

Florida Department of Environmental Protection



Division of Environmental Assessment and Restoration

Basin Management Action Plan (BMAP)

Crystal River Area Springs Coast Basin Kings Bay & Crystal River

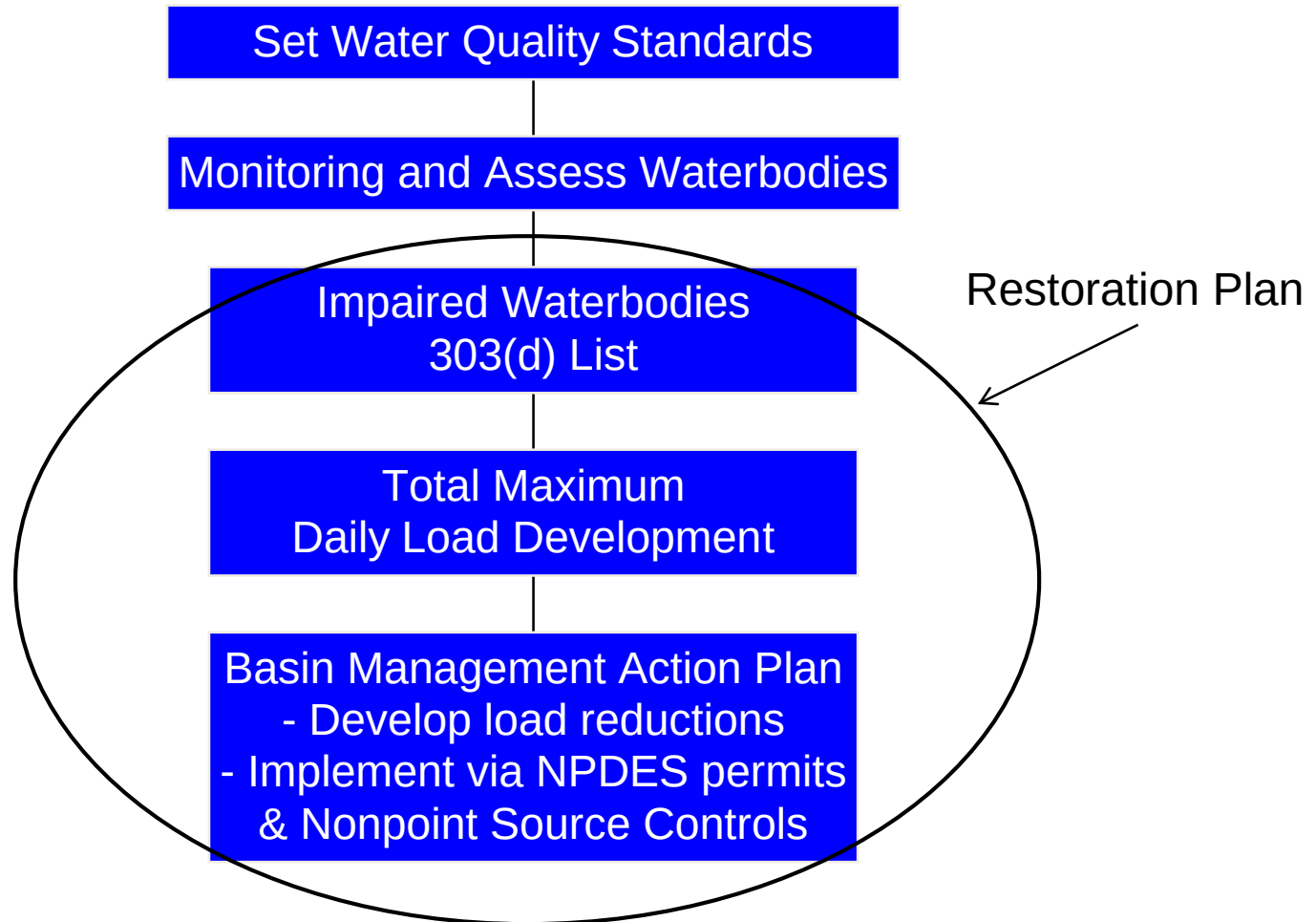
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August 2014

