

2018 Waterfowl Energetics Updated Analysis

Cara Joos

Central Hardwoods Joint Venture

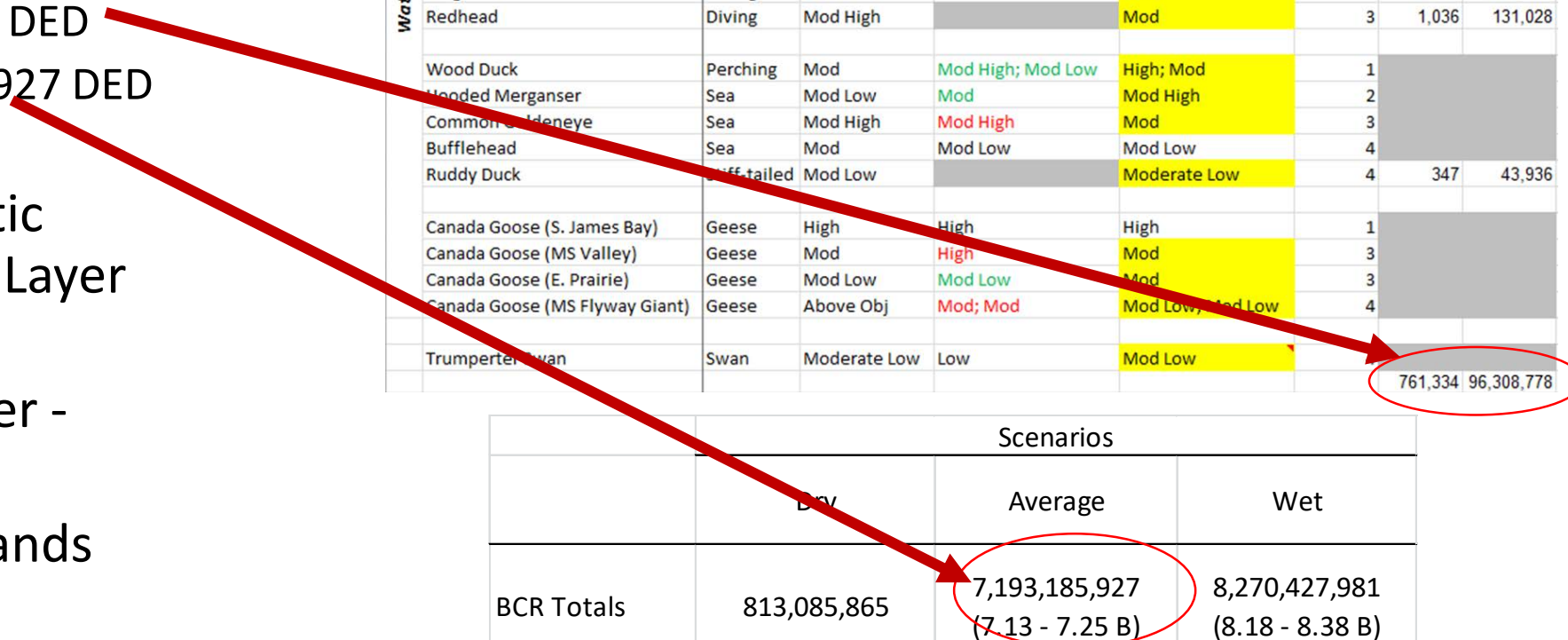
2014 Waterfowl Assessment

- Previous effort

- Pop. Objective = 1970 estimate
 - 761,334 ducks
 - Need 96,308,778 DED
 - Have 7,193,185,927 DED
- USDA - National Agricultural Statistic Service Crop Data Layer (CDL)
- Soil saturation layer - SURGO
- No-National Wetlands Inventory (NWI)
- LMJV kcal/ha values

Species Common Name	Group	Continental Priority	Bird Plan BCR/Regional Priority	Draft CHJV Priority Ranks	CHJV Rank	1970's Pop	Season DUD
Mallard	Dabbling	High	High	High	1	527,318	66,705,673
Am. Black Duck	Dabbling	High	High	High	1	95,107	12,030,989
Northern Pintail	Dabbling	High	Mod	Mod High	2	17,980	2,274,533
American Widgeon	Dabbling	Mod High	Mod Low	Mod High	2	37,858	4,789,047
Blue-winged Teal	Dabbling	Mod High	Mod Low	Mod	3		
Gadwall	Dabbling	Mod	Mod Low	Mod Low	4	13,577	1,717,524
Nothern Shoveler	Dabbling	Mod	Mod Low	Mod Low	4	3,285	415,606
Am. Green-winged Teal	Dabbling	Mod		Moderate Low	4	4,806	607,903
Lesser Scaup	Diving	High	Mod	High	1	25,703	3,251,411
Greater Scaup	Diving	Mod	Mod Low	Mod	3		
Canvasback	Diving	Mod High	Mod Low	Mod	3	5,145	650,807
Ring-necked Duck	Diving	Mod	Mod Low	Mod	3	29,173	3,690,322
Redhead	Diving	Mod High		Mod	3	1,036	131,028
Wood Duck	Perching	Mod	Mod High; Mod Low	High; Mod	1		
Hooded Merganser	Sea	Mod Low	Mod	Mod High	2		
Common Goldeneye	Sea	Mod High	Mod High	Mod	3		
Bufflehead	Sea	Mod	Mod Low	Mod Low	4		
Ruddy Duck	Stiff-tailed	Mod Low		Moderate Low	4	347	43,936
Canada Goose (S. James Bay)	Geese	High	High	High	1		
Canada Goose (MS Valley)	Geese	Mod	High	Mod	3		
Canada Goose (E. Prairie)	Geese	Mod Low	Mod Low	Mod	3		
Canada Goose (MS Flyway Giant)	Geese	Above Obj	Mod; Mod	Mod Low; Mod Low	4		
Trumpeter Swan	Swan	Moderate Low	Low	Mod Low		761,334	96,308,778

