City of Austin WATERSHED PROTECTION

# Watershed Protection Ordinance (WPO) Stakeholder Meeting

# CREEK & FLOODPLAIN PROTECTION: BUFFER SCENARIOS

November 18, 2011

# Meeting Objective

**Discuss & evaluate different stream buffer configurations and judge which best achieve watershed protection and development opportunity goals.**

# Meeting Agenda

1. **Introductions (5 min.)**
2. **Buffer Presentation by Staff (40 min.)**
   a) **Defining a Stream Buffer: Considerations**
   b) **Suburban Watershed Buffer Scenarios**
      - **Gilleland Creek Case Study**
      - **Sun Chase Case Study**
   c) **"Manning's n" Floodplain Character Analysis**
3. **Small Group Discussion (55 min.)**
4. **Full Group Review (20 min.)**

# Defining a Buffer

- **How do we currently define protective buffers for our creeks?**
  - **Width by Drainage Area Threshold**
  - **Width Measured from Centerline**
- **Adjustments for future?**
  - **Buffer Averaging (Dec. 2)**

# Buffer Regulations: What We Want

## 1. Simple

- Easy to define, review
- Protect multiple functions with single geometry
- Fewer, not more, different buffer systems

## 2. Predictable

- Easy to estimate developable land for project
- Well-defined criteria for adjustments (instead of variance)

## 3. Flexible

- Allows for limited averaging, modification without jeopardizing function

# Buffer Functions: What We Want

1. **Water Quality Protection**
   - **Buffer width (minimum)**
   - **Buffer extent (drainage area threshold)**
2. **Erosion Protection**
   - **Erosion Hazard Zone**
3. **Floodplain Functionality**
   - **Floodplain boundary**
   - **Modification limitations**
   - **Manning's n coefficient**

# Potential Buffer Scenarios

## 1. Existing Suburban Watershed Buffers

- Two-tiered system (CWQZ/WQTZ)
- 320 ac. Minor/640 ac. Intermediate/1280 ac. Major
- 50 - 100/100 - 200/200 - 400 feet from centerline (based on 100-Year Fully-Developed Floodplain)

## 2. Western Buffers

- Water Supply Rural/Some BSZ watersheds
- Two-tiered system (CWQZ/WQTZ)
- 64 ac. Minor/320 ac. Intermediate/640 ac. Major
- 50 - 100/ 100 - 200/200 - 400 feet from centerline (based on 100-Year Fully-Developed Floodplain)

# Potential Buffer Scenarios (Cont'd)

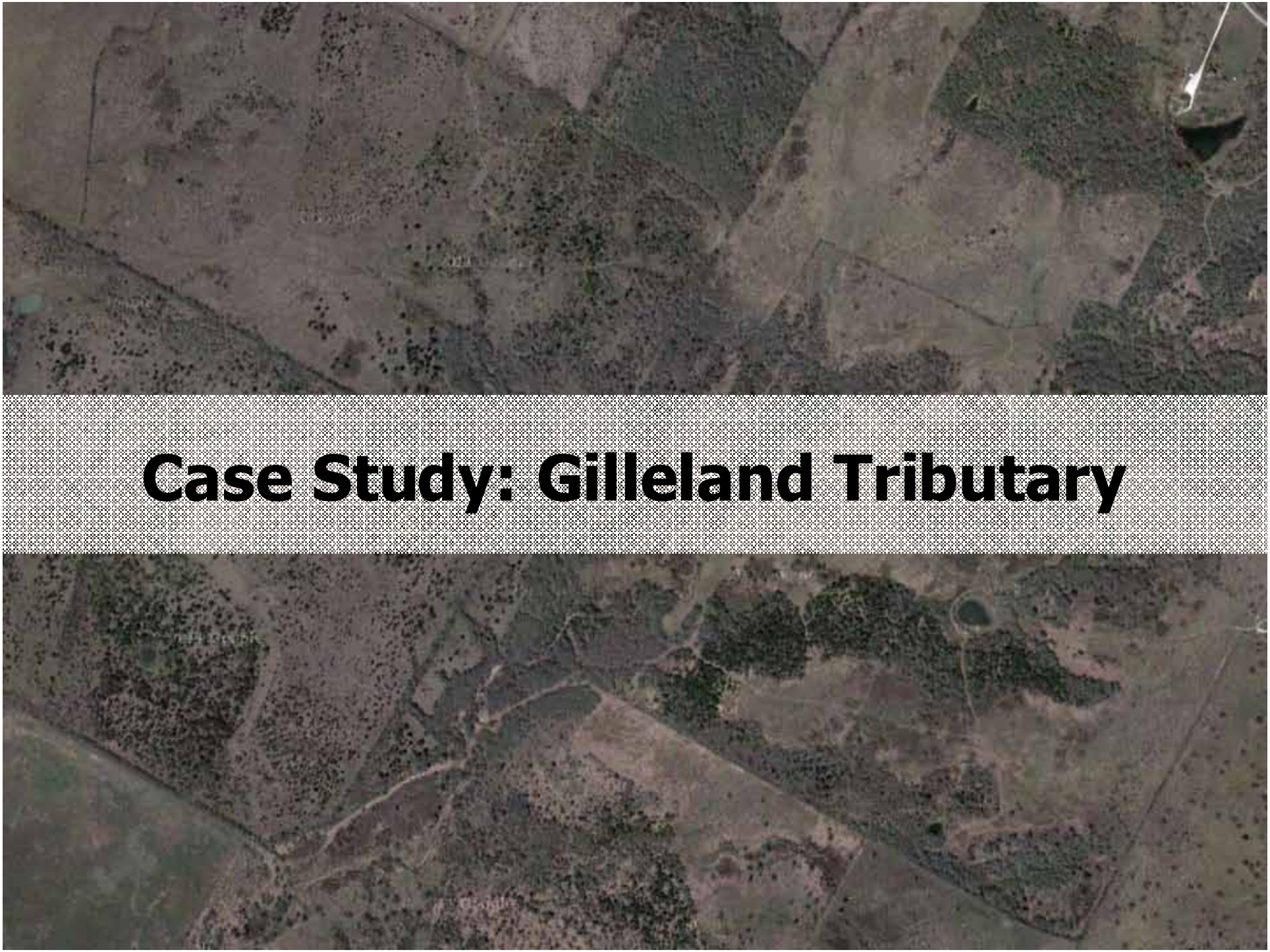
## 3. 100-200-300 Buffers

- **Single-tiered system (CWQZ only)**
- **64 ac. Minor/320 ac. Intermediate/640 ac. Major**
- **100 feet/200 feet/300 feet from centerline**

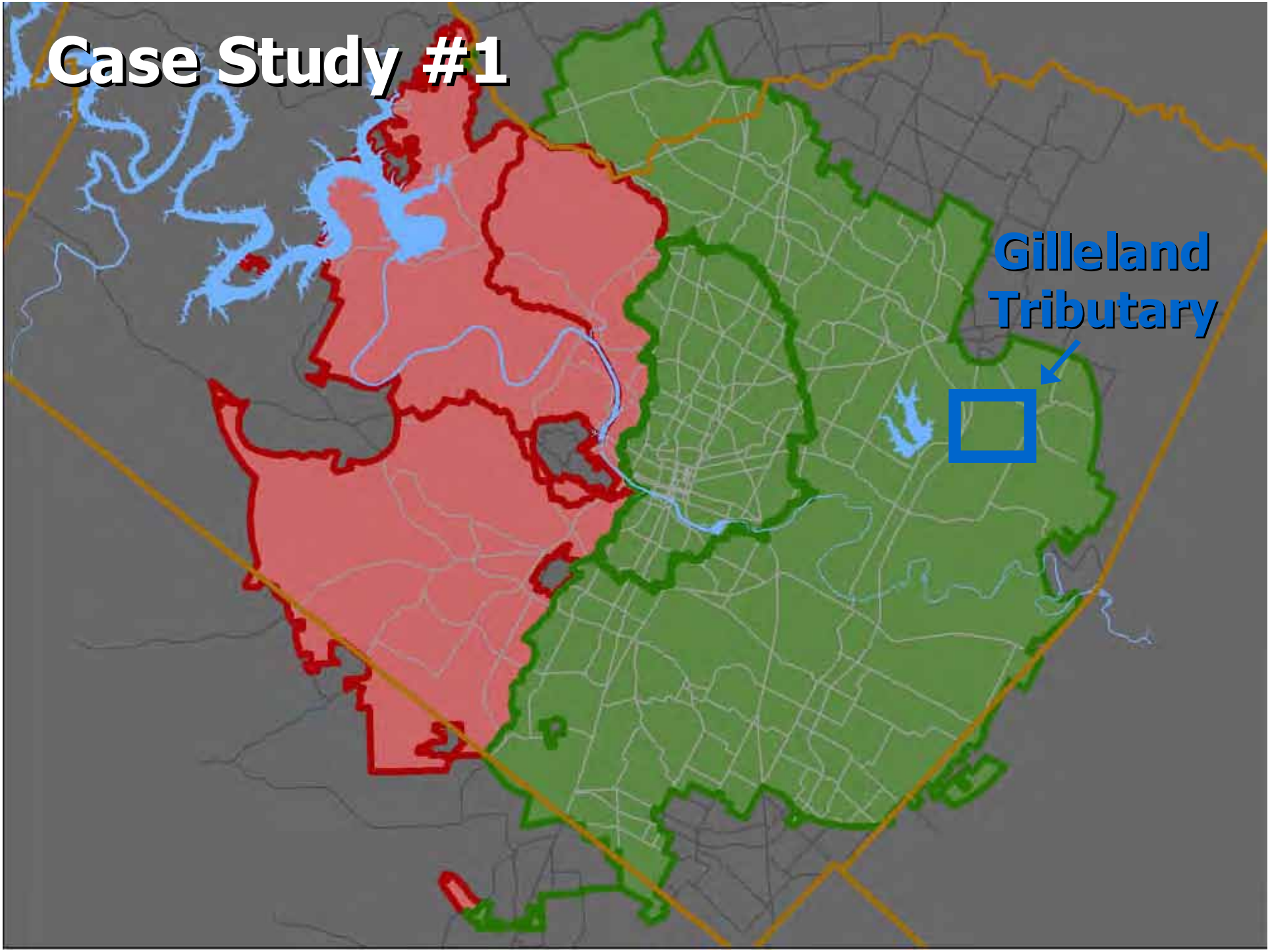
## 4. Modified Urban Watershed Buffers

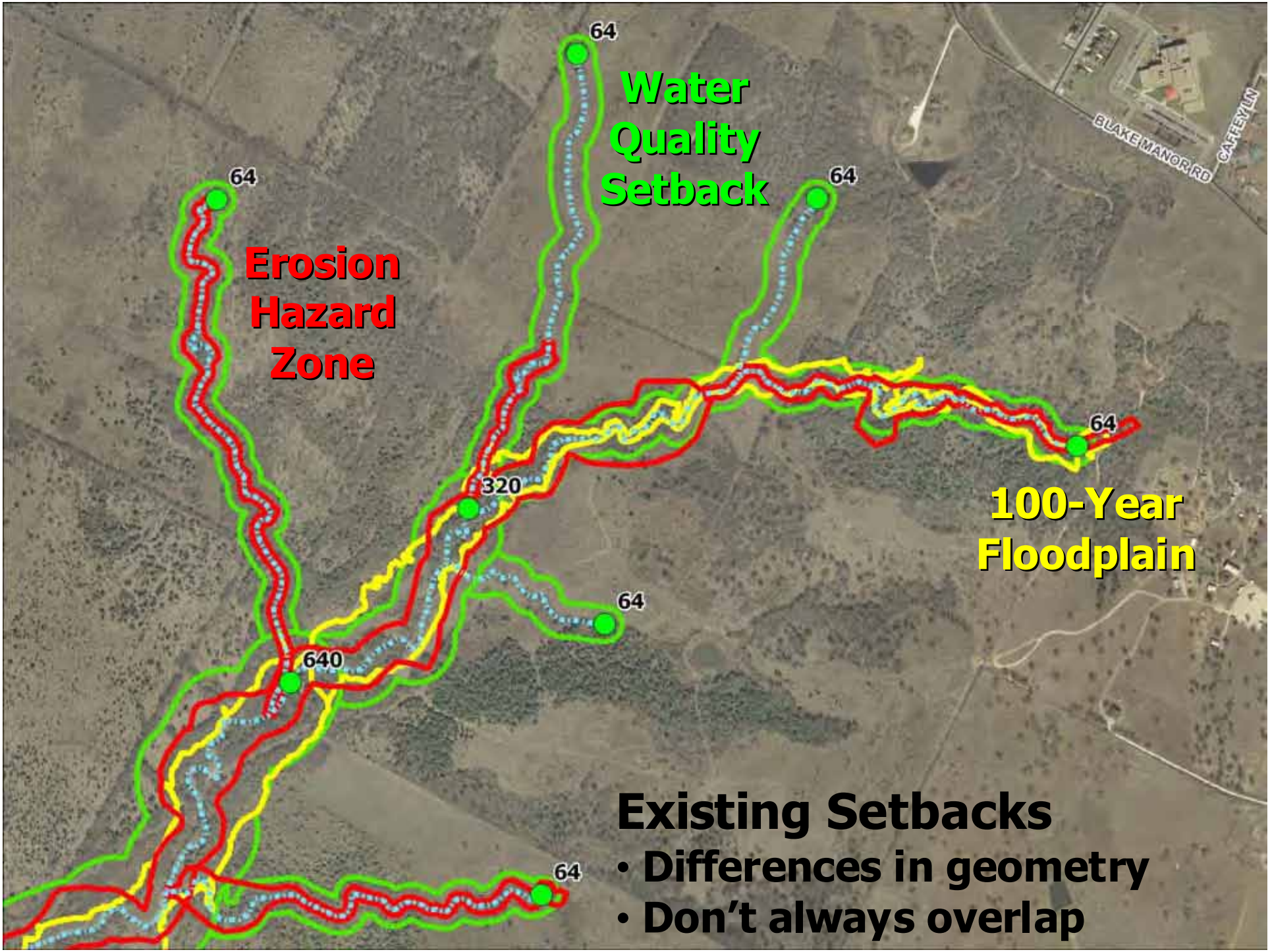
- **Single-tiered system (CWQZ only)**
- **64 ac. threshold – no Minor/Intermediate/Major**
- **100 - 400 feet from centerline (based on 100-Year Fully-Developed Floodplain)***

