Conservation Development in the West:
Trends in Regulation and Practice

SARAH REED, LIBA PEJCHAR & LINDSAY EX

Colorado State University

AGENDA

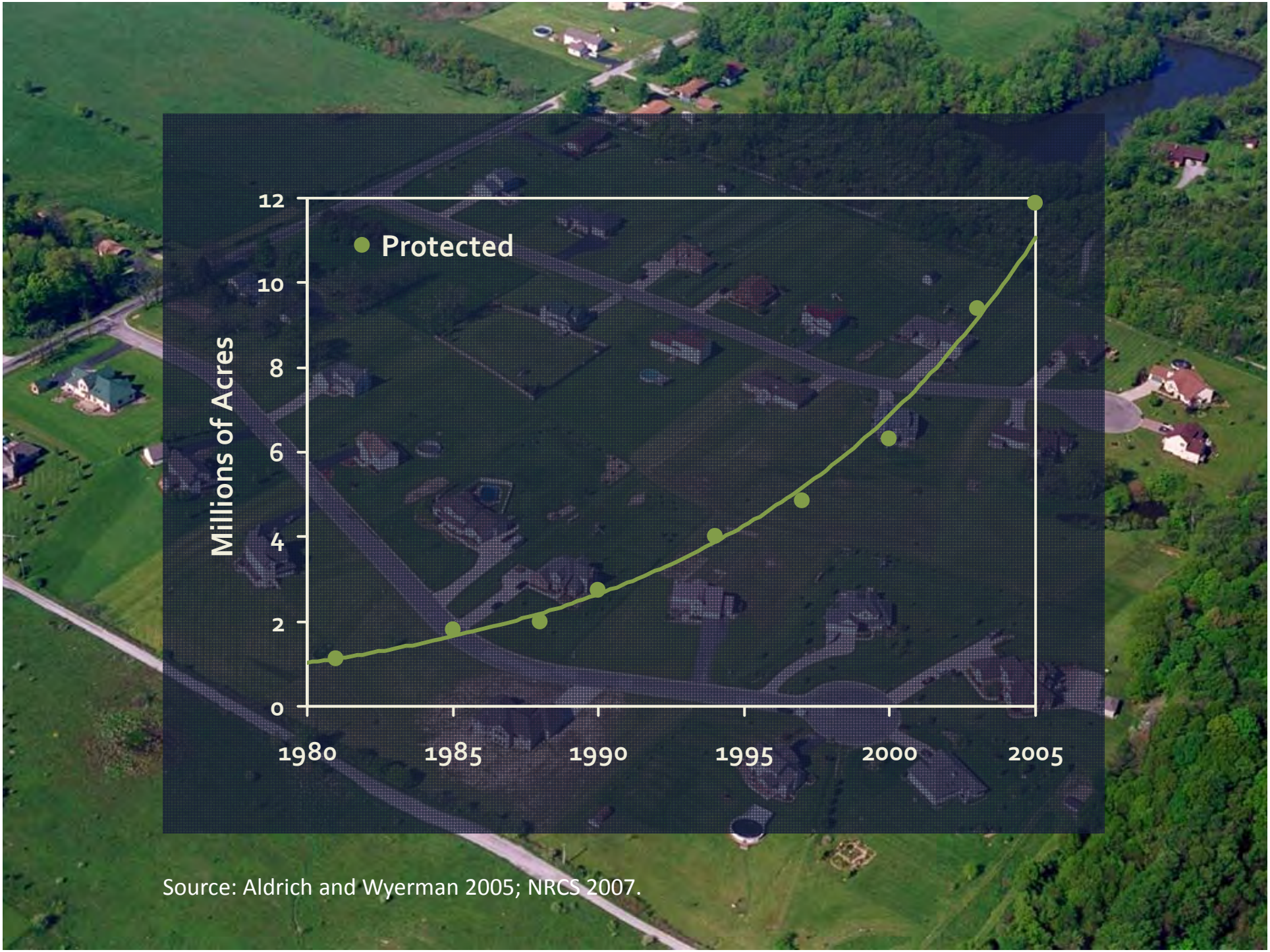
1. DEFINITIONS AND TRENDS
2. REGULATIONS AND INCENTIVES
3. CASE STUDY OF LAND USE AND HOME SALES
4. RESEARCH AND OUTREACH ACTIVITIES
5. QUESTIONS AND DISCUSSION

Definitions and Trends of Conservation Development Activity in the United States

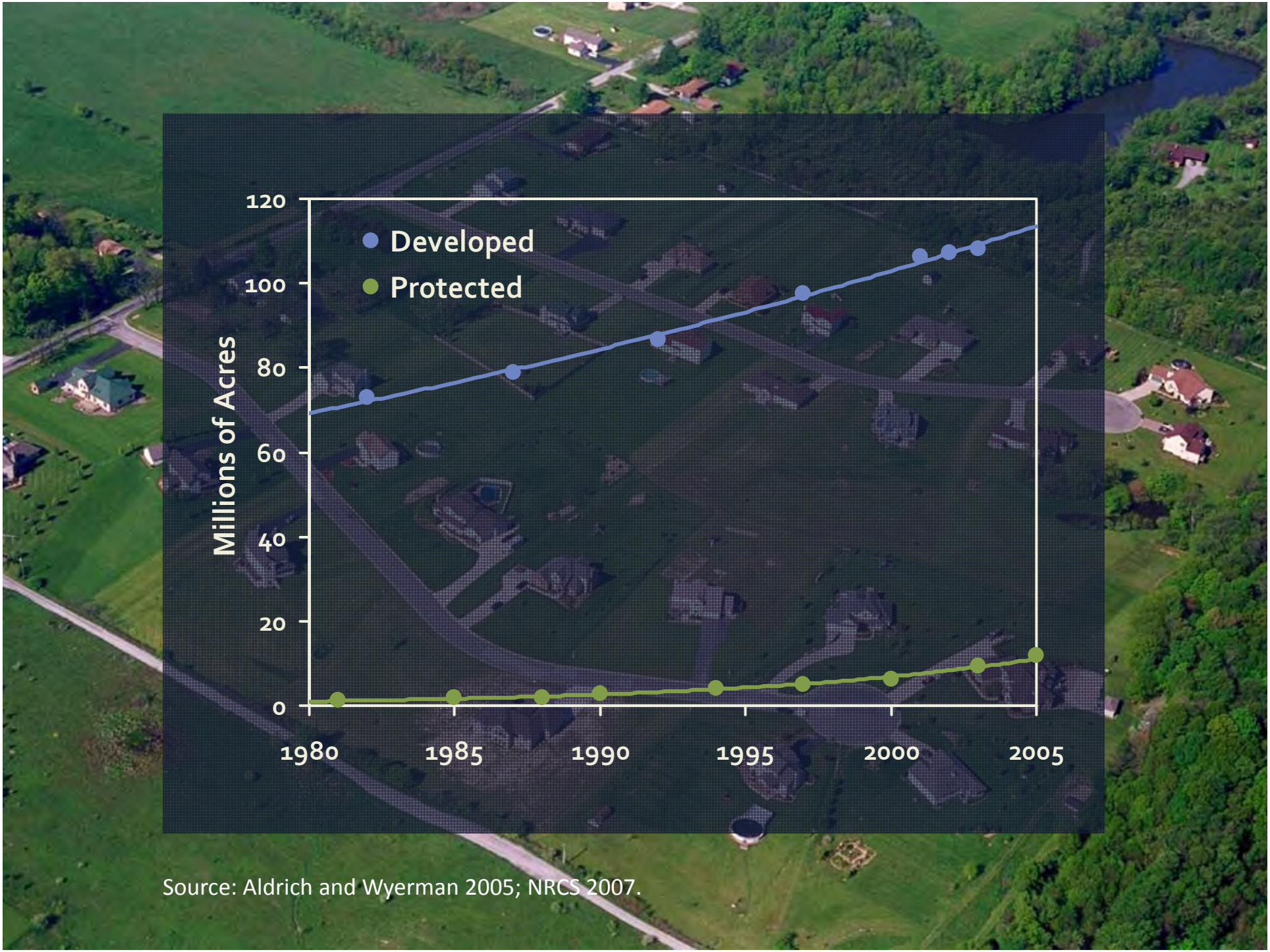
conservation development

SCHOOL OF GLOBAL ENVIRONMENTAL SUSTAINABILITY

Can we design developments to achieve conservation success in ways that are also economically and socially sustainable?



Source: Aldrich and Wyerman 2005; NRCS 2007.



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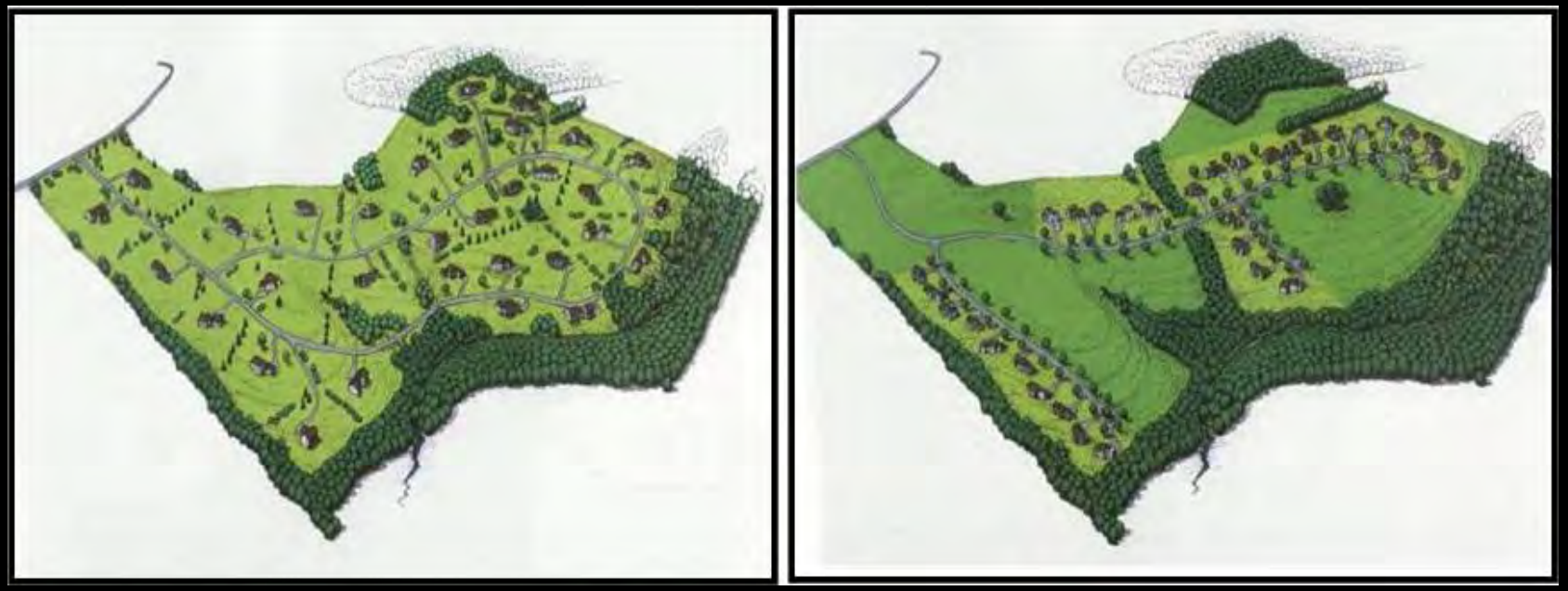
Conservation Development

An approach to land use planning and site design that combines development and land protection while providing functional protection for natural resources



Source: The Conservation Fund

Conservation Development on the Land Use Spectrum

Conservation Development

City centers

Conventional suburban development

Planned developments
Master planned communities
3

Cluster development …
conservation subdivisions
2

Large lot development

Conservation buyer and limited development projects
1

Conservation preservations

← Amount of Development →

[NONE]

← Amount of Conservation →

Source: Milder 2007. *BioScience* 57(9): 757-68.

U.S. Survey Results

- Total: 3,884 projects (1968-2008)

Type	Number surveyed	% of land protected by CD	Median size - ha (acres)	% of land undeveloped
Conservation buyer	3132	81	81 (200)	98
Limited development	219	10	87 (215)	86
Conservation subdivisions	477	1.8	32 (79)	53
Master planned communities	56	7	648 (1608)	54

Source: Milder and Clark 2011. Conservation Biology 25(4): 697-707.

Extent and Trends

- Permanently protected: 4 million ha (10 million acres; Size of New Hampshire + Connecticut)
- Rate of land protection from 2000-2008 was 278,000 ha/year (686,953 acres/year)
- Accounts for 25% of private land conservation

Source: Milder and Clark 2011. Conservation Biology 25(4): 697-707.

Protected Land Management

- All conservation buyer and 93% of limited development projects managed by landowners (restricted by easements)
- 86% of conservation subdivisions and 35% of master planned communities managed by homeowners associations

Source: Milder and Clark 2011. Conservation Biology 25(4): 697-707.

Colorado State University
School of Global Environmental Sustainability (SoGES)

Conservation Development Global Challenges Research Team

Our vision:

1) Synthesize data on existing CD practice

2) Establish a rigorous scientific basis for evaluating CD projects and policies

3) Engage with planning, development, and conservation practitioners to inform the design and monitoring of future CD projects

Conservation Development

SoGES Global Challenges Research Team

Our approach:

1) Facilitate ***exchange of ideas*** among members and partners from diverse disciplines and organizations
2) Write an interdisciplinary ***literature review*** on the interaction between residential land development and open space
3) Conduct a ***case study*** of existing CD projects in Colorado
4) Launch an ***outreach network*** for planning, development, and conservation practitioners

Conservation Development = Sustainable Communities?