	Scenarios		
	Dry	Average	Wet
BCR Totals	813,085,865	7,193,185,927 (7.13 - 7.25 B)	8,270,427,981 (8.18 - 8.38 B)

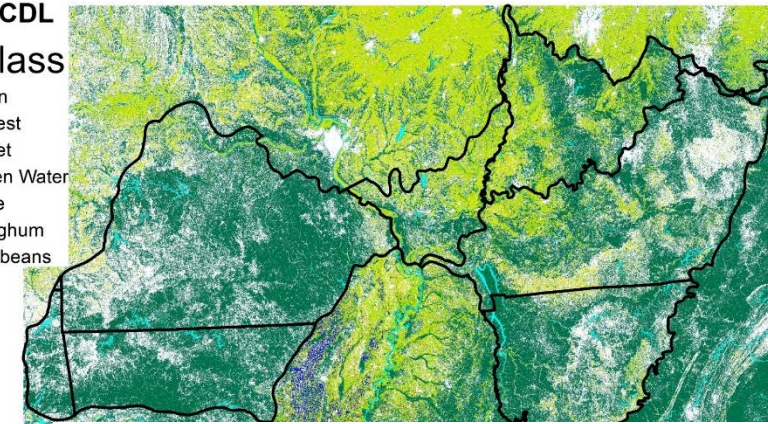


Updated methods

- NASS CDL 2015
- LMJV energetics values
- Updated NWI layer
- Inundation frequency models
- PADUS and easement layers

2015 CDL Reclass

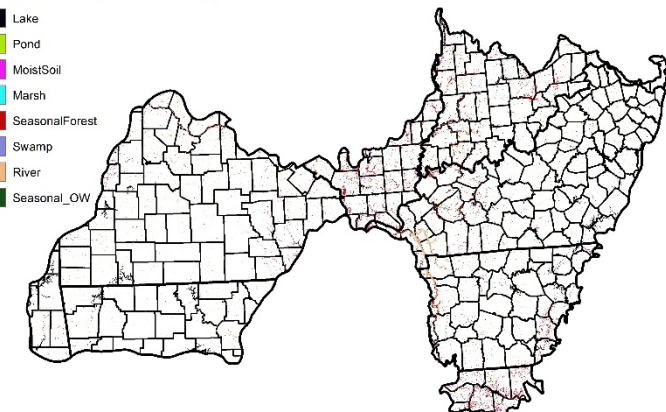
- Corn
- Forest
- Millet
- Open Water
- Rice
- Sorghum
- Soybeans



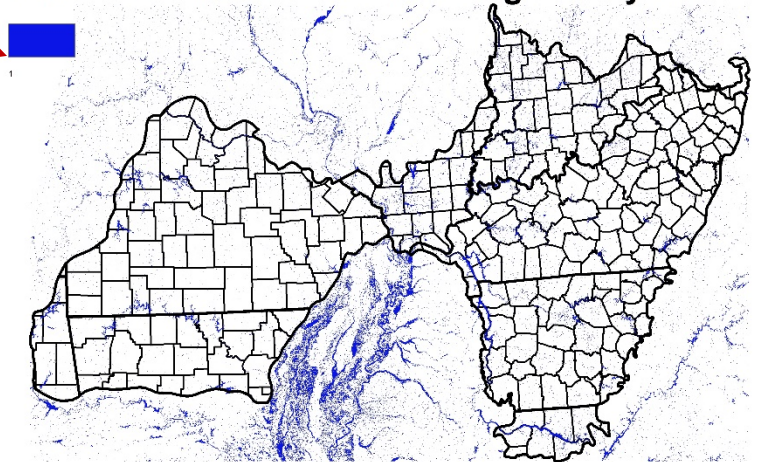
Habitat	Kcals/ha
Flooded Corn (>75%)	367000
Flooded Corn (0%)	20794220
Flooded Rice (>75%)	100200
Flooded Rice (0%)	17334600
Flooded Milo (>75%)	349000
Flooded Milo (0%)	13125890
Flooded Soy (>75%)	26500
Flooded Soy (0%)	3402600
Flooded Millet (0%)	3784500
Moist Soil Public	1358500
Moist Soil Private	0
Seasonal Open Water	237000
Flooded Forest (40%)	113160
Marsh	474000
Swamp	111000
Lake	400000
Pond	400000
River	6000