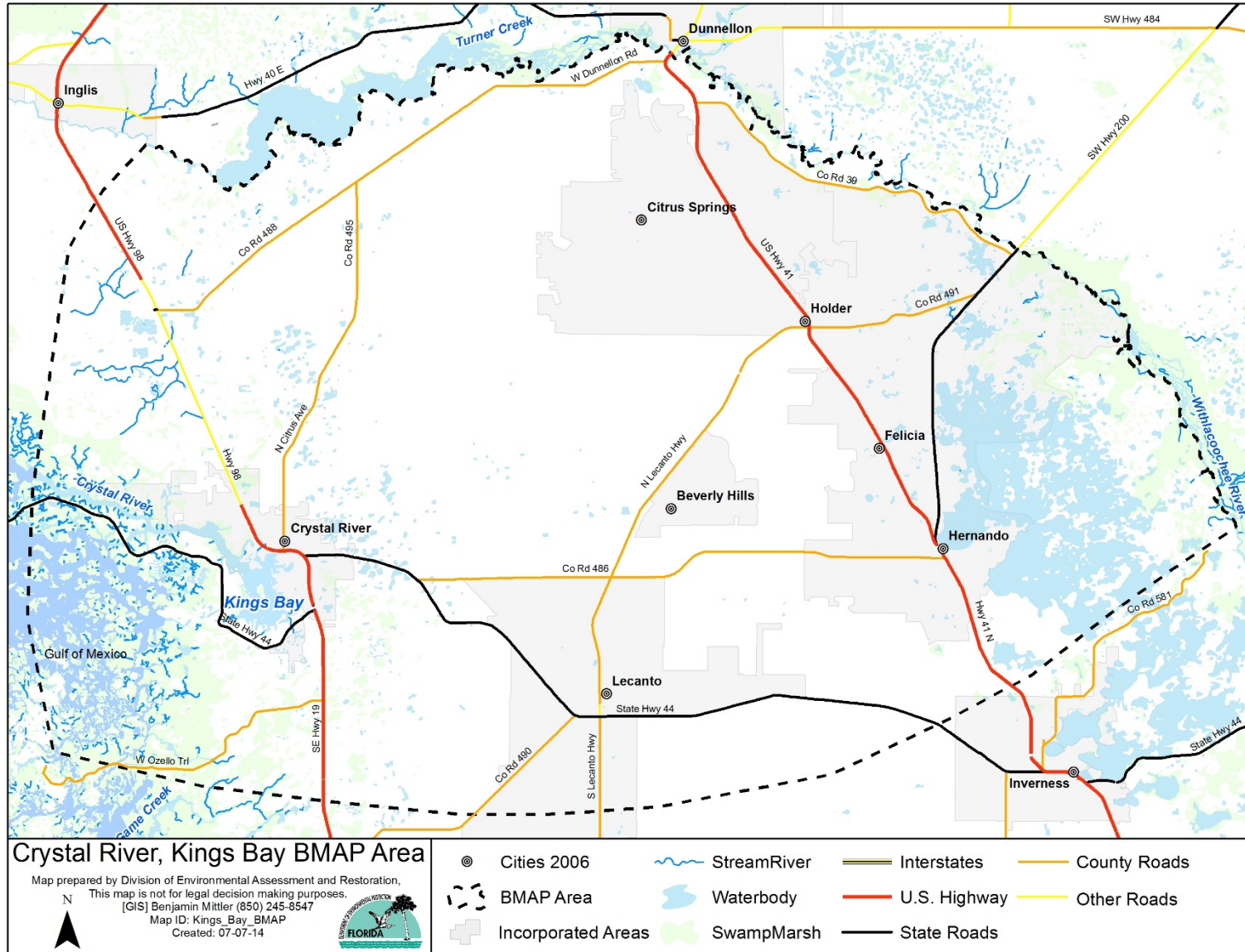




Total Maximum Daily Load (TMDL) Process

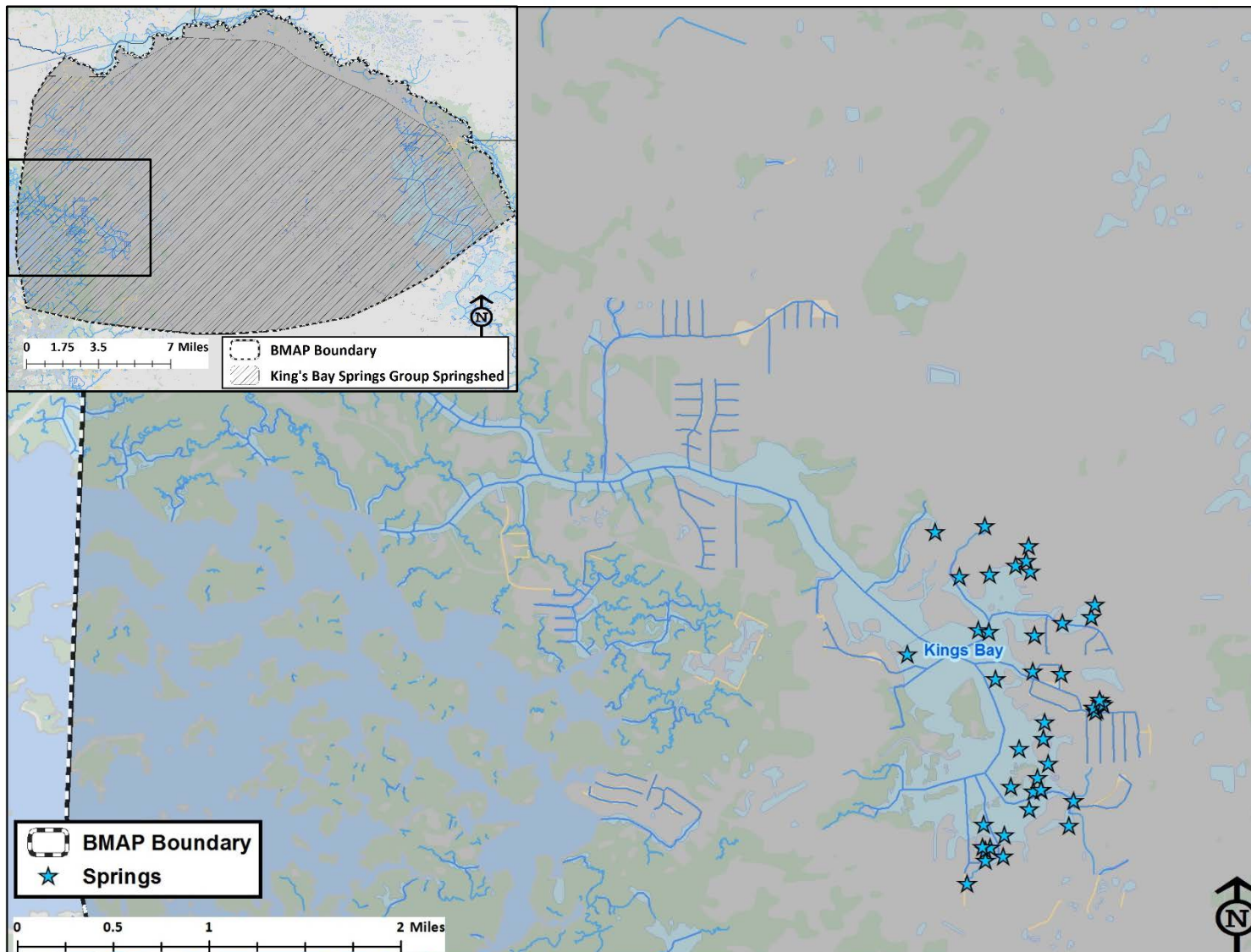


BMAP Area





King's Bay/Crystal River BMAP Area

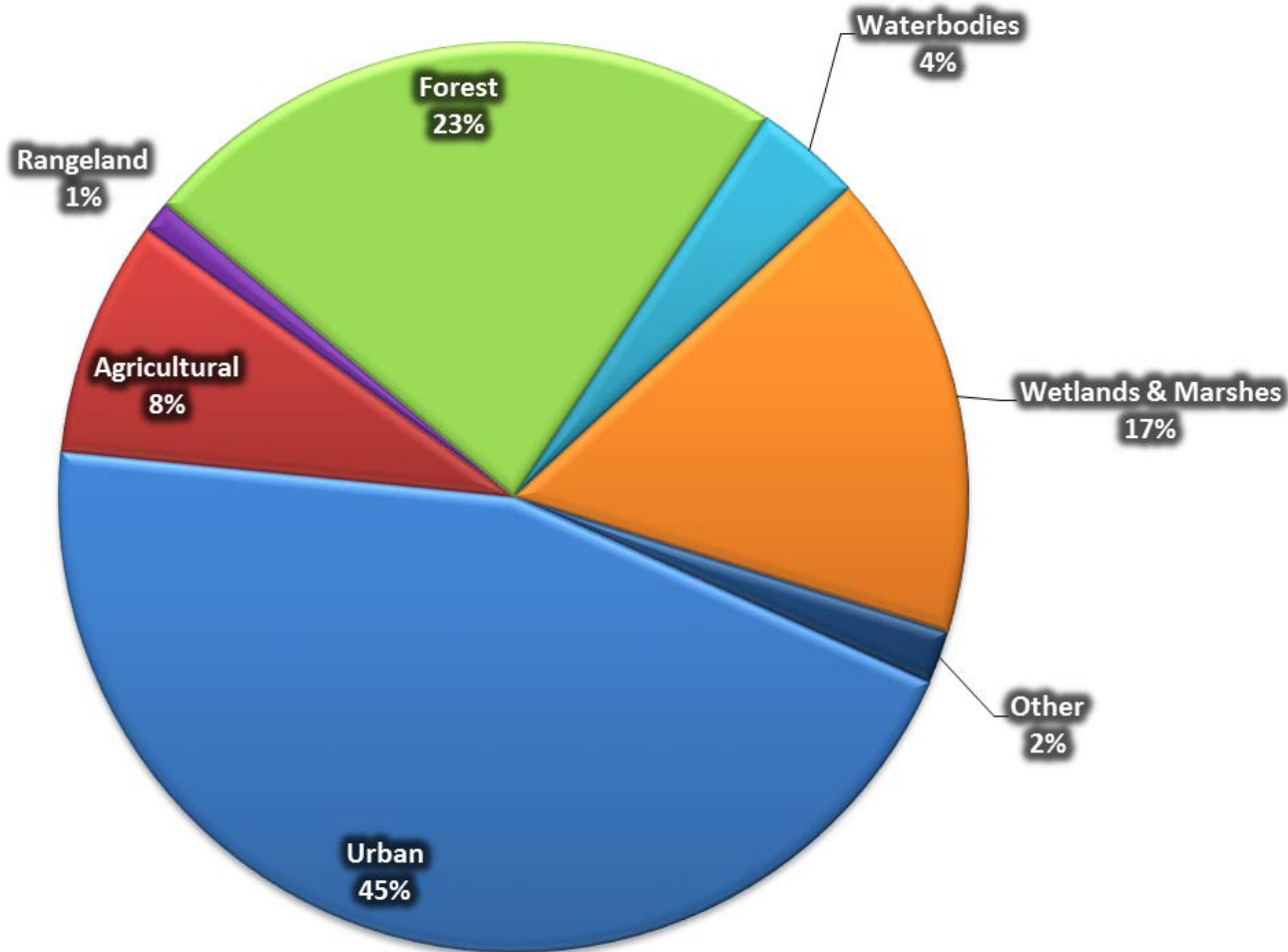


BMAP area
is based on
the King's
Bay springs
group
springshed

This map was prepared on 05/15/14 by FDEP Ground Water Management Section. For display purposes only. For more information: K.Eller (850)245-8652.

8/14/2014

King's Bay Land Use



- ♦ Majority of inputs occur within agricultural and urban landscapes
- ♦ Nitrogen sources are concentrated in 53% of the BMAP land uses