- ecological

- social

- economic

Questions or Comments

conservation development

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Local Land Use Regulations and Incentives for Conservation Development

Sarah E. Reed[1,2] , Jodi A. Hilty[1], and David M. Theobald[2]

[1] North America Program
Wildlife Conservation Society

[2] Department of Fish, Wildlife, and Conservation Biology
Colorado State University

Smith Fellows
In partnership with the Society for Conservation Biology

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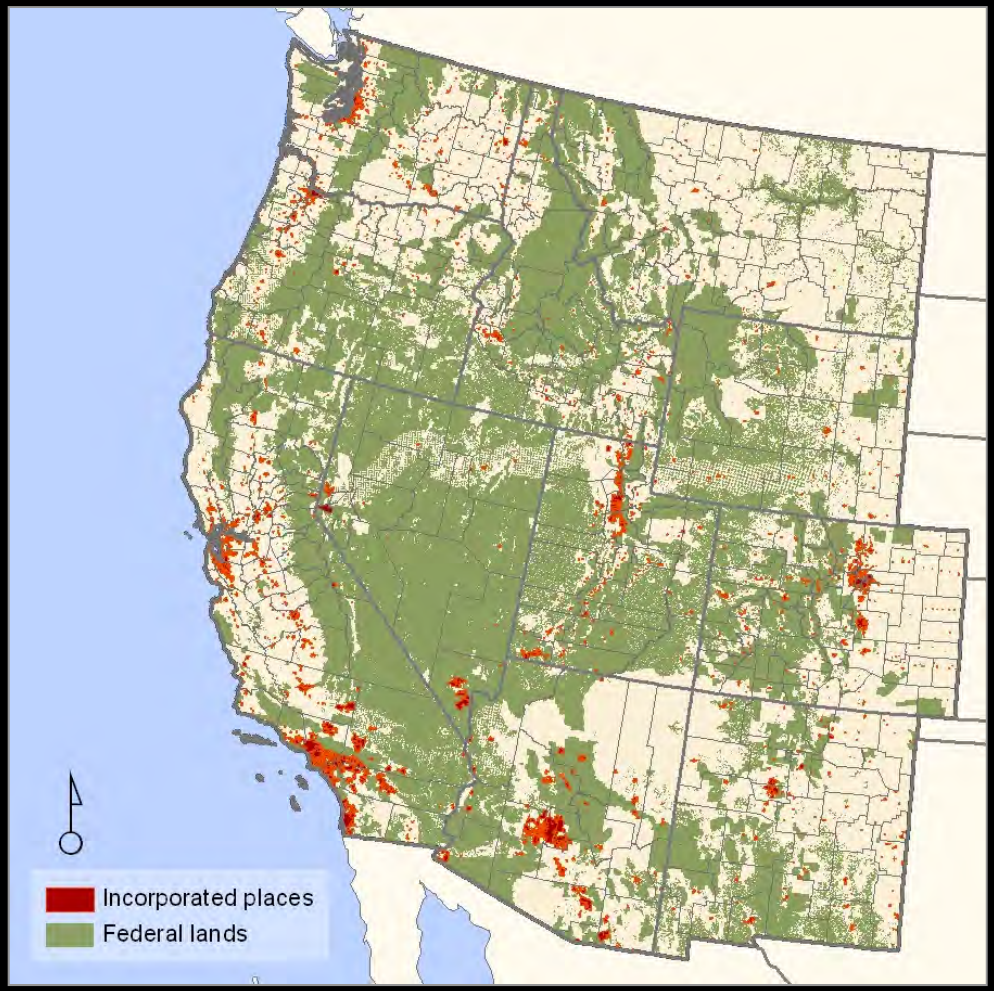
LAND USE REGULATIONS

GUIDING QUESTIONS

- Where and when have counties adopted land use regulations that establish guidelines or create incentives for CD?
- How do the characteristics of counties that have adopted CD ordinances compare to those that have not?
- What are the objectives of CD ordinances, what incentives do they include, and what are their requirements for ecological site analysis, protected area design, ownership and management of protected lands, and developed area design?

WHY COUNTIES?



- Most low-density development is projected to occur in rural areas
- Counties have jurisdiction over development decisions on > 97% of private land area in western US

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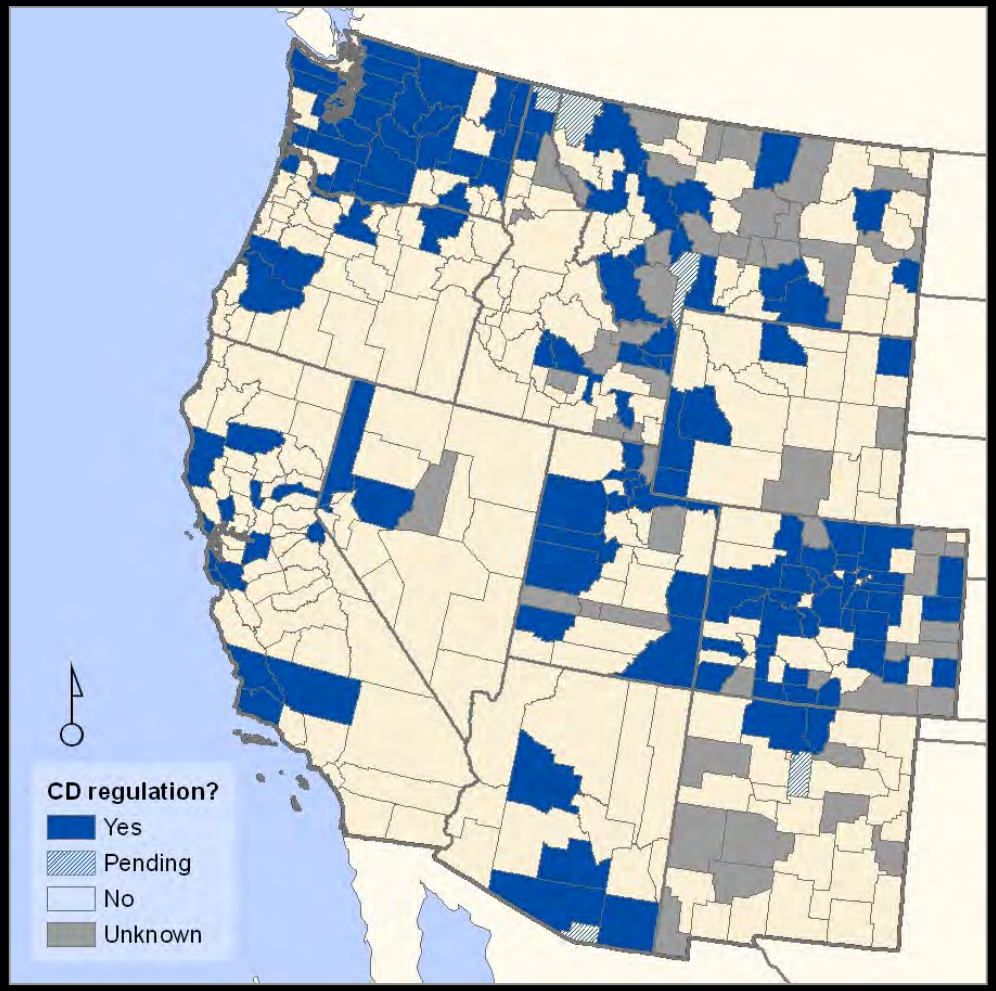
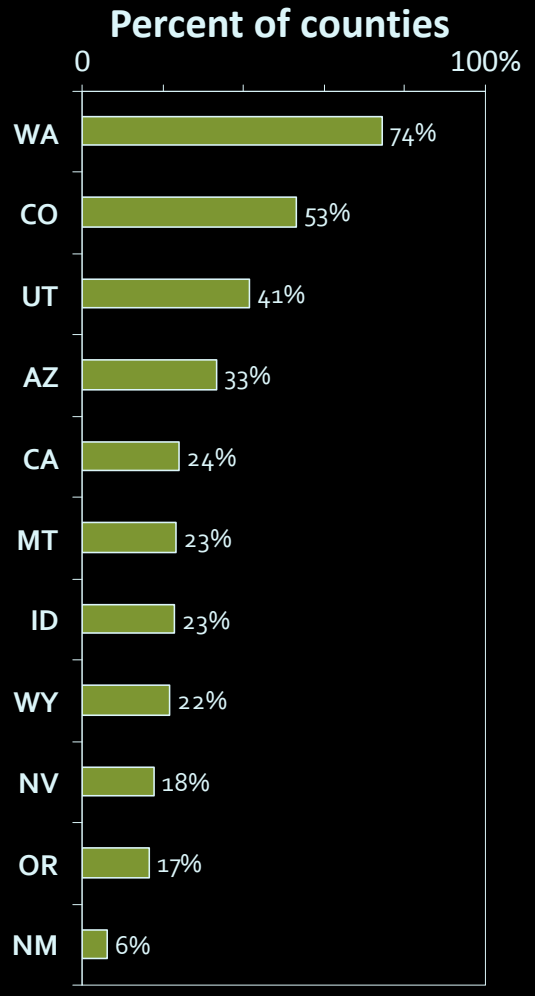
COUNTIES WITH CD ORDINANCES





(n = 414 counties, 87% response rate)

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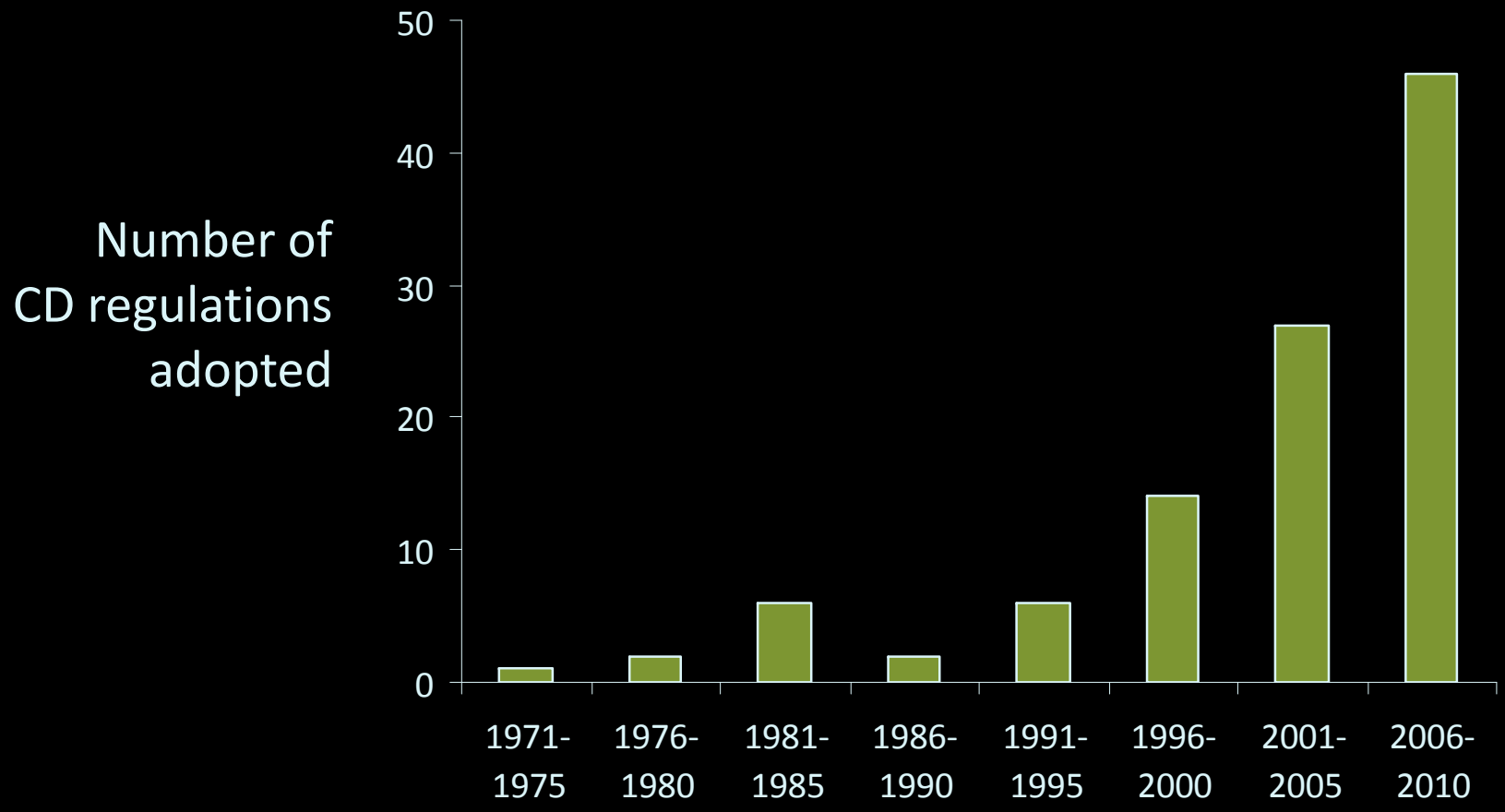
LAND USE REGULATIONS

