (first time e Mid-October, frequency of occurrence field					model calculations	food item	25.4% occurrence occurrence influenced by spatial factors according to model calcul
Sander vitreus	Walleye	Karpé et al 2010	Do Native Predators Feed on Non-vertebrate > 1 study		132–806, mean 390±155 mm TL	predator	native	n/a	St. Lawrence River	Canada	river	Lake St. Pierre	fresh	At mean water discharge of 20°C			August-October (27.6–2.10.)		2007		2007		2006 (first time e Mid-October, frequency of occurrence field					model calculations	food item	46.0% occurrence occurrence mainly influenced by size and predators and biotic factor
Gasterosteidae	Sticklebacks	Karpé et al 2010	Impacts of the Eurasian round goInvertebrates		prey				St. Lawrence River	Canada	river	Lac Saint-Louis													field	several fishing methods	stomach content				competition for Bythotrephes, Polyps negative effect on Flounder and
Dreissena polymorpha and other Mollusc	Zebra mussel and other m Rakauskas et al 2013		Increasing population of the invad vertebrate > 1 study		small 8.9 +/- 0.3 cm TL; medium 13.1+/	predator	top predator	10.4 ± 1.7 mm	Baltic Sea	Lithuania	lagoon	Curonian Lagoon	fresh / brackish?	n/a	n/a	shallow littoral zone	Aug or Sept	Aug or Sept	2007-2012, additional 2010		2002		Bacevičiu	1 - 251 m2 / 1000 m2	field	seine net + gill net	stomach content + stable isotope			food item	gobby in Fi Fisher UD Limnic response niche
Dreissena polymorpha and other Mollusc	Zebra mussel and other m Rakauskas et al 2013		Increasing population of the invad vertebrate > 1 study		10.4 ± 1.7 mm	predator	top predator	10.4 ± 1.7 mm	Baltic Sea	Lithuania	lagoon	Curonian Lagoon	fresh / brackish	n/a	n/a	shallow littoral zone	Aug or Sept	Aug or Sept	2007-2012, additional 2010		2002		Bacevičiu	1 - 251 m2 / 1000 m2	field	seine net + gill net	stomach content + stable isotope			food item	95% of regurgitga changed diet of femora towards probably led to an increase in bo
Gymnocephalus cernua	Ruffe	Rakauskas et al 2013	Increasing population of the invad vertebrate > 1 study		10.4 ± 1.7 mm	predator	top predator	10.4 ± 1.7 mm	Baltic Sea	Lithuania	lagoon	Curonian Lagoon	fresh / brackish	n/a	n/a	shallow littoral zone	Aug or Sept	Aug or Sept	2007-2012, additional 2010		2002		Bacevičiu	1 - 251 m2 / 1000 m2	field	bench seine + gill net	stomach content + stable isotope			food item	95% of regurgitga changed diet of femora towards probably led to an increase in bo
Perca fluviatilis	Eurasian perch	Rakauskas et al 2013	Increasing population of the invad vertebrate > 1 study		small 8.9 +/- 0.3 cm TL; medium 13.1+/	predator	top predator	10.4 ± 1.7 mm	Baltic Sea	Lithuania	lagoon	Curonian Lagoon	fresh / brackish	n/a	n/a	shallow littoral zone	Aug or Sept	Aug or Sept	2007-2012, additional 2010		2002		Bacevičiu	1 - 251 m2 / 1000 m2	field	bench seine + gill net	stomach content + stable isotope			food item	gobby in Fi Fisher UD Limnic response niche
Ameiurus melas	Black bullhead	Rakauskas et al 2013	Increasing population of the invad vertebrate > 1 study		10.4 ± 1.7 mm	predator	top predator	10.4 ± 1.7 mm	Baltic Sea	Lithuania	lagoon	Curonian Lagoon	fresh / brackish	n/a	n/a	shallow littoral zone	Aug or Sept	Aug or Sept	2007-2012, additional 2010		2002		Bacevičiu	1 - 251 m2 / 1000 m2	field	bench seine + gill net	stomach content + stable isotope			food item	around 17% of all round gobby constitutes 17 A+/ stabilisation of round gobby populat
Ameiurus nebulosus	Brown bullhead	Rakauskas et al 2013	Increasing population of the invad vertebrate > 1 study		10.4 ± 1.7 mm	predator	top predator	10.4 ± 1.7 mm	Baltic Sea	Lithuania	lagoon	Curonian Lagoon	fresh / brackish	n/a	n/a	shallow littoral zone	Aug or Sept	Aug or Sept	2007-2012, additional 2010		2002		Bacevičiu	1 - 251 m2 / 1000 m2	field	bench seine + gill net	stomach content + stable isotope			food item	4.3% of consumed organisms 4 stabilisation of round gobby populat
Perca fluviatilis	Eurasian perch	Grey hector	Long-term impacts of the invasive not applicable		≥ 75 mm TL	predator	top predator		St. Clair River	USA	river														field	trotlines	stable isotopes	23		food item	4.3% of consumed organisms
Percopsis omiscomaycus	Trout-perch	Burkett 2013	Long-term impacts of the invasive not applicable		≥ 75 mm TL	predator	top predator		St. Clair River	USA	river														field	seine net + trawling	stomach content			food item	
Sander vitreus	Walleye	Burkett 2013	Long-term impacts of the invasive not applicable			predator	top predator		St. Clair River	USA	river						May			2010		2008 (Kornis et al.								