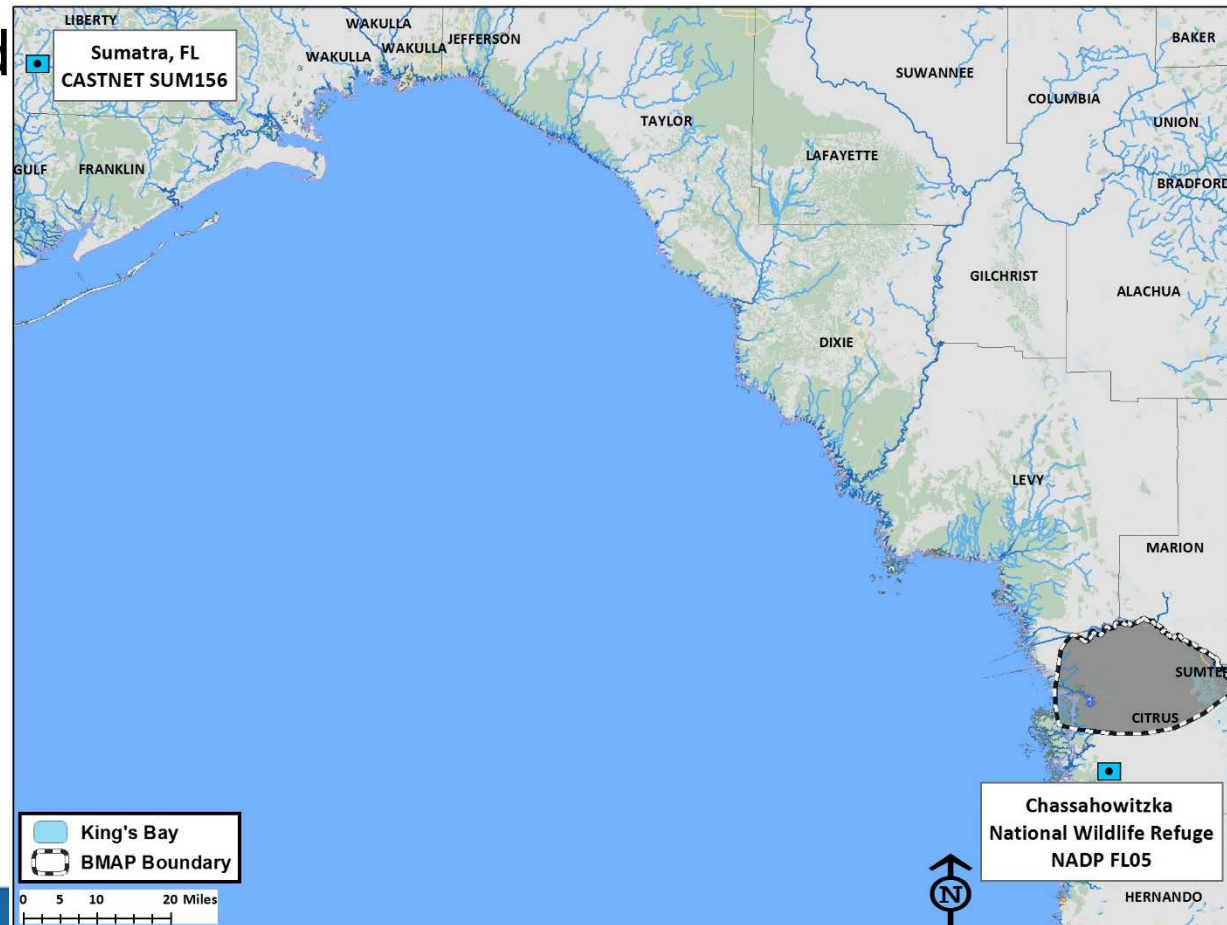
Document Surface Nutrient Reductions

- Nutrient Source Inventory (NSI) estimates surface inputs and attenuation to estimate groundwater loading
- Demonstrate initial success by identifying reductions in surface loads
- Confirm success by seeing reductions in springs



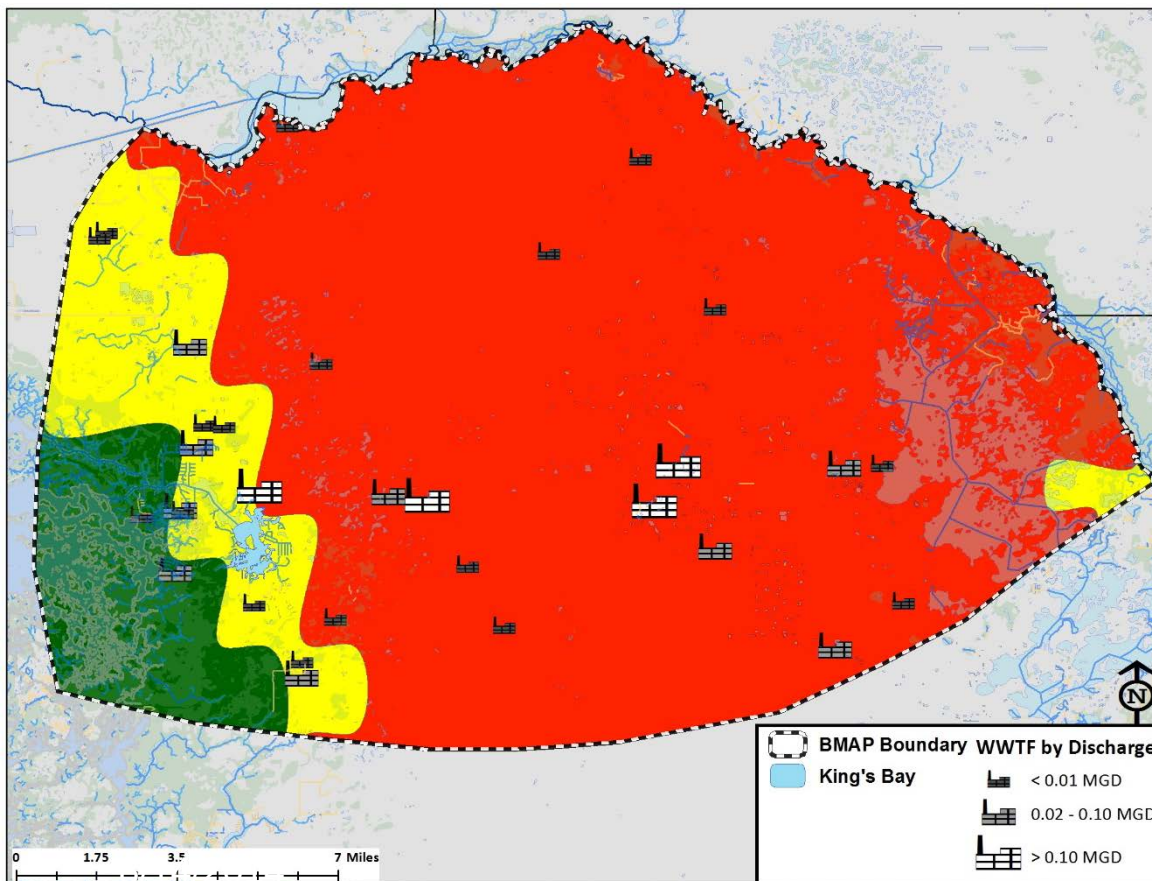
Atmospheric Deposition

- ♦ National Atmospheric Deposition Program (NADP)
 - ♦ Wet deposition
 - ♦ Chassahowitzka National Wildlife Refuge (FL05)
- ♦ Clean Air Status and Trend Network (CASTNET)
 - ♦ Dry deposition
 - ♦ Sumatra, FL (SUM156)
- ♦ Annual Average TN deposition
 - ♦ 2002-2005, 2007, 2010-2011
 - ♦ 3.11 lbs-N/ac



Wastewater Treatment Facilities

- ◇ 31 permitted facilities
 - ◇ 4 with discharge ≥ 0.1 MGD
 - ◇ 9 with discharge < 0.1 & ≥ 0.01 MGD
 - ◇ 18 with discharge < 0.01 MGD
- ◇ TN effluent concentrations as reported in DMR
 - ◇ NO₃ used to project TN data, if necessary
 - ◇ 8.97 mg/L TN used if no data available
 - ◇ 50% design capacity if no flow data available