INCREASING TREND OF ADOPTION



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LAND USE REGULATIONS

COUNTY CHARACTERISTICS

Population and housing change

Land use composition

Socioeconomic characteristics

Land use planning capacity

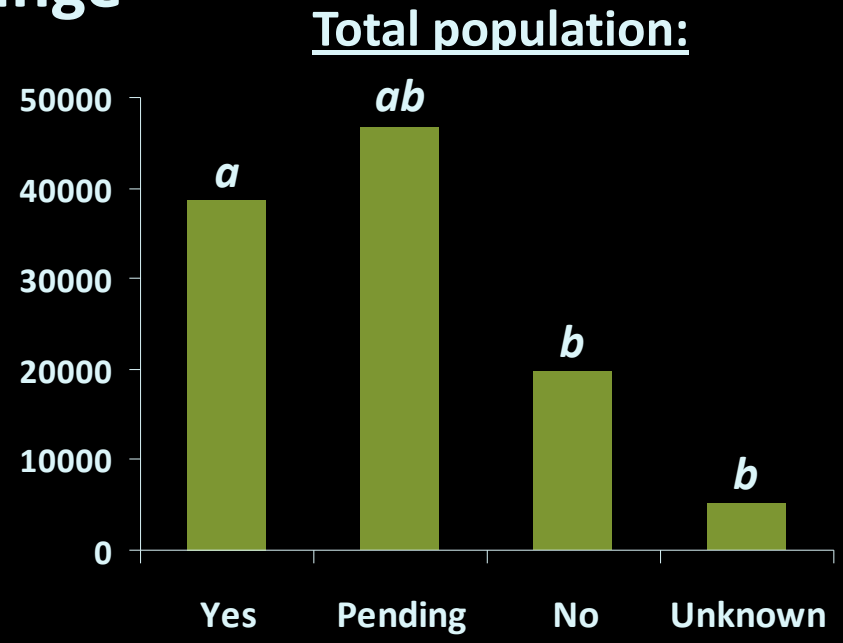
COUNTY CHARACTERISTICS

Population and housing change

Land use composition

Socioeconomic characteristics

Land use planning capacity



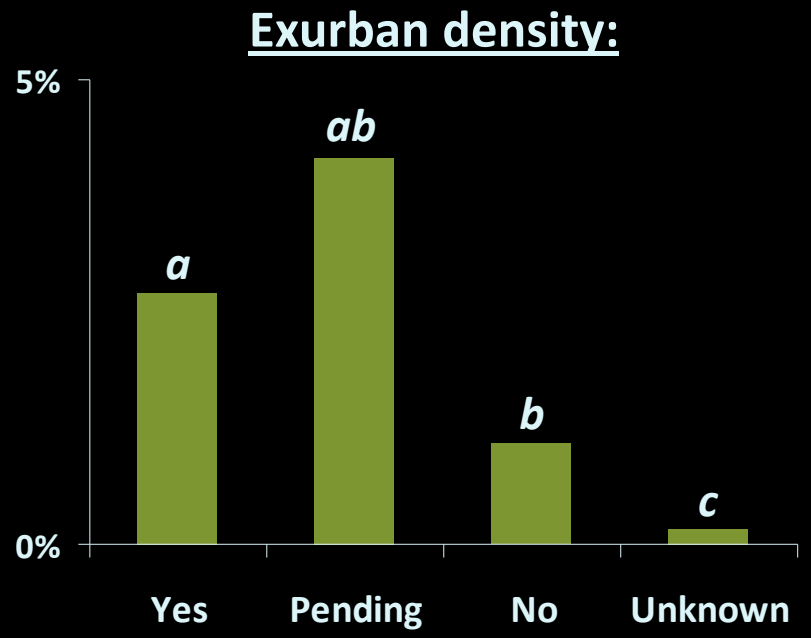
COUNTY CHARACTERISTICS

Population and housing change

Land use composition

Socioeconomic characteristics

Land use planning capacity



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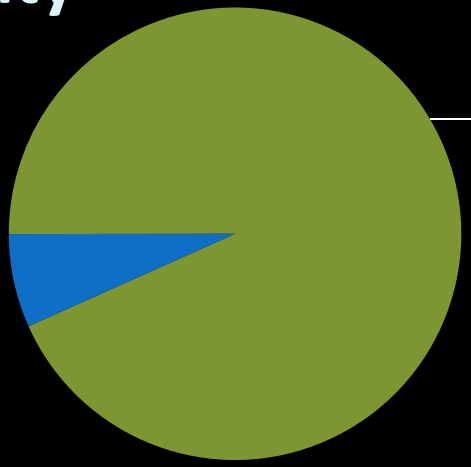

93% of CD regulations were adopted by counties with a planning department

REVIEW OF CD ORDINANCES

Objectives & Applicability

Site Analysis Requirements

Conservation Area Design

Conservation Area Management

Development Incentives

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Most common objectives stated in CD regulations:

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62% reduce infrastructure

56% conserve agricultural lands

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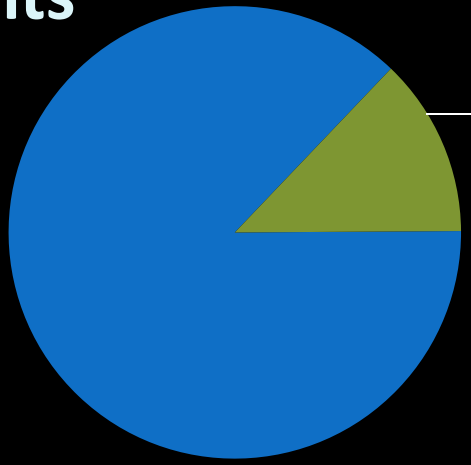

13% of CD regulations require site analysis for ecological features

REVIEW OF CD ORDINANCES

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Site Analysis Requirements

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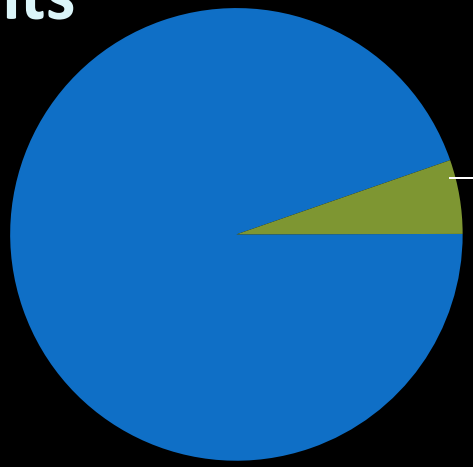

5% of CD regulations require site analysis for ecological features prior to developed area design

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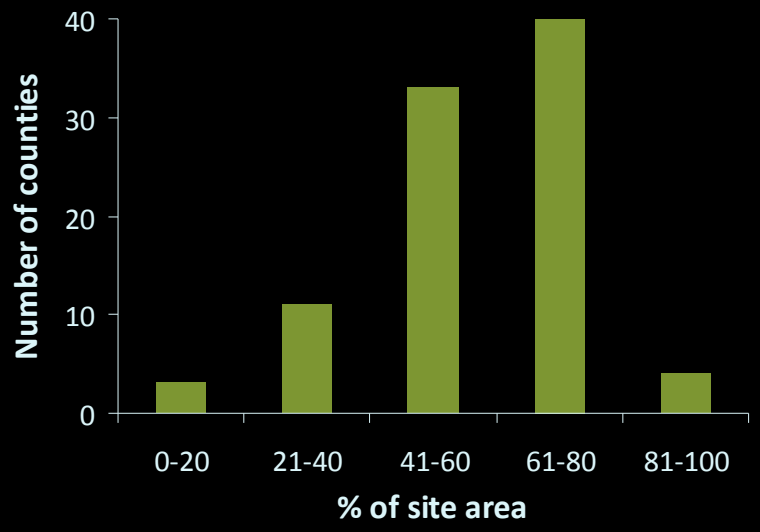
Open space requirements:



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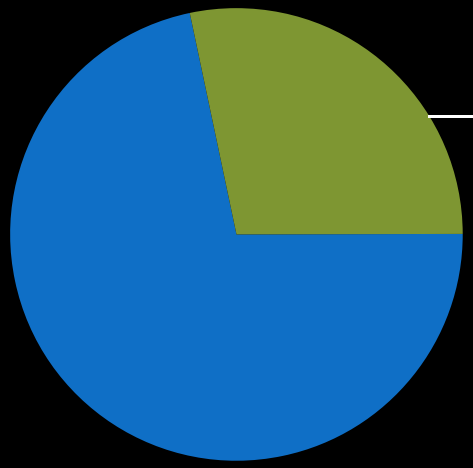

28% of CD regulations require a plan for managing conserved lands

REVIEW OF CD ORDINANCES

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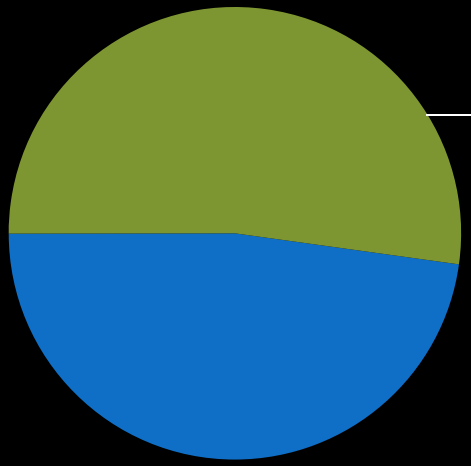

52% of CD regulations offer a density bonus as an incentive

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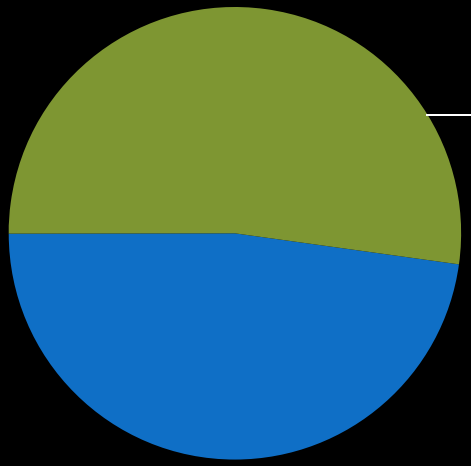

52% of CD regulations offer a density bonus as an incentive

71% mean increase in development yield permitted as a bonus

CONCLUSIONS

- CD ordinances are more widespread than expected
- Growing trend in the adoption and revision of CD ordinances in county land use regulations
- Important differences between ideal conservation design process vs. guidelines in CD ordinances

Case Study of Land Use and Home Sales in Colorado CD Projects

Lindsay Ex[1,2] , Sarah E. Reed[3,4], Liba Pejchar[3], Steve Laposa[5], Christopher Hannum[5], and David M. Theobald[3]

[1] City of Fort Collins

[2] Center for Collaborative Conservation
Colorado State University

[3] Department of Fish, Wildlife & Conservation Biology
Colorado State University

[4] North America Program
Wildlife Conservation Society

[5] Department of Finance and Real Estate
Colorado State University

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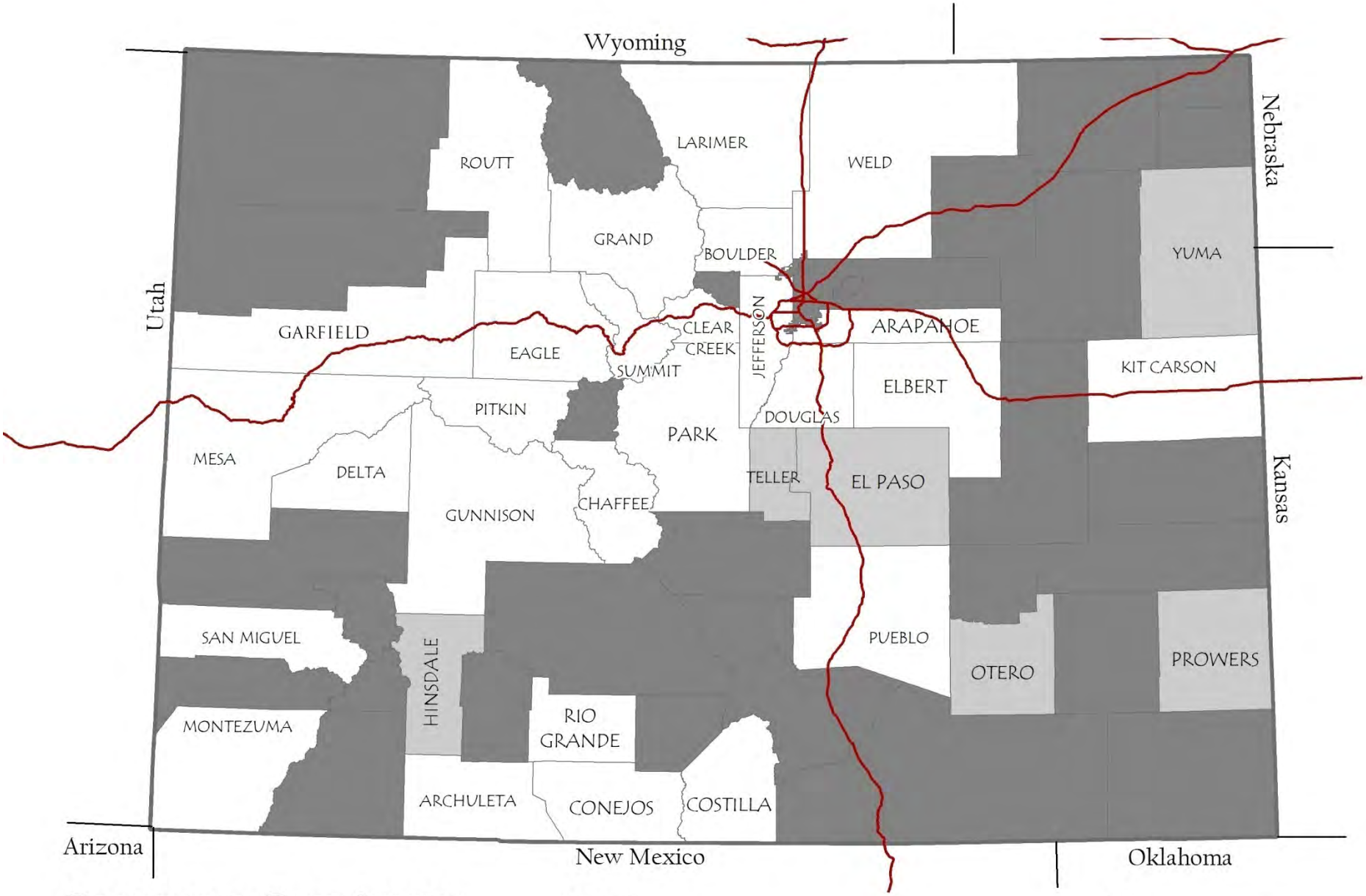
COLORADO
CASE STUDY

GUIDING QUESTIONS

- How many CD projects have been developed in Colorado and where have they been developed?
- What do CD projects in Colorado look like on the ground?
- How do the land uses within CD projects compare to other subdivision development options?
- Are CD projects more profitable than other development options?



