

STUDY QUESTIONS

WFS 340: Wetlands Ecology and Management

What is a Jurisdictional Wetland?

- 1) Know the 3 USACE criteria that are necessary for an area to be classified as a jurisdictional wetland.
- 2) Know low-water depth that defines the beginning of the deepwater (aquatic) system.
- 3) Know the 5 USACE plant classifications, which are related to flood tolerance.
- 4) Know which USACE plant classifications (in #3) are considered hydrophytes.
- 5) Know the % horizontal coverage of hydrophytes that is necessary to meet USACE jurisdictional wetland criteria, and how to calculate percent dominance using the 50/20 dominance rule.
- 6) Know the 3 types of histosols that are considered hydric.
- 7) Know percent composition of organic C required to be classified as an organic soil.
- 8) Know 3 of the 5 hydric soil indicators commonly used in the field.
- 9) Know the hydric soil chroma criteria for Munsell charts.
- 10) Know the gas responsible for the “rotten egg” smell in wetlands that have been inundated for long durations.
- 11) Know the USACE criterion for inundation that indicates wetland hydrology.
- 12) Know the 6 USACE hydrologic zones, and how they differ with respect to growing season flooding duration. Also, know which zones qualify as “wetland hydrology.”
- 13) Be able to calculate the minimum growing season duration necessary for flooding to meet the wetland hydrology criteria. Also, know how this duration differs from the minimum duration for inundated soils to meet the hydric soils criteria.
- 14) Know 4 of the 7 wetland hydrology indicators commonly used in the field.
- 15) Understand the function of aerenchyma.

Wetland Regulations

- 1) Know the Federal legislative act that prevents the filling of jurisdictional wetlands.
- 2) Know the provision of the Food Security Act that penalizes farmers for cultivating wetlands.
- 3) Understand what constitutes a jurisdictional wetland as per federal law.
- 4) Know the effects of the SWANCC decision and overturn of the Tulloch Rule on the definition of a jurisdictional wetland.
- 5) Know what constitutes an isolated wetland in Tennessee according to state law.
- 6) Be able to define “water” and “pollution” as they relate to regulating wetlands in Tennessee.
- 7) Know the state legislative act that helps protect wetlands in Tennessee and the state agency that is in charge of wetland regulation.
- 8) Know the name of the state permit that is required for any activity that results in pollution of state waters.

Wetland Values

- 1) Know the 3 general categories of wetland values.
- 2) Be able to recall 6 of the 11 wetland values discussed in class.
- 3) Know approximately what percentage of breeding birds in North America use wetlands at some time during their life cycle.
- 4) Know that approximately 4% of the world’s surface is wetlands and 40% of the world’s species depend on them.
- 5) Know that approximately 50% of threatened or endangered species in the United States use wetlands.
- 6) Be able to describe how wetlands help slow discharge into a stream or lake after a rain event.
- 7) Understand the importance of streamside vegetation and coastal wetlands in bank stabilization.
- 8) Know the name of the wetlands that are important in groundwater recharging the Ogallala Aquifer.

- 9) Be able to describe how wetlands can improve water quality.
- 10) Know the #1 mammal harvested from wetlands for fur.
- 11) Be able to list some recreational uses of wetlands.
- 12) Be able to recall the estimated total global worth of natural systems, and what percentage is attributed to wetlands.

Wetland Losses and Human Impacts

- 1) Know the pre-European settlement and current acreage of wetlands in the lower 48 states.
- 2) Know the most common wetland type in the United States and what State influences this percentage most.
- 3) Be able to describe the difference between a bog and a fen.
- 4) Know the most common wetland type in the lower 48 and Southeast.
- 5) Know where most of the coastal wetlands are located.
- 6) Know the primary legislation responsible for wetland loss in the United States.
- 7) Know which 3 states have lost the most acreage of wetlands, and what percent of Tennessee wetlands have been lost.
- 8) Know the percent of hardwood bottomlands that have been deforested in the MAV.
- 9) Know the Act in Tennessee that helps conserve, restore, and manage wetlands in the State.
- 10) Know what is the #1 anthropogenic cause for wetland loss and how most wetlands have been destroyed.
- 11) Be able to list and describe 4 of the 6 ways that humans can negatively affect wetlands.
- 12) Know the 2 primary reasons that rivers are channelized and leveed.
- 13) Know the difference between a shoal and valley plug (see S. Oswalt lecture and http://fwf.ag.utk.edu/mgray/wfs560/Hatchie_Shoals_VPs.pdf).
- 14) Know the 2 primary uses of peat worldwide, and how use differs between the western and eastern hemispheres.
- 15) Be able to explain the primary causes of Louisiana coastal erosion.
- 16) Understand the effects of Hurricane Katrina on wetland loss in Louisiana.
- 17) Know which states will likely lose the most coastal wetlands due to global climate change.