Sander vitreus	Walleye	Koonman et al 2014	Angler-Caught Piscivore Diets Re vertebrate > 1 study	adults, minimum legal harvest lengths	predator	sport fishery	mostly < 150 mm TL	Pig	Lake Huron	USA	lake	main basin	fresh	traditionally, most e n/a's			May-October	May-October	2009-2011		2009-2011		after 1991 and wi Lake et al., n/a		field	sport fishing	stomach content			food item	28.1% occurence; 20.1% of wet weight
Mylilus edulis	Mussels	Ward 2001	Pallenbiology has den outmoved not applicable		prey							autumn					autumn		2010		2008 (Kornbluh, n/a)								
Potamogyrgus antipodarum	Gastropods	Ward 2001	Pallenbiology has den outmoved not applicable		prey	invasive						autumn					autumn		2010		2008 (Kornbluh, n/a)								
Hydrobia	Snails	Ward 2001	Pallenbiology has den outmoved not applicable		prey							autumn					autumn		2010		2008 (Kornbluh, n/a)								
Percina maculata	Blackside darter	Kornis et al 2013	Invasion success and impact of a vertebrate, only 1	1 year-reviewed relevant study	prey				catchment of Lake Ont		lake	catchment					2007, 2010		2010		n/a (schung						redundancy effect on abundance		effect expected after a longer pres
Amphipoda	Amphipods	Hempel 2014	Analyse der ökologischen Einnisc not applicable		prey				Kiel Canal	Germany	sea													field	several fishing methods	stomach content		304 round gobies		in 2012! particularly in October:	
Dreissena	Zebra mussel	Dennhart et al 2008	Predation on Invasive eggs by Pe vertebrate	eggs	prey		0+		Lake Erie	USA	lake	Curonian Lagoon		0 m											field	seine net + gill net	stomach content + stable isotope			food item	35% of total stomach content
Osmerus	Smelt	Rakauskas et al 2013	Increasing population of the invad vertebrate > 1 study				0+		Baltic Sea	Poland/Lithuani sea				Aug or Sept			2007-2012				2002		1 - 251 m2 / 1000m2	field	seine net + gill net	stomach content + stable isotope			food item	35% of total stomach content
Dreissena polymorpha + Dreissena bugens	Dreissenid mussels	Laderet al 2006	Impact of Round Gobies (Neogob Invertebrate		prey				Lake Michigan	USA	lake	Door Peninsula east of Green Bay													field + in situ experiment	rock transfer experiment	stomach content			food item	low abundance of Dreissenids in areas with goby or without. Prese
Bryozoa	Bryozoa	Boeckler et al 2013	Comparative feeding ecology of r Invertebrate		prey				Danube	Germany	river	upper Danube					2010				2004 Pointner & wi to 20 gobs / m2		field							
Amphipoda	Amphipods	Laderet al 2006	Impact of Round Gobies (Neogob Invertebrate		prey				Lake Michigan	USA	lake	Door Peninsula east of Green Bay													field + in situ experiment	rock transfer experiment	stomach content			possible prey organisms	possible predation and indirect eff
Dreissena	Zebra mussel	Ward 2001	Pallenbiology has den outmoved not applicable		larvae				Lake Erie	USA	lake	western part of lake									2011				field					highest abundance in may	
Cymatium vokdalor and other Amphipod	Cymatium (amphipods)	Hempel 2014	Analyse der ökologischen Einnisc not applicable		prey				Kiel Canal	Germany	sea														field	several fishing methods	stomach content			important food item	2011: highest frequency in June-September; 2012: highest frequ
Amphipoda	Amphipods	Laderet al 2008	Impacts of the introduced Round Invertebrate		prey				Lake Michigan	USA	lake	Door Peninsula east of Green Bay													field + in situ experiment	rock transfer experiment	stomach content			possible prey organisms	possible predation and indirect eff
Amphipoda	Amphipods	Ward 2001	Pallenbiology has den outmoved not applicable		prey				Lake Erie	USA	lake	western part of lake													field	several fishing methods	stomach content			important food item	lower abundance of gastropods probably direct effect by predatio