Colorado Case Study

Data Collected as of February 2012

Legend

Colorado Counties - Regulation Status

- Data Available
- Data Unavailable
- Unknown Regulatory Framework

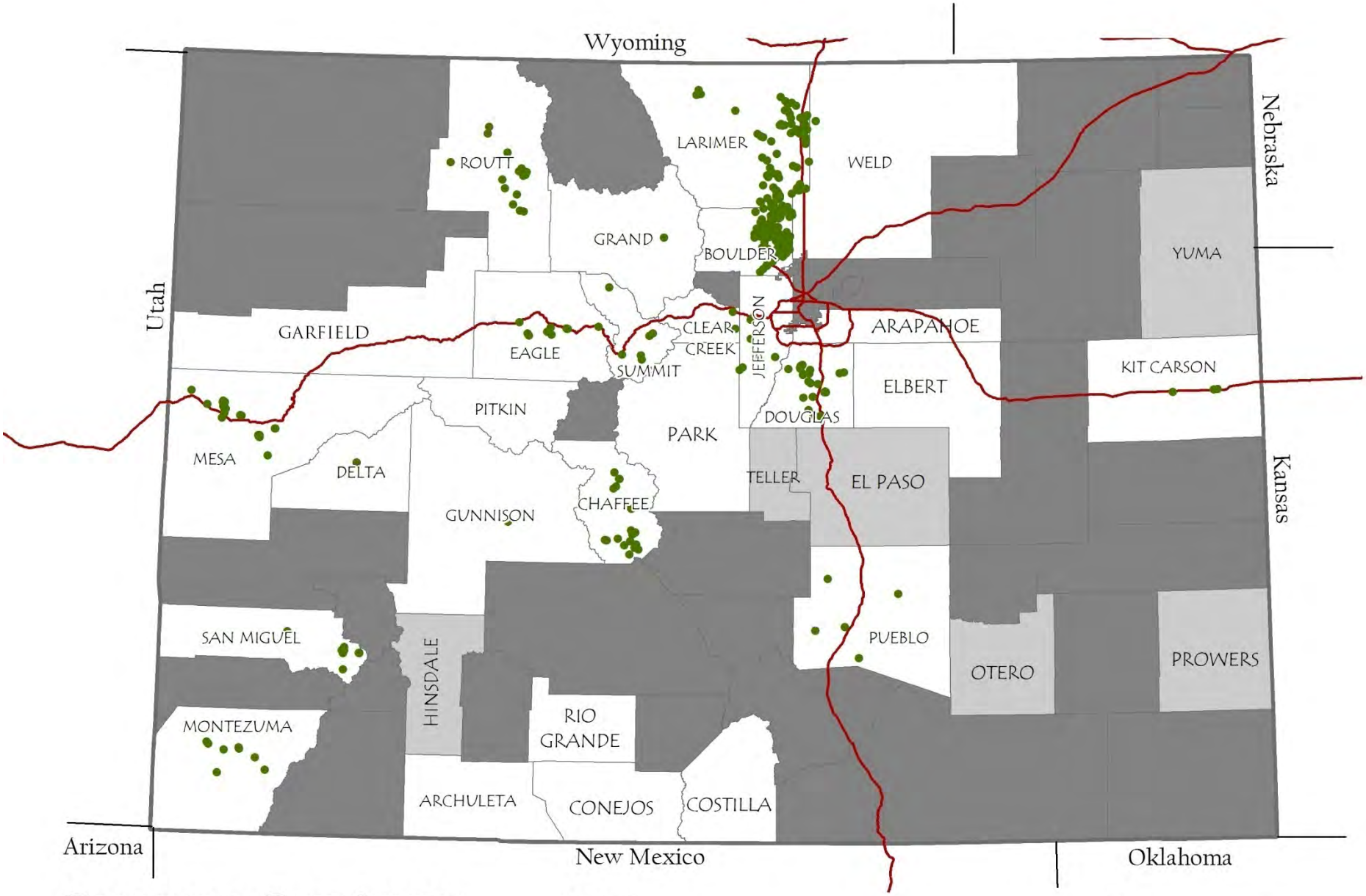
US Interstates

State of Colorado

N

0 30 60 Kilometers

0 25 50 Miles



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STATEWIDE ANALYSIS

County	# of CD projects	Mean area of CD projects
Archuleta	1	Unknown[1]
Boulder	180	28 ha (70 ac)
Chaffee	21	61 (150)
Clear Creek	2	123 (303)
Delta	1	80.9 (200)
Douglas	16	434 (1071)
Eagle	8	27.9 (68.9)
Grand	1	752 (1857)
Gunnison	1	184.7
Jefferson	7	110 (272)
Kit Carson	3	34.7 (85.8)
Larimer	89	67.5 (166.8)
Mesa	20	29 (73)

County	# of CD projects	Mean area of CD projects
Montezuma	8	20 (50)
Pueblo	5	399 (987)
Routt	16	234 (577)
San Miguel	6	243 (601)
Summit	6	152 (377)
Weld	1	51.9 (128.2)
Overall	**408**	**74.8 ha (184.8 ac)**

[1] *Unknown indicates project has either not bee located or data were unavailable.*

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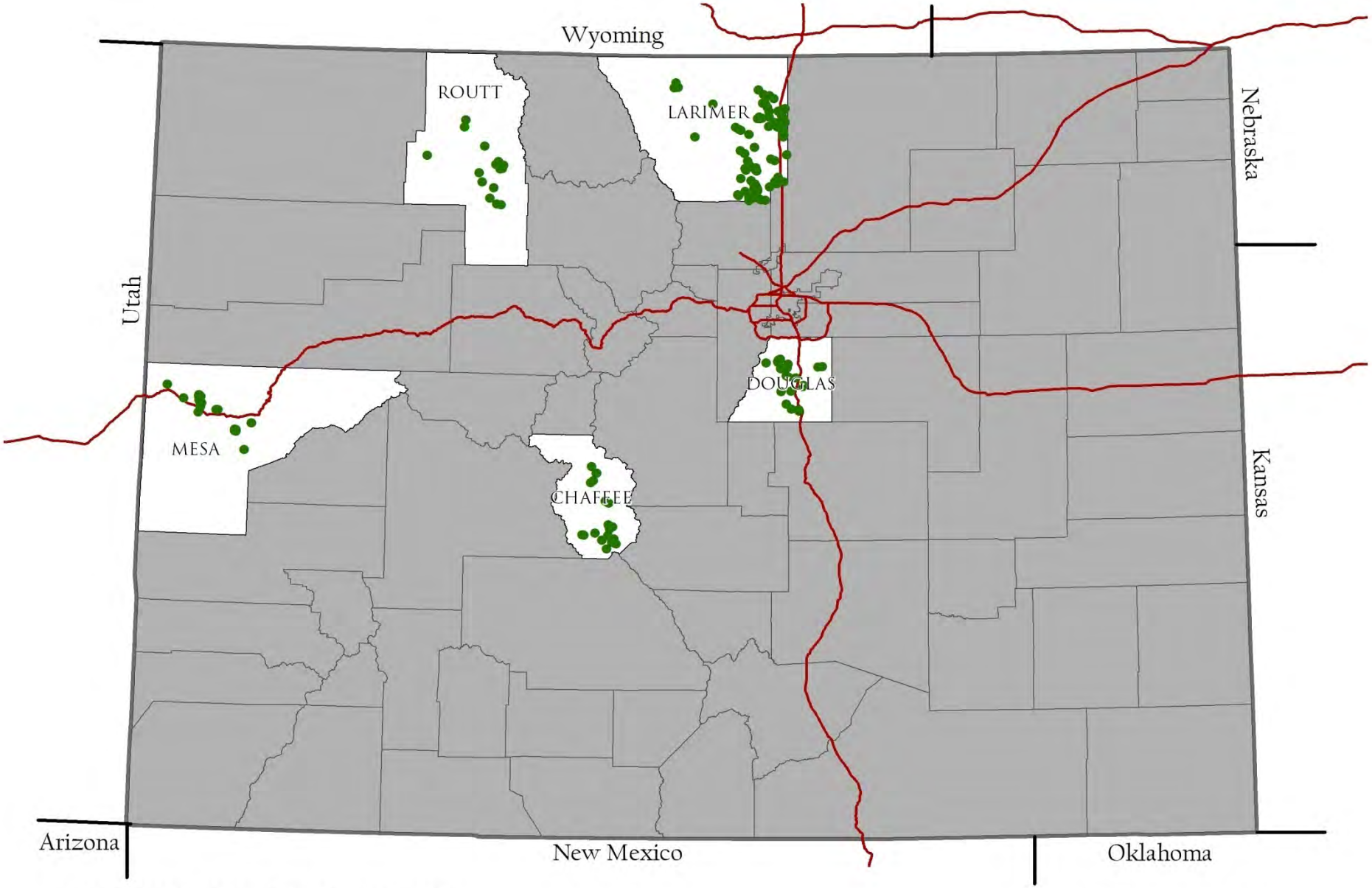


Colorado Case Study

Comparative and sales transaction analyses

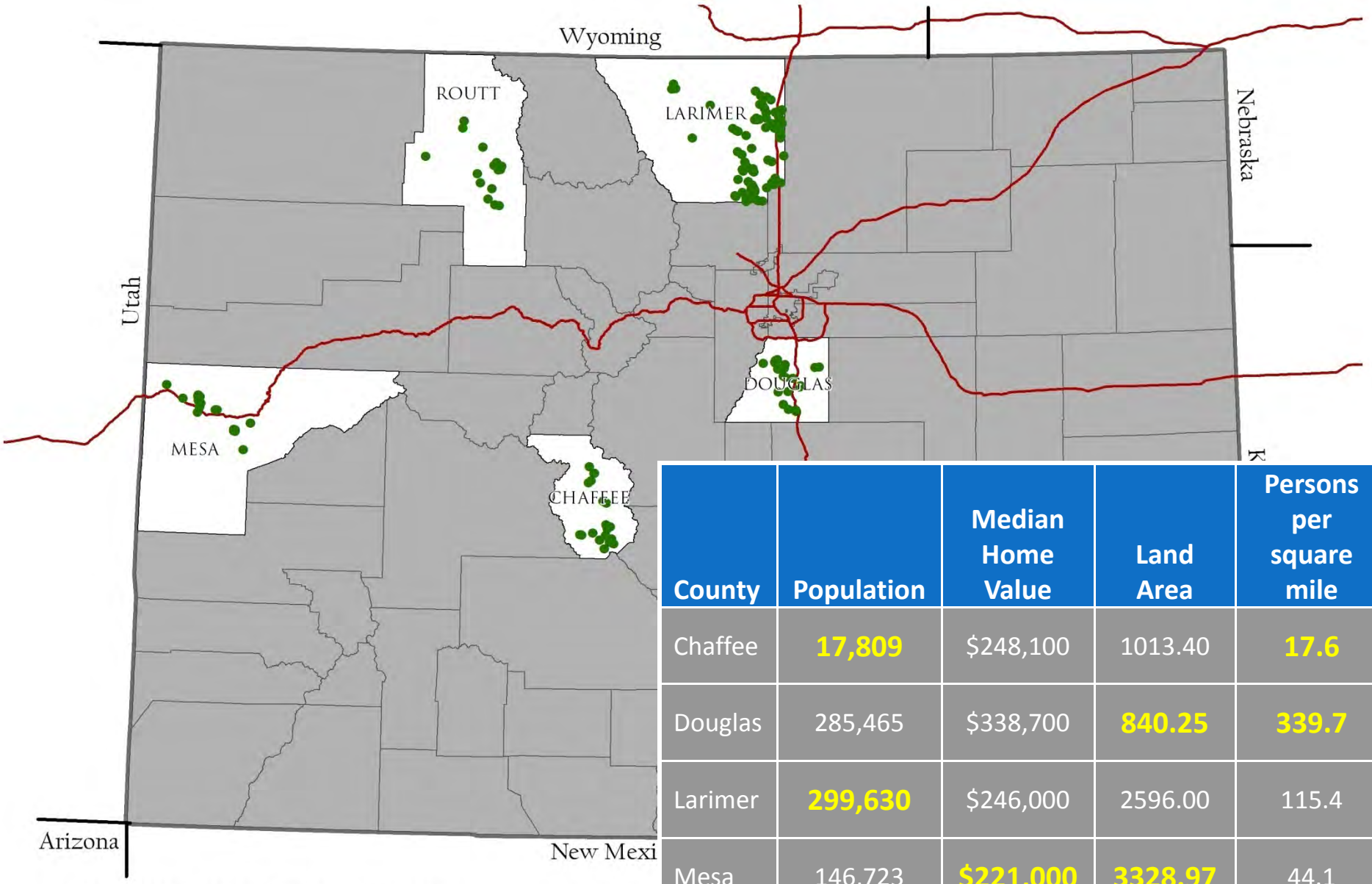
LEGEND

- CD Projects
- US Interstates
- Colorado Counties Analyzed
- All Colorado Counties

