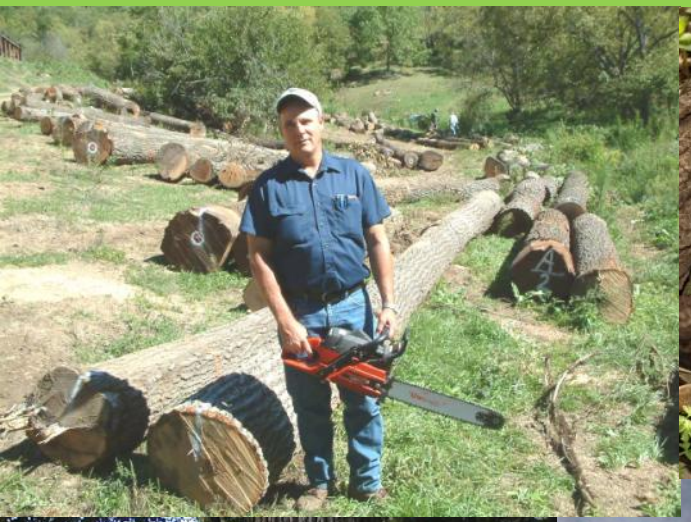
How Managing Kansas Woodlands and Planting Trees Addresses Climate Change and Biodiversity

https://www.nasa.gov/press/goddard/2014/november/nasa-computer-model-provides-a-new-portrait-of-carbon-dioxide/








Carbon dioxide and other gasses trap solar radiation within our atmosphere

Increased human fossil-fuel consumption over the past two centuries has increased levels of carbon dioxide in the atmosphere. Atmospheric CO2 recently surpassed 400 parts per million, the highest level in more than 800,000 years.

As a result of increases in atmospheric carbon dioxide, global surface temperatures have increased by about one degree centigrade since 1880. The 10 warmest years ever recorded—with the exception of 1998—have occurred since 2000. 2014 was the warmest year ever recorded.

Sea levels have risen 6.7 inches over the past century as a result of human-induced global warming. This sea-level rise, which is accelerating, makes coastal storms more destructive.

Reasonable extrapolations from current trends suggest that unchecked fossil-fuel consumption will increase the risk of coastal flooding, droughts, severe storms, heat waves, food and water shortages and other harmful effects.

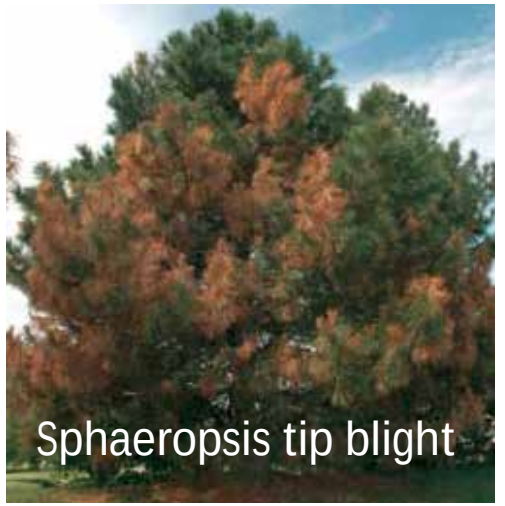
How Climate Change May Effect Kansas

- more frequent & intense droughts, heavy downpours, and heat waves; drier summers, wetter winters *(U.S. National Climate Assessment)*
- Temperature estimated to be 12° hotter century's end
- 10-20 days above 95°(1981-2010); anticipate 75 to 100 days (2-3 months) by 2080 *(American Climate Prospectus, Risky Business)*
- increased irrigation demand - a shift to dryland AG reducing crop yields by a factor of two
- wheat yield decreases by 6% percent for each degree increase in Celsius temp; 42 million tons less produced wheat per degree of increased temperature , ¼ of global trade *(Vara Prasad, professor of crop ecophysiology, KSU)*
- changing timing of flowering, increase in wildfires, pests, shift in species distributions, declines in native species, & increase invasive species

