



# CARTER RUN, GREAT RUN, THUMB RUN, AND DEEP RUN TMDL IMPLEMENTATION PLAN DEVELOPMENT

Virginia Department of Conservation and Recreation  
Rappahannock-Rapidan Regional Commission  
Engineering Concepts, Inc.

STEERING COMMITTEE MEETING  
August 2, 2005



## DEVELOPMENT TASKS

- ☉ Stakeholder involvement
  - Public meetings
  - Working groups – agricultural, governmental, and residential
  - Steering committee
- ☉ TMDL review and needs analysis
- ☉ Implementation actions
  - Identification & quantification
    - ☒ Agricultural
    - ☒ Residential
  - Cost / benefit analysis
    - ☒ Agricultural
    - ☒ Residential
- ☉ Establish milestones and create timeline
- ☉ Develop tracking and monitoring plans



## REVIEW OF TMDL DEVELOPMENT

- ☉ Impairment description
- ☉ Watershed characteristics
- ☉ Water quality monitoring
- ☉ Water quality modeling performed
- ☉ Sources considered
- ☉ Allocations specified



## AGRICULTURAL BMPs

- ☉ Data layers
  - Watershed boundaries – TMDL reports
  - Streams – USGS National Hydrology Dataset
  - Land-use – National Land Cover Dataset (2001 & 1992)
  - Aerial photography - Virginia Geographic Information Network
  - Confined animal feeding operations - DCR
  - Existing best management practices – DCR
  - Farm tracts - Farm Service Agency
  - Parcels – Fauquier County



## SEPARATING BMP TYPES

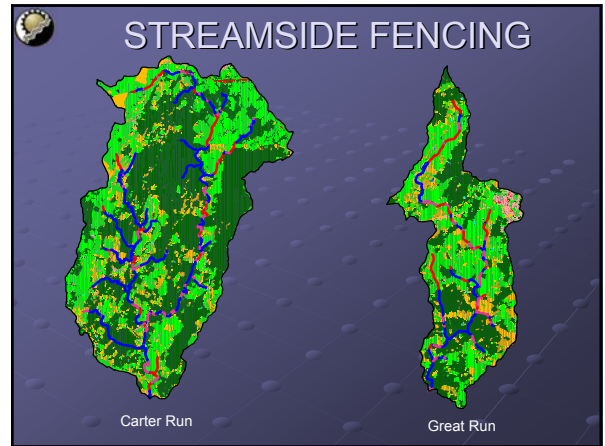
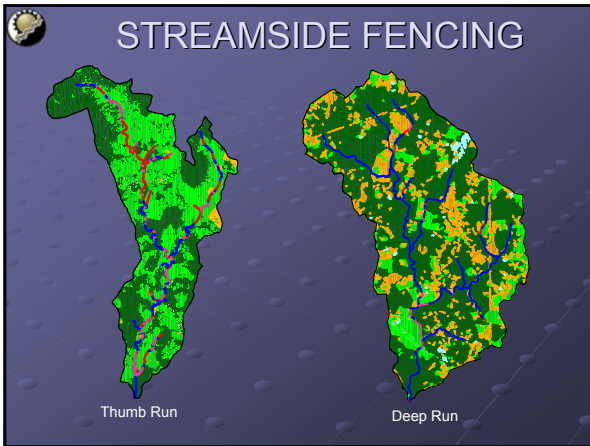
- ☉ Types
  - Direct deposition
  - Land-based
- ☉ Thumb Run and Deep Run
  - Partitioned bacteria loadings
  - Direct loading from livestock and horses
  - Land-based loadings to pasture and cropland
- ☉ Carter Run and Great Run
  - No source partitioning
  - Bacteria source assessment spreadsheet developed by the Biological Systems Engineering Department at Virginia Tech
  - Populations and distribution factors entered into spreadsheet
  - Spreadsheet output describing directly deposited loads will be subtracted from the TMDL-prescribed reductions, applying the identified reduction percentage and considering die-off
  - Balance of load allocation will be assumed to originate from land-based loads for each source



## STREAM EXCLUSION SYSTEMS

- ☉ Clip data layers to subwatershed
- ☉ Tag stream layer for continuous and intermittent streams
- ☉ Create 35' buffer around continuous streams
- ☉ Join buffer and land use layers
- ☉ Intersect buffer-land use layer with streams
- ☉ Overlay buffer-land use-stream layer on orthophotography layer
- ☉ Overlay existing BMPs and CAFO layers
- ☉ Update stream layer
- ☉ Overlay updated stream layer on FSA tract data
- ☉ Determine average characteristics of BMPs installed in region
- ☉ Translate stream fencing to exclusion systems





### PRELIMINARY STREAMSIDE FENCING SUMMARY

Impairment	Continuous Stream Length (miles)	Stream Through Pasture (miles)	Potential Livestock Exclusion Fencing Needed (miles)	Current Livestock Exclusion Fencing Needed (miles)
Thumb Run	29.9	17.4	27.8	24.3
Carter Run	48.8	15.5	23.4	23.4
Great Run	23.9	12.6	19.7	19.7
Deep Run	26.4	3.1	4.3	4.3

- ### LAND-BASED AGRICULTURAL BMPs
- Calculate land-based reductions resulting from exclusion buffers installed
  - Identify additional BMPs with associated efficiency
  - Summarize acreage per FSA tract needing treatment
  - Divide tract acreage by acres treated per BMP to determine number and type of BMP



## RESIDENTIAL BMPS

- Number of corrective actions listed in TMDL report
  - Straight pipes
  - Failing septic systems
- BMP scenarios
  - Identification through septic tank pump-outs
  - Corrective options
    - Minor repairs
    - Replace with traditional septic system
    - Replace with alternative septic system



Straight Pipe



Failed Septic System



## NEXT STEPS

- Second steering committee meeting
  - Translate streamside fencing into exclusion systems
  - Land-based agricultural BMP analysis
  - Verify BMP quantification results with agencies and agricultural working group
  - Residential BMP scenarios
  - Calculate technical assistance and education needed
- Third steering committee meeting
  - Cost analysis
  - Establish milestones and create timeline
  - Develop tracking and monitoring plans
  - Further analysis to aid implementation