N

0 30 60 Kilometers

0 25 50 Miles

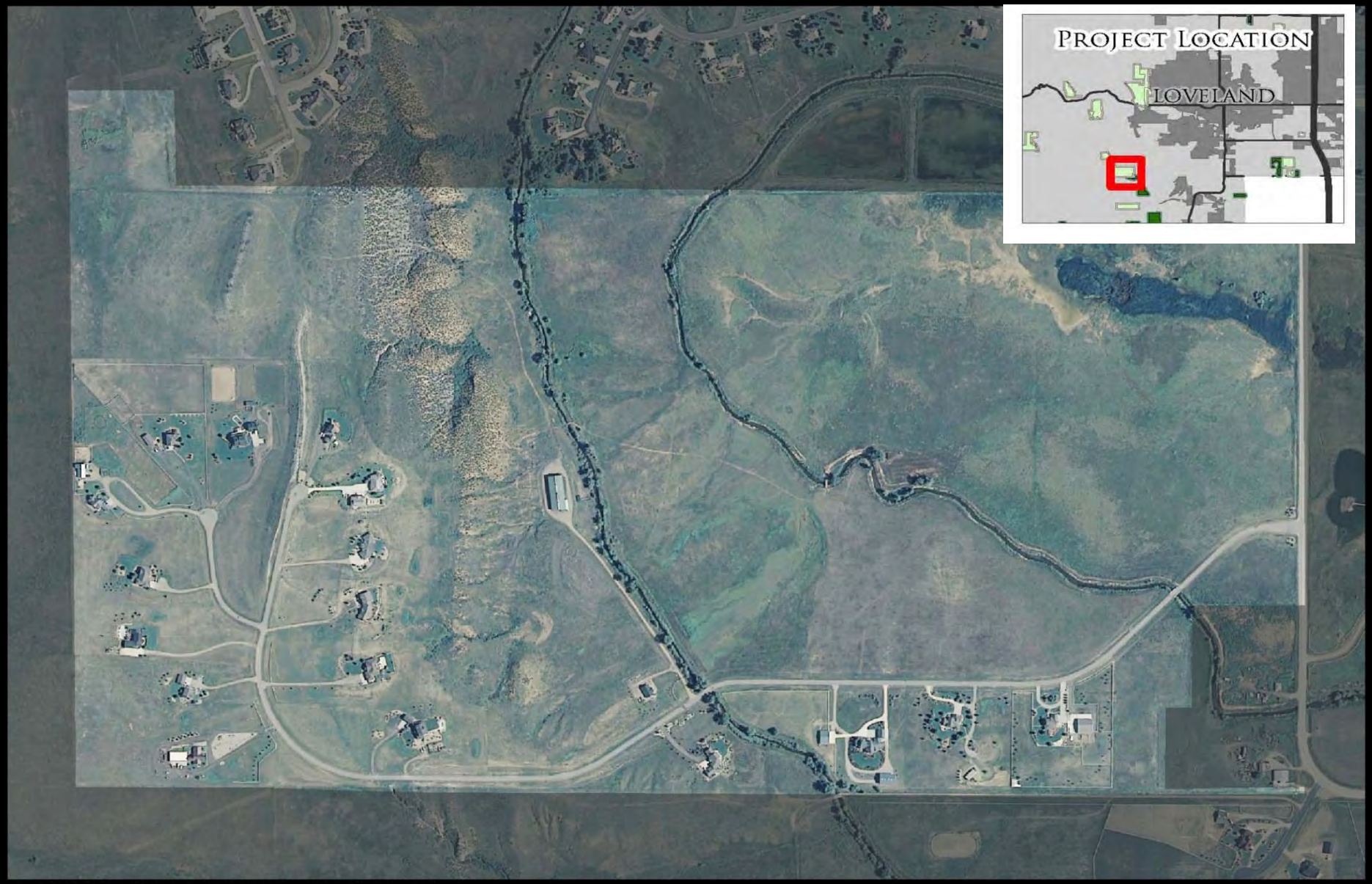


COLORADO CASE STUDY

Comparative and sales transaction analyses

County	Population	Median Home Value	Land Area	Persons per square mile
Chaffee	**17,809**	$248,100	1013.40	**17.6**
Douglas	285,465	$338,700	**840.25**	**339.7**
Larimer	**299,630**	$246,000	2596.00	115.4
Mesa	146,723	**$221,000**	**3328.97**	44.1
Routt	23,509	**$422,300**	2362.03	10.0

LAND USE ANALYSIS - METHODS



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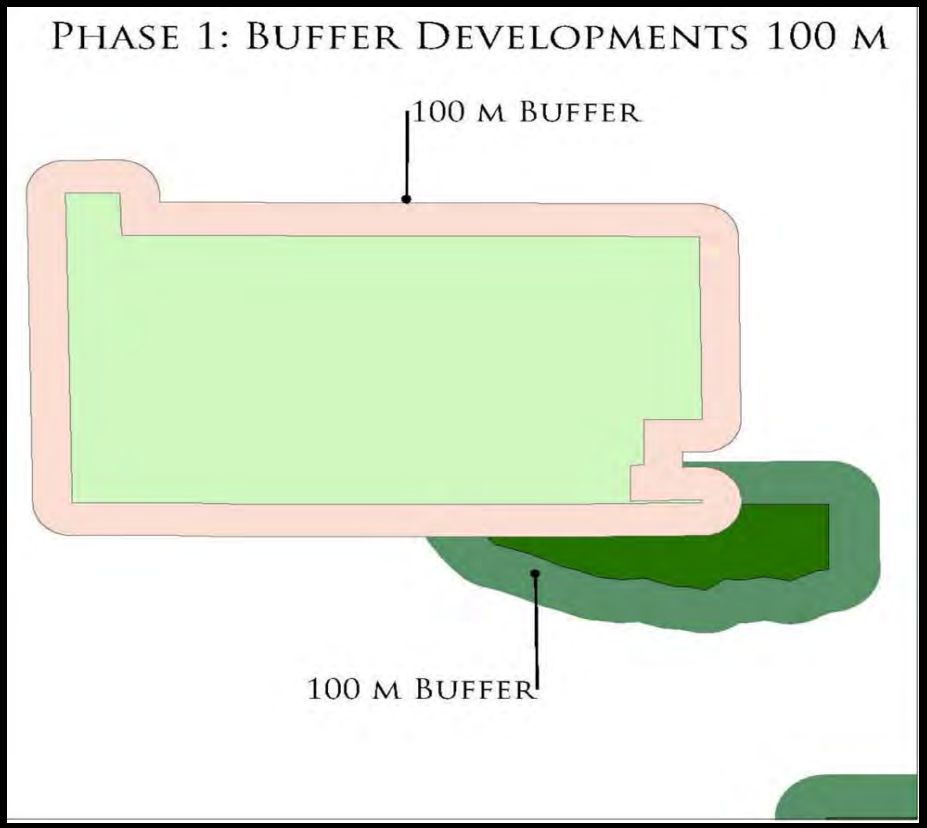

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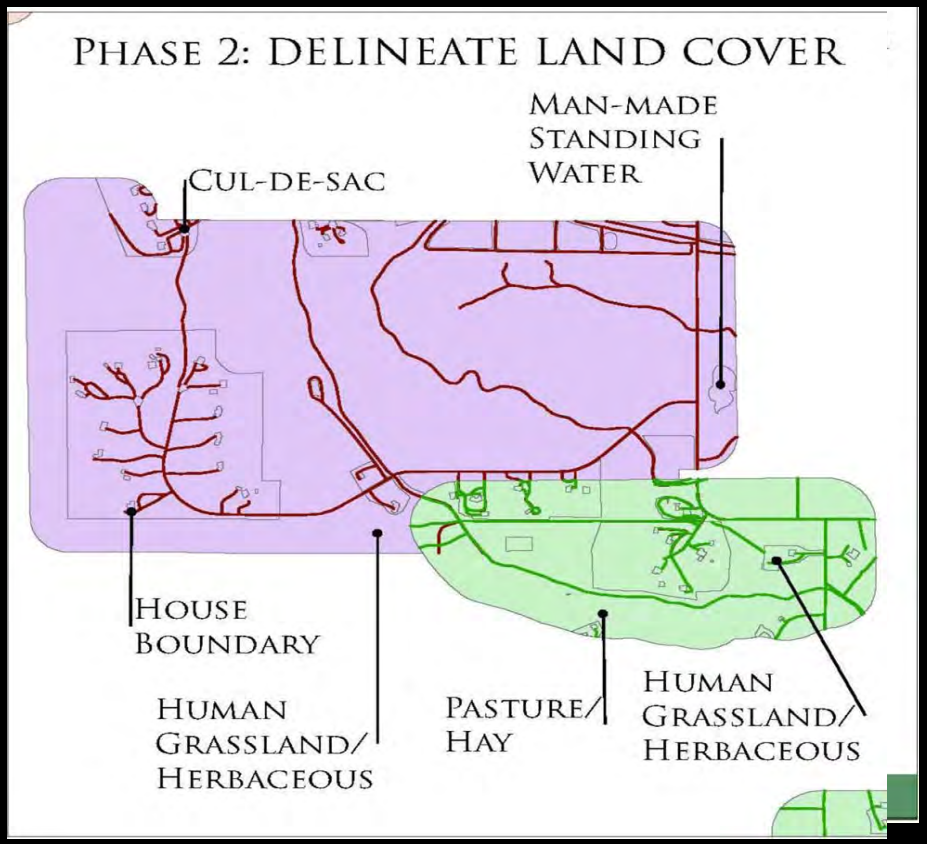

LAND USE ANALYSIS - FINDINGS

CD Projects

Number of Projects

Mean Area of Open Space

Land Use in Protected Open Space in CD Projects

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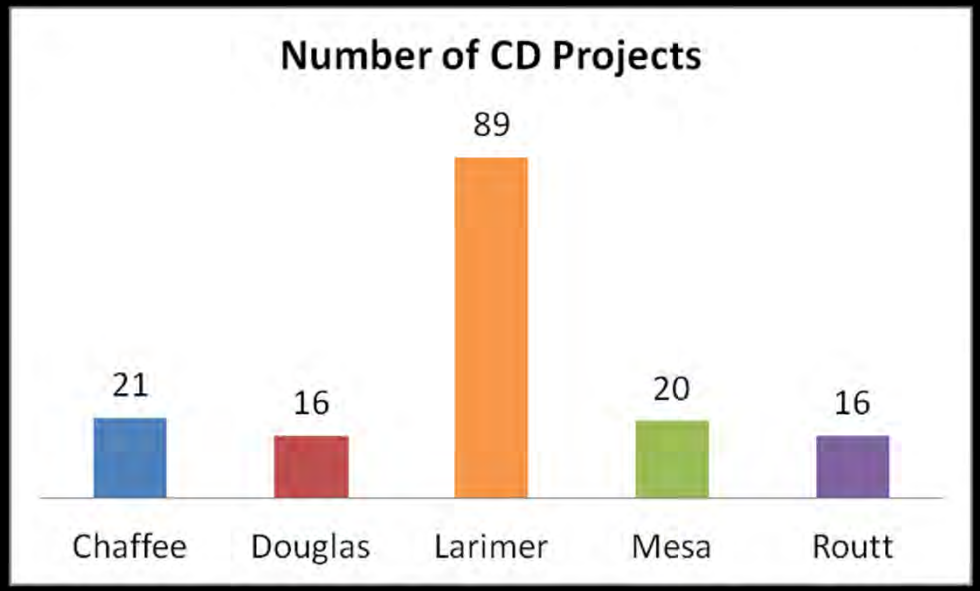

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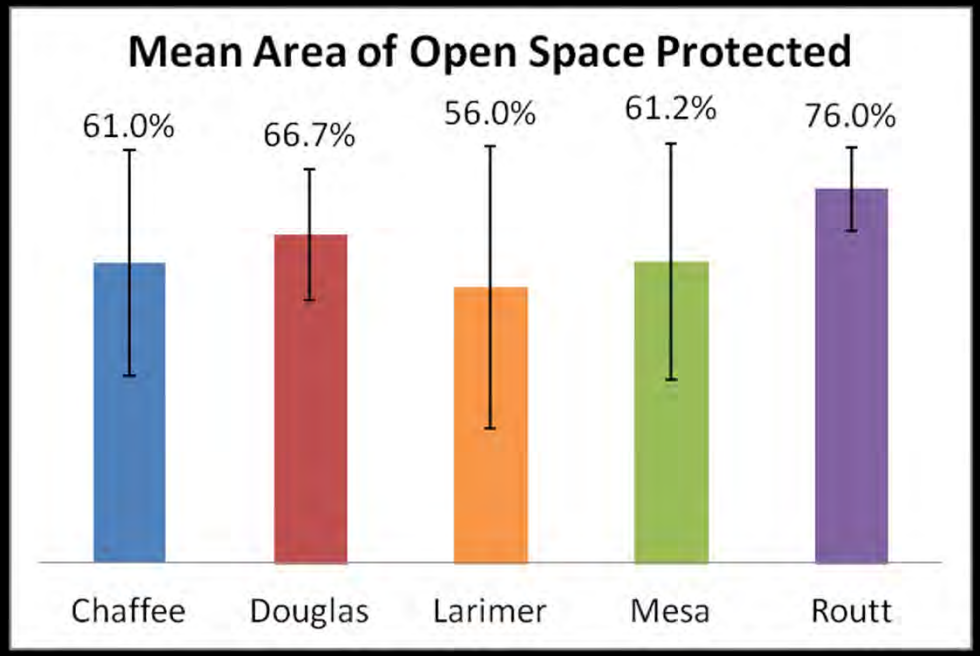
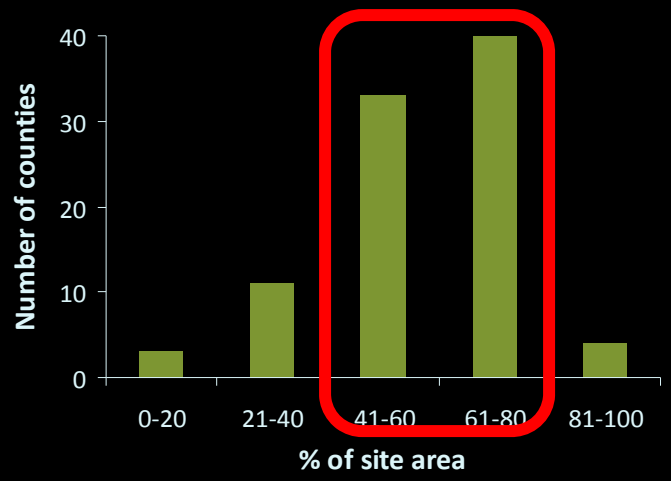


