The Wildfire Approach for RMSF: Shifting from "Emergency Response" to "Always Prepared"

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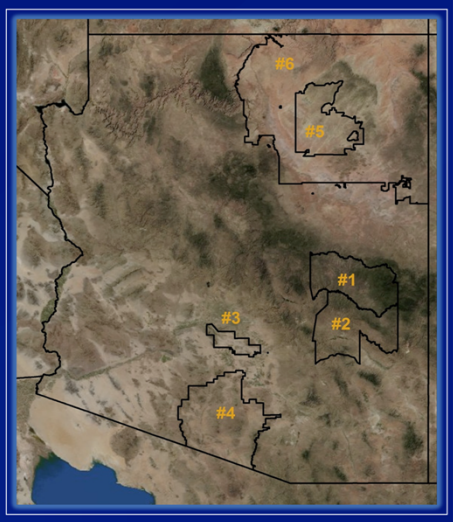
RMSF is Not Going Away

RMSF in Arizona

- There is evidence of human and/or canine RMSF on 6 different AZ reservations
- Cases have been reported every year since 2002
- There have been > 250 cases, 20 deaths
- Case fatality 7%, ~15 X higher than the U.S. rate



Why Did RMSF Emerge on Tribal Lands?

- Changing views on dogs
  - More likely to consider them “pets”
  - May keep dogs inside home
- Movement of dogs between communities and reservations
- More ticks than before?
  - Changing climate and weather
  - People living in closer communities

Why Does RMSF Stay on Tribal Lands?

- Dogs tend to be:
  - Not spayed or neutered
  - Free-roaming
  - Unvaccinated, sick
  - Moved/Adopted between communities and reservations
- Tribal residents:
  - Have limited access to veterinary care
  - Cannot afford effective tick products
  - Cannot FIND effective tick products

The Brown Dog Tick

- The Brown Dog Tick (*Rhipicephalus sanguineus)* is one of the most common ticks in the world
- It transmits similar diseases in Europe
- Ticks feeds on dogs and live in and around houses
- Ticks can remain active year-round
- Tick populations increase in warm weather and after monsoon rains

Spread of RMSF in the Southwest

- Dogs and ticks do not know boundaries
- RMSF-infected brown dog ticks have been documented in Arizona, Mexico, and California
- Large human outbreaks of RMSF have been reported in Mexico (> 1,000 cases in Mexicali in 2009, Sonora in 2013)
- Potential for spread to new tribes, as well as non-tribal areas

Tribes are Hard at Work

- RMSF Rodeo, 2012-2013: *Reduced ticks to < 1% of dogs*
- San Carlos, Reservation-wide prevention effort 2013 (1 year emergency funds): *Reduced ticks to 30% of dogs*
- White Mountain, reservation-wide prevention effort planned for 2014 (1 year emergency funds)
- Tohono O'odham considering a pilot prevention program in 2014
- Navajo developed a new veterinary program to help control RMSF, mobile unit

