Study reference	**Fish/shellfish species**	**Habitat Requirements**				**Threat/Stressor**		**Fish/Habitat Response**
		Type	**DO**	**Temp**	**Salinity**	**Direct**	**Indirect**	
Species 1 – *Elliptio complanata*								
Bogan and Proch 1997, Cummings and Cordeiro 2011, Strayer 1993; USACE 2013	Eastern elliptio	Permanent body of water: large rivers, small streams, canals, reservoirs, lakes, ponds						
Harbold et al. 2014; LaRouche 2014; Lellis et al. 2013; Watters 1996	Eastern elliptio	Presence of fish host species (American eel [*Anguilla rostrata*], Brook trout [*Salvelinus fontinalis*], Lake trout [*S. namaycush*], Slimy sculpin [*Cottus cognatus*], and Mottled sculpin [*C. bairdii*])					Environmental stressors on fish species, migratory blockages	Diminished reproductive success; local extirpation
Sparks and Strayer 1998	Eastern elliptio (juveniles)	Rivers	Interstitial DO > 2-4 mg/L			Reduced dissolved oxygen caused by sedimentation,		Behavioral stress responses (surfacing, gaping, extending siphons and foot), increased

Study reference	Fish/shellfish species	Habitat Requirements				Threat/Stressor		Fish/Habitat Response
		Type	DO	Temp	Salinity	Direct	Indirect	
						nutrient loading, organic inputs, or high temperatures		exposure to predation
Gelinas et al. 2014	Eastern elliptio	Freshwater				Harmful algal blooms, algal toxins		Compromised immune system, reduced fitness
Ashton 2009	Eastern elliptio	Multiple environmental variables (pH, mean daily water temperature, conductivity, DOC, TP, N-N, TN, mean wetted width, fish-IBI, benthic-IBI, % agriculture, channel gradient)		20-24°C		Land cover conversion in upstream drainage area, elevated nutrients, acidification, sedimentation, general channel alteration (=decreased physical complexity)		Decreased frequency of observation, lower numbers of individuals
Chittick et al. 2001	Eastern elliptio	Freshwater streams				Infection with gastrointestinal bacteria, trematodes		Digestive gland atrophy and inflammation, reduced fitness
Kat 1982	Eastern elliptio	Substrate particle size				Soft/muddy bottoms		Elevated energy expenditure, reduced growth rates, diminished fecundity, clogging of filter tissue, irritation of mantle

Study reference	Fish/shellfish species	Habitat Requirements				Threat/Stressor		Fish/Habitat Response
		Type	DO	Temp	Salinity	Direct	Indirect	
								tissue
Archambault et al. 2014	Bivalvia	Freshwater streams		LT50 (lethal temp.) range=33.3–37.2°C; mean=35.6°C		Dewatering (prolonged)	Increased exposure to predation	Mortality
Species 2 – *Pyganodon cataracta*								
Ashton 2009	Eastern floater	Multiple environmental variables (pH, mean daily water temperature, conductivity, DOC, TP, N-N, TN, mean wetted width (MWW), fish-IBI, benthic-IBI, % agriculture, channel gradient)		pH, ~6.8-7.4; nitrite and TN <5mg/L; ammonia ~0.04-0.09 mg/L; MWW, 4-6m; % agriculture,		Land cover conversion in upstream drainage area, elevated nutrients, acidification, sedimentation, general channel alteration (=decreased physical complexity)		Decreased frequency of observation, lower numbers of individuals
Bogan and Proch 1997	Eastern floater	Small ponds, quiet backwaters of creeks, occasionally in larger streams and						