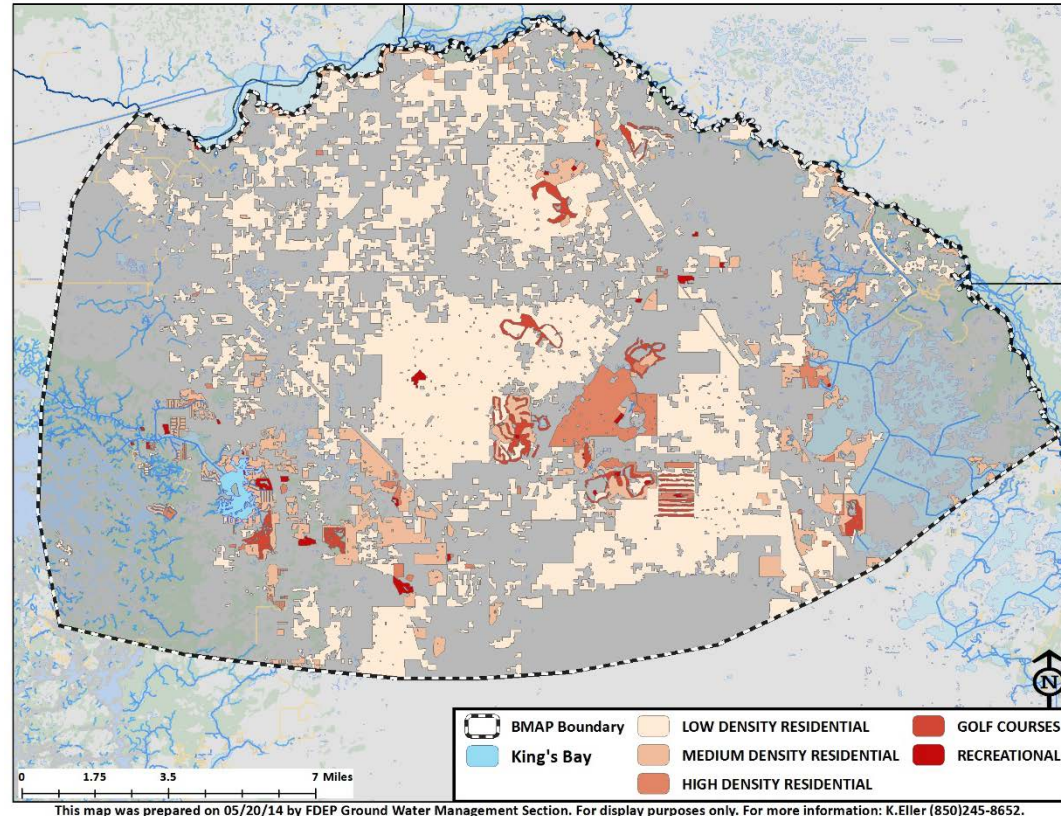


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Recharge Area	Input to Land Surface (lbs-N)
Medium	2,760
High	33,753

Urban Fertilizers

- ◇ FL Dept of Ag Fertilizer Sales Data
 - ◇ Annual data
 - ◇ Total Fertilizer Sold
 - ◇ Total N in Fertilizer Sold
 - ◇ Total Fertilizer for Non-Farm Applications
 - ◇ Full County data ONLY appropriated by land use percentages
- ◇ Golf Course Exception
 - ◇ 150 lb-N/ac application rate
 - ◇ 72% of course is fertilized

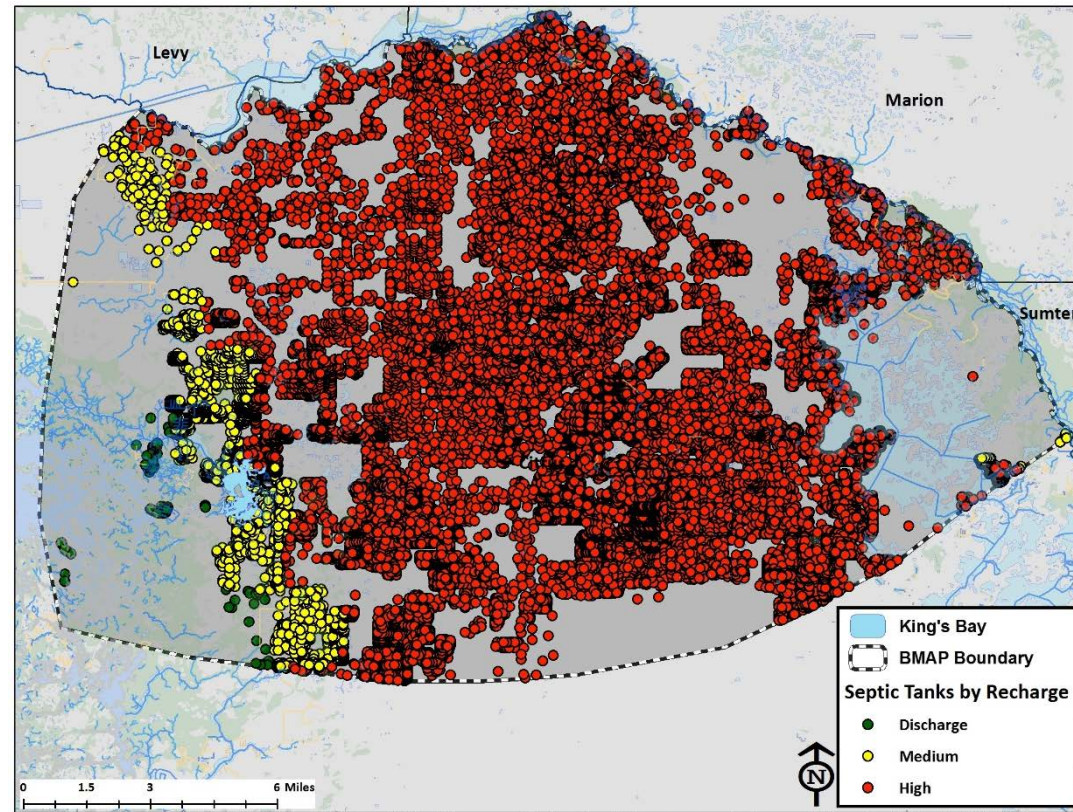


Recharge Area	Input to Land Surface (lb-N)	
	Urban Fertilizers	Golf Courses
Medium	15,079	21,360
High	237,396	323,603