Cymatium sp.	Cymatium (amphipods)	Simonov & Rowe 2013	Diet Composition and Feedi Invertebrate		prey				Danube	Slovakia	river	Danube													field	several fishing methods	stomach content			important food item	lower abundance of gastropods probably direct effect by predatio
Micropterus dolomieu	Smallmouth bass	Crane et al 2015	Trends in body condition of vertebrate > 1 study	140 - 510 mm TL (in categories)	predator	native	n/a		Lake Ontario	USA	lake	eastern part of lake	fresh	see Lantry (2013) focus 16-27°C			late summer	late summer	1993-2012		pre (post-invasion comple 1999		n/a	n/a	field		mess wt length			quantile regression	
Micropterus salmoides	Largemouth bass	Crane et al 2015	Trends in body condition of vertebrate > 1 study						Lake Ontario	USA	lake	eastern part of lake	fresh				late summer	late summer							field	several fishing methods	stomach content			important food item	
Cymatium volodalor and other Amphipod	Cymatium (amphipods)	Hempel 2014	Analyse der ökologischen Einnisc not applicable	larvae	prey				Kiel Canal	Germany	sea										2011				field	several fishing methods	stomach content			important food item	27.66% of biomass, 63.12% occurence
Amphipoda	Amphipods	Laderet al 2008	Impacts of the introduced Round Invertebrate		prey				Lake Michigan	USA	lake	Door Peninsula east of Green Bay													field + in situ experiment	rock transfer experiment	stomach content			possible prey organisms	possible predation and indirect eff
Gasterosteidae	Sticklebacks	Ward 2001	Pallenbiology has den outmoved not applicable		prey				Lake Erie	USA	lake	western part of lake													field	several fishing methods	stomach content			important food item	
Gasterosteidae	Sticklebacks	Rakauskas et al 2013	Increasing population of the invad vertebrate > 1 study			predator			Baltic Sea	Lithuania	lagoon	Curonian Lagoon									2002		1 - 251 m2 / 1000m2	field	seine net + gill net	stomach content + stable isotope			food item	around 17% of all
Monroe chiopias	White bass	Campbell et al 2009	Re-Engineering the Eastern Lake vertebrate > 1 study	average 195.0 mm TL (SD=41.0)	predator	commercially and recreation 0+ f			Lake Erie	USA	lake	central part of lake	fresh	n/a	n/a	n/a	July-August	July-August	2002-2003		2002-2003		n/a		field	several fishing methods	stomach content + stable isotop WB S. RU-Vacc Che	
Sander vitreus	Walleye	Johnson et al 2005a	A Potential New Energy Pathway vertebrate > 1 study	n/a	prey				Lake Erie	USA	lake	central part of lake	fresh				May-October	May-October	1995-2002		2002		1994		Forage Tux standing stock 203 48/field			trawling	stomach content			bioenergetic-food item	53% of diet (dry- no consistent trend in growth a round gobs are suggested to provi
Sander vitreus	Walleye	Koonman et al 2014	Angler-Caught Piscivore Diets Re vertebrate > 1 study		prey				Lake Erie	USA	lake	middle Sandusky													field		electrofishing + hundred			stomach content	
Bryozoa	Bryozoa	Simonov & Rowe 2013	Diet Composition and Feedi Invertebrate		prey				Danube	Slovakia	river	near Bratislava													field					important food item	27.66% of biomass, 63.12% occurence
Sander vitreus	Walleye	Ward 2001	Pallenbiology has den outmoved not applicable		prey				Lake Erie	USA	lake	western part of lake													field	several fishing methods	stomach content			important food item	
Sander lucioperca	Zander	Rakauskas et al 2013	Increasing population of the invad vertebrate > 1 study		predator				Baltic Sea	Lithuania	lagoon	Curonian Lagoon									2002		1 - 251 m2 / 1000m2	field	seine net + gill net	stomach content + stable isotope			food item	around 17% of all