2004 Dust Storm, Colby

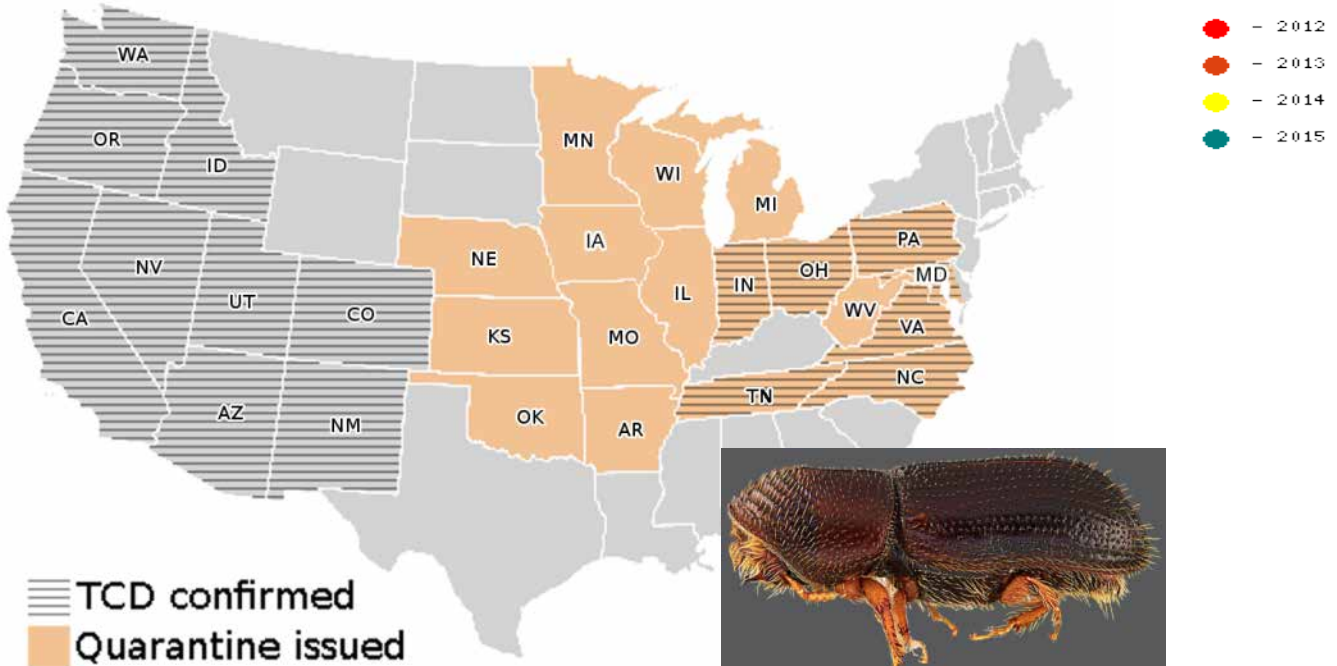
In 2012, KS power plants & industrial facilities emitted 44 million metric tons of carbon pollution = 9 million cars. KS has completed 42 renewable energy projects generating enough energy to power more than 40,000 homes and working toward meeting our goal of generating 20 percent of electricity from renewable energy sources by 2020