Moist-soil Management

- 1) Be able to describe the major life cycle events of North American dabbling ducks throughout the annual cycle, and how these events influence seasonal diet composition of females, males and ducklings – **This topic will be tested on the Lab Practicum.**
- 2) Be able to describe (or draw a timeline) when we focus on management of amphibians, shorebirds, breeding wood ducks, and migratory waterfowl in Tennessee. – **This topic will be tested on the Lab Practicum.**
- 3) Be able to describe how you would manage the hydrology and vegetation using water control structures and natural and mechanical manipulations for a complex of moist-soil units to meet the needs of all communities in #2.
- 4) Know the 5 components of a waterfowl management complex.
- 5) Know approximately what percentage of a management area should be refuge.
- 6) Understand the effects of hydrologic management in wetlands.
- 7) Know the 3 primary foods available for waterfowl in flooded moist-soil wetlands.
- 8) Know the 3 common types of water control structures, and which is most preferred.
- 9) Be able to describe 3 methods that can be used to move water among moist-soil impoundments, and which is cheapest.
- 10) Know the 3 primary reasons why managers in the Southeast may forego mechanical manipulations until autumn.
- 11) Know which mechanical manipulation generally is best at setting back succession.
- 12) Be familiar with the results on autumn mechanical manipulations. Also, know when it is illegal to perform a fall manipulation and hunt over it.

- 13) Be able to describe the hemi-marsh concept and how it can influence waterbird species richness and waterbird and food resource abundance.
- 14) Be able to explain when burning or grazing might be used in managing moist-soil wetlands, and know the influences of these techniques on vegetation and aquatic invertebrate responses.
- 15) Know which herbicides are best for controlling broad-leaved emergent plants that are non-desirable, and which are used for total vegetative kill.
- 16) Know the 2 reasons why agricultural plots ideally should be placed in close proximity to natural wetlands.
- 17) Be able to describe how you would incorporate agriculture (including crop type) into managing for waterfowl, reflecting on differences in seed decomposition and TME. Understand how seed loss differs among rice, corn, soybean and grain sorghum fields.
- 18) Be able to provide several biological reasons for providing natural wetlands for waterfowl (not solely agriculture).
- 19) Know different strategies for creating refuges (i.e., temporal vs. spatial) and allowing hunting access (i.e., drawings, blinds, scramble sites).

Greentree Reservoir Management

- 1) Know the species of bottomland red oaks that we attempt to encourage in the Southeast.
- 2) Know the 2 species of waterfowl that use hardwood bottomlands all year in Tennessee.
- 3) Know the primary 4 reasons that waterfowl use hardwood bottomlands in fall and winter.
- 4) Know the 3 primary waterfowl foods in hardwood bottomlands.
- 5) Be able to provide the definition of a greentree reservoir (GTR).
- 6) Be able to describe goals of GTRs, and how these goals are achieved through management.
- 7) Be able to describe the difference in hydrology between a natural hardwood bottomland and typical historic flooding in a GTR.
- 8) Know at least 3 of the negative effects of historic GTR flooding.
- 9) If hydroperiod is extended substantially, be able to provide some tree species that could begin to become dominant (i.e., overcup oak, water tupelo, baldcypress).
- 10) Know that timber value of typical red oaks in hardwood bottomlands is about 2X greater than water-tolerant white oak species, such as overcup and swamp chestnut oaks.
- 11) Be able to explain why waterfowl seem to prefer smaller red oak acorns.
- 12) Given a certain number of GTRs on a management area, be able to conceive a possible rotational flooding scheme. In particular, address flooding duration, depth and timing.
- 13) Be able to describe forest opening management in GTRs.

Waterfowl Carrying Capacity

- 1) Know the 4 waterfowl flyways.
- 2) Be able to describe the history and goals of the North American Waterfowl Management Plan, and how it is implemented. Especially understand how duck-use days are used in implementation.
- 3) Know the 2 Joint Ventures that include west and middle Tennessee (i.e., Lower MS Valley and Central Hardwoods, respectively).
- 4) Be able to define duck energy-days (DED).
- 5) Be able to describe in detail the concept of duck energy-days, relating it to the DED formula.
- 6) Know the 3 primary reasons why waterfowl managers calculate DEDs.
- 7) Know the 3 common methods for estimating food resources in wetlands, and be able to compare and contrast the advantages and disadvantages of each.
- 8) Understand the results from recent research on the availability of rice, corn, grain sorghum and soybean in harvested fields (i.e., Scott Manley's, Josh Stafford's and Melissa Foster's studies).
- 9) Be able to describe the steps you would take to calculate DEDs using the dot method.
- 10) Be able to describe some future research needs for duck energy-day calculations (see required reading by Williams et al. 2014).

Additional Topics (~30% of exam)

- **Wetland Survey Techniques:** Dr. Andrea Ludwig (BESS) and Chris Graves
- **Wetland Restoration and Conservation Programs:** Chris Graves
- **Human Impacts on West Tennessee Wetlands:** Sonja Oswald (USFS)
- **Waterfowl Population Estimation and Regulations:** Jamie Feddersen (TWRA)
- **Field Trip to Noxubee:** Steven Lewis and Jake Gross (USFWS) and Dr. Brian Davis and students (MSU)
- **Field Trip to Lick Creek:** David Sams (TWRA)

Required Readings (~10% of exam: handouts in class)