Monroe chiopias	White bass	Johnson et al 2005a	A Potential New Energy Pathway vertebrate > 1 study	n/a	predator	n/a	0+ f y		Lake Erie	USA	lake	central part of lake	fresh				May-October	May-October	1995-2002		2002		1994		Forage Tux standing stock 203 48/field			trawling	stomach content			bioenergetic-food item	53% of diet (dry- no consistent trend in growth a round gobs are suggested to provi
Amphipoda	Amphipods	Ward 2001	Pallenbiology has den outmoved not applicable		prey	native	n/a		Lake Erie	USA	lake	western part of lake													field	several fishing methods	stomach content			important food item	
Amphipoda	Amphipods	Bunn et al 2003	Fish community assessment vertebrate > 1 study		prey	native	n/a		Lake Erie	USA	lake	eastern part of lake	catchment				2007, 2010		2003, 2010		n/a (includes a				field	electrofishing	measured, enumerated and released		redundancy/effect on abundance		Environmental characteristics fi effect expected after a longer pres
Amphipoda	Amphipods	Bunn et al 2003	Invasion success and impact of a vertebrate > 1 study		prey	native	n/a		Lake Erie	USA	lake	eastern part of lake	catchment				2007, 2010		n/a (includes a		n/a (includes a		field	electrofishing	measured, enumerated and released		redundancy/effect on abundance		Environmental characteristics fi effect expected after a longer pres
Neogobius melanostomus	Round goby	French III & Jude 2001	Diets and Diet Overlap of Normal vertebrate > 1 study		prey	native	0+ f y		St. Clair River	USA	river														field	several fishing methods	stomach content			important food item	30% occurence of goby remains, goby represent important part of stomach content
Micropterus dolomieu	Smallmouth bass	Greenscombe & Fox 2013	Living at the edge of the Exotic vertebrate > 1 study		prey	native	0+ f y		Lake Ontario	Canada	lake	Bay of Quinte, sampled two locatio fresh		transects: 1.5-3 m, 3 mean temp appe to several methods			May-Oct./Nov.	May-Oct./Nov.	2004/2005	2004/2005		lower bay 1999, upper bay 2	31.2 L/Nm2 lower bay,	field		line + minnow trap + seine net	stomach content		bioenergetic-food item	30% of analysed stomachs contained goby remains
Perca fluviatilis	Yellow perch	Campbell et al 2009	Re-Engineering the Eastern Lake vertebrate > 1 study	average 195.0 mm TL (SD=36.8)	predator	n/a			Lake Erie	USA	lake	eastern part of lake	fresh				July-August	July-August	2002-2003		2002-2003		n/a		field	several fishing methods	stomach content + stable isotop YP TL RU-Vacc Che	
Perca fluviatilis	Yellow perch	Johnson et al 2005a	A Potential New Energy Pathway vertebrate > 1 study	n/a	prey				Lake Erie	USA	lake	central part of lake	fresh				May-October	May-October	1995-2002		2002		1994		Forage Tux standing stock 203 48/field			trawling	stomach content			bioenergetic-food item	29.3% of bec stocks change in top predator diets -> round goby is an important compor
Chaoborus flavicans	Phantom midge	Bunn et al 2003	Fish community assessment vertebrate > 1 study		prey	native	n/a	see table 3	Lake Erie	USA	lake	western part of lake	catchment				2007, 2010		2003, 2010		n/a (includes a				field	electrofishing	measured, enumerated and released		redundancy/effect on abundance		yellow perch declining in abundance, round goby may provide energetic a
Chaoborus flavicans	Phantom midge	Bunn et al 2003	Invasion success and impact of a vertebrate > 1 study		prey				Lake Erie	USA	lake	western part of lake	catchment				2007, 2010		n/a (includes a		0.07 - 0.56 f/d / m2		field	electrofishing	measured, enumerated and released		redundancy/effect on abundance		Environmental characteristics fi effect expected after a longer pres