Septic Tanks

- ◇ FDOH model relying on tax parcel data and sewer service areas
- ◇ Calculate # of people relying on septic tanks from 2010 Census
 - ◇ 2.23 people per household in Citrus County
 - ◇ 41,504 tanks in BMAP boundary
- ◇ Average annual input to septic tank = 9.92 lb-N/person (FDOH)

Recharge Area	Input to Land Surface (lb-N)
Medium	76,268
High	836,865





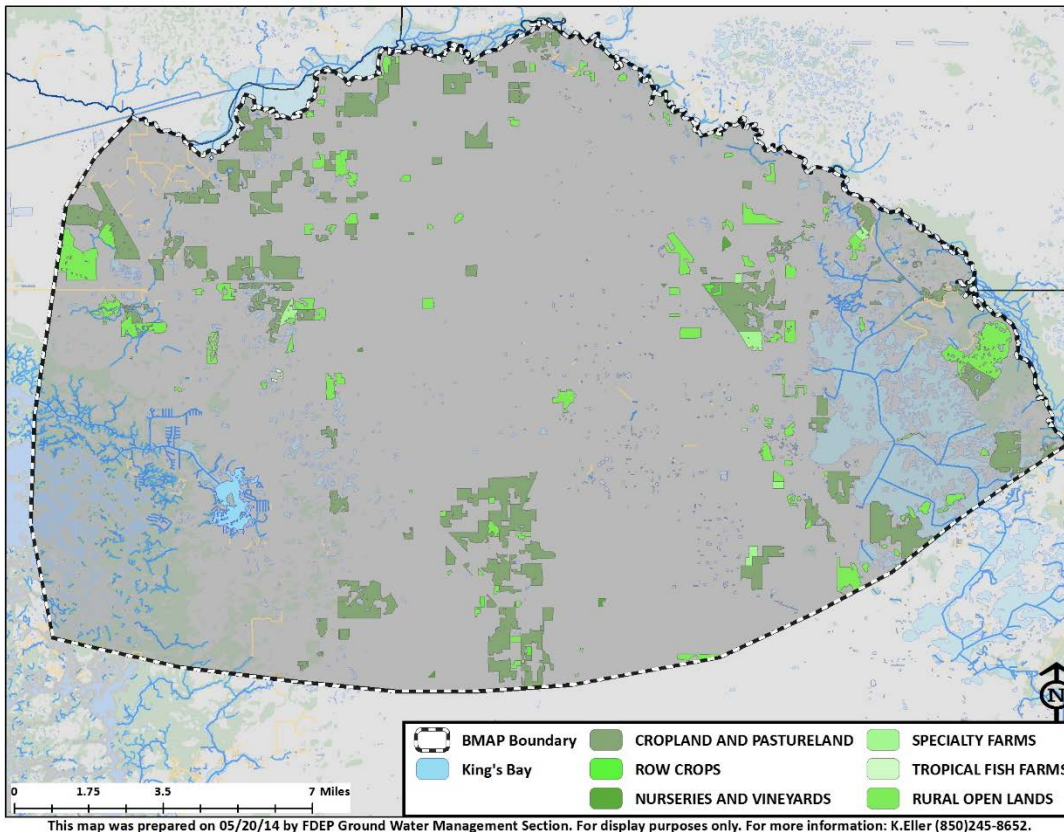
Livestock Waste

- ◇ BMAP populations estimated with land use percentages
 - ◇ 2,201 cattle
 - ◇ 874 calves
 - ◇ 433 horses
 - ◇ 130 broiler chickens
 - ◇ 664 layer chickens
 - ◇ 338 goats
 - ◇ 73 hogs
 - ◇ 104 sheep
 - ◇ 10 turkey
- ◇ Daily waste factors applied



Recharge Area	Input to Land Surface (lb-N)
Medium	48,821
High	312,039

Farm Fertilizers



Recharge Area	Input to Land Surface (lb-N)
Medium	50,379
High	321,132

- ◇ Property appraised land use data was compiled
- ◇ Each county was evaluated individually
- ◇ Land areas for specific crops were estimated
- ◇ Application rates based on IFAS recommendations and farmer feedback
 - ◇ 25 lb-N/ac: Pastures
 - ◇ 80 lb-N/ac: Ornamentals
 - ◇ 110 lb-N/ac: Hay
 - ◇ 150 lb-N/ac: Orchards