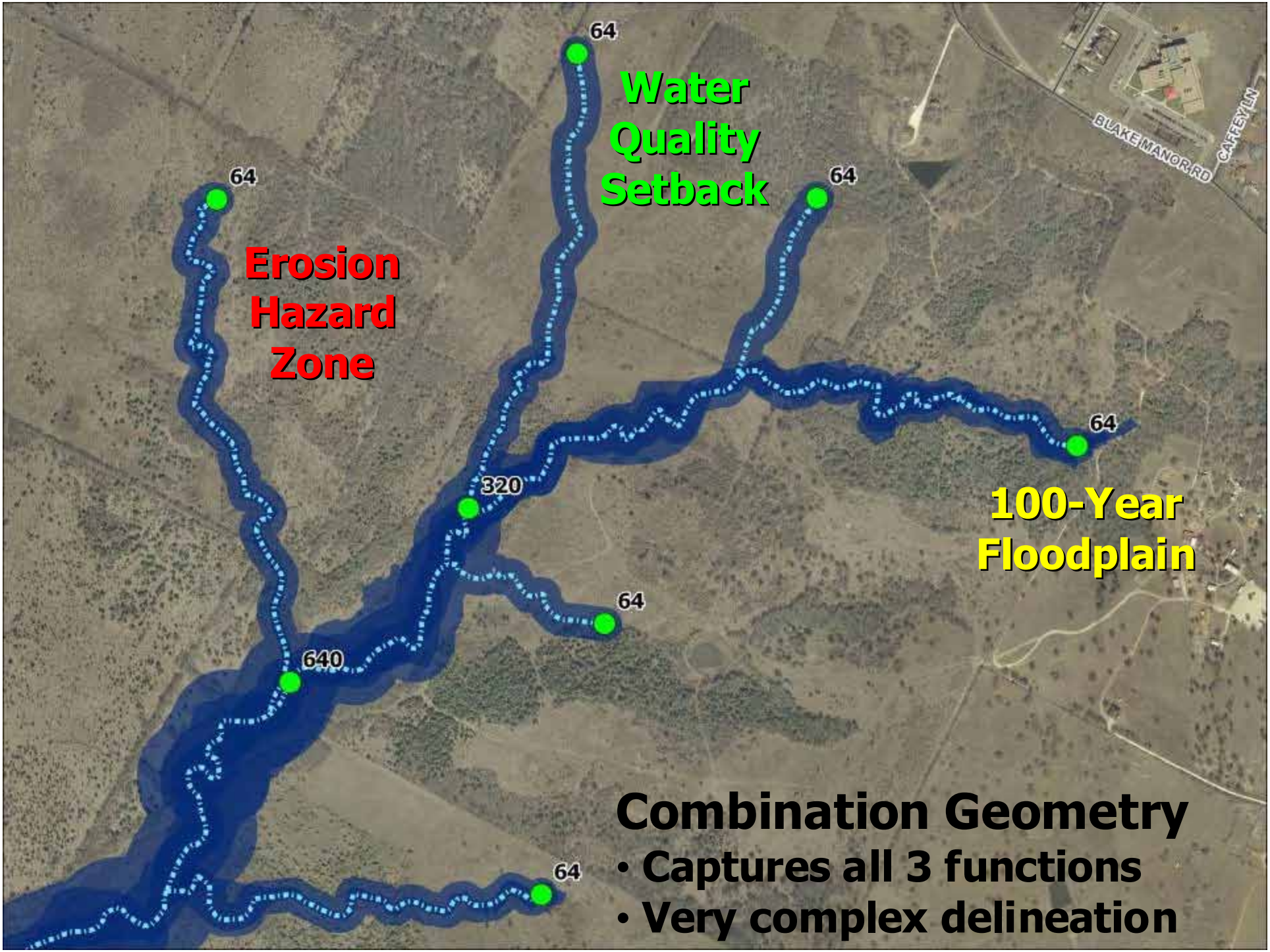
* Urban Watershed Buffers are currently 50 - 400 ft. in width and are based on the FEMA floodplain



# Case Study: Gilleland Tributary

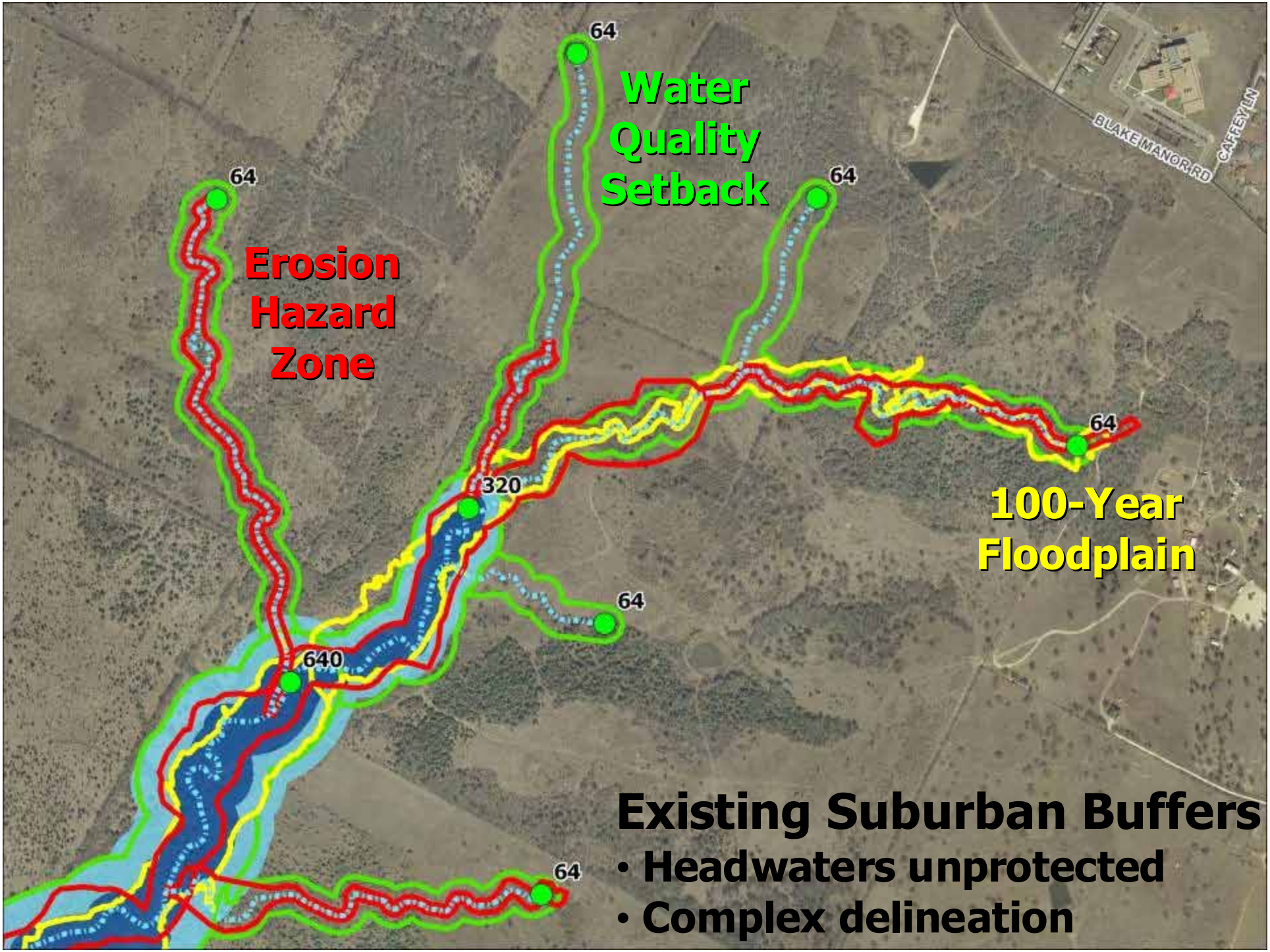

Case Study #1
Gilleland
Tributary

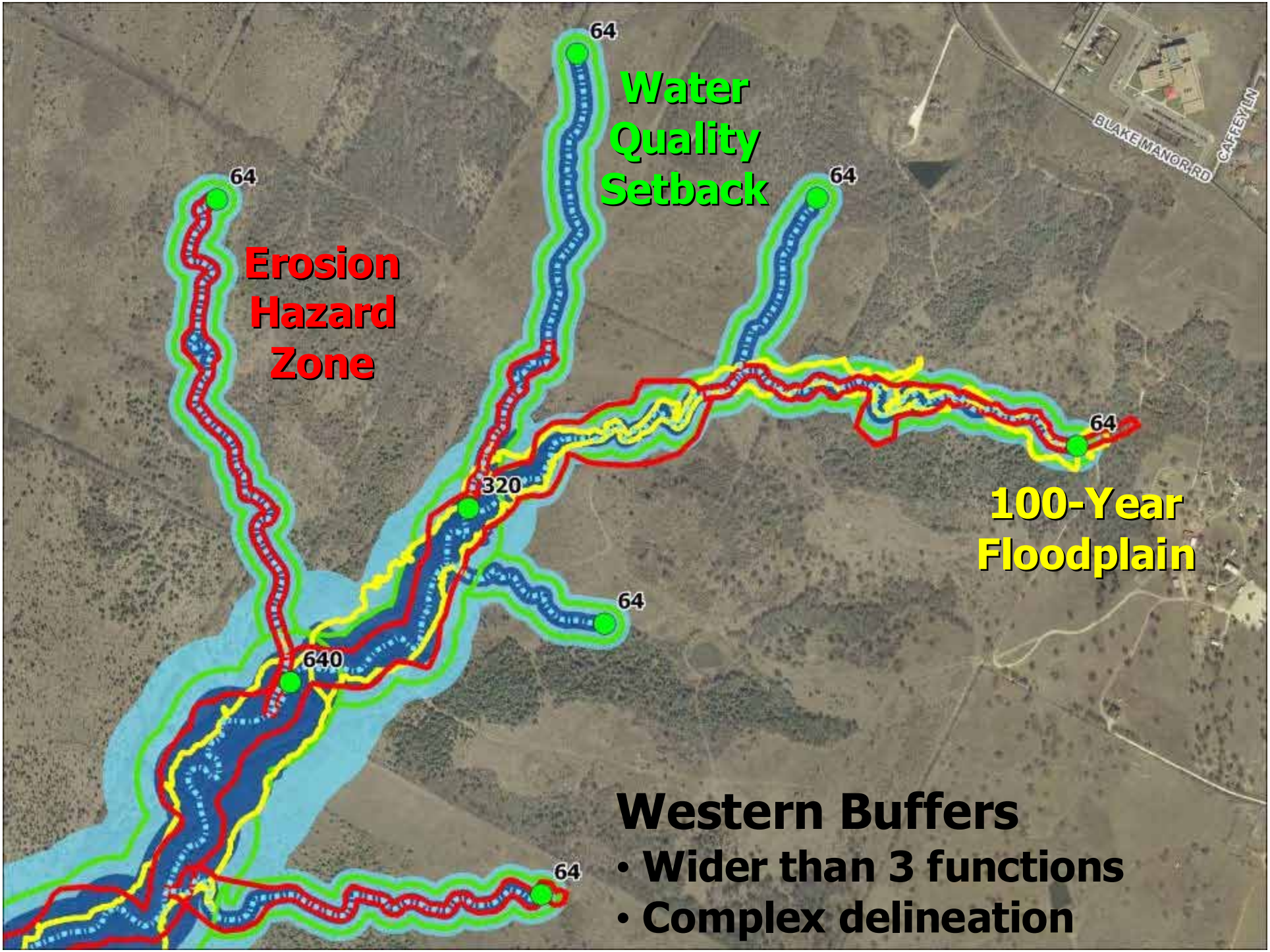

64
Water Quality Setback
64
64
Erosion Hazard Zone
64
320
100-Year Floodplain
64
640
64
BLAKE MANOR RD
CAFFEY LN
Existing Setbacks
• Differences in geometry
• Don't always overlap