Ephemeroptera nigrum	Johnny darter	Kornis et al 2013	Invasion success and impact of a vertebrate > 1 study		prey	native	n/a		Lake Erie	USA	lake	eastern part of lake	catchment				2007, 2010		n/a (includes a		0.07 - 0.56 f/d / m2		field	electrofishing	measured, enumerated and released		redundancy/effect on abundance		Environmental characteristics fi effect expected after a longer pres
Etheostoma olmstedi	Tessellated darter	Kornis et al 2013	Invasion success and impact of a vertebrate > 1 study		prey	native	n/a		Lake Erie	USA	lake	eastern part of lake	catchment				2007, 2010		n/a (includes a		0.07 - 0.56 f/d / m2		field	electrofishing	measured, enumerated and released		redundancy/effect on abundance		Environmental characteristics fi effect expected after a longer pres
Gobia bottili	Mottled sculpin	Kornis et al 2013	Invasion success and impact of a vertebrate > 1 study		prey	native	n/a		Lake Erie	USA	lake	eastern part of lake	catchment				2007, 2010		n/a (includes a		0.07 - 0.56 f/d / m2		field	electrofishing	measured, enumerated and released		redundancy/effect on abundance		Environmental characteristics fi effect expected after a longer pres
Percina kesleri	Bighead goby	Brandner et al 2013	Comparative feeding ecology of r vertebrate > 1 study	average 9.6 cm (SD = 1.3 Donde	predator	invasive	average 9.6 cm (SD = 1.3 Donde		Germany	river	upper Danube			60 cm	n/a	shoreline	29th March+16th Jun 29th March+16th 2010		2004		Pointner & wi to 20 gobs / m2		field	electrofishing	stomach content + stable isotop 2/3 fi ke Heidler & Fi competition	
Percina kesleri	Bighead goby	Brandner et al 2013	Comparative feeding ecology of r vertebrate > 1 study	average 10.0 cm (SD = 1.9 cm)	predator	invasive	average 9.6 cm (SD = 1.3 Donde		Germany	river	upper Danube			60 cm	n/a	shoreline	29th March+16th Jun 29th March+16th 2010		2004		Pointner & wi to 20 gobs / m2		field	electrofishing	stomach content + stable isotop 2/3 fi ke Heidler & Fi competition	
Amphipoda	Amphipods	Barton et al 2005	Effects of Round Gobies (Neogob Invertebrate		prey				Lake Erie	USA	lake	eastern part of lake					2002-2004		n/a (after 1990)		1992		field		scuba + line			stomach content	important food item	
Micropterus sp.	Smallmouth bass	Campbell et al 2009	Re-Engineering the Eastern Lake vertebrate		prey		< 11.2 cm TL		Lake Erie	USA	lake	eastern part of lake					July-August		2002-2003		n/a				field	several fishing methods	stomach content + stable isotope			stomach content	important food item	
Dreissena bugensis	Dreissenid mussels	Campbell et al 2009	Re-Engineering the Eastern Lake vertebrate		prey		> 11.2 cm TL		Lake Erie	USA	lake	eastern part of lake					July-August		2002-2003		n/a				field					stomach content	important food item	
Dreissenidae	Dreissenid mussels	Mamontka et al 2010	Signatures of contamination in n not applicable		prey	n/a			Lake Ontario	Canada	lake	Hamilton Harbour, western part of	lake		<1m				2006						field		microwave trap	toxicology of tissue	ANOVA/MLR contamination	
Dreissena	Zebra mussel	Mamontka et al 2010	Signatures of contamination in n not applicable		prey	n/a			Lake Ontario	Canada	lake	Hamilton Harbour, western part of	lake		May 2 - Oct 26				2006						field		microwave trap	toxicology of tissue	ANOVA/MLR contamination	copper and cadmium were also contaminant transfer may be facili
Dreissena rostriformis bugensis	Dreissenid mussels	Rosenman et al 2006	Predation on Invasive eggs by Pe invertebrate	eggs	prey		41-139 mm TL		Lake Erie	USA	lake	western part of lake	fresh				1995-2002		2002		1994		standing stock 203 48/field			trawling	stomach content + egg pump			138	40% of consumed eggs mass, 90% of vegetation mass consumed by age 0 gobies