Symptoms of Climate Change in Kansas Woodlands

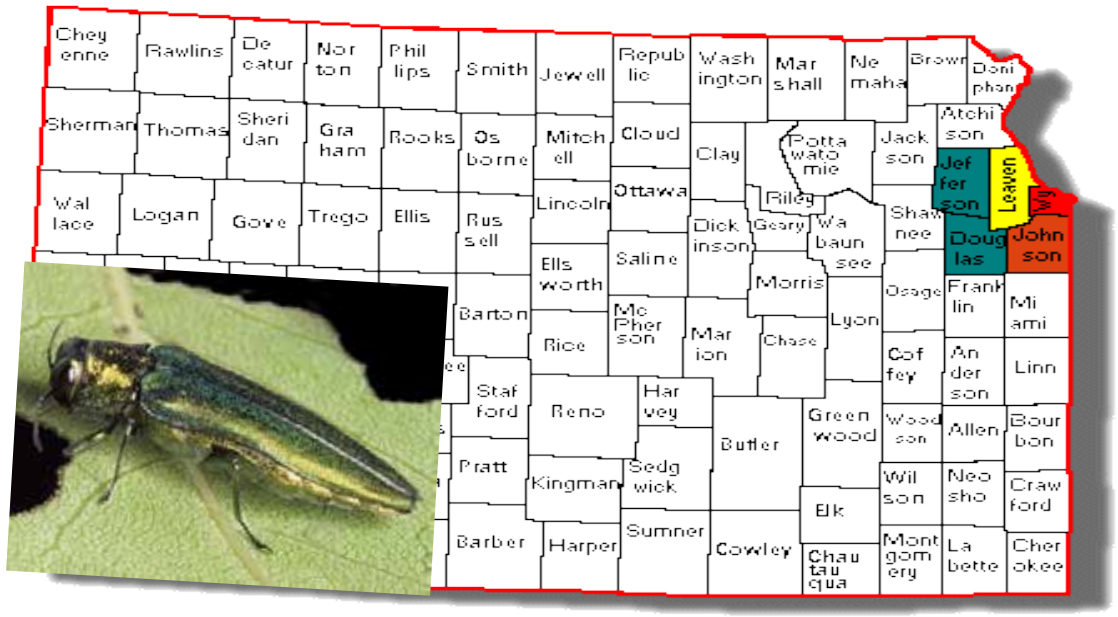


Insects & Disease

Distribution of Thousand Cankers Disease as of April 20, 2015



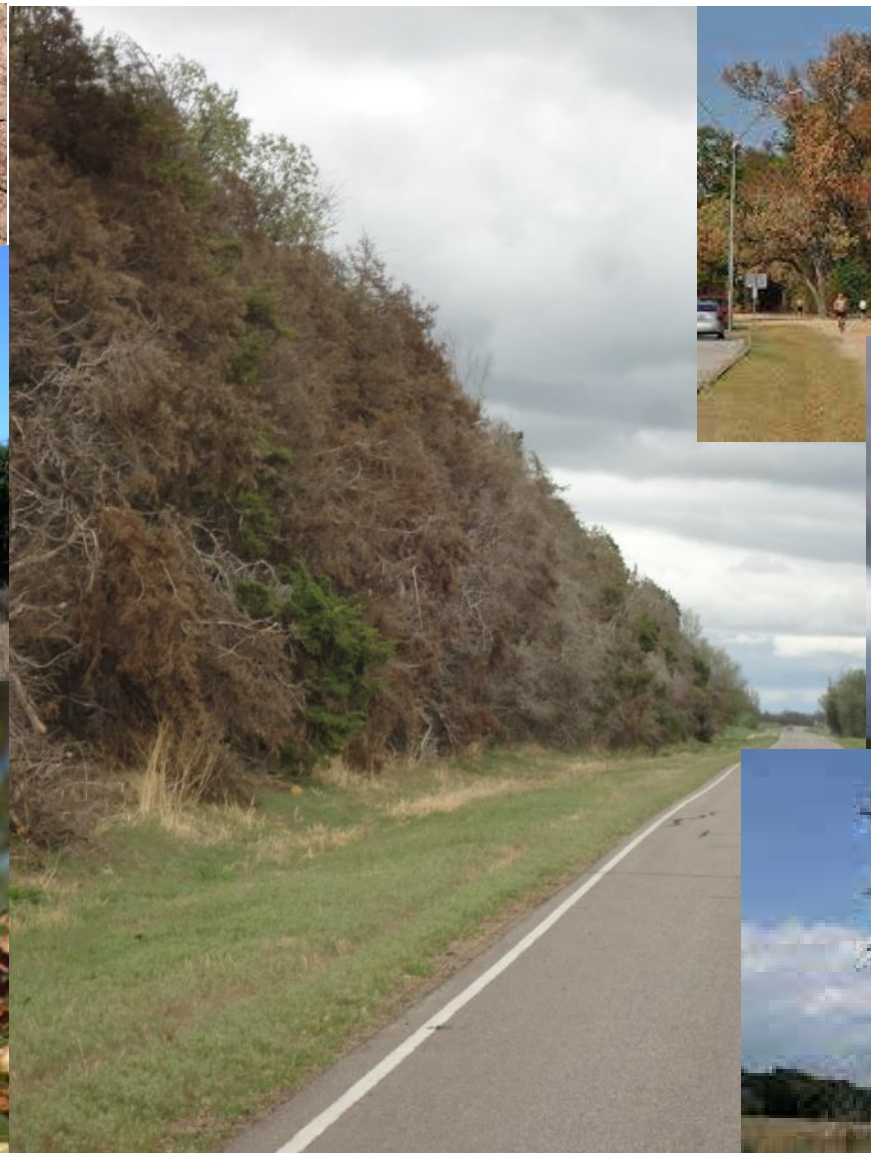
Emerald Ash Borer Counties

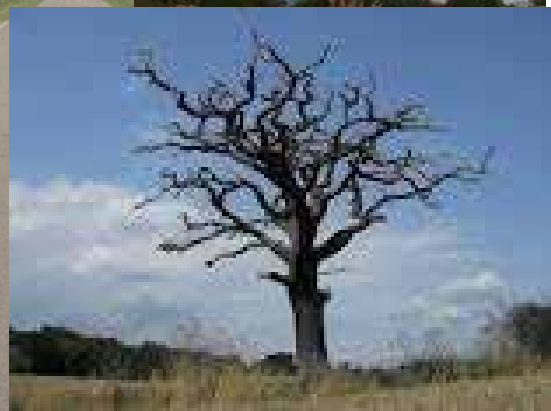


Drought…

…

In 2010…… 82% of KS was in abnormally dry or in drought conditions. 2016 -First time in 6 years there's no drought.





Invasives…

kills biodiversity


Osage orange


bush honeysuckle


Siberian elm


garlic mustard

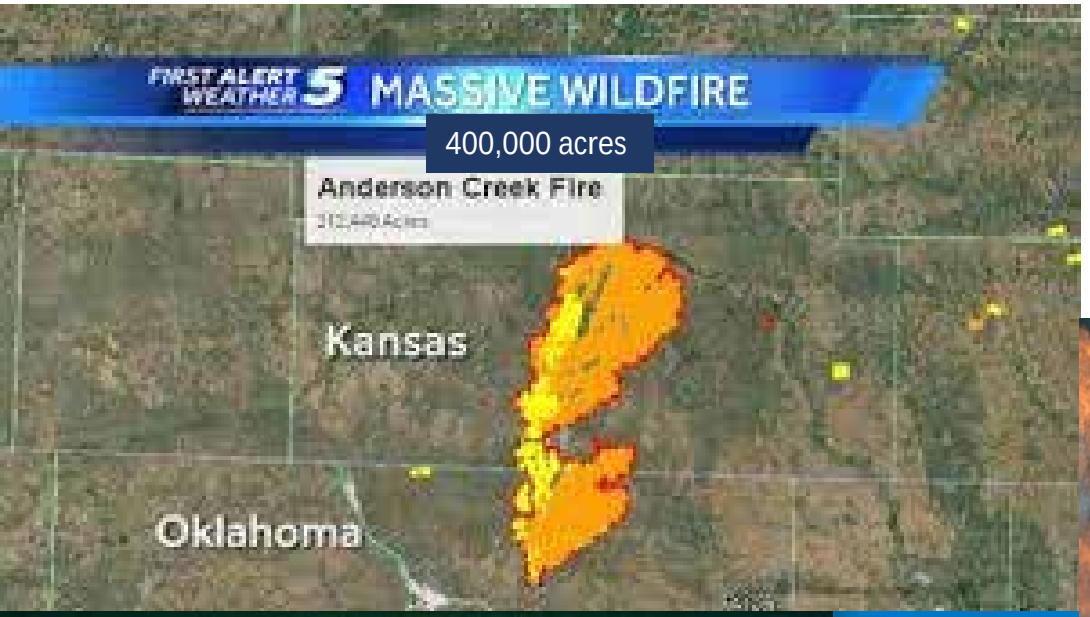
honey locust

Increased Wildfire……..