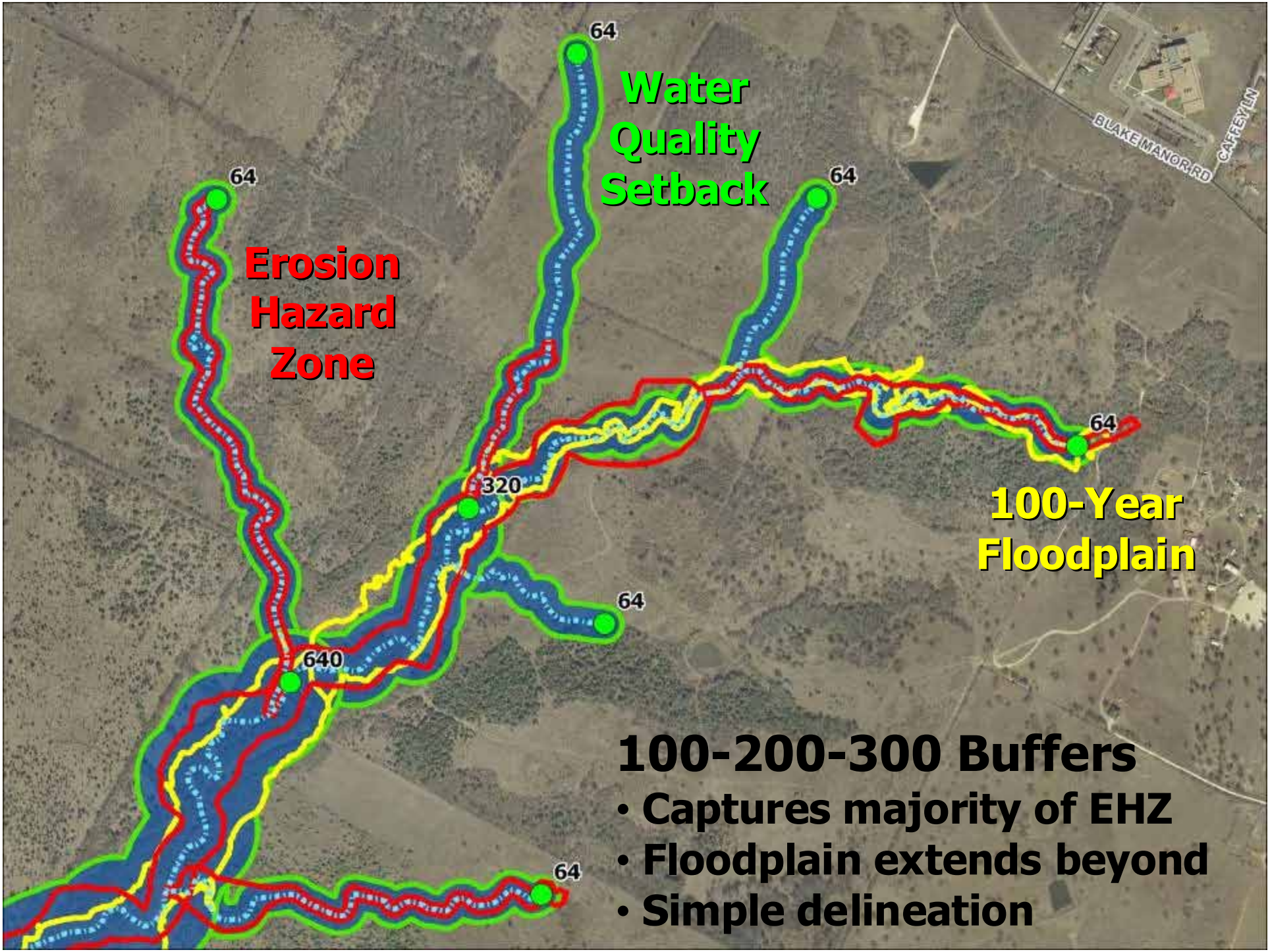


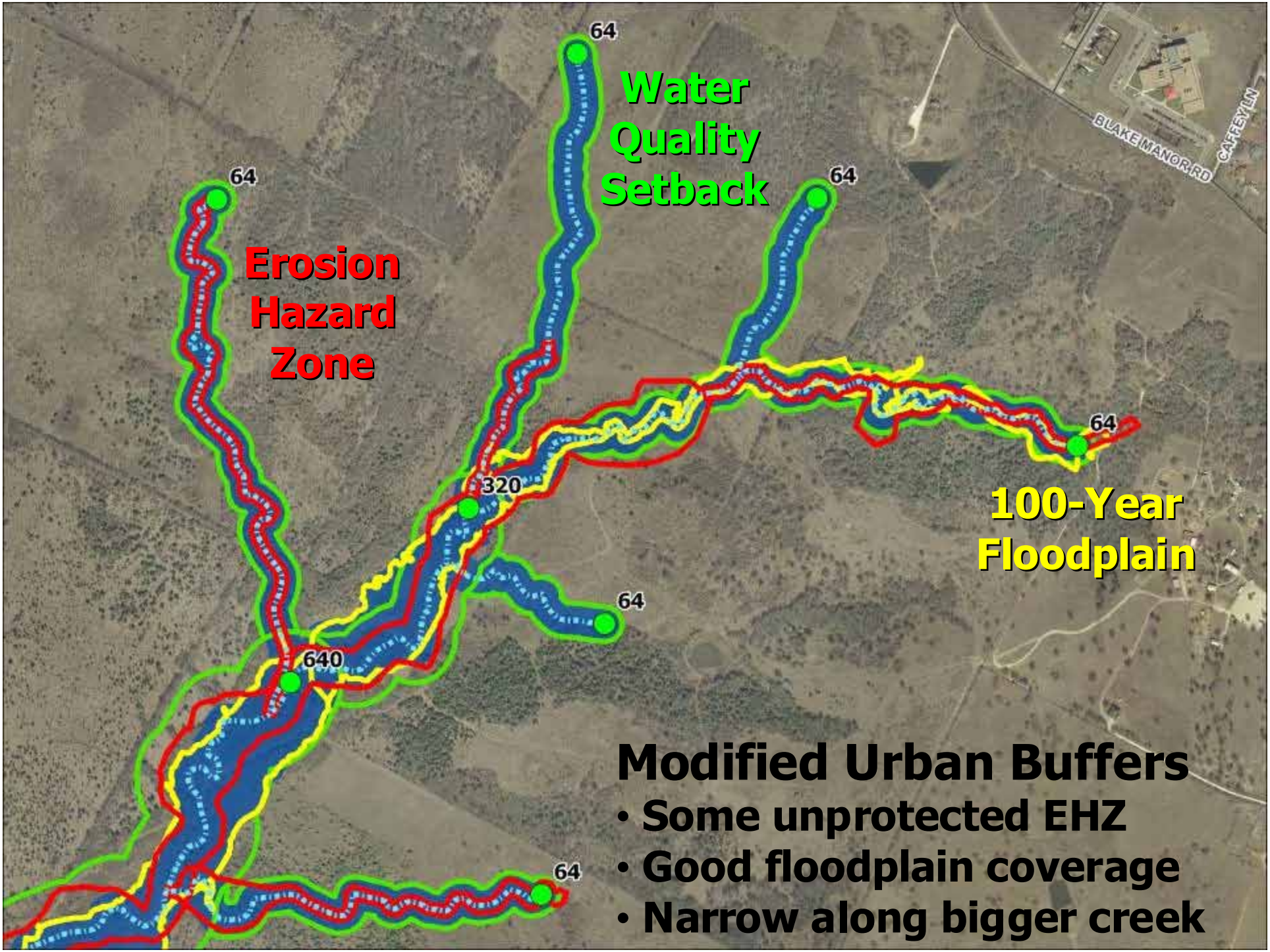

## Combination Geometry

- Captures all 3 functions
- Very complex delineation

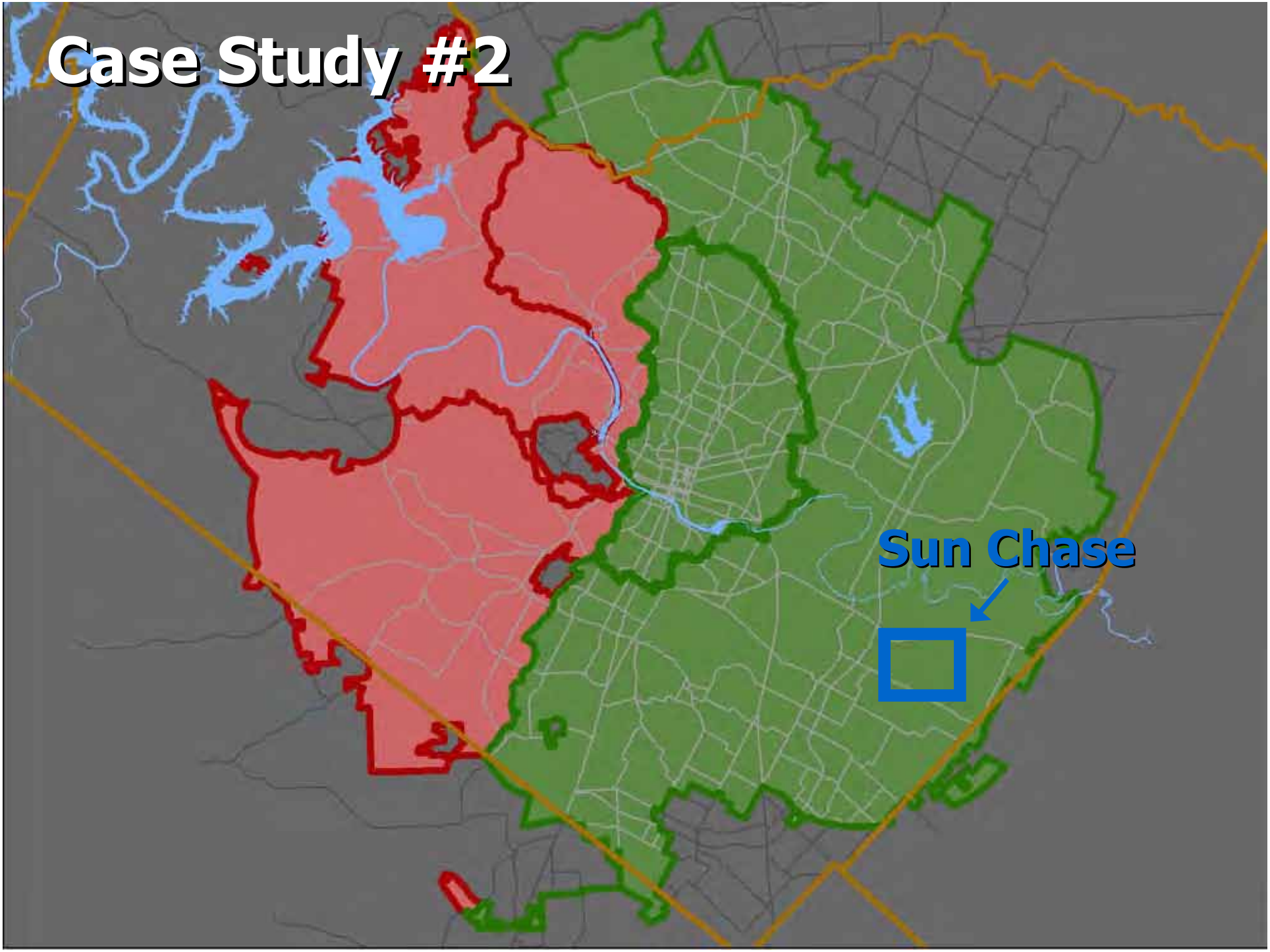

Water Quality Setback
Erosion Hazard Zone
100-Year Floodplain
64
64
64
64
64
320
640
BLAKE MANOR RD
CAFFEY LN
Existing Suburban Buffers
• Headwaters unprotected
• Complex delineation