Dreissenidae and other benthic invertebrates	Invertebrates	Johnson et al 2005a	A Potential New Energy Pathway vertebrate > 1 study		prey		0+ f y		Lake Erie	USA	lake	central part of lake	fresh				1995-2002		2002		1994		standing stock 203 48/field			trawling	stomach content			bioenergetic-food item	58% of consumer-ver 80% of dreissenid biomass consumed by older than 0+ gobies
Dysnectes and other Chydoridae	Invertebrates	Jansson & Lode 2001	Recruitment Failure of Nestled Ecosystem vertebrate		prey				Lake Michigan	USA	lake	Calumet Harbour, southern Lake Michigan													field	several fishing methods	stomach content			important food item	
Selenitoa nemoralis	Lake trout	Rush et al 2012	Long-term impacts of invasive sp vertebrate > 1 study	2-9 years; for lengths see Table 1	predator	native top predator	n/a		Lake Ontario	USA	lake	US waters (?)	fresh	25-50 m	annual 10° isotherm		late trout: September, forage items: ca late trout since 1977, 2008				n/a, however late trout exhi increasing since 2004, field					stable isotopes		bulque-mix-replacement of rainbow smelt (Osmerus mordax) by round-reduced capacity of the Lake Ontario offshore food web to support	
Selenitoa nemoralis	Lake trout	Rush et al 2012	Long-term impacts of invasive sp vertebrate > 1 study		prey		30–200 mm TL		Lake Ontario	USA	lake	US waters (?), Lake Ontario offshor	fresh				late trout: September, forage items: ca late trout since 1977, 2008				n/a, however late trout exhi increasing since 2004, field					stable isotopes			
Amphipoda	Amphipods	Johnson et al 2008	Diet Shift Composition and Feedi Invertebrate		prey				Lake Ontario		lake	nearshore													field					important food item	
Dreissena bugensis	Dreissenid mussels	Johnson et al 2008	Diet Shift Composition and Feedi Invertebrate		prey				Lake Ontario		lake	nearshore													field					important food item	
Oligochaeta	Oligochaetes	Johnson et al 2008	Diet Shift Composition and Feedi Invertebrate		prey				Lake Ontario		lake	nearshore													field					important food item	
-	Fish	Stevens & Kinney 2013	Do invasive lightsnail goby Neogo not applicable		prey				Danube	Bratislava	river														field					important food item	0.84%
-	Fish	Stevens & Kinney 2013	Do invasive lightsnail goby Neogo not applicable	eggs	prey				Danube	Bratislava	river														field	electrofishing + line	stomach content			important food item	cannibalism mainly occurs in summer and autumn. Non-identified fish: 0.43% relativ
Amphipoda	Amphipods	Johnson et al 2008	Diet Shift Composition and Feedi Invertebrate		prey				Lake Ontario		lake	nearshore													field	electrofishing + line	stomach content			important food item	0.52% relative abundance, 0.00% of biomass; 11.31% occurence
Dreissena bugensis	Dreissenid mussels	Johnson et al 2008	Diet Shift Composition and Feedi Invertebrate		prey				Lake Ontario		lake	nearshore													field					important food item	
Oligochaeta	Oligochaetes	Johnson et al 2008	Diet Shift Composition and Feedi Invertebrate		prey				Lake Ontario		lake	nearshore													field					important food item	
Amphipoda	Amphipods	Johnson et al 2008	Diet Shift Composition and Feedi Invertebrate		prey				Lake Ontario		lake	nearshore													field					important food item	0.84%
-	Fish	Vasek et al 2014	Diet of two invading gobiid species Non-animal	eggs	prey				Danube	Czech Republic	river	Dyje River System													field	electrofishing	stomach content			not an important part of diet	only 2 stomach of 110 non-empty stomachs contained non-identifiable fish eggs; <1