Since mid 1980s forest wildfire activity has increased in size, frequency, duration with extended fire seasons (4 x the av)

(Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity; A. L. Westerling1,2,*, H. G. Hidalgo1, D. R. Cayan1,3, T. W. Swetnam4

- § Variable moisture conditions (wet/dry)
- § Increase drought frequency
- § Spring arrives earlier (10 days compared to 1950s) early snow melt, flooding, followed by lack of moisture latter in the year



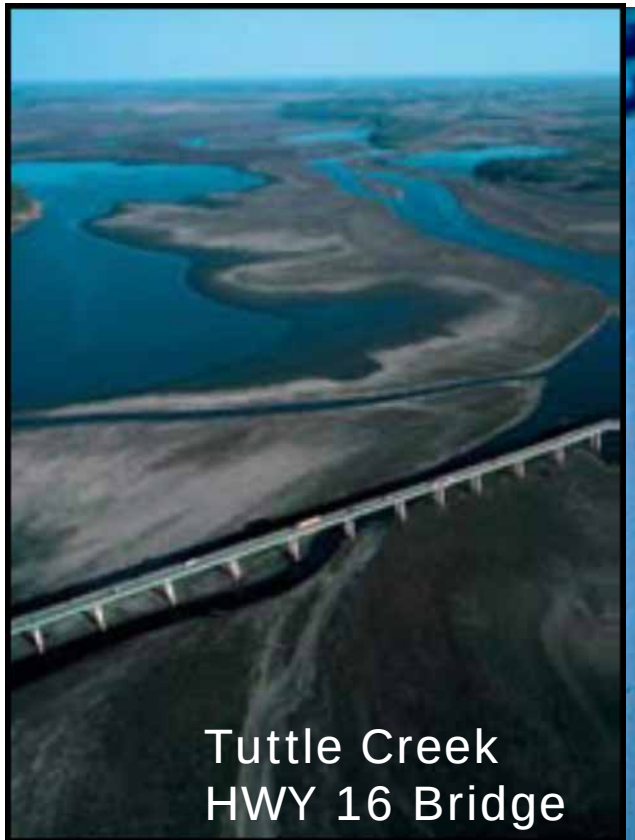
Flooding……

Increased temperatures cause warmer air to hold more moisture (picture steam in the air following a hot shower) until it meets cold air….

Kansas

1951 – displaced half a million people
1981 – Great Bend (20” in 12 hrs.)
1986 – SE KS – October
1993 – Mississippi/MO Basin
1998 – SC KS Halloween
2007-2008 – Midwest
2013 - Midwest

- Heavy participation events (top 1%) now drop 67% more precipitation in NE, 31% more in Midwest, 15% more in Great Plains than 50 years ago
- Scientist anticipate that amount of rainfall during heavy events will increase by 40% by end of the century
- Floods are more frequent but not necessarily bigger in size