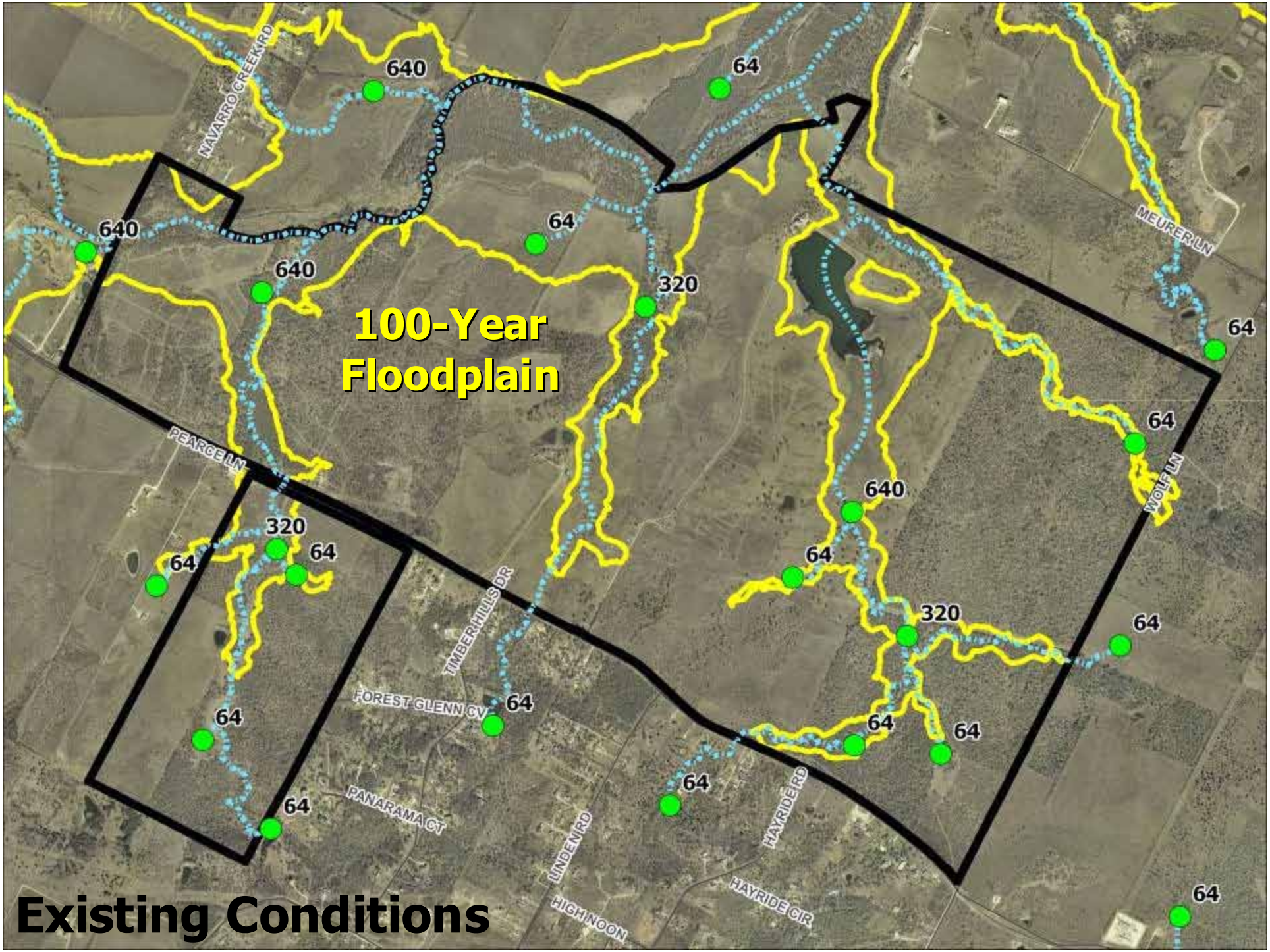

64
64
64
64
64
64
320
640
Water Quality Setback
Erosion Hazard Zone
100-Year Floodplain
BLAKE MANOR RD
CAFFEY LN
Western Buffers
• Wider than 3 functions
• Complex delineation

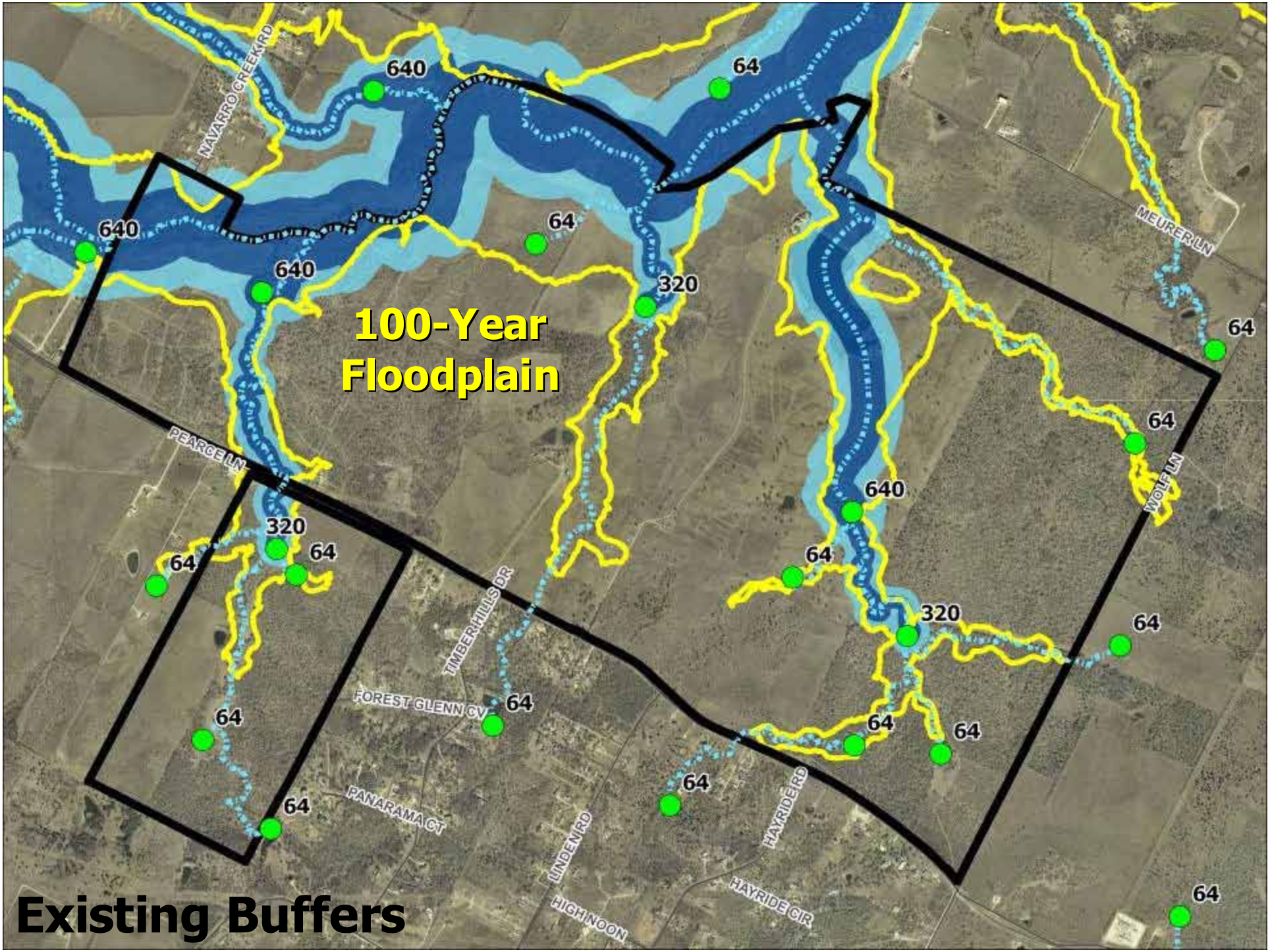

64
64
64
64
64
64
320
640
Water Quality Setback
Erosion Hazard Zone
100-Year Floodplain
BLAKE MANOR RD
CAFFEY LN
100-200-300 Buffers
• Captures majority of EHZ
• Floodplain extends beyond
• Simple delineation

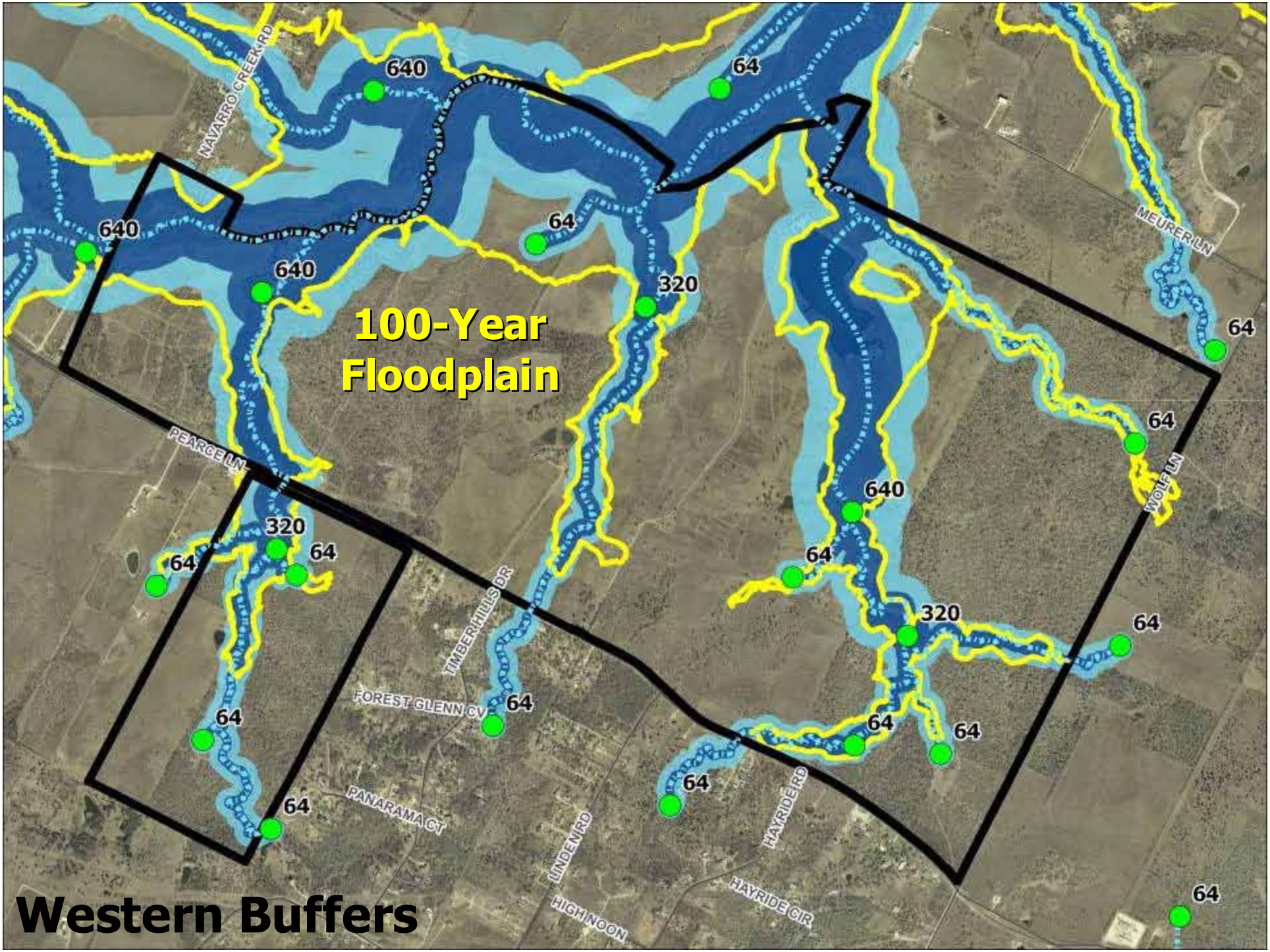

Water Quality Setback
Erosion Hazard Zone
100-Year Floodplain
64
64
64
64
64
320
640
BLAKE MANOR RD
CAFFEY LN
Modified Urban Buffers
• Some unprotected EHZ
• Good floodplain coverage
• Narrow along bigger creek