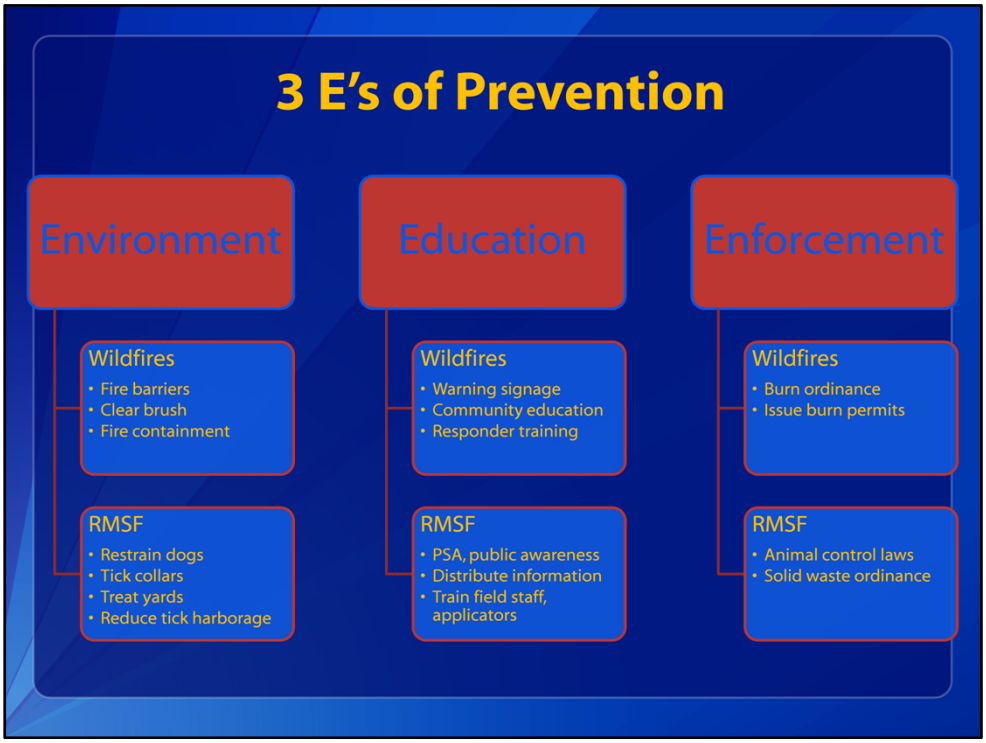
One year "Emergency" prevention efforts may temporarily bring tick numbers down, but will not "fix" the problem

Initial Efforts are needed to bring tick numbers down…

But What Happens Next?

Continual Prevention is Vital

- Once introduced to an area, RMSF risk is always present, similar to risk of wildfires
- Continual need for prevention activities to reduce risk even when there's no wildfire
- Prevention activities can vary depending on the risk;
  - Different response required for a 1000 acre wildfire vs. a small contained fire


3 E's of Prevention
Environment
Wildfires
• Fire barriers
• Clear brush
• Fire containment
RMSF
• Restrain dogs
• Tick collars
• Treat yards
• Reduce tick harborage
Education
Wildfires
• Warning signage
• Community education
• Responder training
RMSF
• PSA, public awareness
• Distribute information
• Train field staff, applicators
Enforcement
Wildfires
• Burn ordinance
• Issue burn permits
RMSF
• Animal control laws
• Solid waste ordinance

4th E: Evaluation

Evaluation

Wildfires
- Aerial surveillance for fires
- Fire towers
- Review response to fires
- Plan for improvement

RMSF
- Tick checks on dogs
- Dry ice trapping
- Talk to homeowners
- Change plans if problems identified

Thinking About a Sustainable Plan

Draft RMSF Control Plan

- 5 Year plan, covers an ~ 3,000 home reservation
- Funding through a combination of grants and tribally covered positions/responsibilities
- Includes "*Emergency Response*" activities and establishment of "*Permanent Infrastructure*"
- Combines elements of tick control (emergency) and animal control (sustained).
- Starts small in Year 1 (pilot neighborhood of ~ 600 homes), and then expands to cover entire reservation Years 2-5

Key Parts of the RMSF Control Plan

- Controlling Ticks: Treatment of dogs with tick collars, and initial treatment of yards with pesticides
- Maintaining Low Levels of Ticks: Once ticks are controlled, maintaining low tick levels with collars alone, and only applying pesticide when needed (proper evaluation is key to deciding need)
- Improving Pet Health: Introducing regular spay/neuter programs, starting a licensing program, distributing stakes and tie-outs to encourage pet restraint
- Establishing Programs: Hiring staff, purchasing permanent equipment

It Takes a Lot of Skilled, Trained People

Hard Work, Dedicated Plan of Action

You Need the Right Equipment

RMSF Prevention Kits

Collar Kit

- Tick collars
- Tick spray
- Nylon collars
- Tags and "S" hooks
- Scissors
- Pliers
- Dog treats
- Dog registration documentation