National Wetlands Inventory

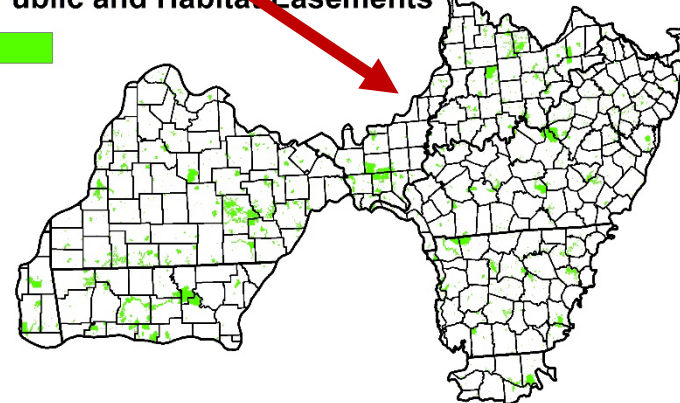
- Lake
- Pond
- MoistSoil
- Marsh
- SeasonalForest
- Swamp
- River
- Seasonal_OW



Landcover that floods on average 6/10 years



Public and Habitat Easements



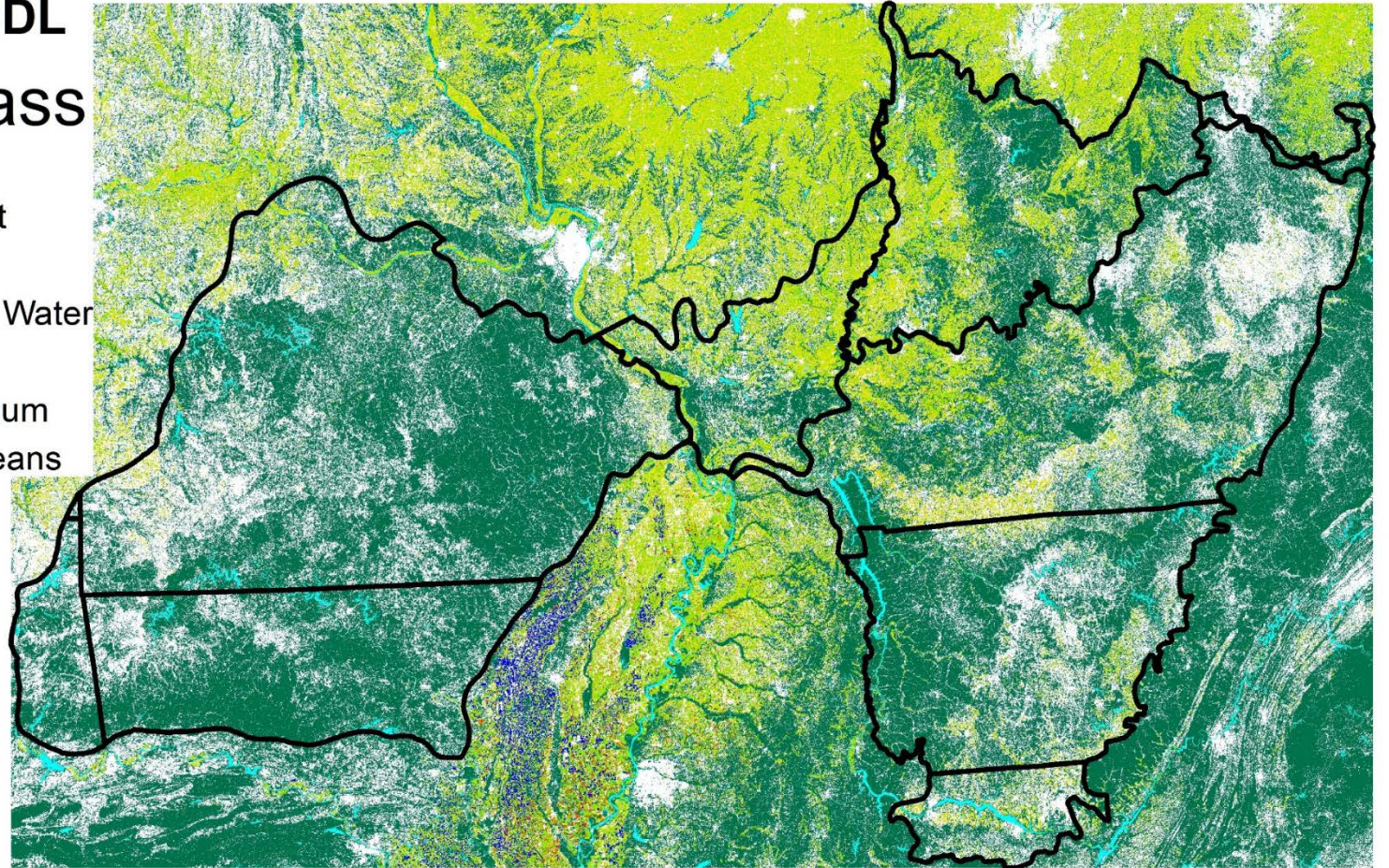
Cropland Data Layer 2015 Classification

- Corn acres lowest since 2010
- Soy acres record high
- Non-habitat 33%
- Corn 5%
- Rice 0.01%
- Sorghum 0.06%
- Soy 5.6%
- Forest 54%
- Open Water 2%