Open space requirements:



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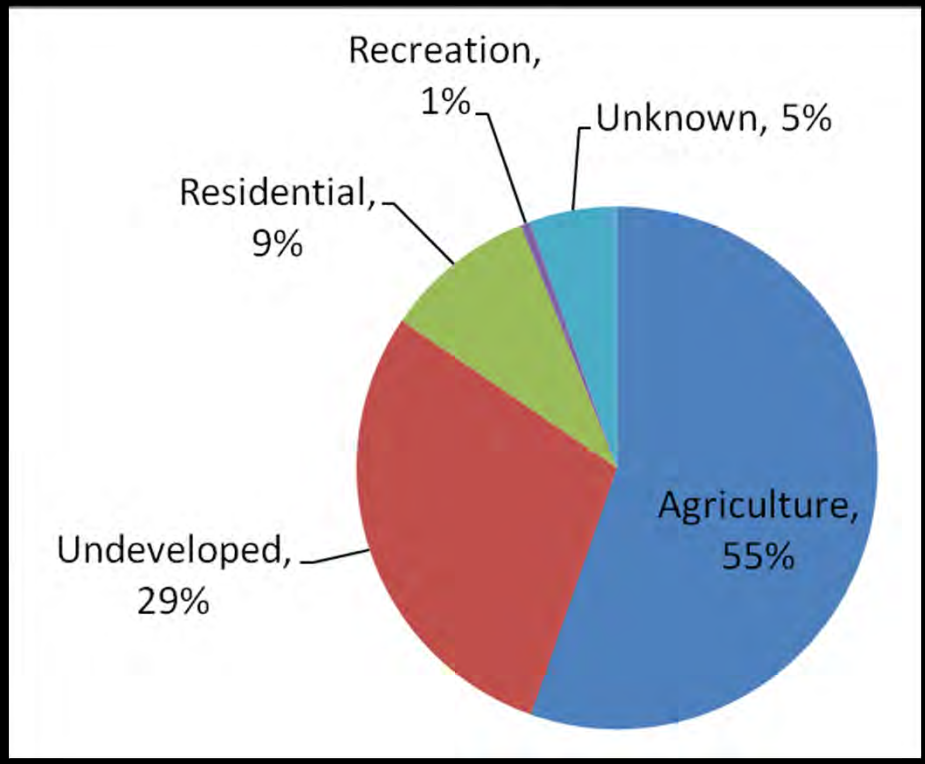

Most common objectives stated in CD regulations:

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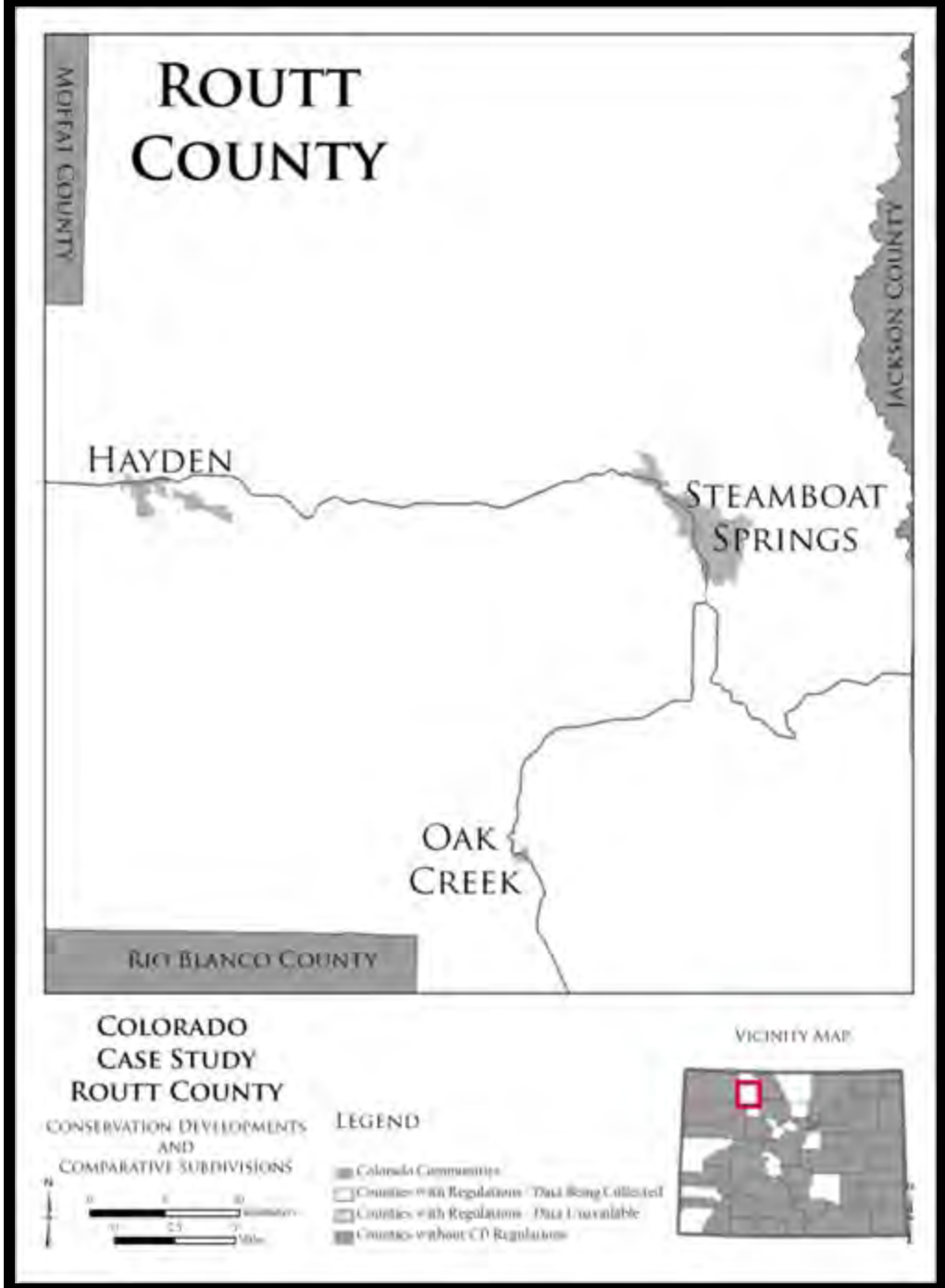
62% reduce infrastructure

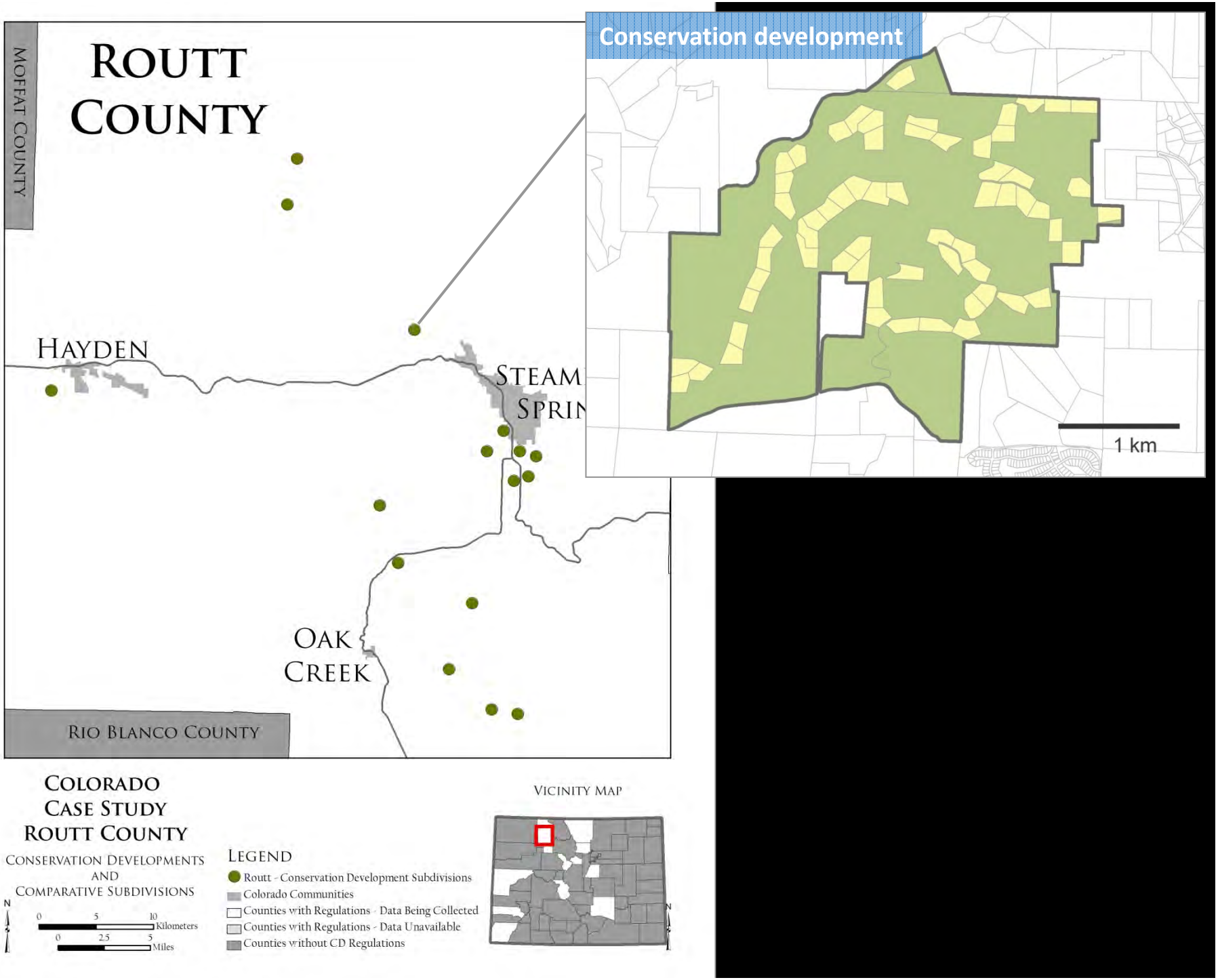
56% conserve agricultural lands

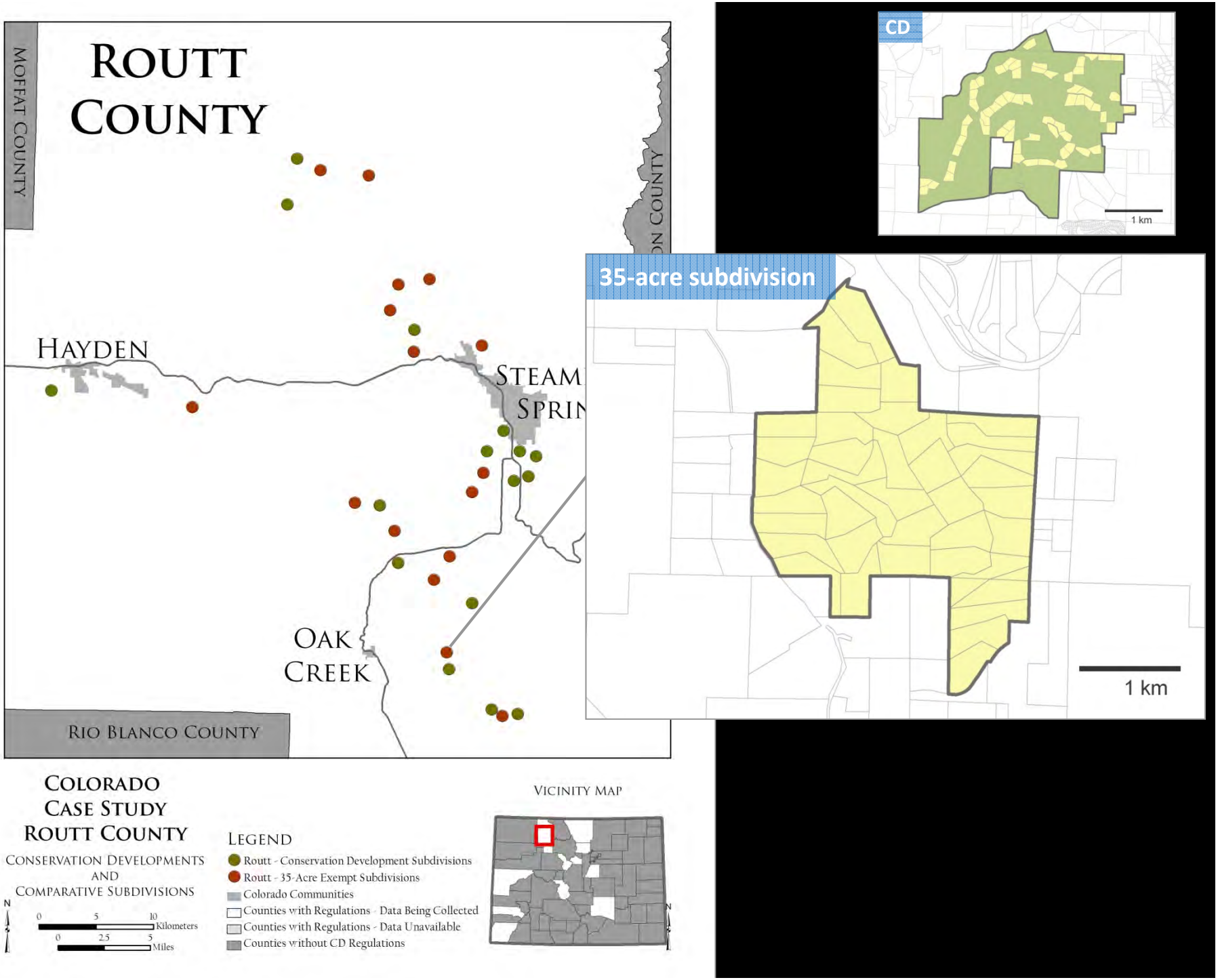
Note: Chaffee was excluded due to inadequate delineation of open space areas.



