SUCCESSION IN INVERTEBRATE COMMUNITIES IN SOUTHEASTERN BEAVER-CREATED WETLANDS

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Abstract. Southeastern US beaver-created wetlands are typically unstable transitory systems due to a history of extreme sedimentation resulting in unstable streambeds and regional weather patterns. The Southeastern US receives high annual precipitation (1300+ mm per year) as well as strong tropical and winter storms that create large stream surges.

Dams are frequently breached, rebuilt, relocated, or abandoned which results in complexes of newly-created, mature, and abandoned beaver wetlands. Abandoned beaver wetlands typically retain parts of the original stream channel as well as developing secondary channels and usually fill with some seasonal standing water.

We compared invertebrate communities of beaver wetlands among three basic stages of habitat succession, Invertebrates were sampled in newly formed (created within 2 years; n = 4), mature (established for >15 years; n = 4), and abandoned wetlands (breached dams; n = 3) in October 2013 and May 2014 in Oconee National Forest in Georgia, USA.

There were a relatively high number of taxa (>60 families) in each wetland type, with strong seasonal variation in invertebrate communities. In October, invertebrate communities differed among all successional stages, while in May only the mature beaver wetland communities differed from newly formed or abandoned ponds.

This seasonal difference suggests that both seasonal change and longer- term succession strongly control invertebrate community structures in these beaver wetlands. Beaver wetlands are typically found in complexes of clustered wetlands frequently comprised of several successional stages.

Variation in invertebrate community structure among successional stages may increase invertebrate diversity at the watershed (or Beta-diversity) scale, which could be important in the face of wetland loss, fragmentation, and the impacts of climate change.

Table 1. Successional state by order and family (* = presence of taxa)

		Successional State		
Order	**Family**	**New**	**Mature**	**Abandoned**
Turbellaria			*	
Gastropoda	Lymnaeidae	*	*	*
	Physidae	*	*	*
	Planorbidae	*	*	*
Bivalvia	Sphaeriidae	*	*	*
Oligochaeta		*	*	*
Hirudinea		*	*	*
Aranaea		*	*	*
Acari		*	*	*
Pseudoscorpiones		*		
Ostracoda		*	*	*
Cladocera	Daphniidae	*	*	*
Copepoda		*	*	*
Decapoda	Cambaridae	*	*	
Isopoda	Asellidae	*	*	

Amphipoda	Crangonyctidae	*	*	*
	Hylellidae	*	*	*
Collembola	Entomobryidae	*	*	*
	Hypogasturidae	*		*
	Isotomidae	*	*	*
	Poduridae			*
	Sminthuridae		*	*
Ephemeroptera	Baetidae	*	*	*
	Caenidae	*	*	*
	Ephemeridae		*	
Odonata	Aeshnidae	*		*
	Coenagrionidae	*	*	*
	Gomphidae	*		
	Lestidae		*	
	Libellulidae	*	*	*
Orthoptera	Gryllidae			*
	Tettigonidae			*
Psocoptera				*
Thysanoptera	Terebrantia			*
Hemiptera	Aphidae	*	*	*
	Belastomatidae	*	*	*
	Cercopidae			*
	Cicadellidae	*	*	*
	Coccoidea	*	*	*
	Corixidae	*	*	*
	Delphacidae	*	*	*
	Gerridae	*	*	
	Hebridae		*	*
	Hydrometridae			*
	Mesoveliidae	*	*	*
	Miridae	*		*
	Nepidae	*	*	
	Reduviidae		*	*
	Veliidae	*	*	*
Neuroptera	Corydalydae	*	*	*
	Sialidae	*		
Coleoptera	Anthicidae		*	
	Carabidae		*	*
	Chrysomelidae			*
	Coccinellidae	*		*
	Curculionidae		*	*
	Dytiscidae	*	*	*
	Elateridae			*
	Elmidae	*		*

	Gyrinidae			*
	Haliplidae		*	*
	Hydreanidae			*
	Hydrophilidae	*	*	*
	Lampyridae		*	*
	Latridiidae			*
	Noteridae		*	*
	Phalacridae			*
	Ptilodactylidae		*	*
	Scirtidae		*	*
	Silvanidae			*
	Staphylinidae			*
Trichoptera	Hydroptilidae	*	*	*
	Hydropsychidae			*
	Leptoceridae	*		
	Polycentripodidae	*		
	Rhyacophilidae	*		
Lepidoptera	Crambidae	*		
	Noctuidae	*	*	*
	Tineidae		*	
Diptera	Ceratopogonidae	*	*	*
	Chironomidae	*	*	*
	Corethrellidae	*	*	*
	Culicidae	*	*	*
	Empididae		*	
	Ephydridae	*	*	
	Psychodidae			*
	Ptychopteridae	*	*	*
	Simulidae			*
	Stratiomyidae	*	*	*
	Tabanidae	*	*	*
	Tipulidae	*	*	*
Hymenoptera	Formicidae		*	*
	Chalcidoidea			*
	Mymaridae	*		
	Platygastroidea	*	*	*