2015 CDL

Reclass

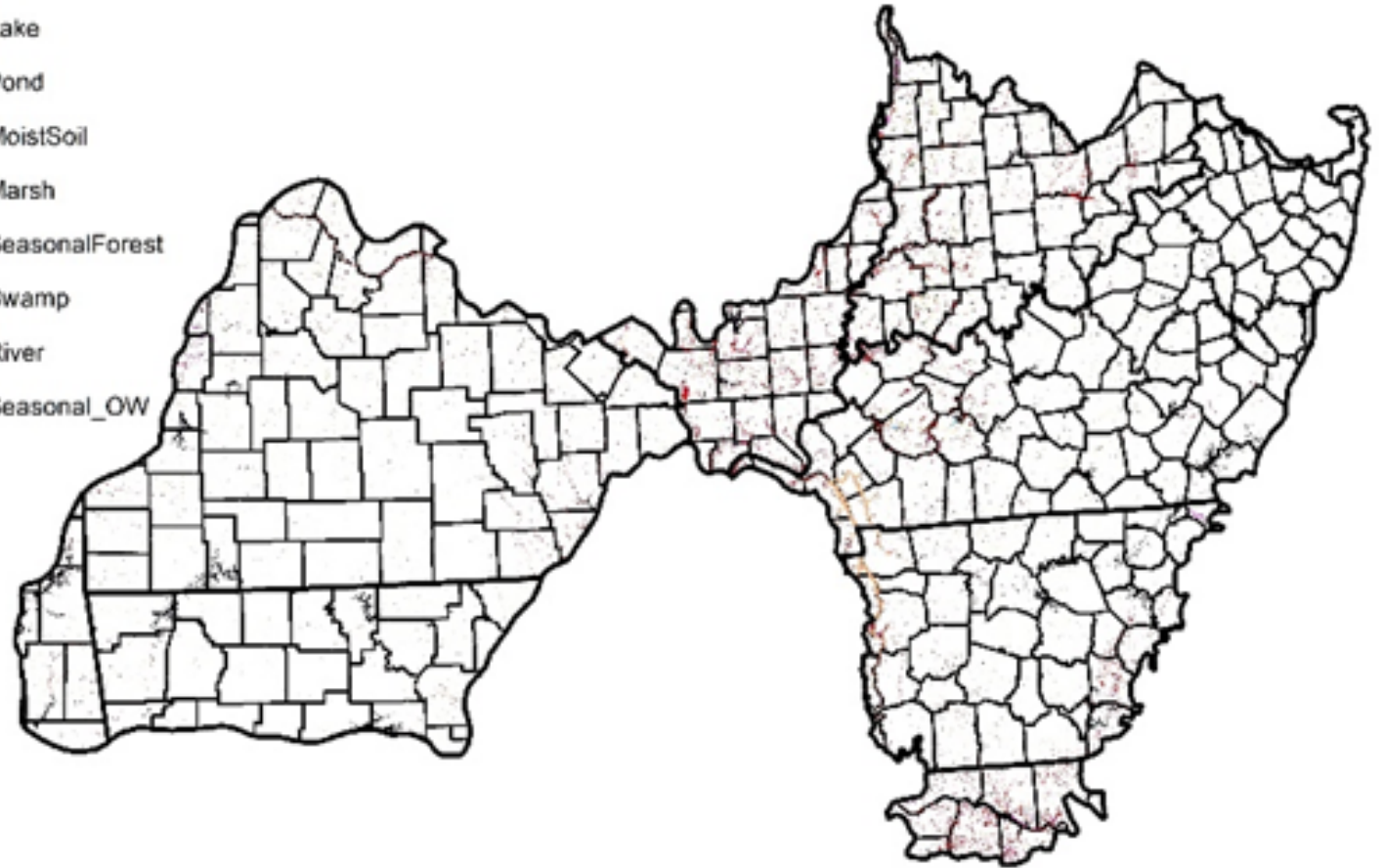
- Corn
- Forest
- Millet
- Open Water
- Rice
- Sorghum
- Soybeans



NWI wetland classes

- Most recent version
- Grouped into 8 relevant classes
- 1,139,374 ha
- Lake 24%
- Pond 11%
- Moist Soil 4%
- Flooded Forest 38%
- Marsh 0.06%
- River 20%
- Seasonal Open Water 0.2%