-	Fish	Vasek et al 2014	Diet of two invading gobiid species Non-animal		prey				Danube	Czech Republic	river	Dyje River System													field	electrofishing	stomach content			part of diet	5% of stomach content
Proterorhinus semilunaris	Western tubenose goby	Vasek et al 2014	Diet of two invading gobiid species vertebrate, only 1	year-reviewed relevant study	prey				Danube	Czech Republic	river	Dyje River System					May + June								field	electrofishing	stomach content			part of diet	Schiewer's Index 0.03-0.30
Proterorhinus semilunaris	Western tubenose goby	Vasek et al 2014	Diet of two invading gobiid species vertebrate, only 1	year-reviewed relevant study	prey				Danube	Czech Republic	river	Dyje River System					End of June + July								field	electrofishing	stomach content			small part of diet	only one goby (118 mm TL) of 110 was found with a juvenile P. semilunaris ; 40% of
Bythotrephes	Bythotrephes	Johnson et al 2008	Diet Shift Composition and Feedi Invertebrate		prey				Lake Ontario		lake	nearshore													field					important food item	
Dreissena polymorpha	Zebra mussel	Neilbell & Rudstam 2014	Predation on invasive zebra mus invertebrate		prey																				field + in situ experiment					important food item	round goby could affect zebra mus
Dreissena	Dreissenid mussels	Johnson et al 2008	Diet Shift Composition and Feedi Invertebrate		prey				Lake Ontario		lake	nearshore													field					important food item	
Dugesiidae	Flatworms	Herring 2014	Analyse der ökologischen Einnisc not applicable		prey				Kiel Canal	Germany	sea						June + September								field	several fishing methods	stomach content			important food item	
Mollusca	Mollusca	Hempel 2014	Analyse der ökologischen Einnisc not applicable		prey				Travе River System	Germany	river														field	several fishing methods	stomach content			important food item	highest frequency in September; also high in July, high percentage of biomass in Jul
Mytilus trossulus	Bay mussel	Hempel 2014	Analyse der ökologischen Einnisc not applicable	>20 cm TL	predator				Kiel Canal	Germany	canal														field	electrofishing	stomach content			important food item	Particularly in warm months mass part of diet: ... pot

Table S2: Round goby interactions with Yellow perch (*Perca flavescens*) are context dependent. (n.a. = not available, TL = total length, SL = standard length)

Species		**Yellow perch (*Perca flavescens*) (1/2)**								
Water body		**Lake Ontario**				**Lake Erie**				
Sampling site		Eastern part		Lower Bay of Quinte	Upper Bay of Quinte	Eastern part			Central part	Hatchery Bay, Western Lake Erie
Abiotic factors	Salinity	Fresh water		Fresh water		Fresh water			Fresh water	Fresh water
	Depth [m]	n.a.	n.a.	Transects: 1.5-3 m, 3-5 m, 5-7m Traps, seining, angling: 1-5 m		n.a.	n.a.	n.a.	Bottom trawl at 5-9.9 m, 10-14.9 m, 15-19.9 m, and > 20 m	1-3 m
	Temp.	See Fig. 1				See Fig. 1		n.a.	See Fig. 3	n.a. for field, 23.6 °C ± 1.13 SD and 20.8 °C ± 1.1 SD in lab experiments
Year(s) of study		Pre-invasion: 1993-2004 Post-invasion: 2005-2012		2004/2005		Pre-invasion: 1993-1998 Post-invasion: 1999-2012		2002/2003	1995-2002, data from 2002	2002
Season of study		Late summer		May-Oct./Nov.		Early autumn		July-August	May-Oct	June-Aug.
First record round goby		2005		1999	2001	1999		n.a.	1994	Early 1990s
Age of round goby population		0-7 years		6 years	4 years	0-13 years		n.a.	8 years	Approx. 10 years
Round goby population density		n.a.		11.2 t/km^2; see table 1	5 t/km^2; see table 1	n.a.		n.a.	Standing stock 203-4803 t/y, peak at 4.2 ± 1.5 billion ind. (1999), since then rel. stable probably due to predators, see table 2	n.a.
