JOSEPH W. JONES
ECOLOGICAL RESEARCH CENTER
at Ichauway

Publication Brief

01 May 2018

Flood Pulses Reduce Nuisance Vegetation in a Shallow Subtropical Impoundment

In the past 100 years humans have extensively modified the world's rivers. It is estimated that, globally, more than 50% of the main channels of rivers has been impounded. In subtropical and tropical areas many impoundments and natural lakes have extensive shallow areas. Shallow water and warm temperatures, combined with runoff from adjacent human land use often cause dense growth of submerged aquatic vegetation (SAV). Comprised of both native and invasive species, SAV is often considered a nuisance with much time and money spent on control, often with minimal success.

Figure 1. SAV growth in Lake Seminole

We wanted to understand how SAV, both native and invasive species, might respond to climate patterns typical of those forecast for the SE US. Lake Seminole is ideally suited as a case study as it is a shallow, 50+ year-old impoundment located at the confluence of the Flint and Chattahoochee River basins in southwestern Georgia. Lake Seminole is noted for abundant native and invasive SUV. *Hydrilla verticillata*, a native of Asia is often the dominant SAV species and an invasive of concern for reservoir managers.

During our study (2012-2014) SAV coverage of the lake ranged from 36% to 50% of the reservoir surface. Greatest SAV occurred during the drought year (2012) with *Hydrilla* being the dominant species. SAV coverage declined during years having normal rainfall patterns with *Hydrilla* coverage declining by almost 90%. Declines were associated with increased water turbidity occurring with late spring and summer flood pulses. Turbidity reduced light availability in the water and suppressed SAV growth.

Chemical and biological control measures have failed to eliminate nuisance and invasive SAV from Lake Seminole and similar shallow aquatic habitats. Normal flood pulses can effectively reduce SAV

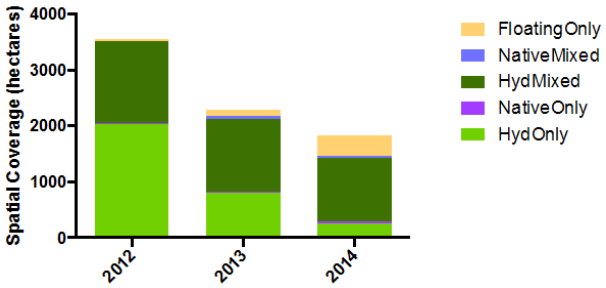

Figure 2. Changes in SAV spatial coverage across the study

coverage. We acknowledge that droughts cannot be predicted or prevented. Water management strategies that maintain normal growing season flood pulses may help limit SAV to tolerable levels. Flood pulses also provide many other benefits to rivers and impoundments including creation of habitat, supplementing base flows and levels, processing and assimilation of effluents, and food web support.

CITATION

Shivers, S. D., S. W. Golladay, M. N. Waters, S. B. Wilde, P. D. Ashford, and A. P. Covich. 2018. Changes in submerged aquatic vegetation (SAV) coverage caused by extended drought and flood pulses. Lake and Reservoir Management 34:218-229.

CONTACT

Steve Golladay, steve.golladay@jonesctr.org

KEY POINTS

Humans have extensively modified rivers across the world

Modifications have promoted growth of native and invasive nuisance submerged aquatic vegetation (SAV)

Chemical and biological controls of SAV are often expensive and unsuccessful

Strategies for maintaining natural flood pulses may reduce SAV abundance while providing other benefits