National Wetlands Inventory



Bioenergetic modeling

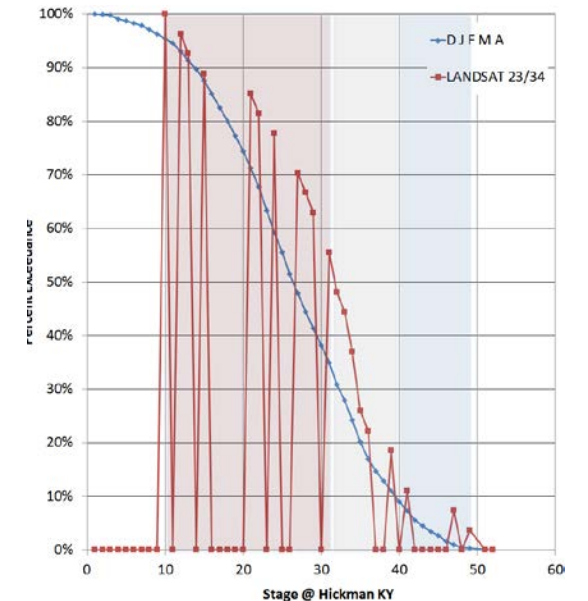
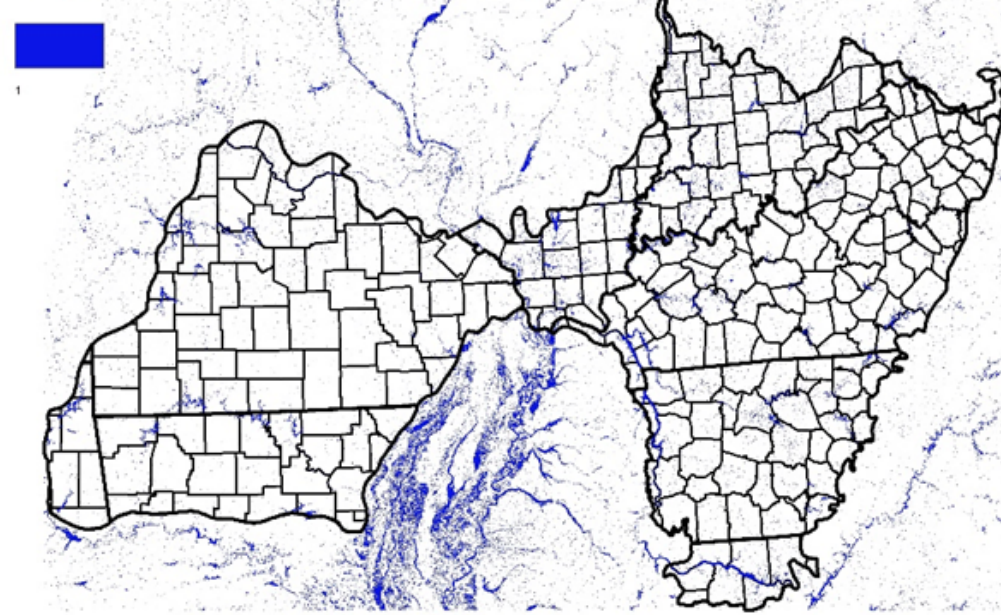
- Same LMJV kcal/ha values as 2014
- Changes from 2014
 - Public lands assumed to have 75% harvest leases
 - Assume forests are on average 40% red oak
 - Omitted lake and river landcovers
 - Considered moist soil on private land was 0 kcal/ha

Habitat	Kcals/ha
Flooded Corn (>75%)	367,000
Flooded Corn (0%)	20,794,220
Flooded Rice (>75%)	100,200
Flooded Rice (0%)	17,334,600
Flooded Milo (>75%)	349,000
Flooded Milo (0%)	13,125,890
Flooded Soy (>75%)	26,500
Flooded Soy (0%)	3,402,600
Flooded Millet (0%)	3,784,500
Moist Soil Public	1,358,500
Moist Soil Private	0
Seasonal Open Water	237,000
Flooded Forest (40%)	113,160
Marsh	474,000
Swamp	111,000

Inundation Frequency

- Uses Landsat imagery to identify what landcover is flooded during given flood stages.
- Used gauge data from Hickman, KY just below the confluence of the Mississippi and Ohio to determine flood stage
- Average = inundated 6/10 years which meets NAWMP goal of meeting “years of average environmental conditions”
- Dec – April