Study reference	Fish/shellfish species	Habitat Requirements				Threat/Stressor		Fish/Habitat Response
		Type	DO	Temp	Salinity	Direct	Indirect	
		rivers; bottom materials mud, sand, and/or gravel						
Cummings and Cordeiro 2012	Eastern floater	Freshwater river systerms						
Dimock and Wright 1993	Eastern floater (juveniles)	pH>4.5 (96h LC50 pH ~4.5)	Anoxic	>33°C (96h LT50 33°C)				Mortality
Strayer 1993; Strayer and Jirka 1997	Eastern floater	Small lowland or piedmont streams; marshes, lakes, and ponds						
Tankersley and Dimock Jr 1993	Eastern floater (brooding)	Water column particulates				Increased variability of substrate particle sizes		Reduced fitness; altered capacity for acquiring nutritional resources
van Snik Gray et al. 1999; NatureServe 2015	Eastern floater (glochidia)	*Amploplites rupestris* (Rock bass), *Catostomus commersoni* (White sucker), *Cyprinus carpio* (Common carp), *Gasterosteus aculeatus*					Environmental stressors on fish species, migratory blockages	Diminished reproductive success; local extirpation

Study reference	**Fish/shellfish species**	**Habitat Requirements**				**Threat/Stressor**		**Fish/Habitat Response**
		Type	**DO**	**Temp**	**Salinity**	**Direct**	**Indirect**	
		(Threespine stickleback), *Lepomis gibbosus* (Pumpkinseed), *Lepomis macrochirus* (Bluegill), *Perca flavescens* (Yellow perch)						
Strayer and Malcom 2012	Eastern elliptio	Interstitial water chemistry				Un-ionized ammonia >0.02 mg/L		Recruitment failures
Taxon 3 - “Selected anodontine species”: Dwarf Wedgemussel (*Alasmidonta heterodon*), Green Floater (*Lasmigona subviridis*), Brook Floater (*Alasmidonta varicosa*)								
Burch 1973	All three	Rivers and streams, freshwater, nontidal						
Swartz and Nedeau 2007	Brook floater	Relatively low gradient streams, consistent flows, low nutrients, low calcium (soft waters)						
Strayer and Ralley 1993; Strayer 1993	Brook floater, Dwarf Wedgemussel	Relatively low gradient streams, consistent flows, low				Flashy, scouring flows; water pollution that increases nutrients		Local extirpation

Study reference	Fish/shellfish species	Habitat Requirements				Threat/Stressor		Fish/Habitat Response
		Type	DO	Temp	Salinity	Direct	Indirect	
		nutrients, low calcium (soft waters); medium sand (0.25-1.0mm), water depth (mean 27.7cm, range 0.4-104 cm) and current speed (mean 11.8 cm/s, range 0.0-65.0 cm/s).				and/or calcium		
NatureServe 2015; Watters 1996	Brook floater	Host fish species (laboratory): Longnose dace (*Rhinichthys cataractae*), Golden shiners (*Notemigonus crysoleucas*), Pumpkinseed (*Lepomis gibbosus*), Marginated madtom (*Noturus*					Environmental stressors on fish species, migratory blockages	Diminished reproductive success; local extirpation

Study reference	Fish/shellfish species	Habitat Requirements				Threat/Stressor		Fish/Habitat Response
		Type	DO	Temp	Salinity	Direct	Indirect	
		insignis), Yellow perch (*Perca flavescens*), Blacknose dace (*Rhinichthys atratulus*), and Slimy sculpin (*Cottus cognatus*)						
Campbell 2014	Dwarf Wedgemussel	Flows, water quality (Calcium, water temperature)		Stable temp. regime; max..<29° C		Aragonite precipitation ($CaCO_3$), elevated water temperature		Mortality, local extirpation
Strayer 1993	Dwarf Wedgemussel, Green Floater	Freshwater, nonotidal streams, flows				Unstable hydrology (flashiness)		Mortality, local extirpation
Michaelson and Neves 1995; Watters 1996	Dwarf Wedgemussel	Substrate particle sizes, water velocity; host fish species (laboratory): *Etheostoma nigrum, Etheostoma olmsteadi, Cottus bairdii*				Unstable hydrology (flashiness)/preference for finer substrate particle sizes	Environmental stressors on fish species, migratory blockages	Diminished reproductive success; local extirpation
Clarke 1981	Dwarf Wedgemussel	Gravel, sand, or muddy						