Pesticide Kits

- Spray equipment
- Chemical gloves
- Goggles
- Pesticide
- Measuring cup
- Spill kit
- Eye wash

For both:

-First Aid kits
-Educational materials
-Tick repellent
-Hand sanitizer
-Pens
-Maps
-Emergency plans

Year 1

- Pick a 600 home community to start (best to choose an area with significant human RMSF)
- Why a Pilot? Train staff, gear up volunteers, work out kinks
- Grant-Funded Budget: ~$240,000
  - Initial purchase of equipment (vehicle) and product
  - Hiring of a grant-funded RMSF Coordinator
  - 2 Seasonal staff
  - Contract (mobile) veterinary services
- Tribal contribution: 2 full time ACOs: $70,000
- Rely on Seresto 8 month collars, pesticide treatments
- EVALUATE HOW EFFECTIVE THE PROGRAM IS!

Year 2

- Expand Collar/Pesticide program reservation-wide
- Pilot community : collars alone if tick control was achieved in year 1 *(*mop up pesticide treatments if ticks observed, done on a house-by-house basis)*
- Grant-Funded Budget: ~ $511,000
  - Purchase additional equipment (vehicle) and product
  - Fund a grant-funded RMSF Coordinator
  - 4 Seasonal staff
  - Contract (mobile) veterinary services
- Tribal contribution: 2 full time ACOs: $70,000
- Rely on Seresto 8 month tick collars, pesticide treatments
- EVALUATE HOW EFFECTIVE THE PROGRAM IS!

Year 3

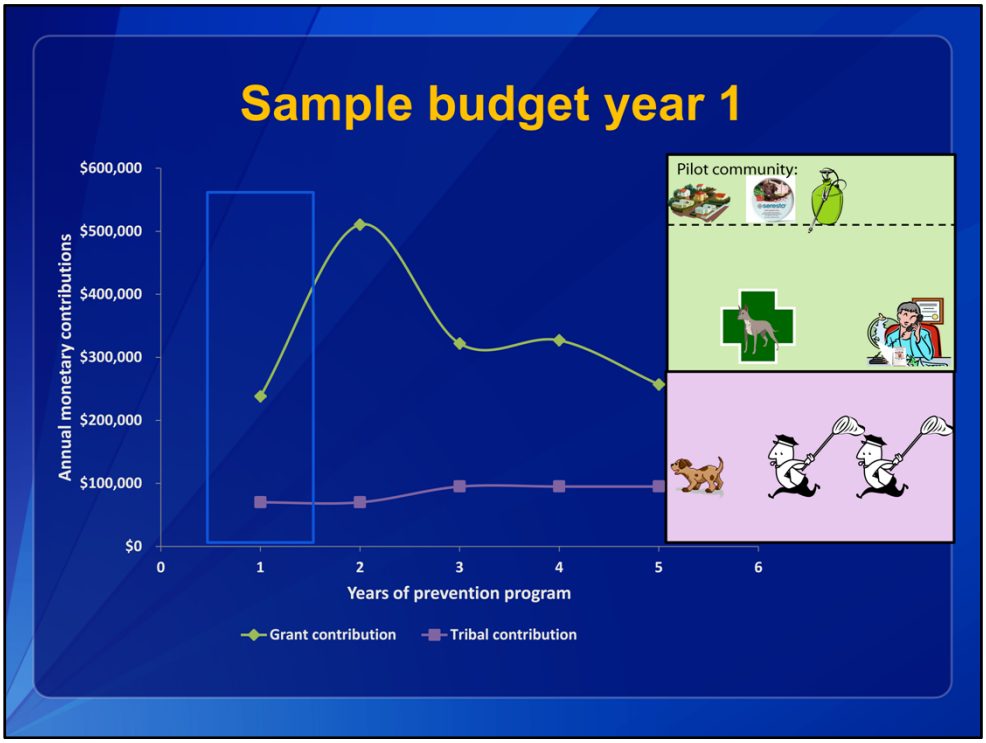
- If control was achieved in prior year, entire reservation will use collars only to maintain tick levels *(*mop up pesticide treatments if ticks observed, done on a house-by-house basis)*
- Grant-Funded Budget: ~$322,000
  - Purchase additional equipment (vehicle) and product
  - Fund a grant-funded RMSF Coordinator
  - 2 Seasonal staff
- Tribal contribution:
  - 2 full time ACOs: $70,000
  - Contract (mobile) veterinary services: $25,000
- Rely on Seresto 8 month tick collar
- EVALUATE HOW EFFECTIVE THE PROGRAM IS!