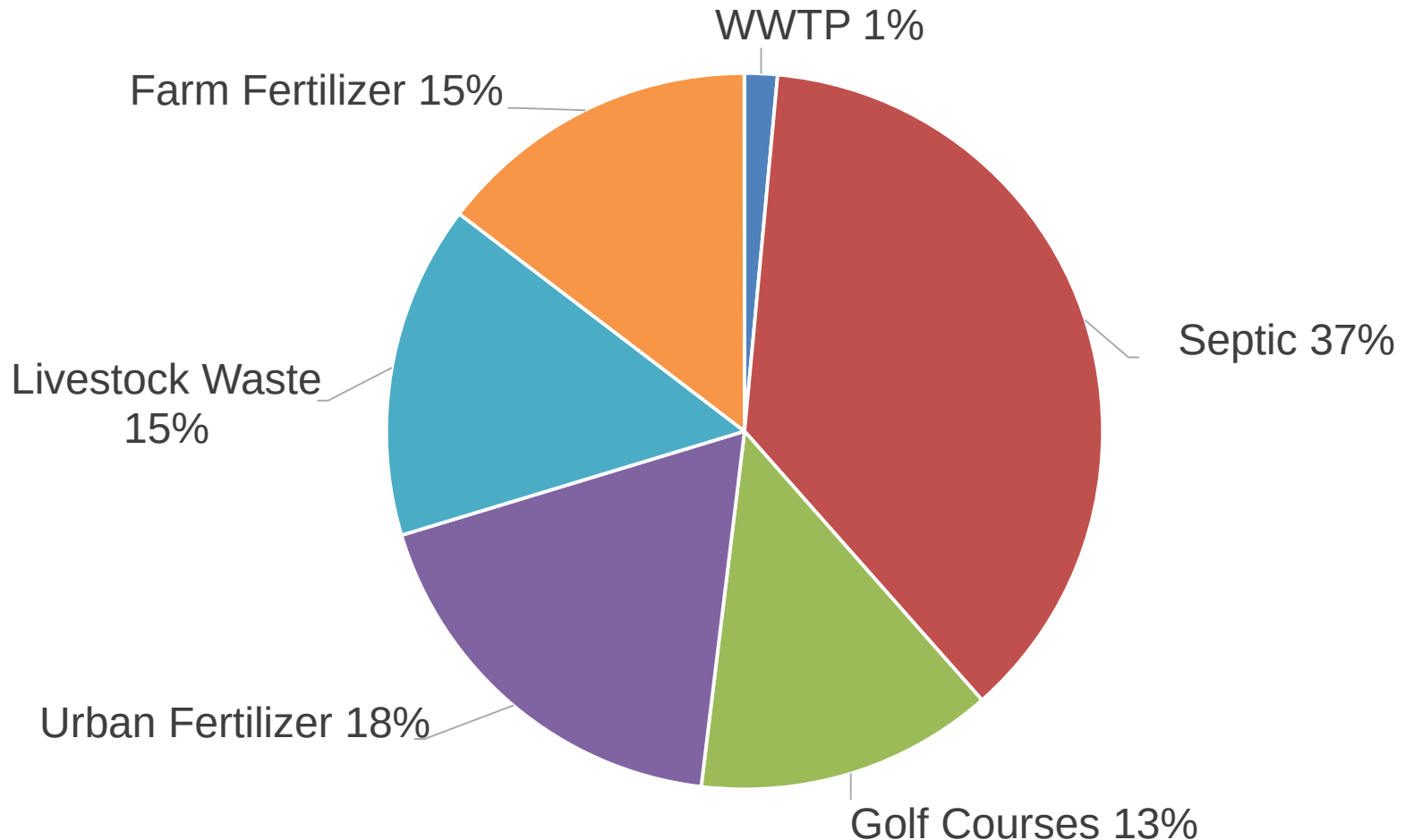


Surface Loading

- Document load reductions to surface
 - Stormwater load reductions are accounted for in separate calculations
 - Atmospheric deposition to surface is considered background loading

Surface Loading

Crystal River BMAP Area Loading to Surface





Nutrient Reduction Solutions

- Urban Fertilizer
 - County & municipal ordinances
- WWTP
 - Permit modifications upon renewal (WWTP Initiative)
- OSTDS
 - Septic Tank Initiative
- Agriculture (Fertilizer & Livestock Waste)
 - BMPs
- Golf Courses
 - BMPs
- Stormwater



WWTP Initiative

As permits are renewed for WWTP within the BMAP area:

- Plants with discharge $>100,000$ gallons per day (GPD)
 - TN $\leq 3.0\text{mg/l}$
- Plants with discharge $<100,000$ and $>20,000$ GPD
 - TN $\leq 6.0\text{ mg/l}$
- Plants with discharge $< 20,000$ GPD
 - TN, $\leq 10.0\text{ mg/l}$



Septic Initiative

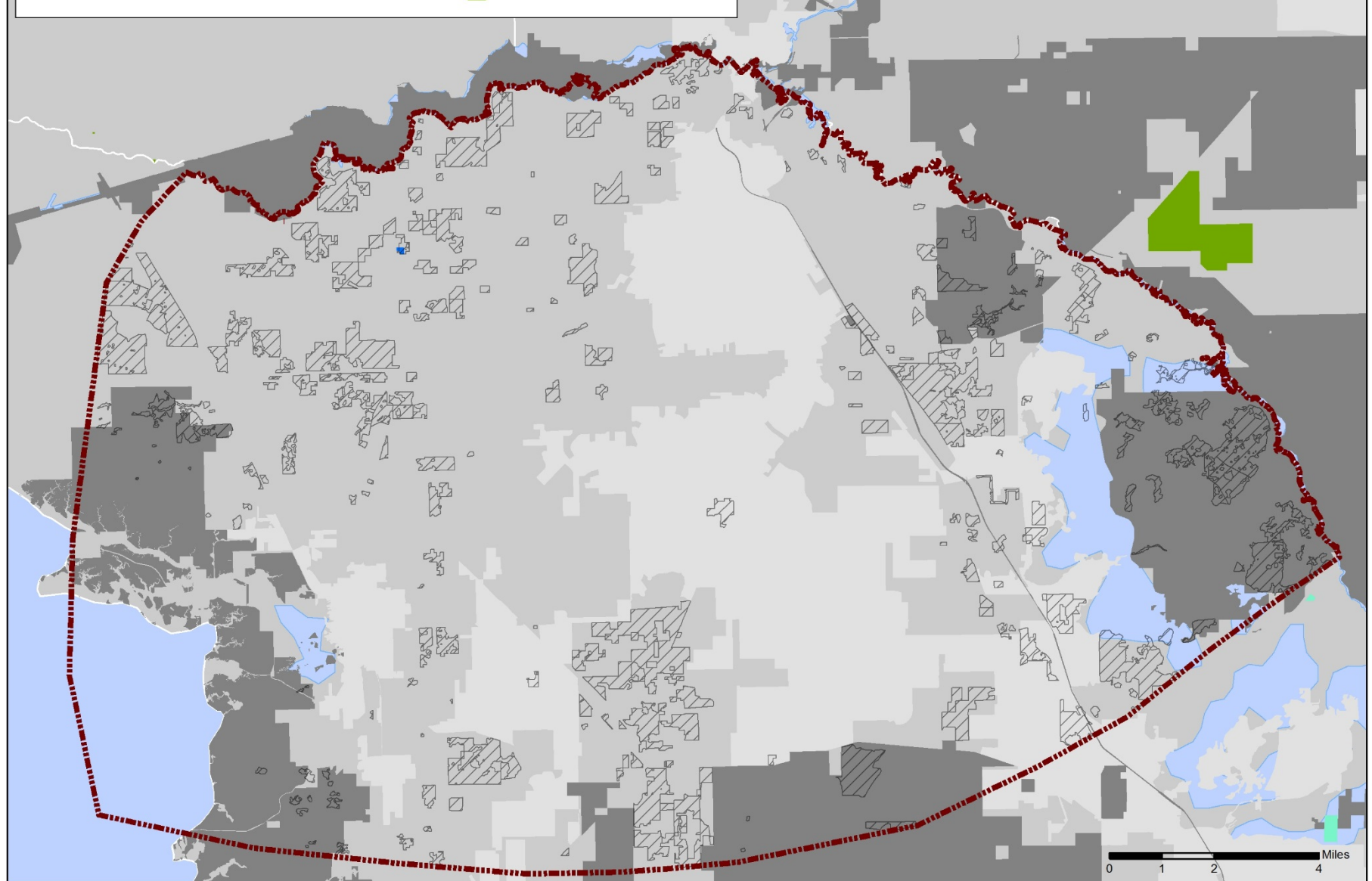
- Be prepared to utilize funding as it becomes available
- Identify effective, financially feasible strategies
 - Education and outreach programs
 - Determine responsibilities
 - ID funding sources
 - Develop implementation schedule
- Understand current capacity & plan for future growth