COMPARATIVE LAND USE ANALYSIS

- How do CD projects compare to other subdivision development options?


ROUTT COUNTY
MOFFAT COUNTY
HAYDEN
STEAM
SPRIN
OAK CREEK
RIO BLANCO COUNTY
Conservation development
1 km
COLORADO CASE STUDY ROUTT COUNTY
CONSERVATION DEVELOPMENTS AND COMPARATIVE SUBDIVISIONS
N
0 5 10 Kilometers
0 2.5 5 Miles
LEGEND
Routt - Conservation Development Subdivisions
Colorado Communities
Counties with Regulations - Data Being Collected
Counties with Regulations - Data Unavailable
Counties without CD Regulations
VICINITY MAP
N


ROUTT COUNTY
MOFFAT COUNTY
HAYDEN
STEAM
SPRIN
OAK CREEK
RIO BLANCO COUNTY
CD
1 km
35-acre subdivision
1 km
COLORADO CASE STUDY ROUTT COUNTY
CONSERVATION DEVELOPMENTS AND COMPARATIVE SUBDIVISIONS
N
0 5 10 Kilometers
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LEGEND
Routt - Conservation Development Subdivisions
Routt - 35-Acre Exempt Subdivisions
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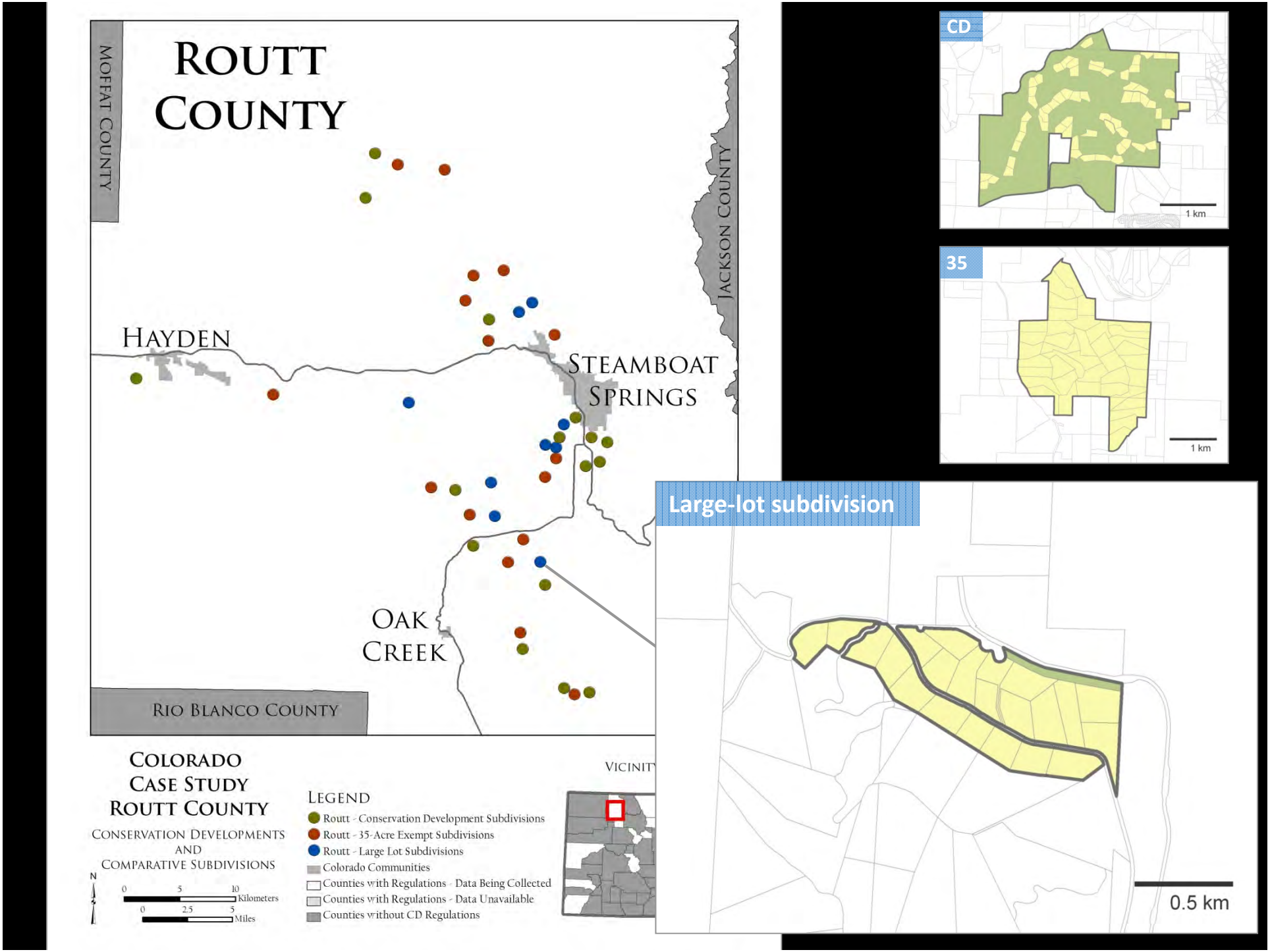
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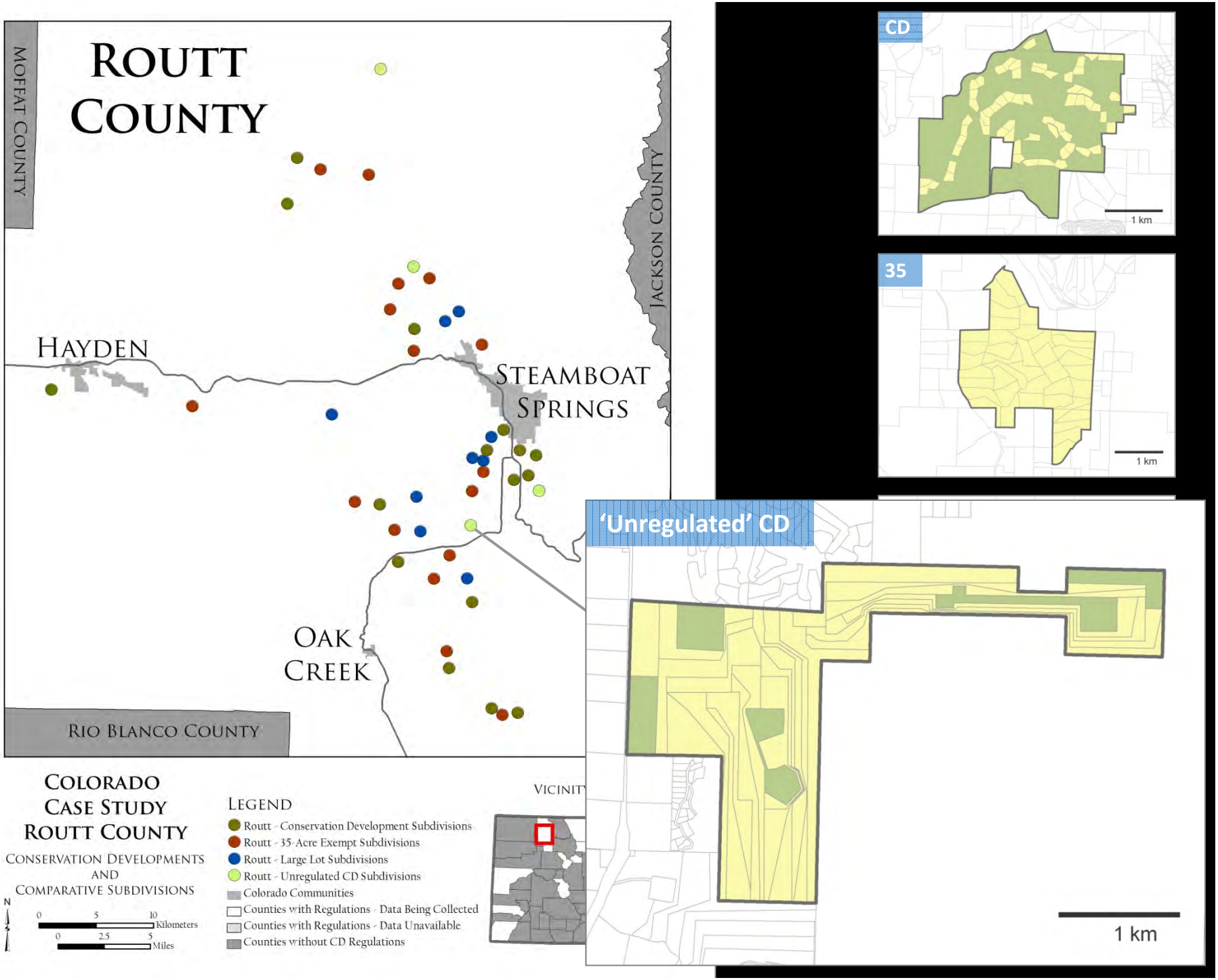
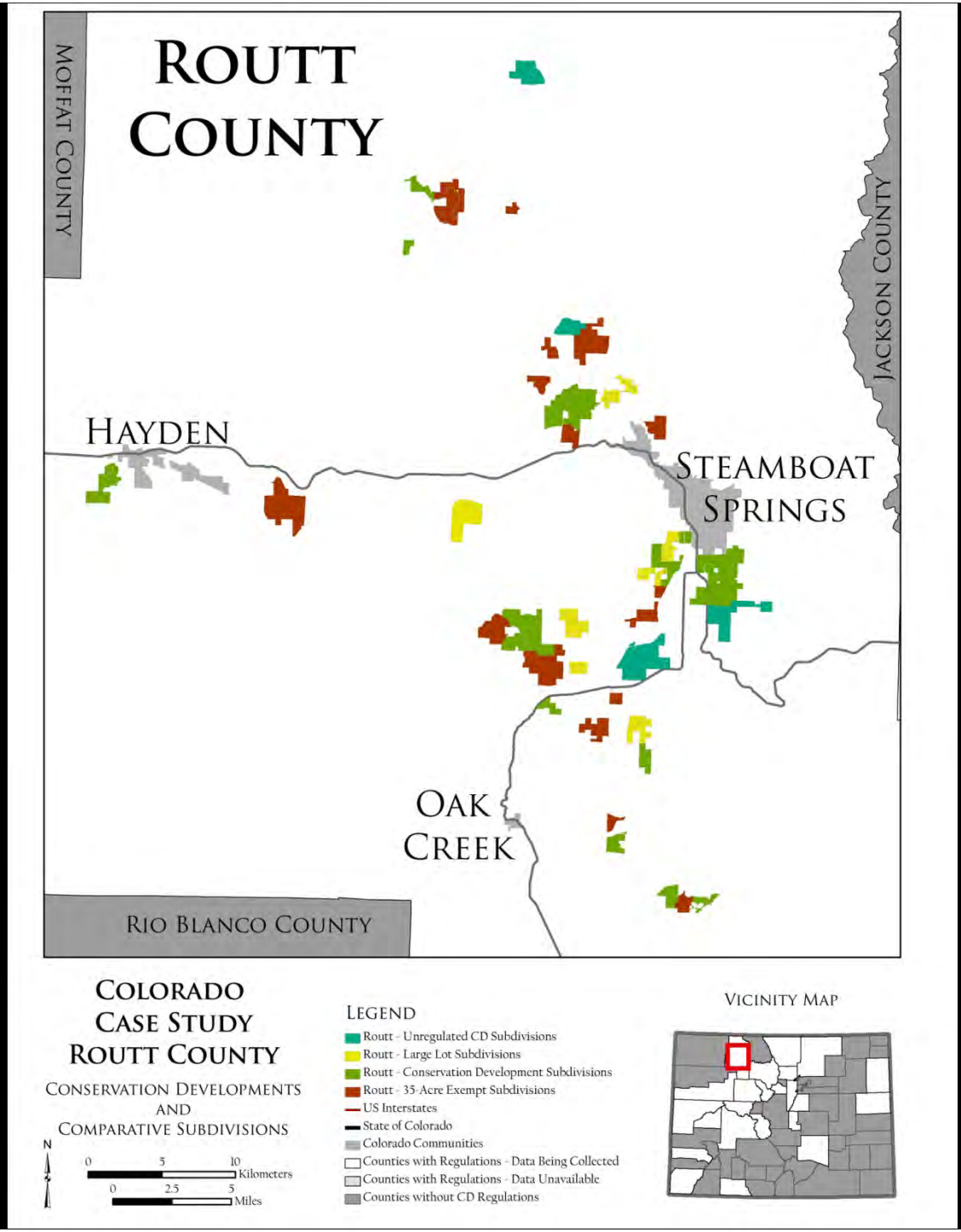
VICINITY
CD
1 km
35
1 km
Large-lot subdivision
0.5 km


ROUTT COUNTY
MOFFAT COUNTY
JACKSON COUNTY
HAYDEN
STEAMBOAT SPRINGS
OAK CREEK
RIO BLANCO COUNTY
COLORADO CASE STUDY ROUTT COUNTY
CONSERVATION DEVELOPMENTS AND COMPARATIVE SUBDIVISIONS
N
0 5 10 Kilometers
0 2.5 5 Miles
LEGEND
Routt - Conservation Development Subdivisions
Routt - 35-Acre Exempt Subdivisions
Routt - Large Lot Subdivisions
Routt - Unregulated CD Subdivisions
Colorado Communities
Counties with Regulations - Data Being Collected
Counties with Regulations - Data Unavailable
Counties without CD Regulations
VICINITY
CD
1 km
35
1 km
'Unregulated' CD
1 km