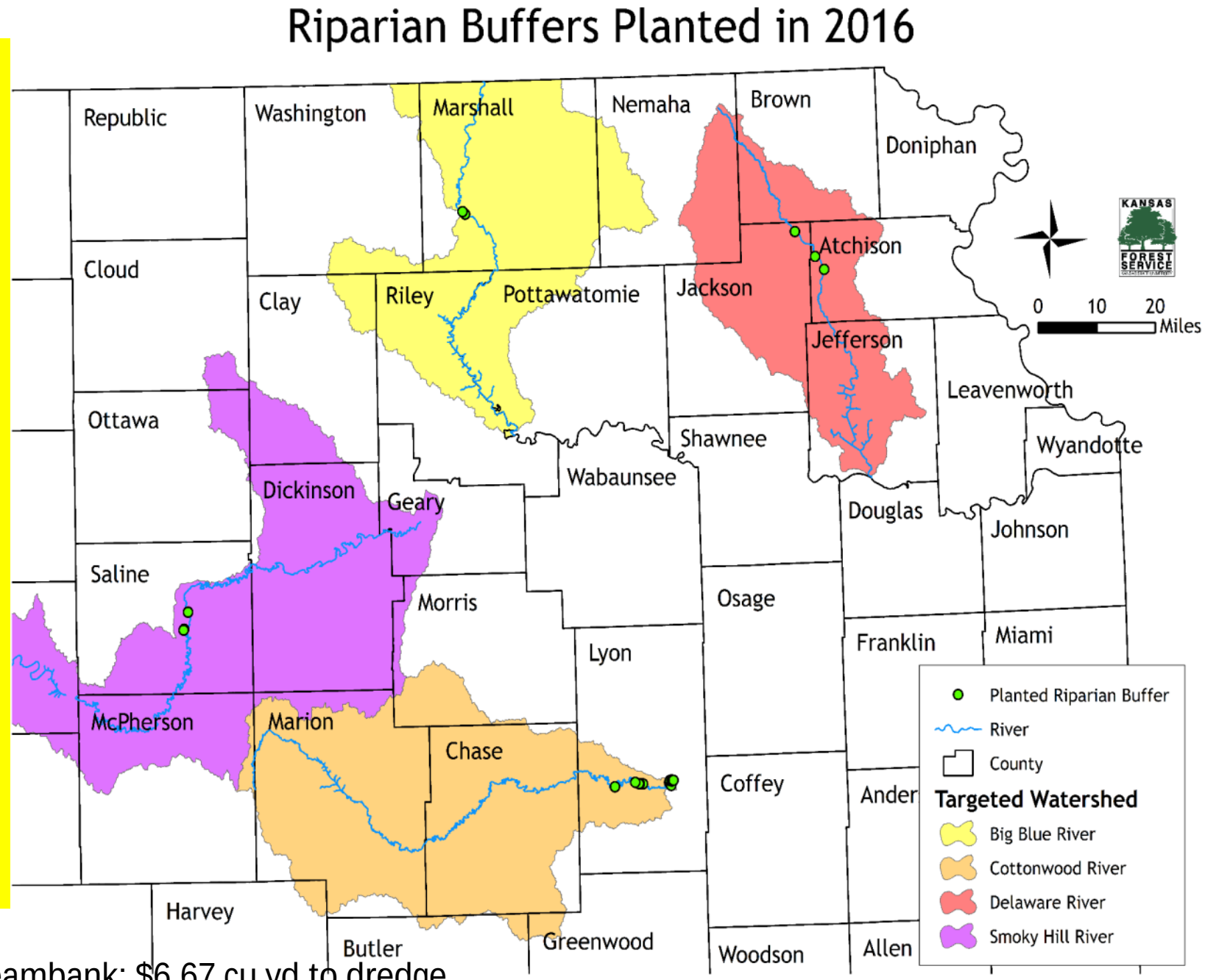


Streambank Protection Program
KS Department of AG – DOC
KS Forest Service
KS Water Office
KDHE – Water Bureau – Watershed

2016 Watersheds/Federal Reservoirs
Smoky Hill/Kanopolis
Cottonwood/John Redmon-Wolf Creek
Tuttle Creek/Tuttle Creek Reservoir
Delaware/Lake Perry

Planted 3.34 miles on 24 new sites. The riparian forest buffers alone are estimated to keep 1,837* tons of sediment and associated phosphorus/nitrogen out saving $188,179 in dredging costs

612 acres of woodland improvement



*1.6 cu yds of sediment saved/mi. of streambank; $6.67 cu yd to dredge

Improving Water Quality Through the Implementation of Forestry Practices and the Assessment of Riparian Systems in Kansas' Priority Watersheds

$ 13,565,890 Non-Federal Partner Match

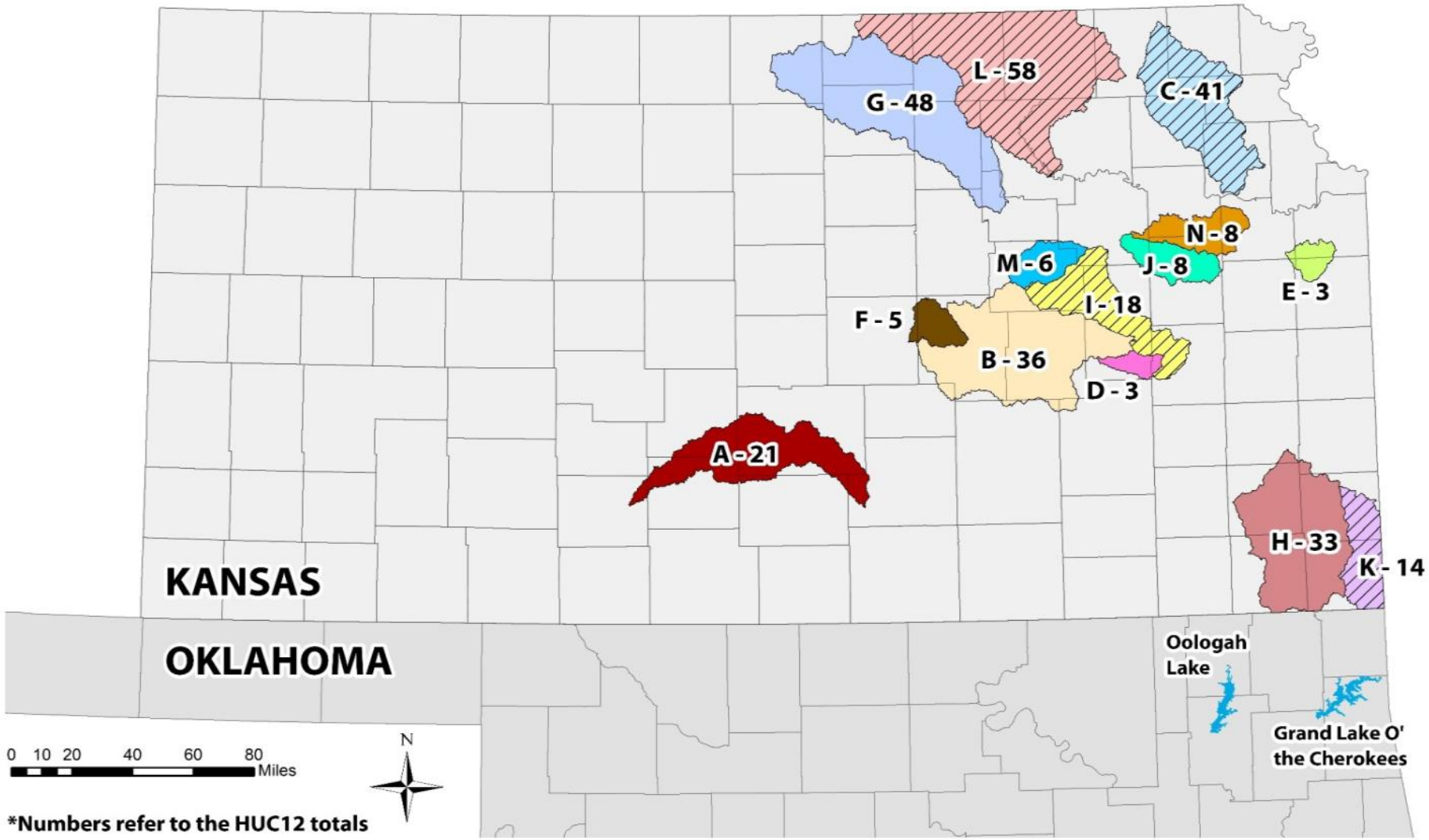
Successful Roll Out January 13, 2016!!