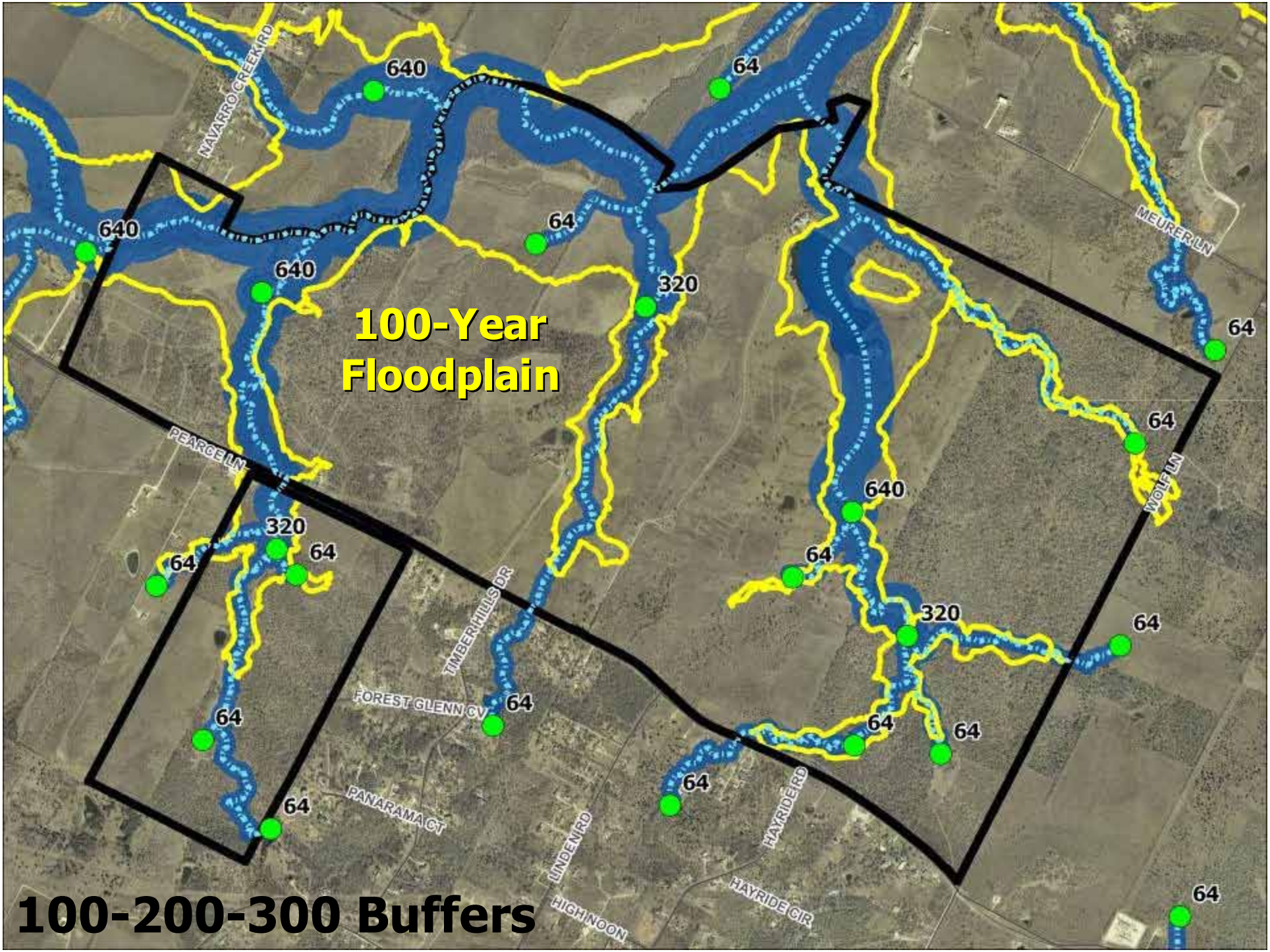
# Case Study: Sun Chase Tributaries

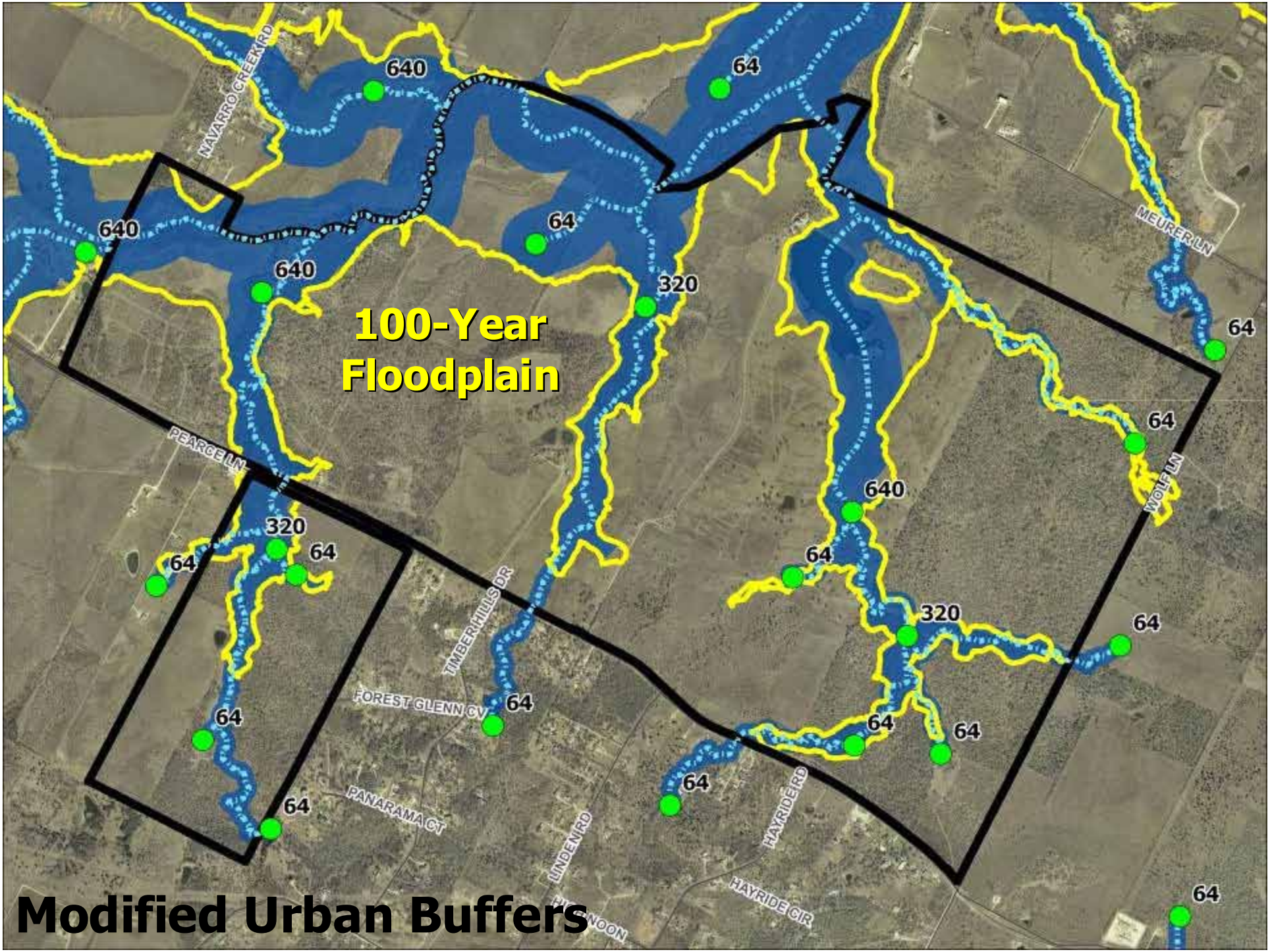

Case Study #2
Sun Chase

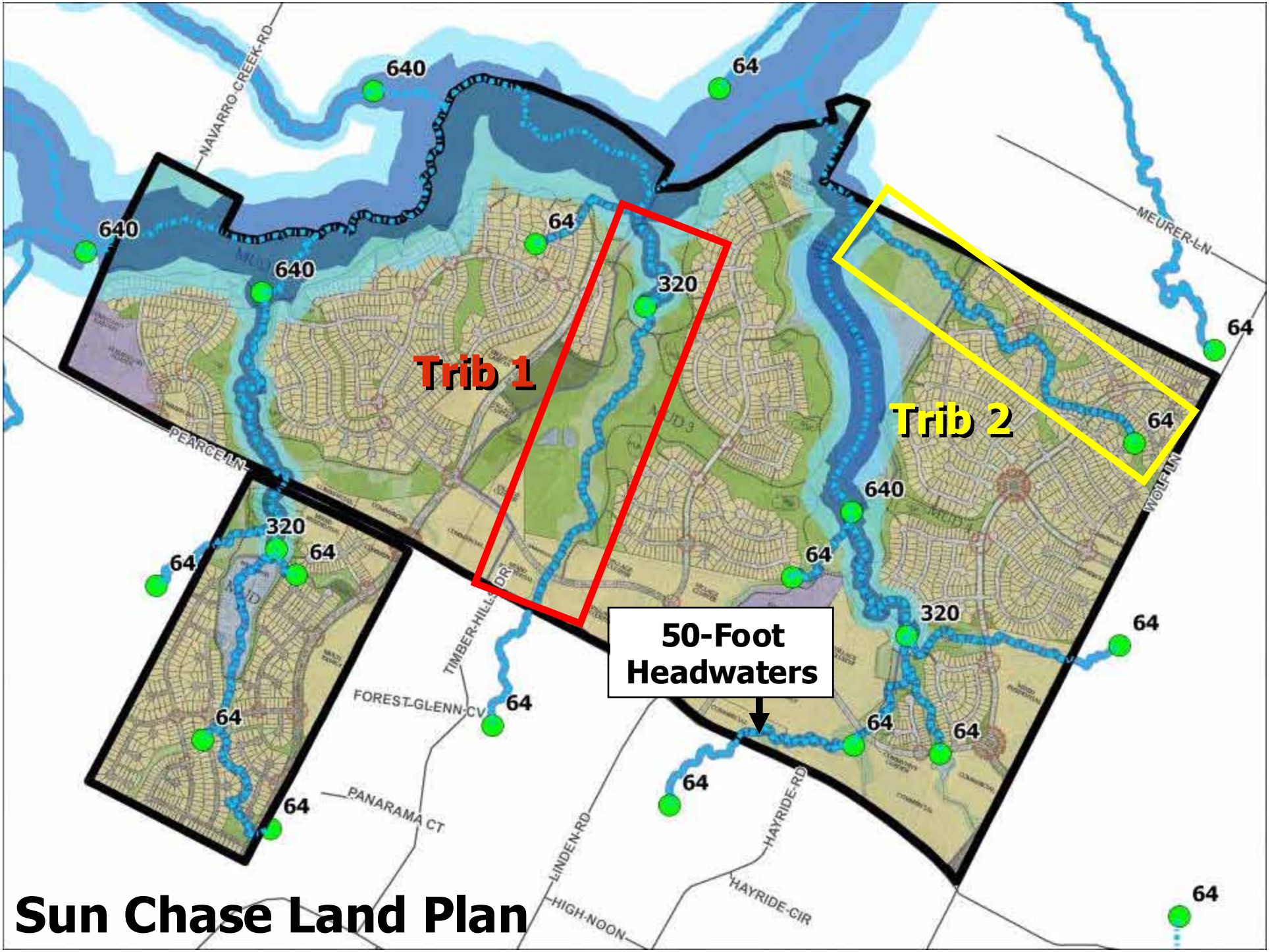

100-Year
Floodplain
Existing Conditions
NAVARRO CREEK RD
PEARCE LN
TIMBER HILLS DR
FOREST GLENN CV
PANARAMA CT
LINDEN RD
HIGH NOON
HAYRIDE RD
HAYRIDE CIR
MEURER LN
WOLF LN
640
64
320


100-Year
Floodplain
Existing Buffers
NAVARRO CREEK RD
PEARCE LN
TIMBER HILLS DR
FOREST GLENN CV
PANARAMA CT
LINDEN RD
HIGH NOON
HAYRIDE RD
HAYRIDE CIR
MEURER LN
WOLF LN
640
320
64