Study reference	Fish/shellfish species	Habitat Requirements				Threat/Stressor		Fish/Habitat Response
		Type	DO	Temp	Salinity	Direct	Indirect	
		bottoms, sometimes associated with SAV beds; water depth 12-18”						
Strayer et al. 1996	Dwarf Wedgemussel	Population density				Any factor diminishing suitable habitat		Lowered rates of fertilization
Species 4 – *Micropterus dolomieu*								
Davis 1975; Spoor 1984	Smallmouth bass (larvae)		>6.5 mg l^{-1}				Eutrophication	Eutrophication results in hypoxic areas in tidal regions and reservoirs.
Helmus and Sass 2008; Sechnick et al. 1986; Todd and Rabeni 1989	Smallmouth bass	Structure (logjams, rootwads, boulders)				Riparian forest removal; stream clearing; siltation		Removal of forest deprives stream of woody debris, as does direct removal of instream structure.
Brown et al. 2009; Davis 1975; Jones and Hoyer 1982; Murdy et al. 1997; Pease and Paukert 2014; Schmidt and Stillman 1998	Smallmouth bass (adult)		>6 mg l^{-1} >7 mg l^{-1} (spawning)	13^{o} – 27^{o}C	<5 ppt		Eutrophication; climate change	Decreased oxygen availability, particularly in reservoirs; increased temperatures. Growth rate increased (with temperature), and therefore may be prey-limited.

Study reference	Fish/shellfish species	Habitat Requirements				Threat/Stressor		Fish/Habitat Response
		Type	DO	Temp	Salinity	Direct	Indirect	
Species 5 – *Micropterus salmoides*								
Meador and Kelso 1989; Stuber et al. 1982	Largemouth bass (fry)	Slow moving water	>5 mg l^{-1}	> 15° C	0 ppt	Climate change	Precipitation changes, influencing flow changes to salinity and temperature	Loss of suitable parameters for growth and recruitment to fishery
Love 2011; Meador and Kelso 1989; Murdy et al. 1997; Rose et al. 2009	Largemouth bass (adult)	Slow moving water;	>3.5 mg l^{-1}	5-28 ° C	< 5ppt	Climate change, hypoxia		Low oxygen results in low fitness; compresses habitat availability
Batiuk et al. 2000; Love 2011	Largemouth bass (Adult)	SAV					Eutrophication	Loss of SAV habitat due to poor light attenuation
Species 6 – *Esox niger*								
Armbruster 1959; Coffie 1998; Kerr et al. 2009; Murdy et al. 1997	Chain pickerel (adult)			2-23° C	< 5 ppt	Warming (Climate change)		Reduced fitness at increased temps
Armbruster 1959; Dennison 1987; Li et al. 2007; Murdy et al. 1997; Scott and Crossman 1973	Chain pickerel (adult)	SAV				Dredging, loss of SAV	Eutrophication	Loss of SAV habitat
Benke et al. 1985; Jenkins and Burkhead 1994	Chain pickerel (adult)	Snags, woody debris				Dredging; removal of snags		Loss of feeding habitat
Jenkins and Burkhead 1994; Meixler and Bain 2011; Moring and	Chain pickerel	Slow moving water				Unknown	Unknown	Unknown