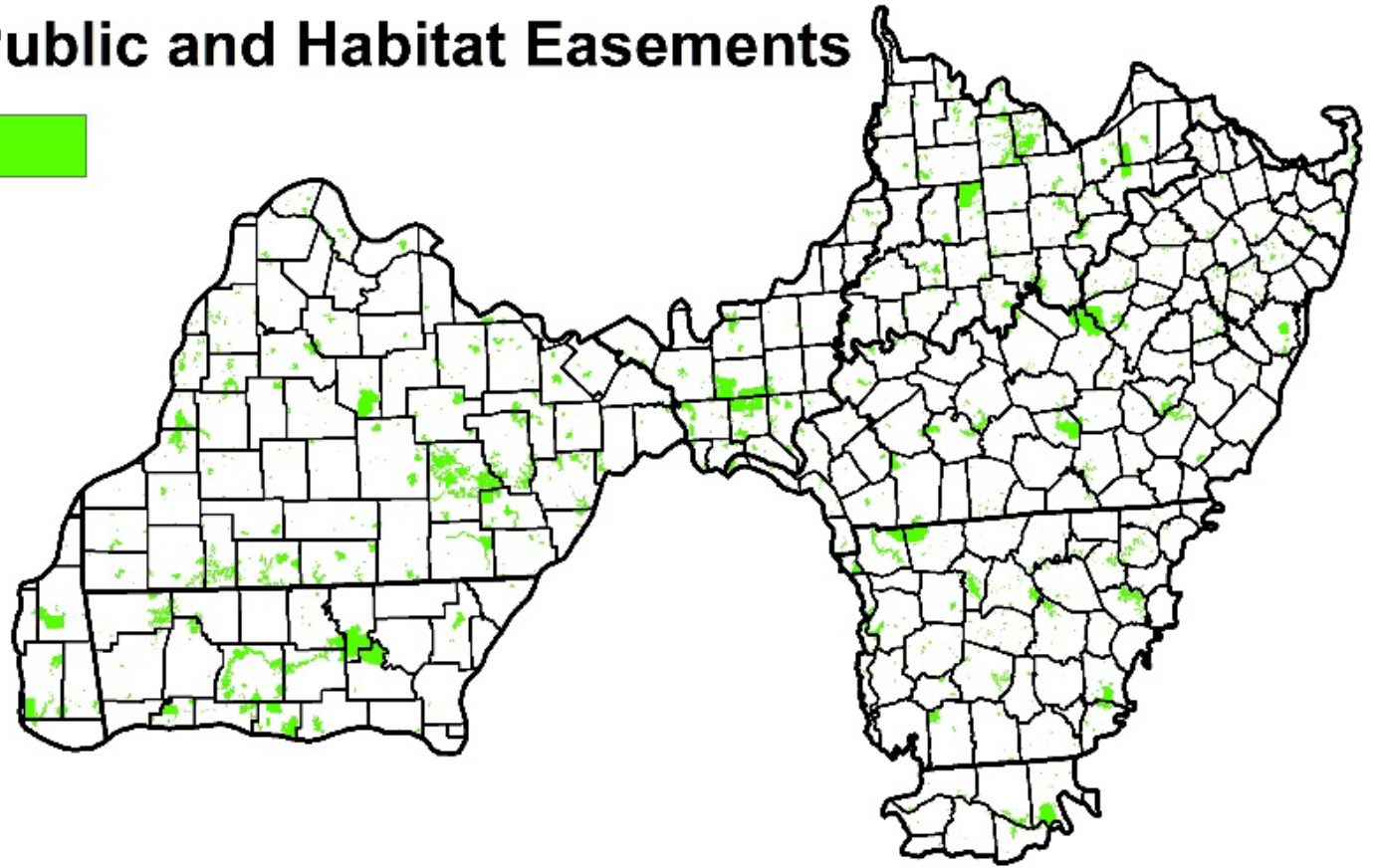
Landcover that floods on average 6/10 years



Public and Private Land Designation

- Divided landcover into public and private as land management varies with ownership
- Public lands were designated using PADUS and NCED landcover layers

Public and Habitat Easements



NSST Population Objectives

Based on Fleming et al. 2017

Table 6. Joint Venture population abundance objectives for the autumn planning period, corresponding to long-term average continental objectives, as calculated using Method 4B described herein.

Joint Venture	Species																	
	ABDU	AGWT	AMWI	BUFF	CANV	GADW	LTDU	MALL	NOPI	NSHO	REDH	RNDU	RUDU	SCAU	WODU	BWTE	CITE	TOTAL
AMJV	94,853	30,539	6,732	38,771	1,027	18,128	6,484	334,205	8,649	4,140	1,473	18,439	81,372	22,481	423,203	11,050	0	1,101,546
ACJV	825,111	441,028	140,757	396,085	6,571	55,716	676,376	1,129,322	243,478	95,513	13,058	335,083	246,155	698,495	1,390,620	108,639	0	6,802,009
CHJV	23,310	59,130	23,117	20,716	3,038	85,461	0	240,365	39,330	50,713	5,404	32,836	19,315	100,369	241,492	35,156	0	979,753

Table 7. Joint Venture population abundance objectives for the mid-winter planning period, corresponding to long-term average continental objectives, as calculated using Method 4D described herein.

Joint Venture	Species																	
	ABDU	AGWT	AMWI	BUFF	CANV	GADW	LTDU	MALL	NOPI	NSHO	REDH	RNDU	RUDU	SCAU	WODU	BWTE	CITE	TOTAL
AMJV	133,507	20,413	21,879	82,021	28,171	113,680	6,695	480,310	20,875	16,694	19,975	51,615	97,019	120,866	191,160	500	0	1,405,380
ACJV	768,467	232,287	174,622	1,049,911	109,243	99,973	1,113,058	1,082,076	204,227	90,306	131,329	647,461	693,490	2,438,336	1,838,785	102,179	0	10,775,752
CHJV	88,371	64,435	61,743	55,480	15,050	228,687	0	933,654	81,439	72,776	22,344	75,905	36,118	214,712	174,237	1,066	0	2,126,016

Fleming et al. 2017 guidelines	4D	4B
Pop Objective	2,126,016	969,753
Period days	62	60
DED needed	131,812,992	58,185,180
2 period DED need	189,998,172	