Year 4

- If control was achieved in prior year, entire reservation will use collars only to maintain tick levels
- Grant-Funded Budget: ~$327,000
  - Maintain equipment and purchase product
  - Fund a grant-funded RMSF Coordinator
  - 2 Seasonal staff
  - Contract (mobile) veterinary services
- Tribal contribution:
  - 2 full time ACOs: $70,000
  - Contract (mobile) veterinary services: $25,000
- Switch to amitraz collars to avoid resistance, replace mid-summer (2 collar applications)
- EVALUATE HOW EFFECTIVE THE PROGRAM IS!

Year 5

- Use collars only to maintain tick levels
- Grant-Funded Budget: ~$257,000
  - Maintain equipment and purchase product
  - Conduct activities under tribal direction (no RMSF coordinator anymore)
  - 2 Seasonal staff
- Tribal contribution: $95,000
  - 2 full time ACOs: $70,000
  - Contract Veterinary Services: $25,000
- Return to Seresto tick collars
- EVALUATE HOW EFFECTIVE THE PROGRAM IS!


Sample budget year 1
Annual monetary contributions
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$0
0
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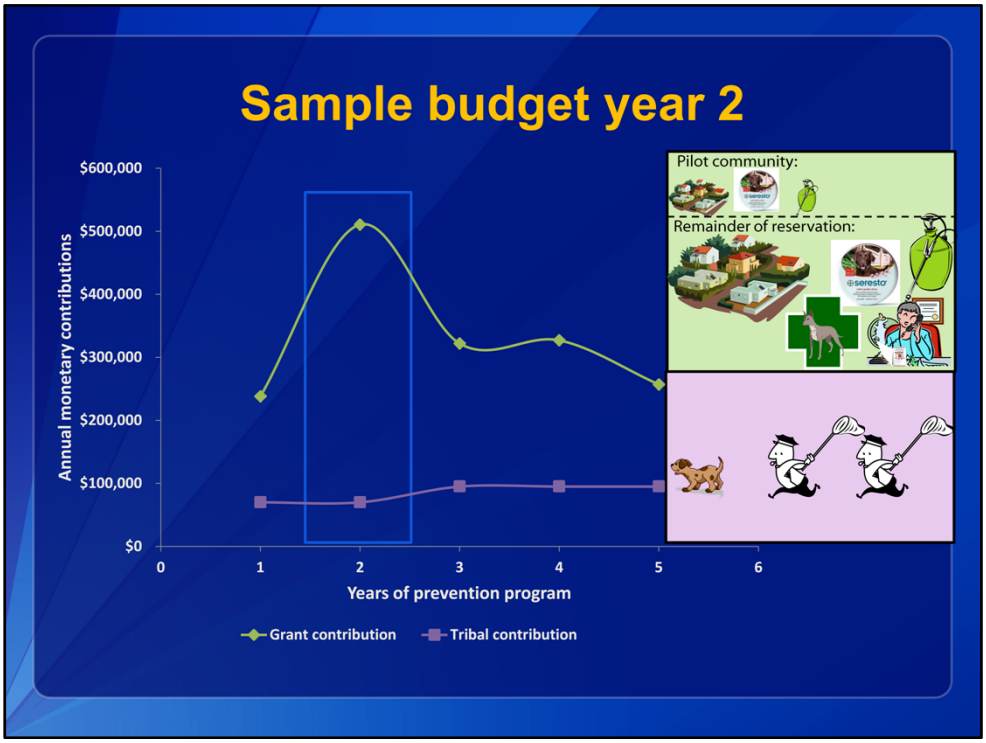
6
Years of prevention program
Grant contribution
Tribal contribution
Pilot community:


Sample budget year 2
Annual monetary contributions
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$0
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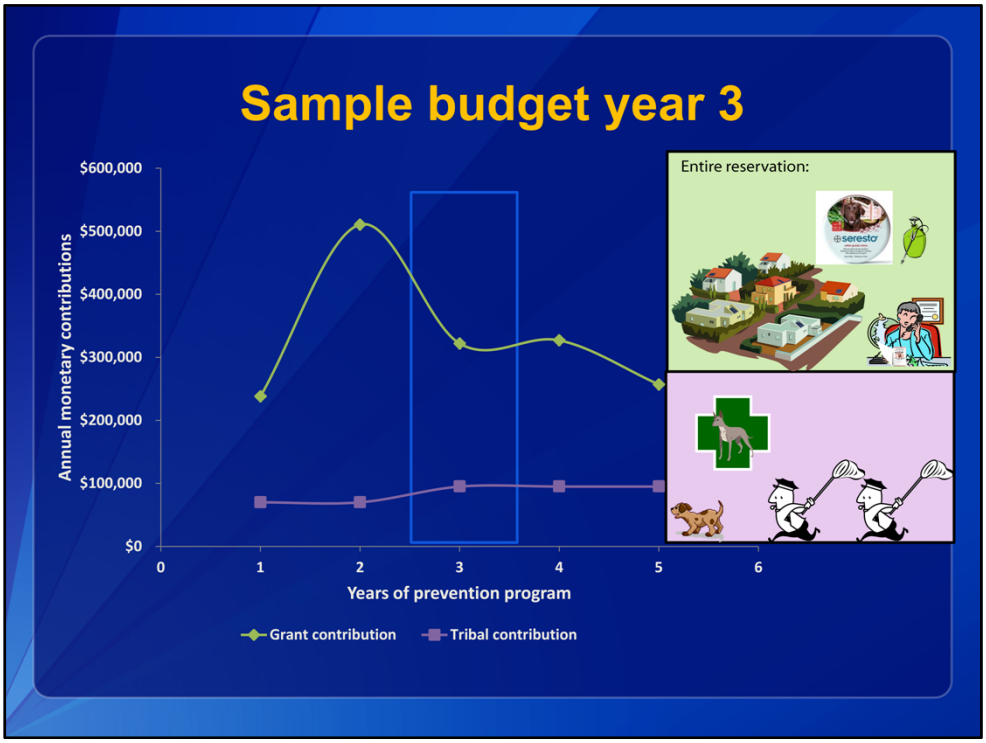
Years of prevention program
Grant contribution
Tribal contribution
Pilot community:
Remainder of reservation:


Sample budget year 3
Annual monetary contributions
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$0
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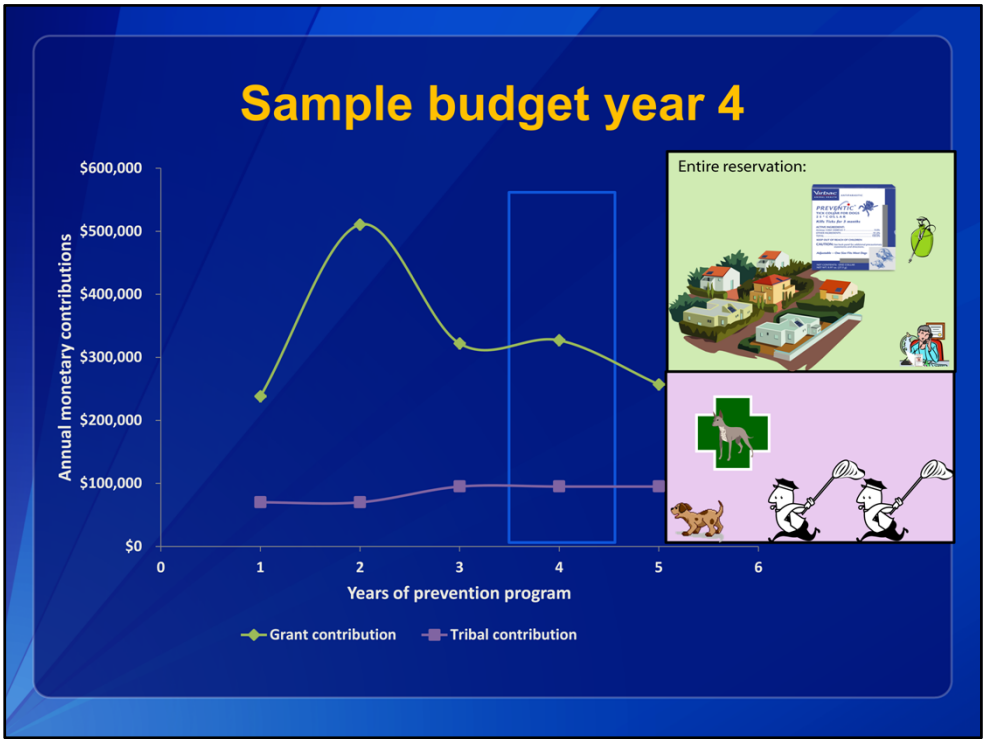
Years of prevention program
Grant contribution
Tribal contribution
Entire reservation:
seresto


Sample budget year 4
Entire reservation:
Annual monetary contributions
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$0
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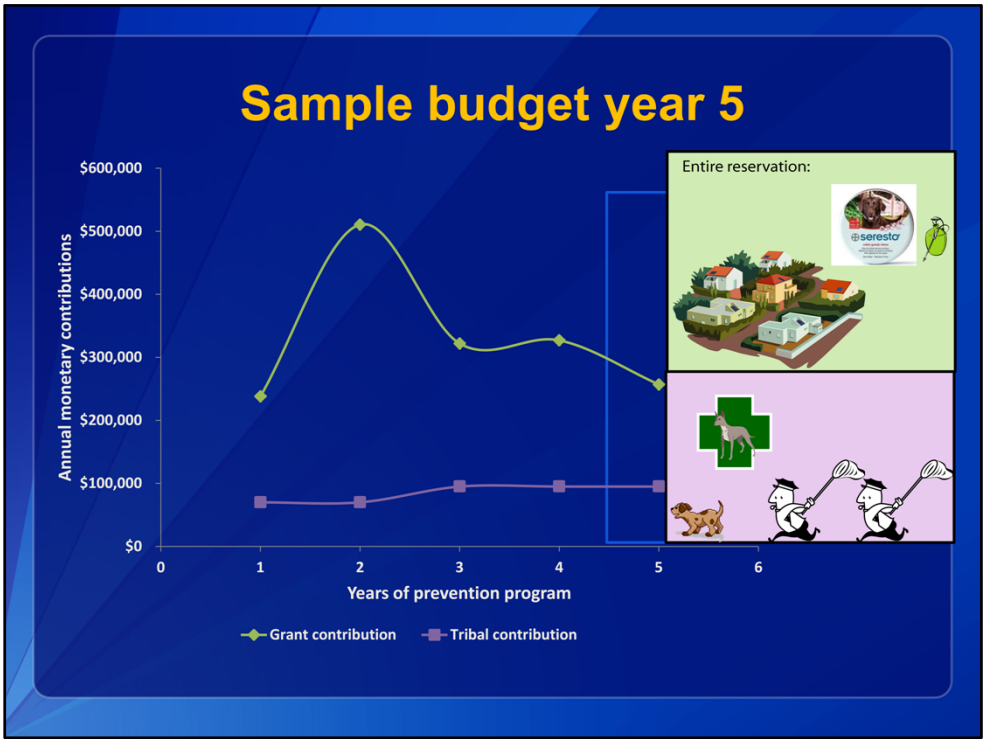
Years of prevention program
Grant contribution
Tribal contribution