Study reference	Fish/shellfish species	Habitat Requirements				Threat/Stressor		Fish/Habitat Response
		Type	DO	Temp	Salinity	Direct	Indirect	
Nicholson 1994								
Species 7 – *Morone americana*								
Marguiles 1988; Roessig et al. 2004; Setzler-Hamilton 1991; Stanley and Danie 1983	White perch (larva)		>5.0 mg l^{-1}	15-20^{o} C	0-13 ppt		Climate change	Increased water temperatures can stress larvae and increase mortality rates, depending on food availability
Breitburg 2002; Hanks and Secor 2011	White perch (juvenile)		>40% saturation		<18 ppt, but tolerant of 0-35 ppt		Eutrophication	Eutrophication results in hypoxic conditions which affects fish fitness.
Able and Fahay 1998	White perch (juvenile)	Level bottoms of compact silt, mud, sand or clay				Dredging		Dredging directly alters level bottoms; may also remove substantial amounts of sand
Batiuk et al. 2000; Kraus and Jones 2012	White perch (adult)	SAV				Dredging	Eutrophication	Dredging directly removes SAV habitat; eutrophication creates reduced water clarity, thereby inhibiting plant growth
Breitburg 2002; Campbell and Rice 2014; Kerr et al. 2009; Newhard et al. 2012; Setzler-Hamilton 1991;	White perch (adult)		>4.0 mg l^{-1}	12-14^{o} C (spawning) 10-27^{o} C	0-30 ppt		Eutrophication; Climate change	Eutrophication will result in hypoxic areas that will reduce the amount of habitat white perch can utilize;

Study reference	Fish/shellfish species	Habitat Requirements				Threat/Stressor		Fish/Habitat Response
		Type	DO	Temp	Salinity	Direct	Indirect	
Stanley and Danie 1983								climate change may result in a water temperature increase, creating less than ideal conditions for spawning
Species 8 – *Anchoa mitchilli*								
Houde and Zastrow 1991; Olney 1983	Bay anchovy (Larva)		>4.0 mg l^{-1}	17-27° C	0-15 ppt		Eutrophication; climate change	Hypoxia (reduced habitat volume; higher temperature creates physiological stress
Batiuk et al. 2009; Houde and Zastrow 1991; Olney 1983; Roessig et al. 2004; Zhang et al. 2014	Bay anchovy (adult)		>4.0 mg l^{-1}	5-30° C	0-32 ppt		Eutrophication; climate change	Hypoxia (reduced habitat volume; higher temperature creates physiological stress
Species 9 – *Leiostomus xanthurus*								
Brady and Targett 2013; Uphoff et al. 2011	Spot (juvenile)		>3.0 mg l^{-1}			hypoxia	Urbanization (impervious surface)	Reduced fitness and survival
Able et al. 2007; Bilkovic and Roggero 2008; Seitz et al. 2006; Szedlmayer and Able 1996; Zapfe and Rakocinski 2008	Spot (juvenile)	Salt marsh				Development (marsh destruction)		Loss of habitat results in loss of fish productivity

Study reference	Fish/shellfish species	Habitat Requirements				Threat/Stressor		Fish/Habitat Response
		Type	DO	Temp	Salinity	Direct	Indirect	
Buchheister et al. 2013; Horodysky et al. 2008	Spot (adult)	Water column (demersal)				Hypoxia; water clarity	Eutrophication; Water clarity	Decreased feeding;
Species 10 – *Macoma balthica*								
Birchenough et al. 2015; Jansson et al. 2015; Philippart et al. 2003	Macoma (juvenile)	pH	>3.0 mg l^{-1}			Ocean acidification; increased temps	Climate change	Acidification weakens $CaCO_2$ deposition in bivalves, reducing fitness. Increasing water temperatures will likely adversely affect phenology and create mis-match with food sources
Hiddink 2003a; Hiddink 2003b; Powers et al. 2002; Seitz et al. 2006	Macoma	Tidal and intertidal mudflats				Dredging; shoreline development	Contaminants (oil in particular)	Reduction in infaunal populations; mortality or reduced fitness due to contaminants
Dauer et al. 1987; Lippson et al. 1981; Long et al. 2008; Long et al. 2014; Philippart et al. 2007; Sturdivant et al. 2014	Macoma (adult)		>3.0 mg l^{-1}		5-28 ppt	Hypoxia	Eutrophication	Disruption in coastal food webs, including phytoplankton availability; decreased burial (greater susceptibility to predation); Reduced reproductive output