Life stage or length of round goby		n.a.		Populations were dominated by age 0 to age 2; especially 2.3-13.6 cm TL, see table 2		n.a.	n.a.	Small: < 11.2.cm Large: ≥11.2 cm	0-4 years, see table 3	< 6 cm TL Lab: overall mean sizes of round goby 63.5 ± 2.8 SD (dreissenid habitat) and 62.2 ± 4.0 SD (macrophyte habitat)
Life stage or length of native species		16.5-22.5 cm TL	27.5-34 cm TL	12.6-29 cm TL		16.5-22.5 cm TL	27.5-34 cm TL	average 19.53 ± 5.68 cm TL	n.a.	Field: < 95mm: n=29; 95–150 mm: n=38; > 150 mm TL: n=32 Lab: overall mean sizes of yellow perch 63.5 ± 0.6 SD (dreissenid habitat) and 63.1 ± 1.9 SD (macrophyte habitat)
Primary data acquisition method		Mass-at-length from field samples		Stomach content from field samples, bioenergetics modelling		Mass-at-length from field samples		Stomach content and stable isotopes from field samples	Stomach content from field samples	Stomach content from field samples and lab experiments
Sample size of perch		Pre-invasion: 1154 Post-invasion: 1608		123	88	Pre-invasion: 593 Post-invasion: 8972		33	n.a.	99

Primary interaction and indices	Predation on round goby								Competition with round goby
	n.a.		Mean percent composition by weight of round goby in perch stomach: spring 93%, summer 82%, fall 92%, table 5	Mean percent composition by weight of round goby in perch stomach: spring 89%, summer 20%, fall 100%, table 5	n.a.		Round gobies are part of yellow perch diet, see figure 5	Yellow perch derived approximately 30% of their diet from round gobies	Significant diet overlap between juvenile perch (< 95 mm TL) and gobies (< 60 mm TL) in August, large yellow perch displayed very little diet overlap with any round goby size class, see figure 1
Resulting impact on native species	Mass-at-length partly deteriorated, see table 4	Mass-at-length generally improved, see table 4	Change in top predator diets		Mass-at-length partly deteriorated, see table 4	Mass-at-length generally improved, see table 4			Low to strong aggression depending on the amount of food present; differing habitat preference and food resource use allow coexistence
Anticipated future effects	Changes in body condition may have implications for additional population and life history characteristics		n.a.		Changes in body condition may have implications for additional population and life history characteristics		Changes in energy flows between profundal, pelagic and littoral environments due to round goby	Round goby may provide energetic advantage over traditional prey (reduction in foraging cost); round goby transfer energy from benthos to higher trophic levels	Heterogeneous habitat structure may avoid negative effects
Authors	Crane et al. (2015)		Taraborelli et al. (2010)		Crane et al. (2015)		Campbell et al. (2009)	Johnson et al. (2005)	Duncan et al. (2011) (Duncanetal.É

Species		Yellow perch (*Perca flavescens*) (2/2)					
Water body		St. Lawrence river	Lake Michigan				
Sampling site		Lake St. Pierre	Southern part				
Abiotic factors	Salinity	Fresh water	Fresh water				
	Depth [m]	1.5-3.9, average 3.2 m, navigation channel 11.3 m	Max. depth of Lake 265 m, mean 99 m Sampling at 5 / 10 / 15 m				
	Temp.	Around 20° C	n.a.				
Year(s) of study		2007	2002				
Season of study		Aug.-Oct.	June-Aug.				
First record round goby		2006	1998				
Age of round goby population		1 year	4 years Diet 2002 compared to other studies from 1984 and 1992/93 (pre-invasion)				
Round goby population density		n.a.	n.a.				
Life stage or length classes of round goby		n.a.	21–170 mm TL				
Life stage or length classes of native species		92-319 mm TL, mean 177 ± 39 mm TL	10-11.9 cm TL	12-15.9 mm TL	16-18.9 mm TL	> 18.9 cm TL	< 10 cm TL

Primary data acquisition method	Stomach content from field samples	Stomach content from field samples				
Sample size of perch	245	1984: 365 1992/93: 68 This study 2002: 365	1984: 127 1992/93: 167 This study 2002: 127	1984: 9 1992/93: 208 This study 2002: 9	1984: 5 1992/93: 401 This study 2002: 184	2212 total captured, out of them 1293 randomly sub-sampled for stomach analysis, out of them 268 contained alewife or round goby and were used for subsequent diet analysis
Primary interaction	**Predation on round goby**					**No predation on round goby**
	21.9% frequency of occurrence; 16.4% perch consume exclusively round goby; 4.4-100% of weight of consumed food organisms, table 1	10.2% of stomach content	33.3% of stomach content	68.9% of stomach content; yellow perch ≥ 150 mm LT consumed round goby as a major prey item	38.8% of stomach content	Perch < 10 cm TL were collected, but were found not to consume round goby
Resulting impact on native species	Goby preference mainly governed by biotic (assemblage of predators) and geographic factors (round goby density)	Energetic link between zebra mussels and yellow perch; new food source for yellow perch; diet shift from mottled sculpin and johnny darter as prey items in 1984 to a diet with round goby in 2002				n.a.
Anticipated future effects	Changes in nutrient and contaminant transfers	It appears that yellow perch has the capability to successfully adapt to diet changes caused by environmental features and influences, specifically those enhanced by anthropogenic activity				n.a.
Authors	Reyjol et al. (2010)	Truemper and Lauer (2005) and Truemper et al. (2006)				Truemper and Lauer (2005)

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