Results

Landcover Classes	DED based on habitat
Flooded Corn (>75%) 1-2% of unharvested	16,516,571
Flooded Corn (75% harvested)	19,471,385
Flooded Rice (>75%) 1-2% of unharvested	324,936
Flooded Rice (25% unharvested)	53,921
Flooded Milo (>75%) 1-2% of unharvested	277,659
Flooded Milo (25% unharvested)	468,016
Flooded Soy (>75%) 1-2% of unharvested	2,911,799
Flooded Soy (25% unharvested)	5,141,347
Flooded Millet (0%)	7,097,763
Flooded Forest * 0.4	93,488,735
Moist Soil	39,727,921
Seasonal Open Water	1,794,372
Marsh	10,564,926
Swamp	7,307,718
Total DED available	205,147,069

• Total DED for both 4B and 4D population objectives = 191,577,925

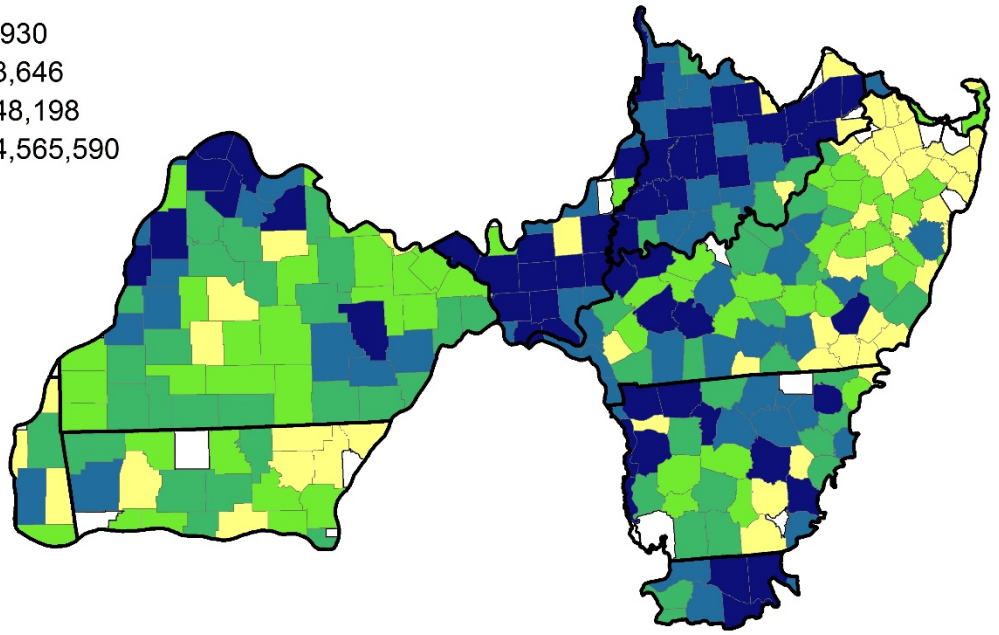
Private

Habitat	DED
Corn	16,516,571
Rice	324,936
Sorghum	277,659
Soy	2,911,799
Millet	43,971
Moist Soil	0
Marsh	7,885,325
Flooded Forest	78,037,3980
Swamp	5,626,880
Seasonal Open Water	1,311,829
Sum	289,238,053

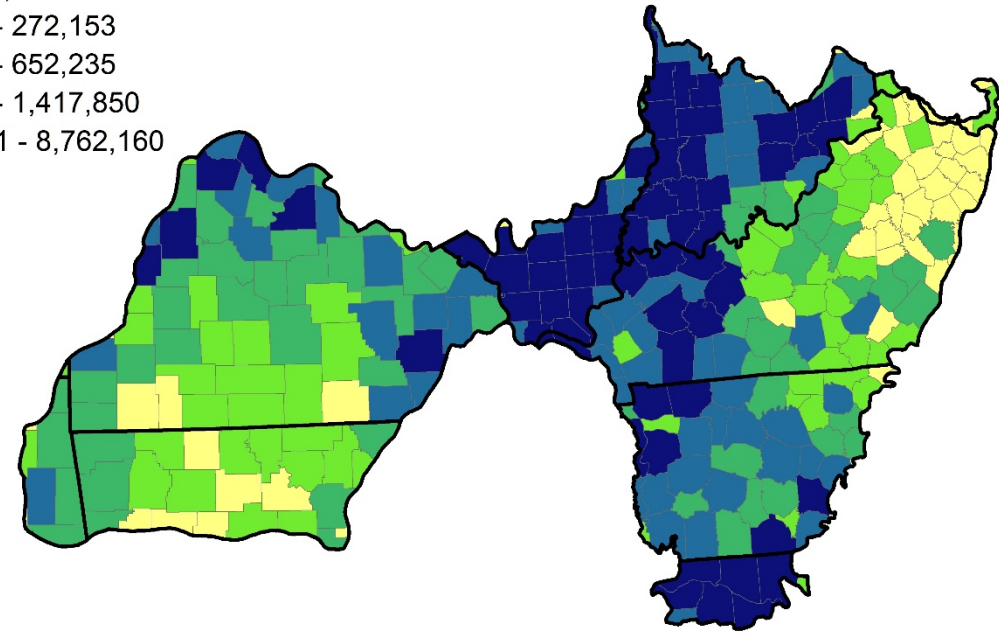
Public

Habitat	DED
Corn	19,471,385
Rice	53,921
Sorghum	468,016
Soy	5,141,347
Millet	0
Moist Soil	39,727,921
Marsh	2,679,602
Flooded Forest	11,363,251
Swamp	1,680,838
Seasonal Open Water	482,543
Sum	81,068,824