Study reference	**Fish/shellfish species**	**Habitat Requirements**				**Threat/Stressor**		**Fish/Habitat Response**
		Type	**DO**	**Temp**	**Salinity**	**Direct**	**Indirect**	
Species 11 – *Menidia menidia*								
Austin et al. 1975; DePasquale et al. 2015; Eby and Crowder 2004; Fay et al. 1983	Atlantic silverside (larva)		>7.9 mg l^{-1}	15^{o}-20^{o} C	30 ppt (optimal growth)		Eutrophication	Eutrophication creates hypoxic regions, leading to mortality or unusable habitat
Gilmurray and Daborn 1981	Atlantic silverside (adult)	Water clarity				Increased runoff	Eutrophication	Evidence that high levels of turbidity prevents feeding
Batiuk et al. 2000; Orth and Heck Jr. 1980; Schein et al. 2012	Atlantic silverside (adult)	Seagrass				Dredging	Eutrophication	Loss of seagrass habitat directly from dredging activities; dieback of seagrasses as eutrophication creates poor water quality conditions
Fay et al. 1983	Atlantic silverside (adult)			5^{o}-30^{o} C	7-8 ppt (preferred); 5-33 ppt	Climate change		Increased water temperatures will reduce fitness and increase mortality rates
Balouskus and Targett 2012; Bilkovic and Roggero 2008; Seitz et al. 2006	Atlantic silverside (adult, spawning)	Salt marsh, in association with *Enteromorpha*				Salt marsh destruction (shoreline hardening; development)		Destruction of spawning habitat
Species 12 – *Paralichthys dentatus*								
Brady and Targett 2010; Eby et al. 2005	Summer flounder (juvenile)		>4.2 mg l^{-1}			Hypoxia		Low DO reduces available habitat

Study reference	**Fish/shellfish species**	**Habitat Requirements**				**Threat/Stressor**		**Fish/Habitat Response**
		Type	**DO**	**Temp**	**Salinity**	**Direct**	**Indirect**	
Buchheister et al. 2013; Eby et al. 2005; Murdy et al. 1997; Sackett et al. 2008	Summer flounder (adult)		6.5 mg l^{-1}	20.5 ^{o}C	Polyhaline	Ocean warming; hypoxia		Rising temperatures result in less available habitat; rising temperatures result in lower DO concentrations
Packer and Hoff 1999; Rountree and Able 2007; Smith and Daiber 1977	Summer flounder (juvenile)	Demersal; polyhaline; Seagrass beds; salt marsh dominated creeks;				Dredging	Eutrophication;	Reduced water quality can eliminate seagrass habitat; Dredging can directly reduce seagrass habitat;
Eby et al. 2005; Sackett et al. 2008	Summer flounder (adult)	Deeper water (>6.0m);					Climate change; hypoxia	Increasing water temperatures and hypoxia will reduce reduce demersal habitat;
Species 13 – *Centropristis striata*								
Drohan et al. 2007	Black sea bass (larvae)			22^{o} C				
Arve 1960; Coen et al. 1999; Lehnert and Allen 2002	Black sea bass (juvenile and adult)	Oyster reef				Habitat destruction; disease	Loss of prey items	Decrease in black sea bass productivity from loss of foraging area
Berlinsky et al. 2000; Drohan et al. 2007; Schwartz 1964	Black sea bass		>4.0mg l^{-1}	2^{o} C (death) 8^{o} C (stop feeding)	> 11 - 15ppt		Eutrophication-induced hypoxia	
Lehnert and Allen 2002; Orth et al. 2010; Stephan and Lindquist 1989;	Black sea bass (adult)	Seagrass; wrecks;					Eutrophication	Eutrophication causes declines in seagrass distribution,

Study reference	Fish/shellfish species	Habitat Requirements				Threat/Stressor		Fish/Habitat Response
		Type	DO	Temp	Salinity	Direct	Indirect	
Weinstein and Brooks 1983								thereby reducing available habitat

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