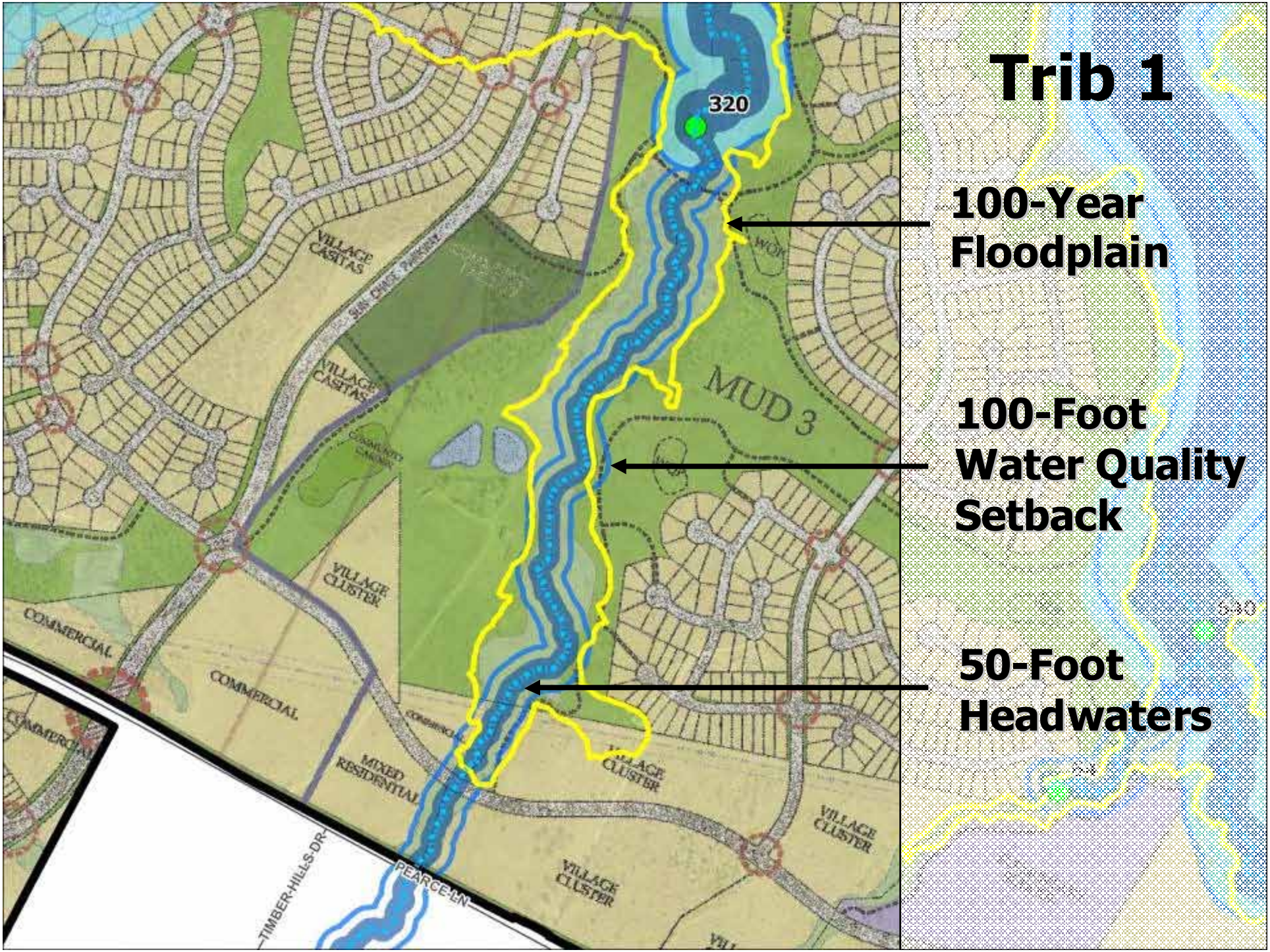

100-Year
Floodplain
Western Buffers
NAVARRO CREEK RD
PEARCE LN
TIMBER HILLS DR
FOREST GLENN CV
PANARAMA CT
LINDEN RD
HIGH NOON
HAYRIDE RD
HAYRIDE CIR
MEURER LN
WOLF LN
640
320
64


100-Year
Floodplain
100-200-300 Buffers
NAVARRO CREEK RD
PEARCE LN
TIMBER HILLS DR
FOREST GLENN CV
PANARAMA CT
LINDEN RD
HIGH NOON
HAYRIDE RD
HAYRIDE CIR
MEURER LN
WOLF LN
640
64
320


100-Year
Floodplain
Modified Urban Buffers
NAVARRO CREEK RD
PEARCE LN
TIMBER HILLS DR
FOREST GLENN CV
PANARAMA CT
LINDEN RD
HAYRIDE RD
HAYRIDE CIR
MEURER LN
WOLF LN
640
64
320

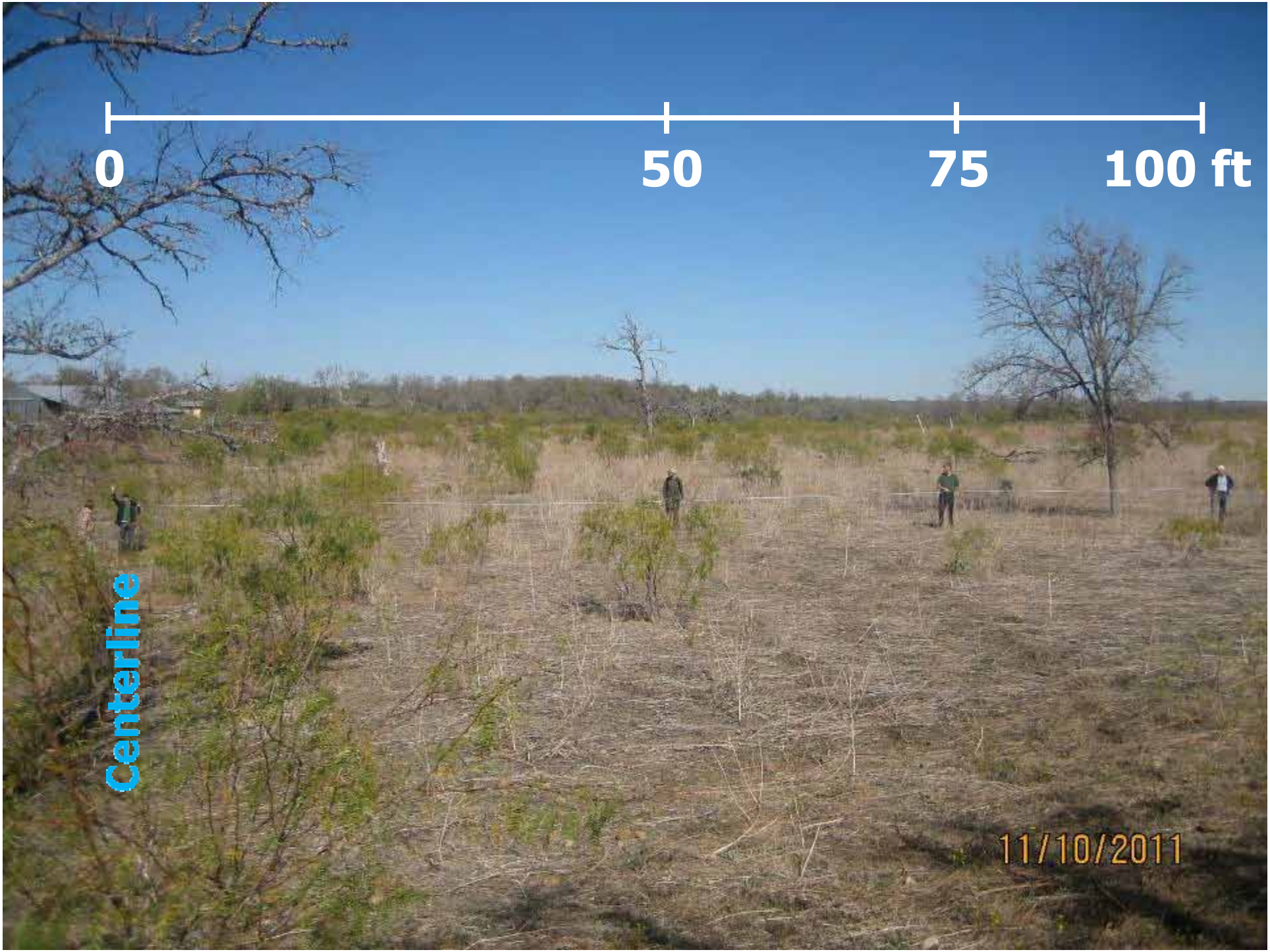


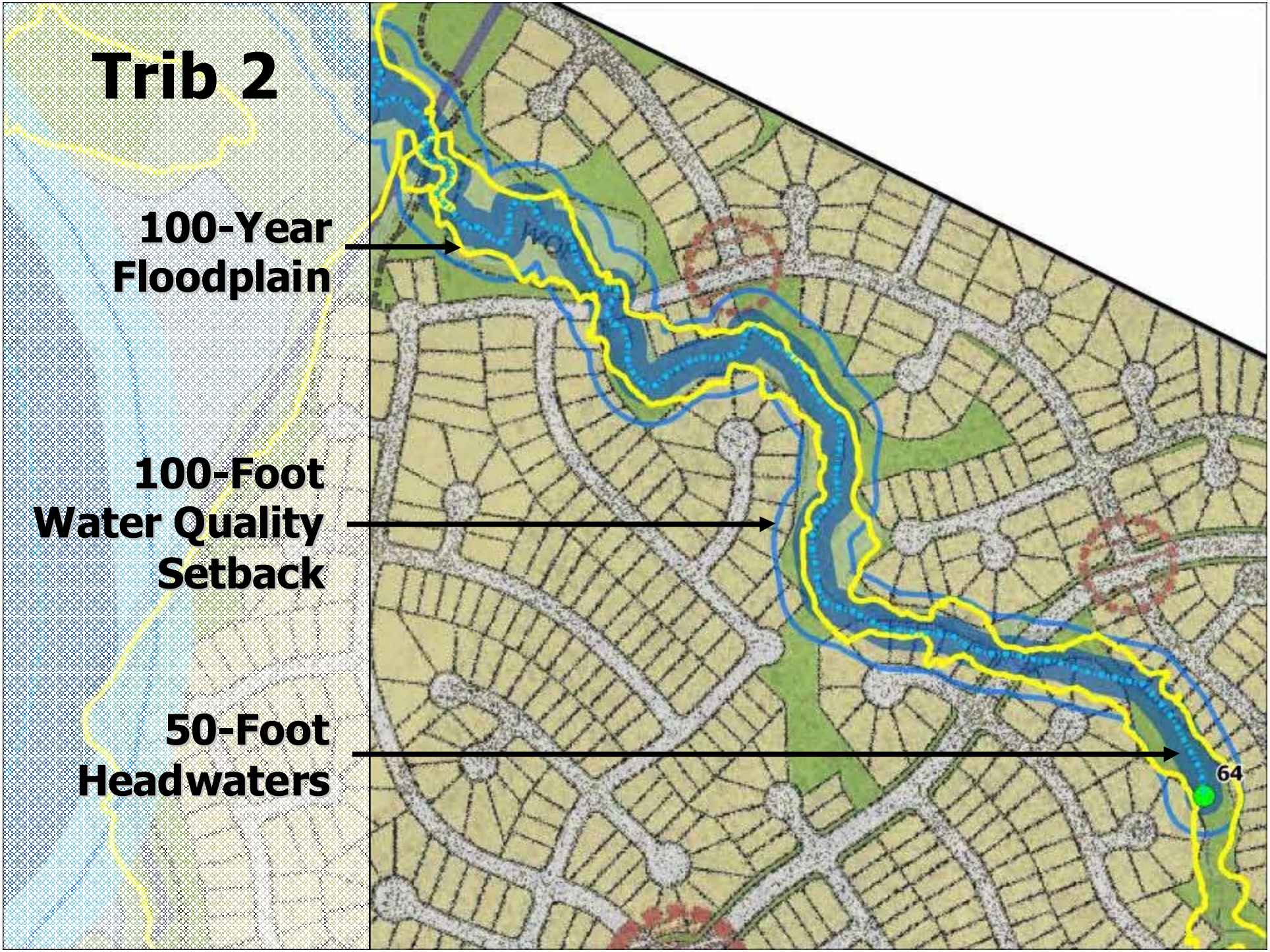

# Sun Chase Land Plan


Trib 1
320
100-Year Floodplain
100-Foot Water Quality Setback
50-Foot Headwaters
VILLAGE CASITAS
MUD 3
VILLAGE CLUSTER
COMMERCIAL
MIXED RESIDENTIAL
TIMBER HILLS DR
PEARCE LN