INVESTMENT TO REDUCE SEDIMENTATION IN FEDERAL RESERVOIRS

- **FINANCIAL ASSISTANCE**:
  $8,045,544
- **TECHNICAL ASSISTANCE** (KFS):
  $2,354,456
- **TECHNICAL ASSISTANCE** (NRCS)
  $2,600,000

TOTAL: $13,000,000



- Cheney Reservoir - A - 21
- Cottonwood River - B - 36
- Delaware River - C - 41
- Eagle Creek - D - 3
- Hillsdale Reservoir - E - 3
- Marion Reservoir - F - 5
- Milford Reservoir - G - 48
- Middle Neosho - H - 33
- Neosho Headwaters - I - 18
- Pomona Reservoir - J - 8
- Spring River - K - 14
- Tuttle Creek Reservoir - L - 58
- Twin Lakes - M - 6
- Upper Wakarusa - N - 8
- Assessment Watershed
- Implementation Watershed

GOALS

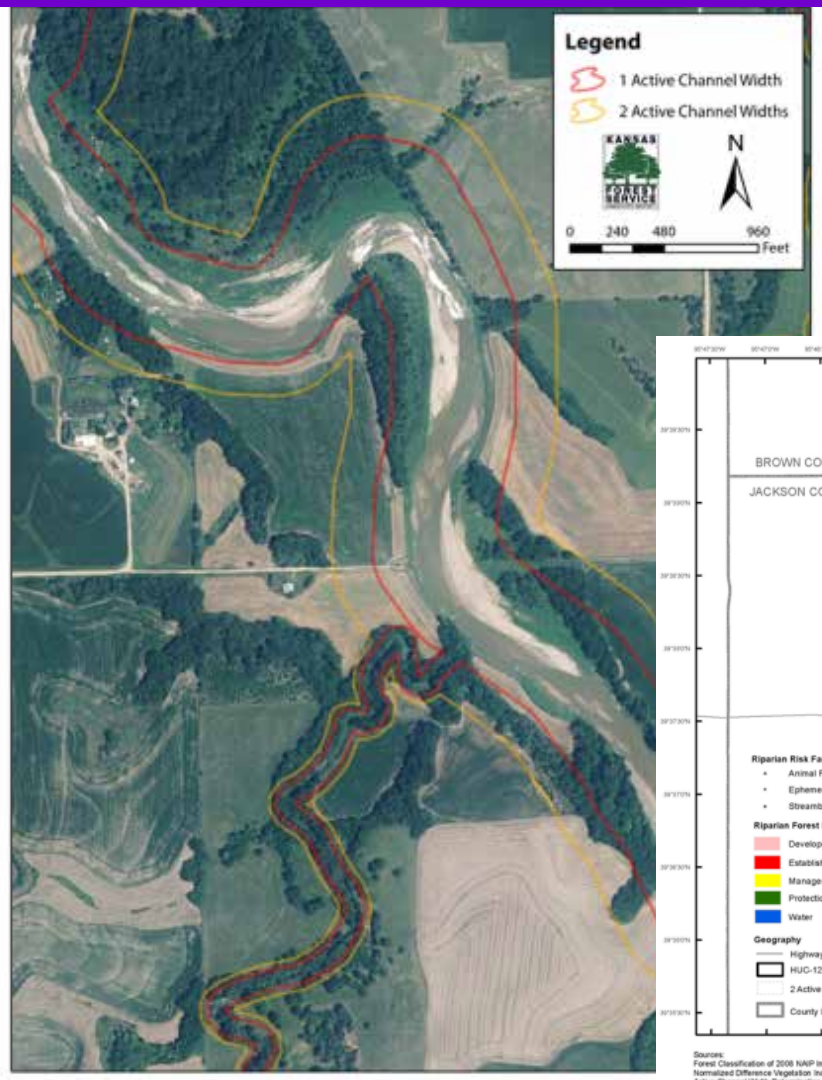
TREE PLANTING

- 5,200 AC/1,040 AC/YR

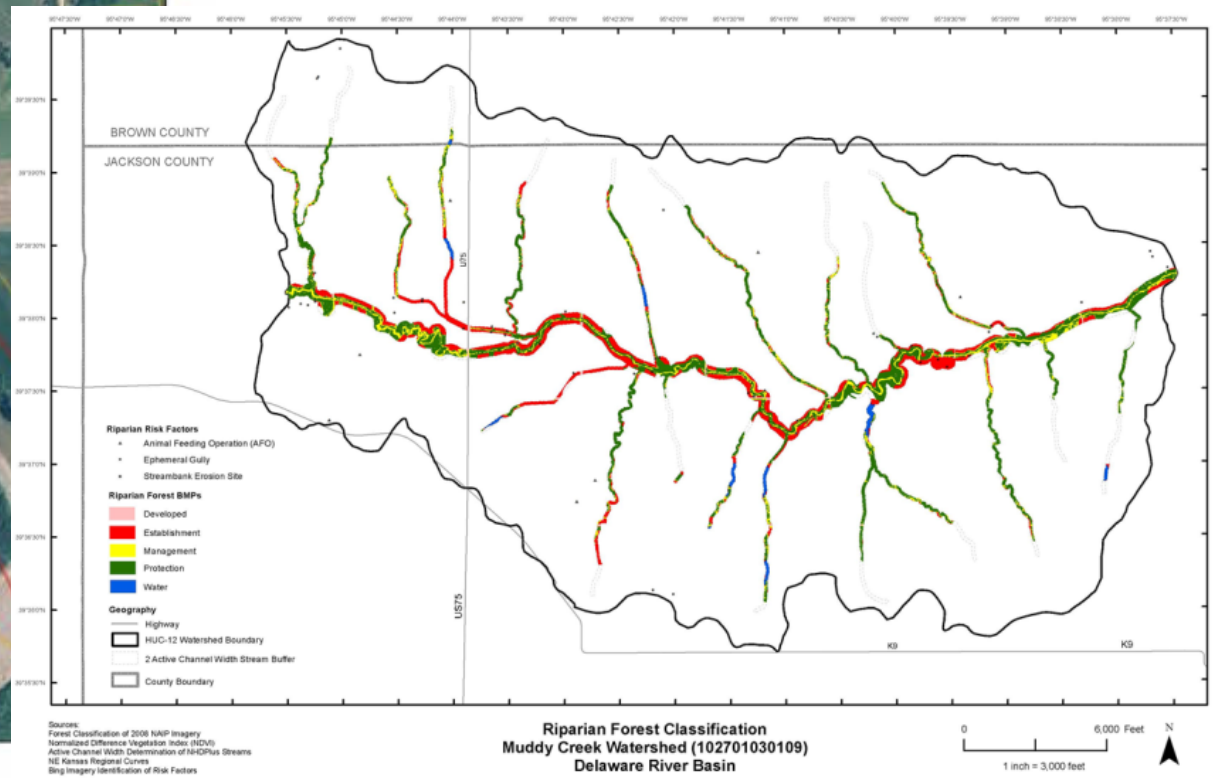
FOREST IMPROVEMENT

- 10,400 AC/2,080 AC/YR

Assessment, Education, Outreach



- Assess 10 additional HUC 12 Watersheds
- Assessments guide direct contact with Landowners through County Conservation Districts
- Peer-to-Peer Mentoring Networks



KS RCCP Program Outline

- Contact KFS Forester or NRCS
- Resource Concerns – Degraded Plant Condition/Water Quality
- Forester prepares plan
- 19 Eligible Conservation Practices