Sample budget year 5
Entire reservation:
seresto
Annual monetary contributions
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$0
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6
Years of prevention program
Grant contribution
Tribal contribution

Cost of Prevention vs. Response

- 10 year estimated cost of disease (2002-2011) on San Carlos and White Mountain
  - Represents 205 cases, 15 fatalities
    - Medical visits
    - Days lost due to illness
    - Cost of a death

=at least $13.4 million

COMPARED TO

- 5 years of RMSF prevention on 2 reservations

=$4 million

Organization is Key

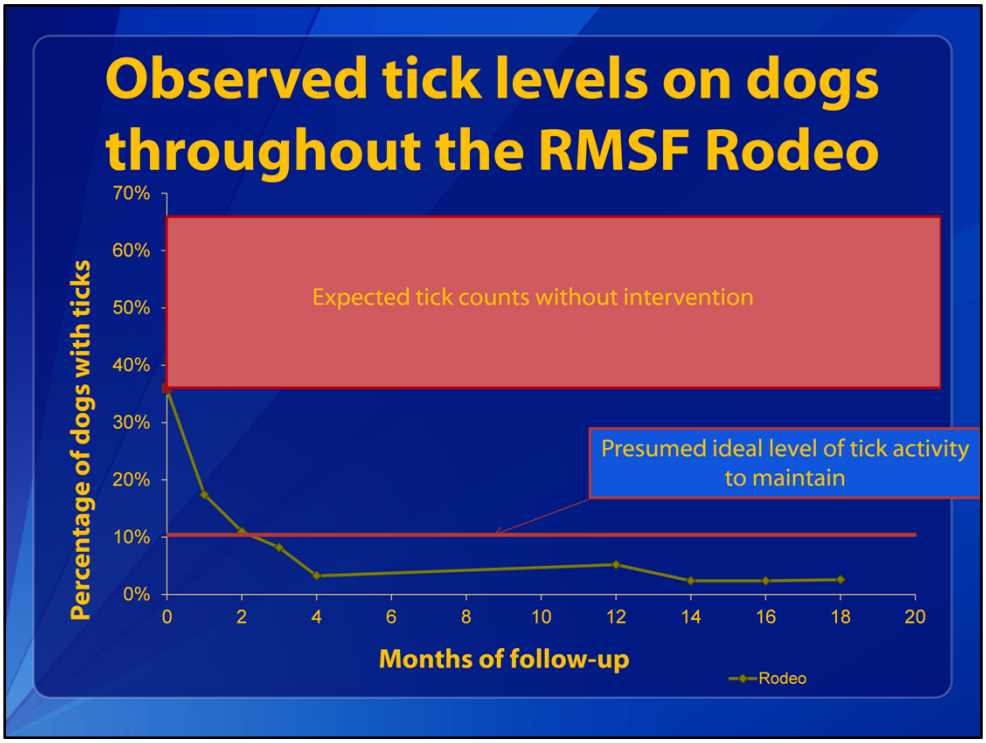
- You need good maps showing every house on the reservation
  - Forestry service
  - Google Earth
- Identify "working units"
  - Neighborhoods
  - Districts
- Implement a dog licensing program, register/count dogs
- Track puppies to go back and place collars
- Organize staff in teams that work well together, and have the needed skill sets (pesticide applicator PLUS someone who works well with dogs; native speaker available.)