Trib 1
11/10/2011

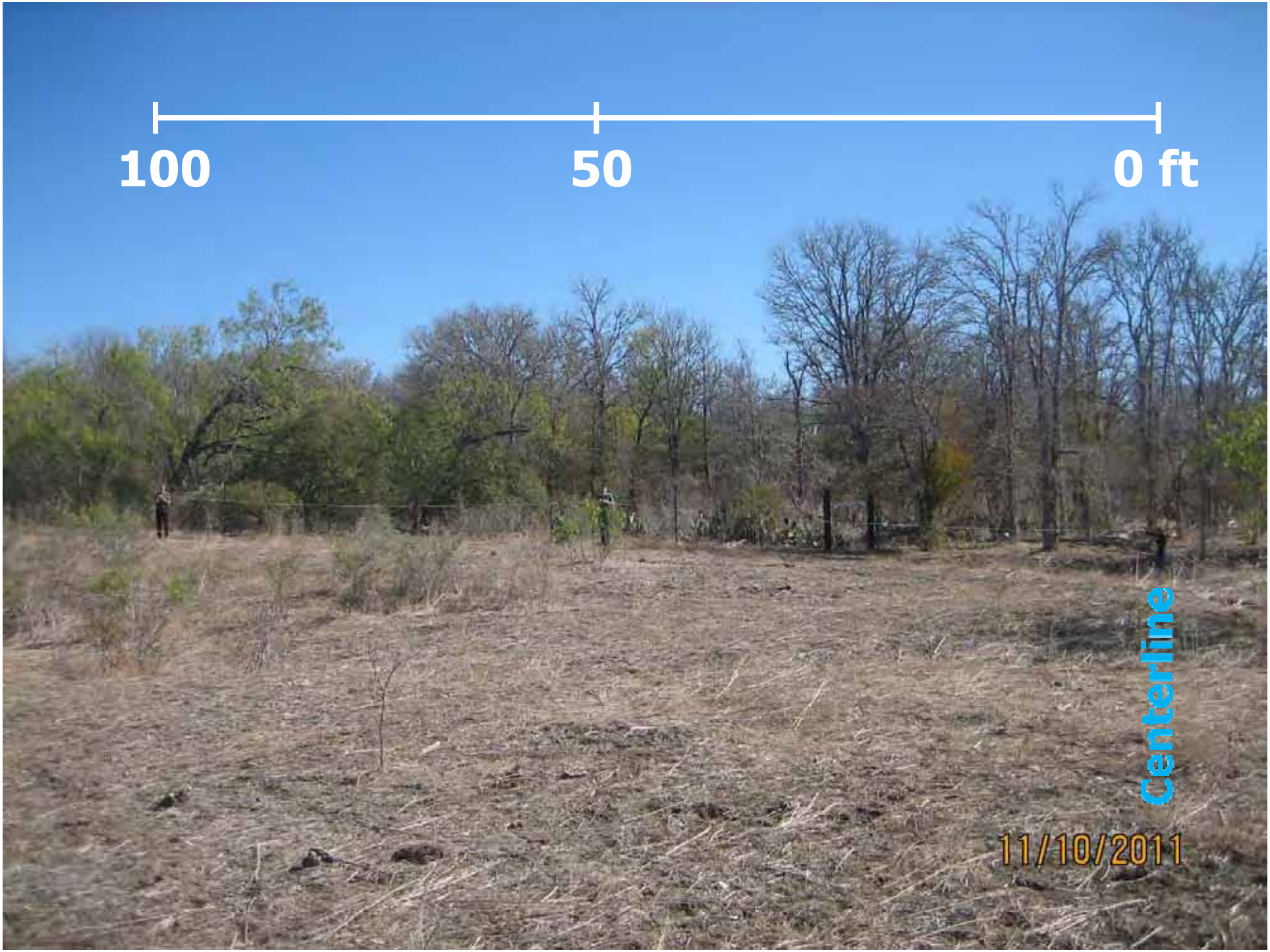

Trib 1
11/10/2011


0
50
75
100 ft
Centerline
11/10/2011

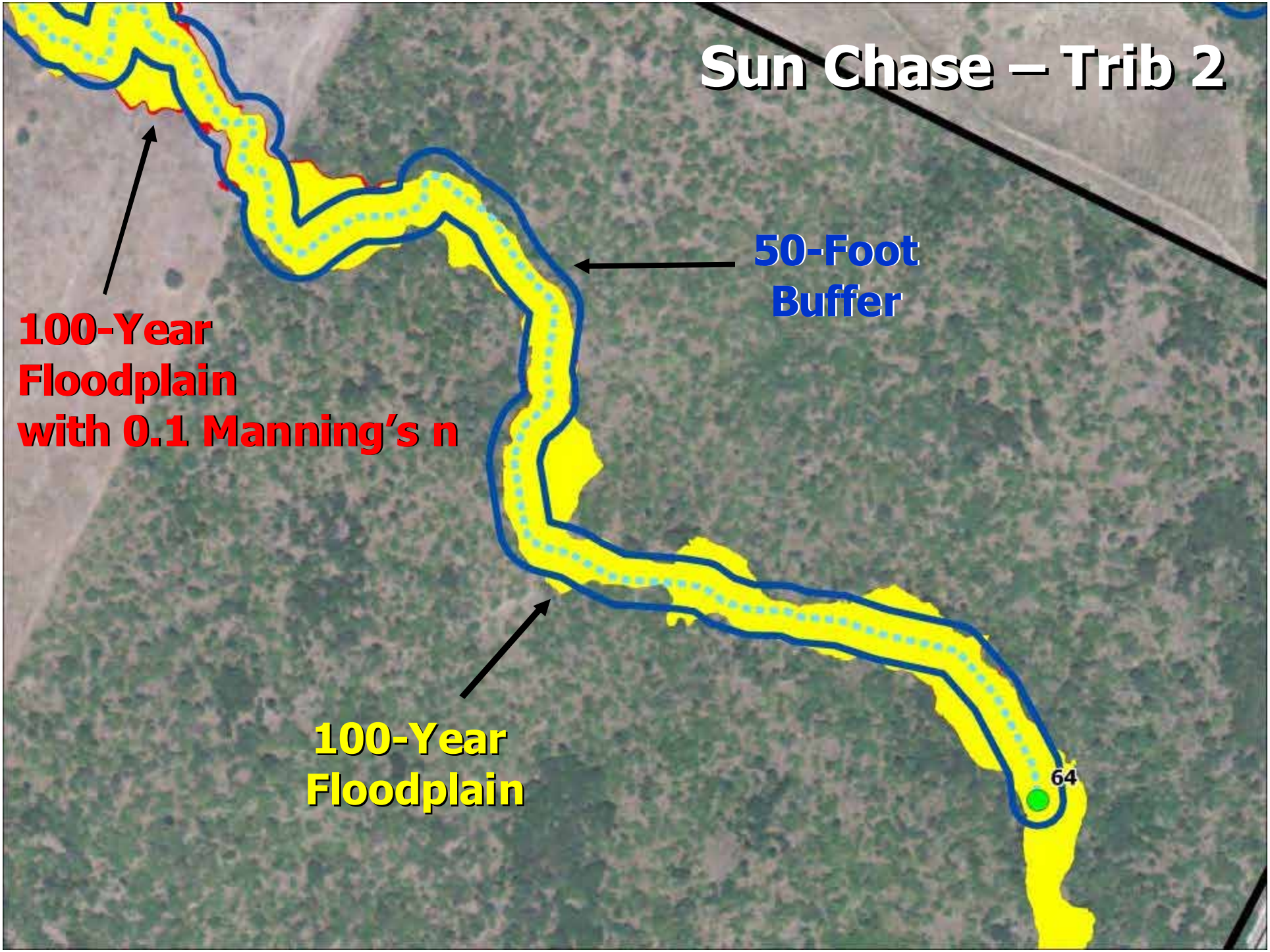

Trib 2
100-Year Floodplain
100-Foot Water Quality Setback
50-Foot Headwaters
64

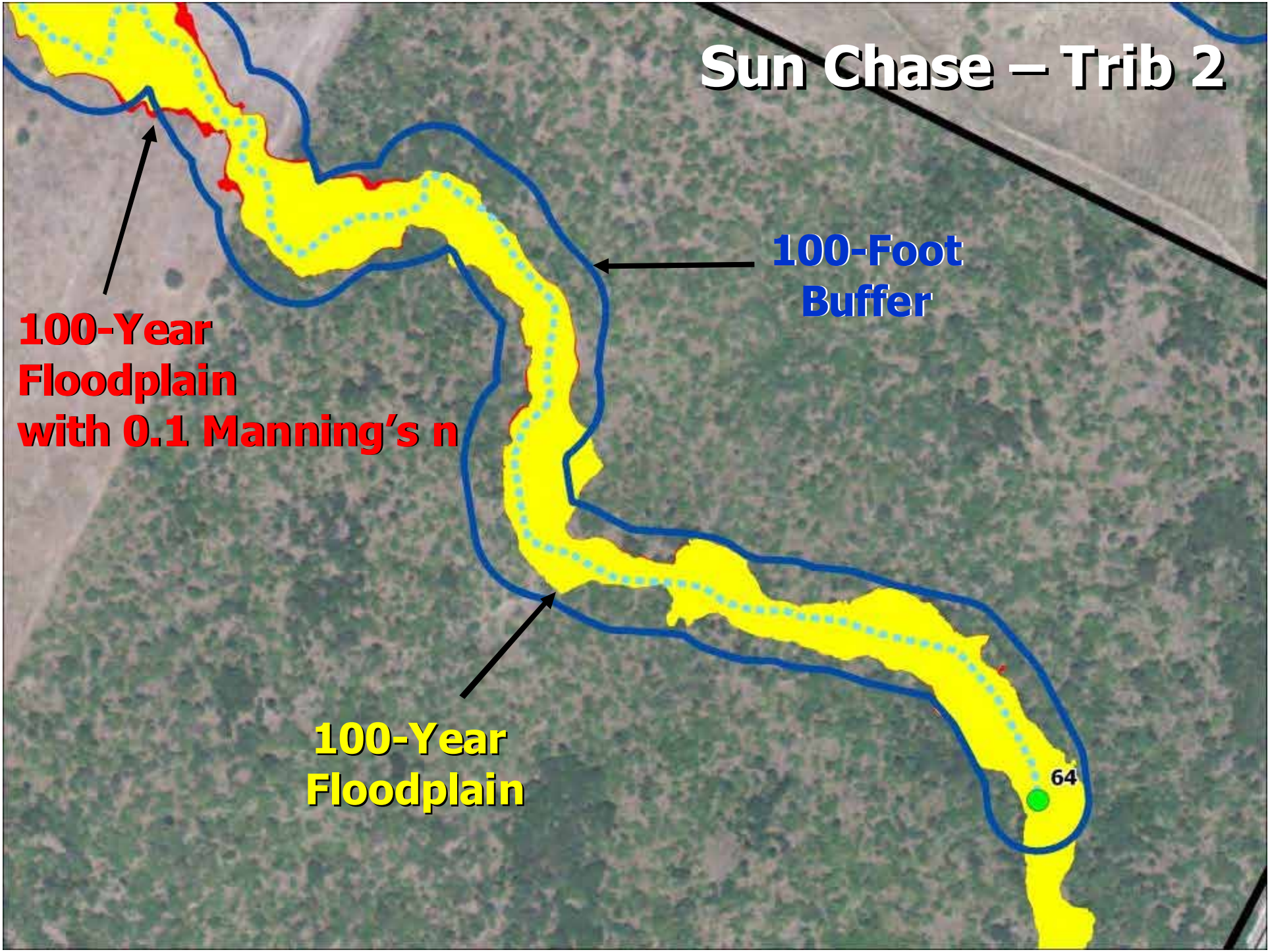

Trib 2
11/10/2011

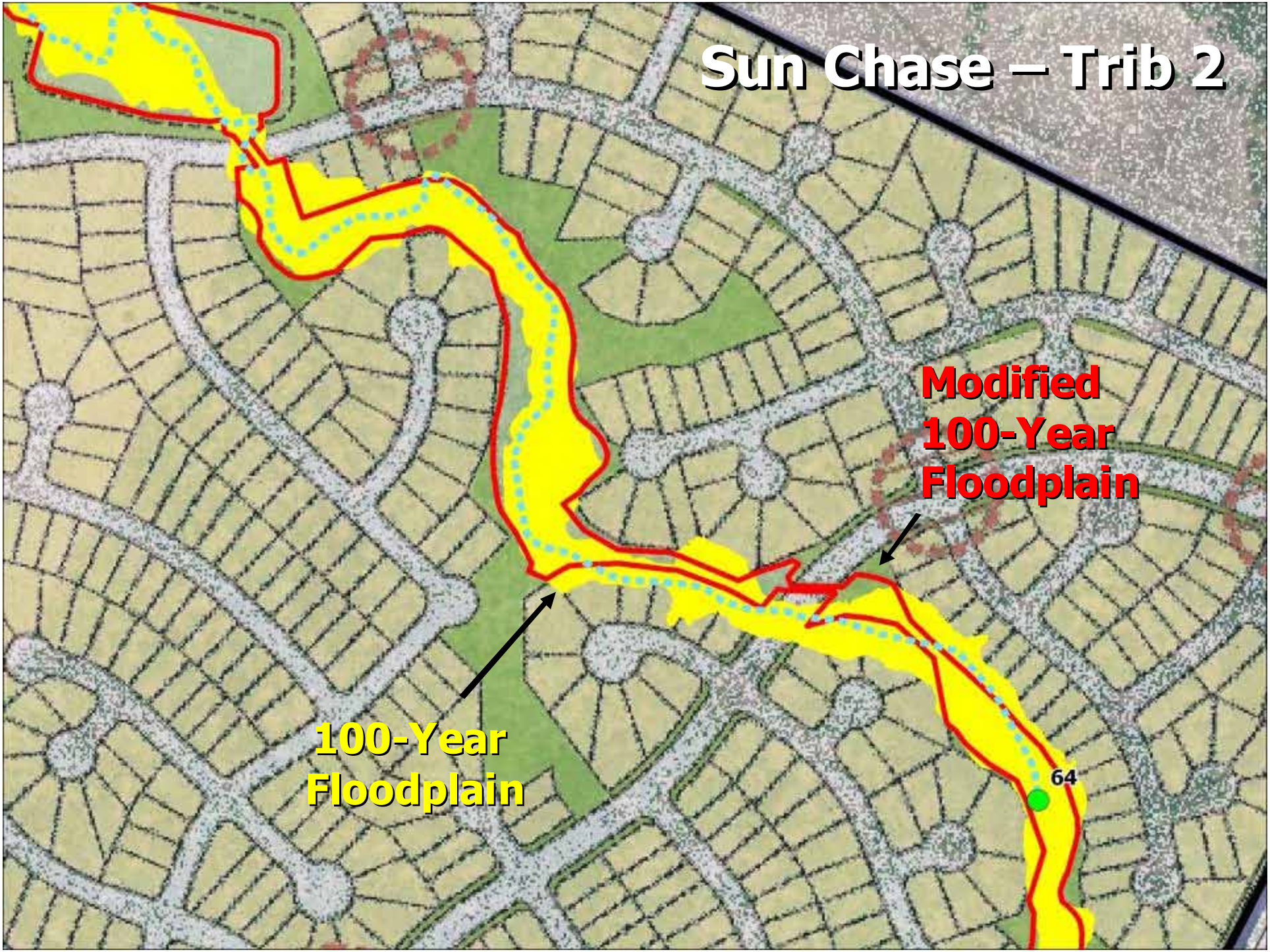

Trib 2
11/10/2011

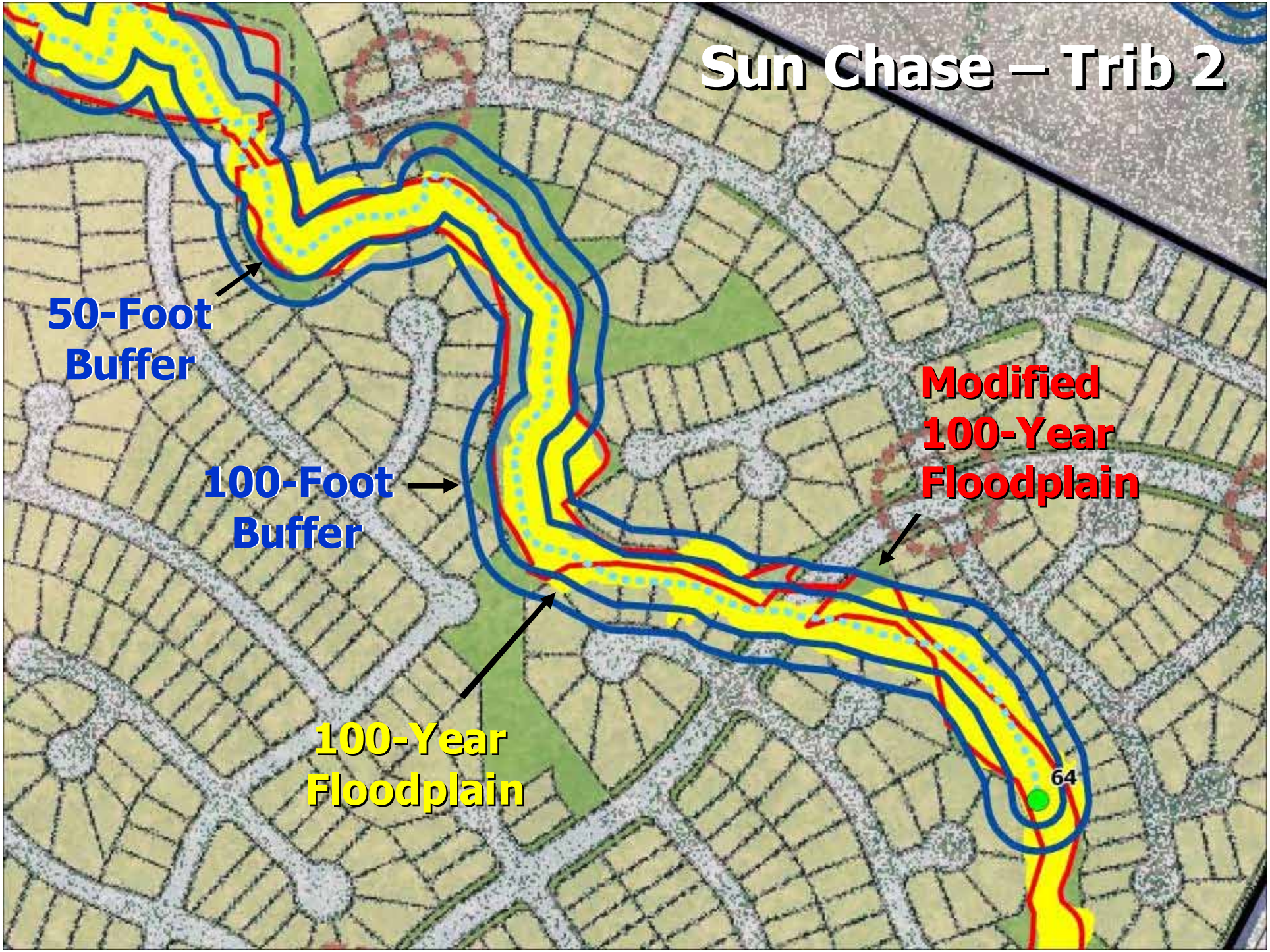

100
50
0 ft
Centerline
11/10/2011

# Manning's n Analysis


Sun Chase – Trib 2
100-Year
Floodplain
with 0.1 Manning's n
50-Foot
Buffer
100-Year
Floodplain
64


Sun Chase – Trib 2
100-Foot
Buffer
100-Year
Floodplain
with 0.1 Manning's n
100-Year
Floodplain
64


Sun Chase – Trib 2
Modified
100-Year
Floodplain
100-Year
Floodplain
64


Sun Chase – Trib 2
50-Foot Buffer
100-Foot Buffer
100-Year Floodplain
Modified 100-Year Floodplain
64

# Manning's n Analysis: Results

- **Manning's n analysis results**
  - **Multiple scenarios evaluated in Suburban Watersheds**
  - **Relatively modest changes in Floodplain Area (0 to 10%) using assumption for mature riparian forest**
  - **Options available to reduce impacts further using flexible buffer delineation & other potential tools**

# Manning's n Analysis: Results

| | Average Percent Change in Floodplain Area | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | DA = 64–320 | | DA = 320–640 | | DA = 640–1280 | | DA = 1280+ | |
| Case Study | 50 ft Buffer | 100 ft Buffer | 100 ft Buffer | 200 ft Buffer | 150 ft Buffer | 300 ft Buffer | 150 ft Buffer /FP | 300 ft Buffer /FP |
| Sun Chase T2 | 1% | 3% | | | | | | |
| Sun Chase T1 | 0% | 10% | 1% | 4% | | | | |
| Dry East T10 | 4% | 4% | 5% | 2% | | | | |
| Gilleland T1 | -2% | 3% | 1% | 3% | 2% | 3% | | |
| Dry East | 3% | 5% | 3% | 5% | 6% | 5% | 2% | 2% |

# Manning's n Analysis: Results

| | Average Percent Change in Top Width | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | DA = 64–320 | | DA = 320–640 | | DA = 640–1280 | | DA = 1280+ | |
| Case Study | 100 ft Buffer | 50 ft Buffer | 200 ft Buffer | 100 ft Buffer | 300 ft Buffer | 150 ft Buffer | 300 ft Buffer /FP | 150 ft Buffer /FP |
| Sun Chase T2 | 3% | 1% | | | | | | |
| Sun Chase T1 | 5% | 2% | 6% | 2% | | | | |
| Dry East T10 | 3% | 3% | 2% | 9% | | | | |