- High priority practices are funded (those with a RC and plan)
- Applications funded as received (no batch period)

PRACTICES & PAYMENT

Conservation Practices

314—Brush Management
315—Herbaceous Weed Control
338—Prescribed Burning
342—Critical Area Planting
380—Windbreak/Shelterbelt Establishment
382—Fence
390—Riparian Herbaceous Cover
391—Riparian Forest Buffer
393—Filter Strip
394—Firebreak
472—Access Control
484—Mulching
490—Tree/Shrub Site Preparation
512—Forage & Biomass Planting
550—Range Planting
595—Integrated Pest Management
612—Tree/Shrub Establishment
660—Tree/Shrub Pruning
666—Forest Stand Improvement

Cost-Share Components (not all listed)

Mechanical Mowing	$11.62/AC
Herbicides (banding)	$31.06/AC
Weed Barrier Fabric (sq)	$1.79/EA
Mechanical Tree Establ	$151.56/AC
Tree/Shrub Site Prep (med)	$212.72/AC
Tree/Shrub Site Prep (heavy)	$240.54/AC
Direct Seeding	$741.19/AC
Tree Planting (Mach & Tubes)	$7.20/EA
Tree Planting (Hand/Tubes)	$4.07/EA
Tree Planting (Machine)	$2.14/EA
Riparian Forest Buffer Cont	$1,809.32/AC
Riparian Forest Buffer B Root	$1,125.74/AC
Barbed Wire Fence (multi)	$1.31/LnFt
Forest Stand Improvement	$253.58/AC
Competition Control, Heavy	$389.22/AC
Thinning for Wildlife	$732.32/AC