Education is Key

- INFORMING THE COMMUNITY IS VITAL
  - They need to know what you are doing and why
  - Need to know what to expect
  - Will participation be by consent or mandatory?
  - Answer questions on RMSF
  - Educating on how to use and protect the Seresto collars is very important
  - Evaluate your success with educational efforts by asking questions

Evaluation is Key

- Draft plan should include an evaluation step every year
- Monitoring success of tick control is vital to inform decisions for what to do the next year
  - During the summer (is a change in strategy needed?)
  - At the end of each year's prevention efforts
  - Evaluate individual neighborhoods (rather than presuming one is representative
- Tick counts on dogs: Best method
  - No ticks, 1-10 ticks (low), 10+ ticks
- Dry ice trapping: Not as good, influenced by climate, wind, trap placement



These data represent the program observations in the monthly or bi-monthly checks in the RMSF Rodeo areas only.
What we can see is that SUSTAINED CONTROL has been established since May of 2012. And those low levels have been maintained since that time.
We believe that RMSF risk becomes substantially lower when you can reduce tick activity to be present on fewer than 10% of dogs.

You Can't Let Your Guard Down, Or Think it Won't Come Back

Role of CDC?

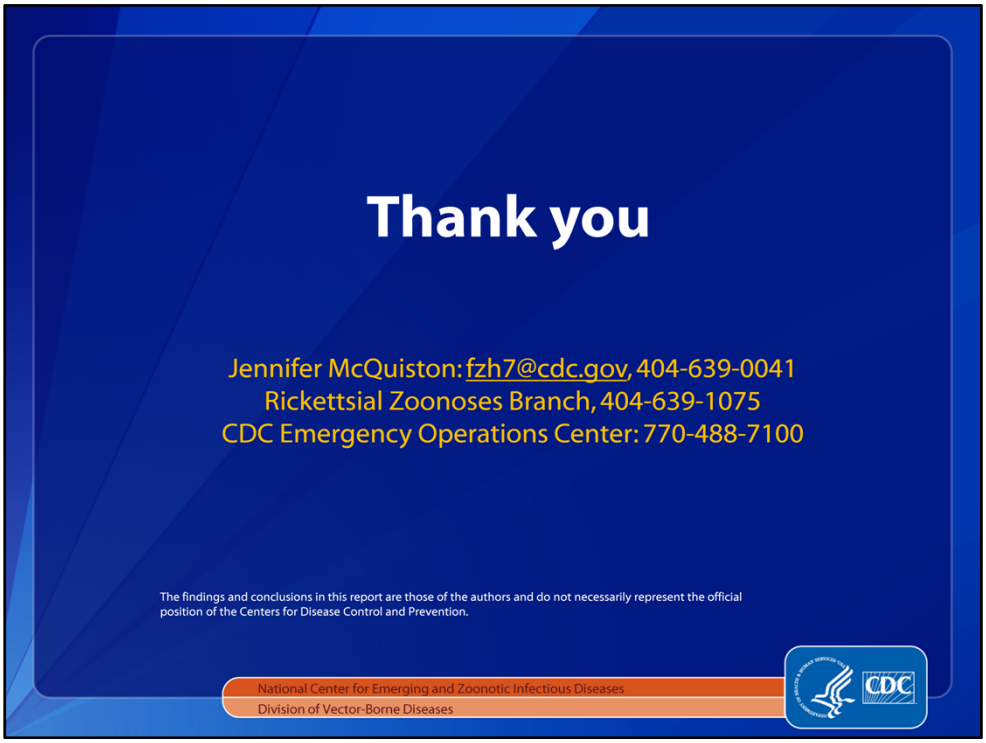
Summary

Mural depicting one of the first children in AZ to die from RMSF.

- RMSF is preventable and fixable
- Not a one year emergency effort: It's a long-term battle, estimate at least 5 years for control
- The end goal should sustained infrastructure for response, and maintenance of low levels of ticks
- Model plan, budget is simply one suggested option
- Tribes should work together to bring attention to the problem of RMSF in AZ and seek funding options that permit an effective response

Only You Can Prevent Ticks

Discussion


Thank you
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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
National Center for Emerging and Zoonotic Infectious Diseases
Division of Vector-Borne Diseases
CDC

Thank you.