Agriculture

- Implement BMPs
- Assist FARMS and FDACS with additional projects

BMP Enrollment within the Kings Bay/ Crystal River Proposed BMAP Area



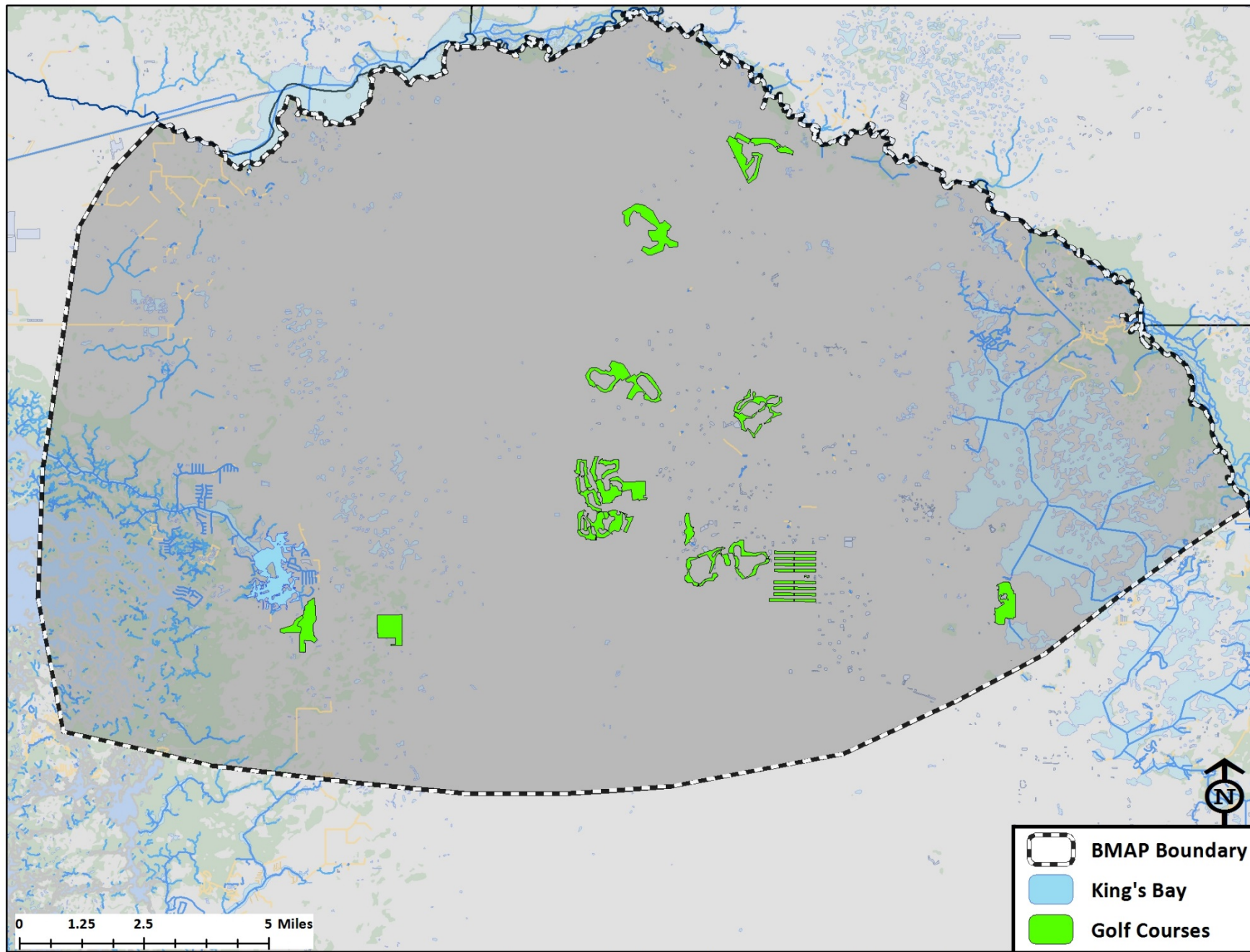


Golf Courses

- Questionnaire for Golf Course Superintendents to fill out (PDF)

[..\..\GOLF COURSES\Springs Coast Golf Course Questionnaire.pdf](#)

- Develop additional guidance as needed



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Stormwater

- NOT included in loading to surface in springshed
- Loads variable in nature and extent across basin
- Utilize existing removal efficiencies for BMPs on individual project basis



Other Projects

- SWFWMD existing and ongoing projects that may NOT fit into a source category



Next Steps

- Collect Project Information

Questions??