| Gilleland T1 | 1% | 0% | -1% | -1% | 6% | 4% | | |
| Dry East | 7% | 4% | 8% | 4% | 7% | 4% | 2% | 2% |

# Manning's n Analysis: Results

| | | Percent of Cross-Sections where Top Width is Completely Contained within Buffer | | | | | |
|---|---|---|---|---|---|---|---|
| | | DA = 64–320 | | DA = 320–640 | | DA = 640–1280 | |
| Case Study | Total # Cross-Sections | 100 ft Buffer | 50 ft Buffer | 200 ft Buffer | 100 ft Buffer | 300 ft Buffer | 150 ft Buffer |
| Sun Chase T2 | 18 | 67% | 11% | | | | |
| Sun Chase T1 | 18 | 28% | 0% | 75% | 0% | | |
| Dry East T10 | 9 | 22% | 0% | 22% | 0% | | |
| Gilleland T1 | 19 | 95% | 37% | 67% | 0% | 70% | 5% |
| Dry East | 18 | 72% | 6% | 70% | 0% | 6% | 0% |

# Manning's n Analysis: Q&A

- **Stakeholder Feedback**
  - **Do you think the evaluated creeks are representative?**
  - **Are there cases where the floodplain will be significantly expanded?**
  - **Other observations?**

# Breakout Session

**Buffer Scenarios**

- Existing Suburban Watershed Buffers
- Western Buffers
- 100-200-300 Buffers
- Modified Urban Buffers

1. Which buffer systems do you like? Why?
2. Which buffer systems do you not like? Why?
3. What are other ways to define the buffer?
4. What other information should we consider?

# Adoption Schedule

| | |
|---|---|
| **Stakeholder Meetings** | Sep 2011 – April 2012<br>(Meetings approx. every two weeks) |
| 1. Creek Protection: | Sep 9, 23, Oct 7 |
| 2. Floodplain Protection: | Oct 21, Nov 18, Dec 2 |
| 3. Development Patterns & Greenways: | Dec 16, Jan 2012 |
| 4. Improved Stormwater Controls: | Jan |
| 5. Simplify & Clarify Regs/Maintain Opportunity: | Feb |
| 6. Mitigation Options (Desired Development Zone): | Mar |
| 7. Draft Ordinance: | Apr |
| **Boards & Commissions** | May – June 2012 |
| **City Council** | August 2012 |
| **Travis County Commissioner's Court** | Fall 2012 |

# Contact Information

**Matt Hollon**
**Watershed Protection Department**
**City of Austin**
**(512) 974-2212**
**matt.hollon@austintexas.gov**

**www.austintexas.gov/watershed/ordinances2.htm**

# The Big Picture

- **Citywide summaries**
  - **% Floodplain of land**
  - **% Floodplain of undeveloped land**
  - **% Creek length by Drainage Area**
  - **% Creek buffers of land**
  - **Etc.**