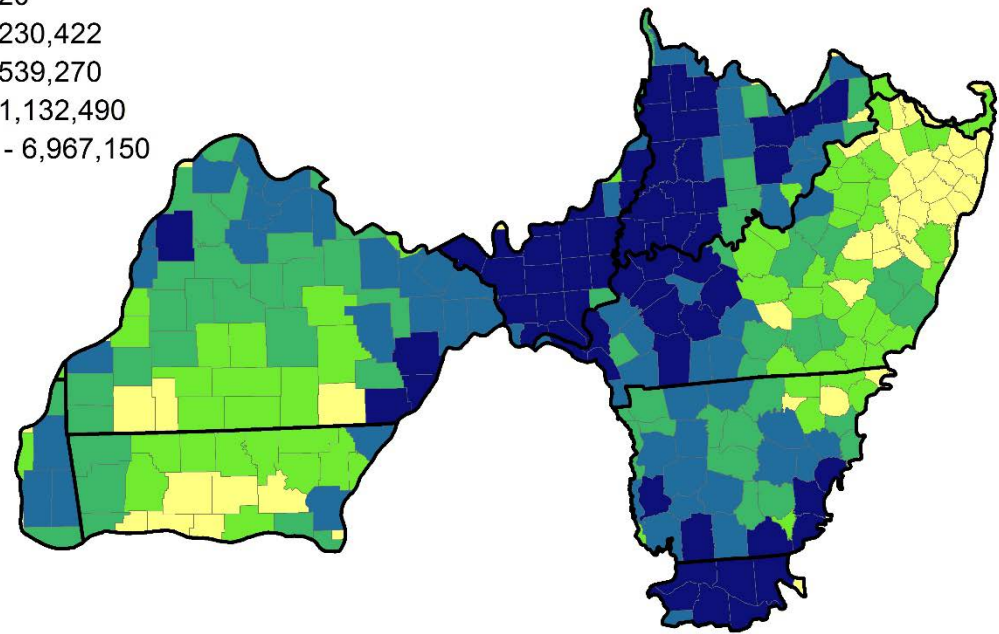
DED per County on Public Lands



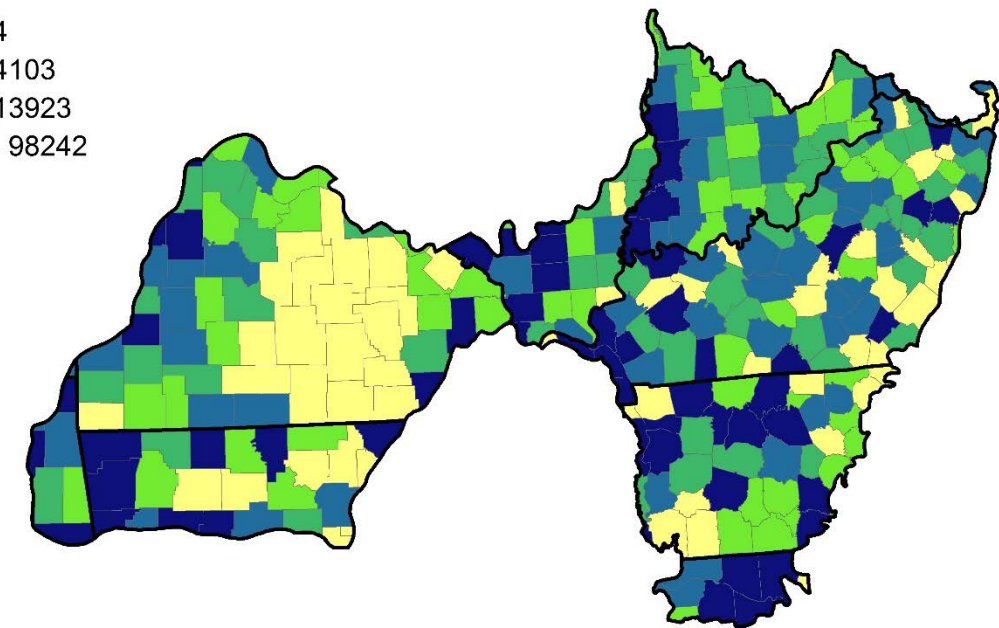
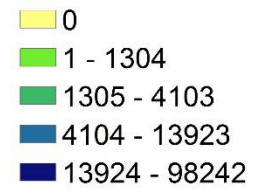
Total DED per County



DED per County on Private Lands



4D Population Objectives by county



Mismatch between county harvest and county habitat

Total DED per County



4D Population Objectives by county