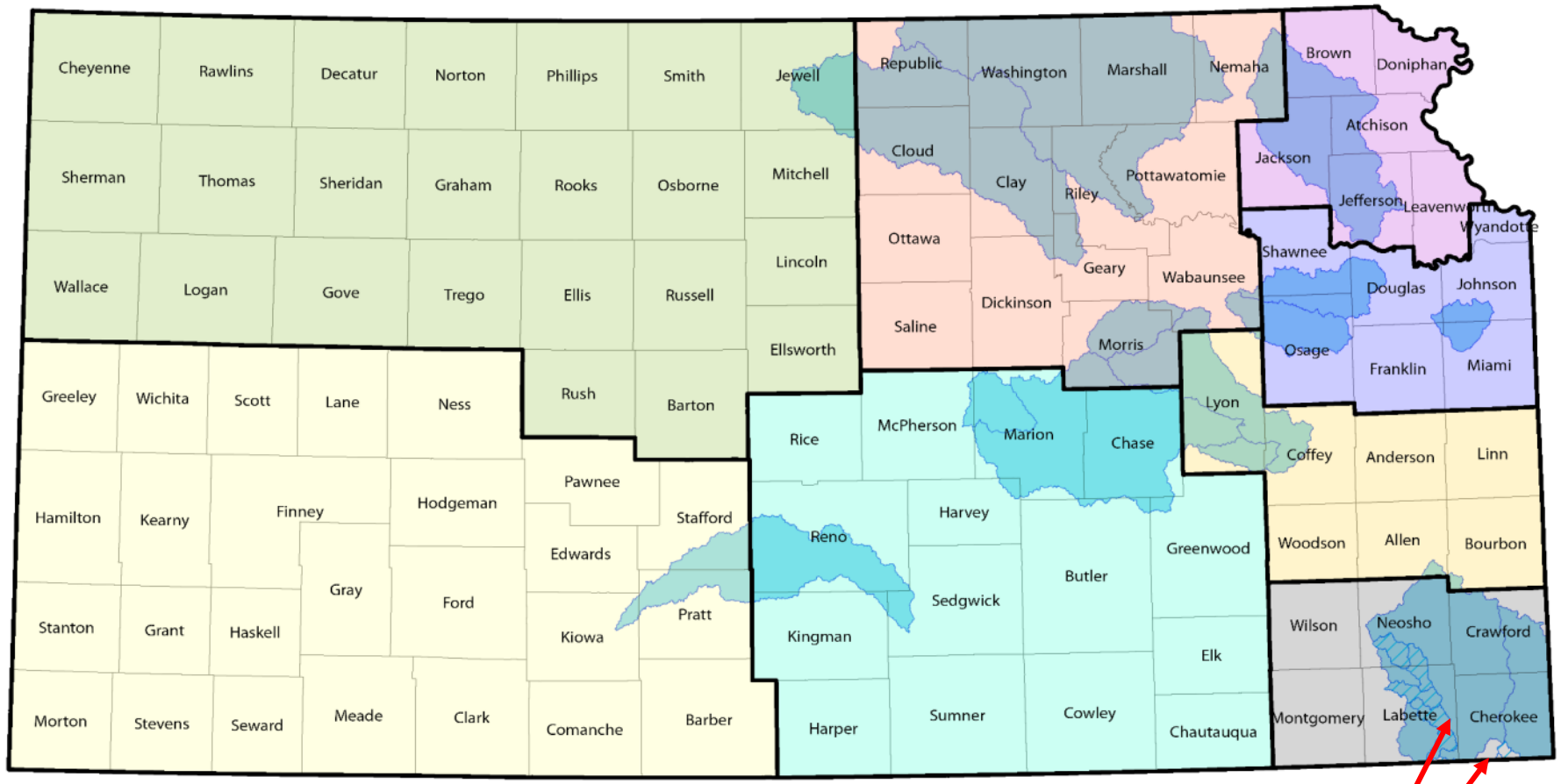
Additional WRAPS Funding will cover 90% of costs

Middle & LOWER Neosho River Basin RCCP

Kansas and Oklahoma-Grand Lake O' The Cherokees

- KS: Labette, Tar & Elm Creek Watersheds
- Resource Concerns – bacteria, sediment, nutrients
- Livestock BMPs upper watershed, cropland BMPs in lower watersheds
- $1.4 million to KS through EQIP
- KDA – Division of Conservation Cost-share
- March 18th first application cut off

Kansas Forest Service Proposed Districts
Kansas and Oklahoma RCPP Areas



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KANSAS FOREST SERVICE
KANSAS STATE UNIVERSITY

0 10 20 40 60 80
Miles

Legend

Proposed District

- Bruton
- Dhungel
- Freerksen
- New Forester
- Rhodes
- Carlson
- Peterson
- Klempa

- County
- Kansas RCPP Area
- Oklahoma RCPP Area

General EQIP Sign Up –State Wide – Forestland Health

Financial assistance for managing woodlands, windbreaks, and riparian forests

Environmental Quality Incentives Program (EQIP)

Sign up anytime but applications are not approved until 2018

Mechanical Mowing	$11.62/AC
Herbicides (banding)	$31.06/AC
Weed Barrier Fabric (squares)	$1.79/EA
Mechanical Tree Establishment	$151.56/AC
Tree/Shrub Site Prep (medium)	$212.72/AC
Tree/Shrub Site Prep (heavy)	$240.54/AC
Direct Seeding (Riparian Buffer)	$741.19/AC
Tree Planting (Machine & Tubes)	$7.20/EA
Tree Planting (Hand/Browse Protection)	$4.07/EA
Tree Planting (Machine)	$2.14/EA
Riparian Forest Buffer Tree Planting, Container & Machine	$1,809.32/AC
Riparian Forest Buffer Tree Planting, Bare Root & Machine	$1,125.74/AC
Barbed Wire Fence (multi strand)	$1.31/LnFt
Forest Stand Improvement (single stem treatment)	$253.58/AC
Competition Control, Mechanical Heavy Equipment	$389.22/AC
Windbreak Renovation Supplemental Planting BR	$471.88/AC
Windbreak Renovation Row Removal—Dozer	$207/AC

Old windbreaks with gaps and dead trees or shrubs

Streambank erosion where additional tree planting can provide long-term reduction in soil loss

Forest or woodlands that are over crowded (need thinning), or would benefit from additional tree planting; or contain a high percentage of invasive or undesirable trees and shrubs

Kansas Forest Service Districts