ROUTT COUNTY
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CONSERVATION DEVELOPMENTS AND COMPARATIVE SUBDIVISIONS
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0 5 10 Kilometers
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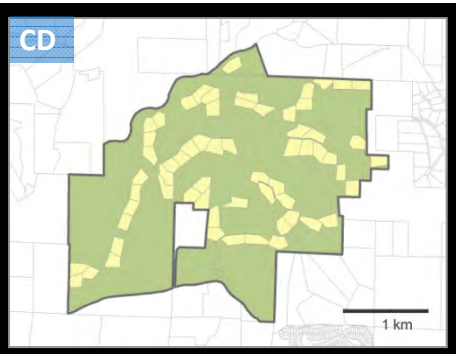
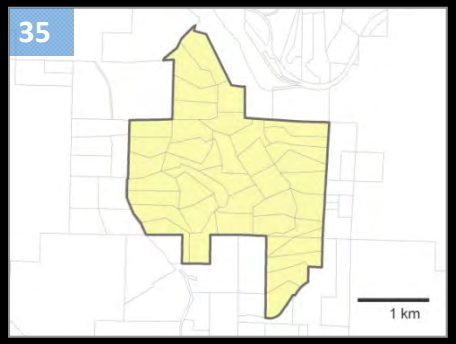
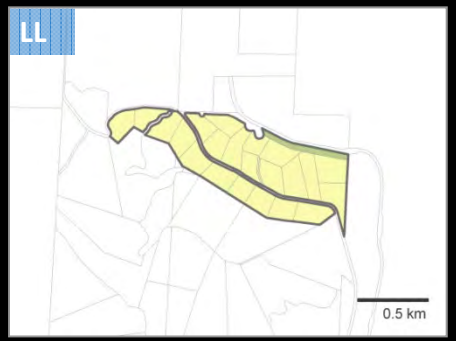
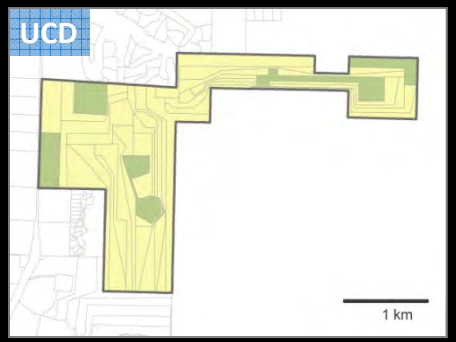
Routt - 35-Acre Exempt Subdivisions
US Interstates
State of Colorado
Colorado Communities
Counties with Regulations - Data Being Collected
Counties with Regulations - Data Unavailable
Counties without CD Regulations
VICINITY MAP


CD
1 km


35
1 km


LL
0.5 km


UCD
1 km

COMPARATIVE LAND USE ANALYSIS - FINDINGS

CD Projects

Number of Projects

Mean Area of Open Space

Land Use in Protected Open Space in CD Projects

Comparative Sites

Mean Area of Open Space

Fragmentation in CD versus comparative subdivisions

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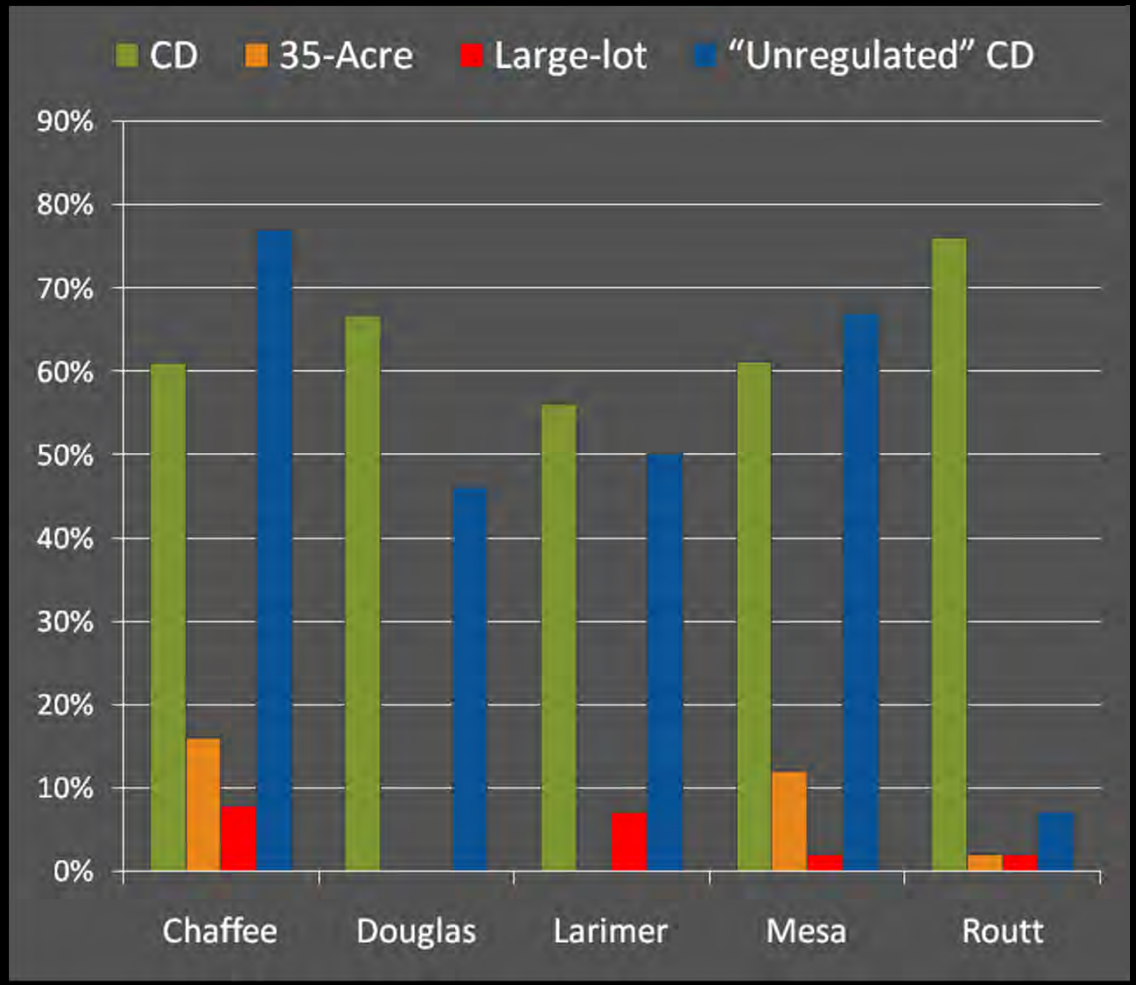

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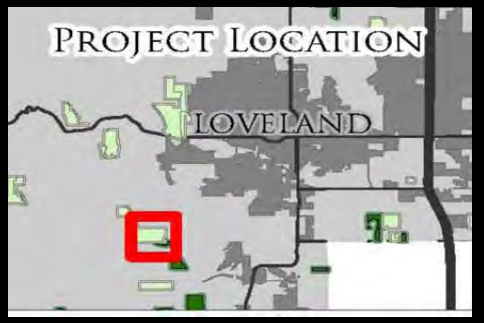
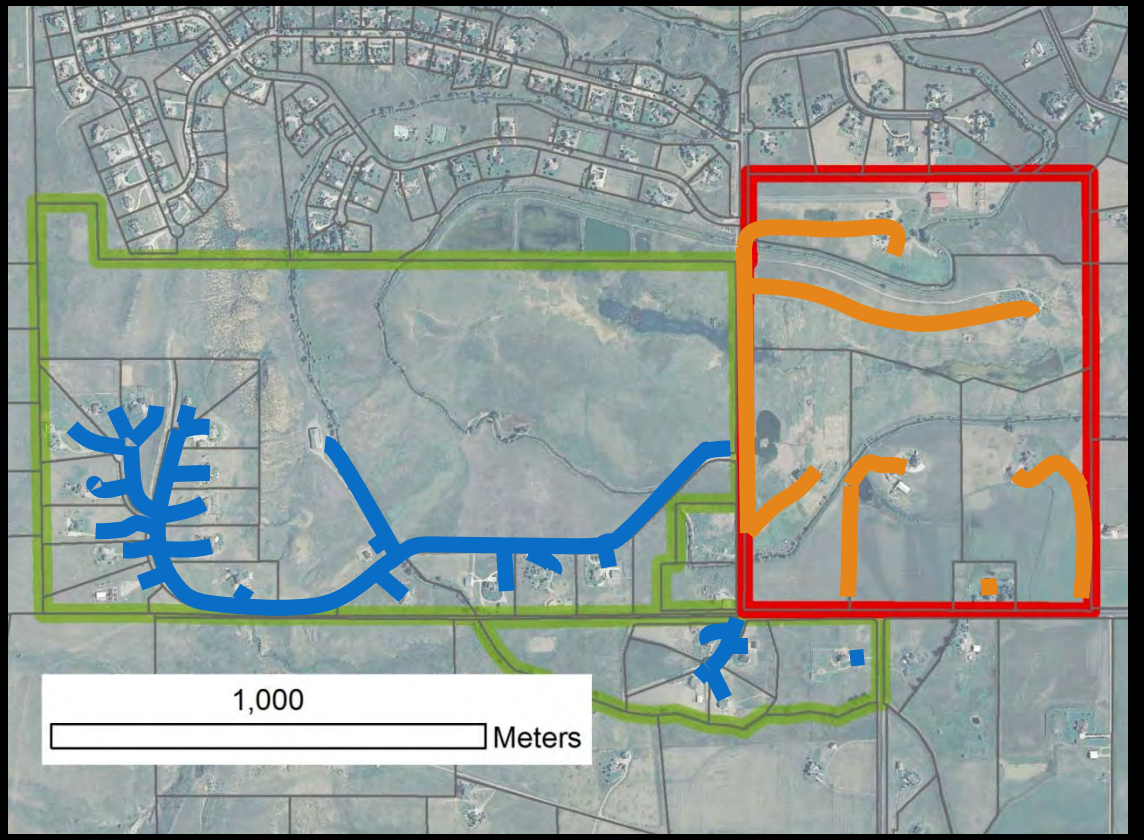
Fragmentation in CD versus comparative subdivisions

Note: Mesa was excluded due to lack of comparative data.





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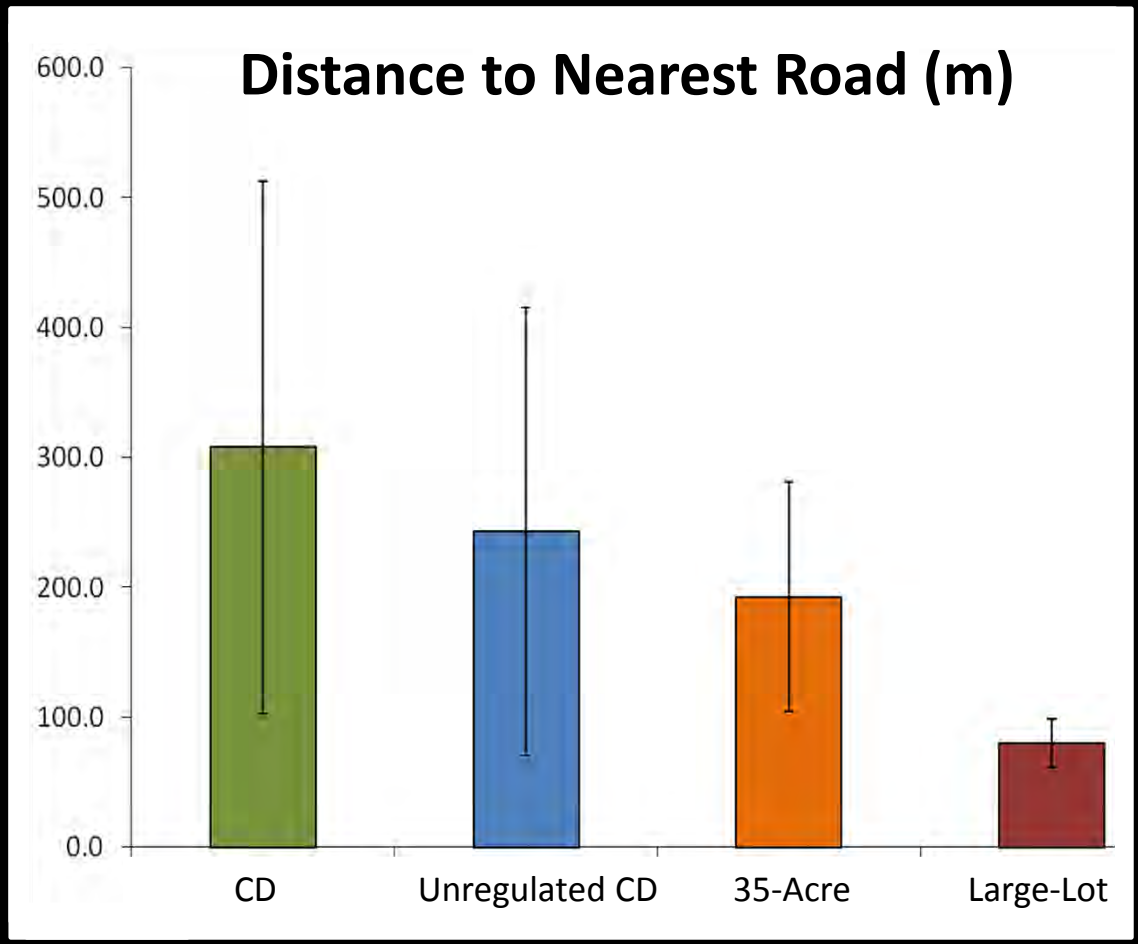


Note: Mesa was excluded due to lack of comparative data.

COMPARATIVE ANALYSIS: SALES TRANSACTIONS – GUIDING QUESTIONS

- Are CD projects more profitable than other development options?
  - Are there significant differences in prices for homes in CD projects versus the other development options?
  - Are there significant differences for homes in CD projects across the five Colorado counties?

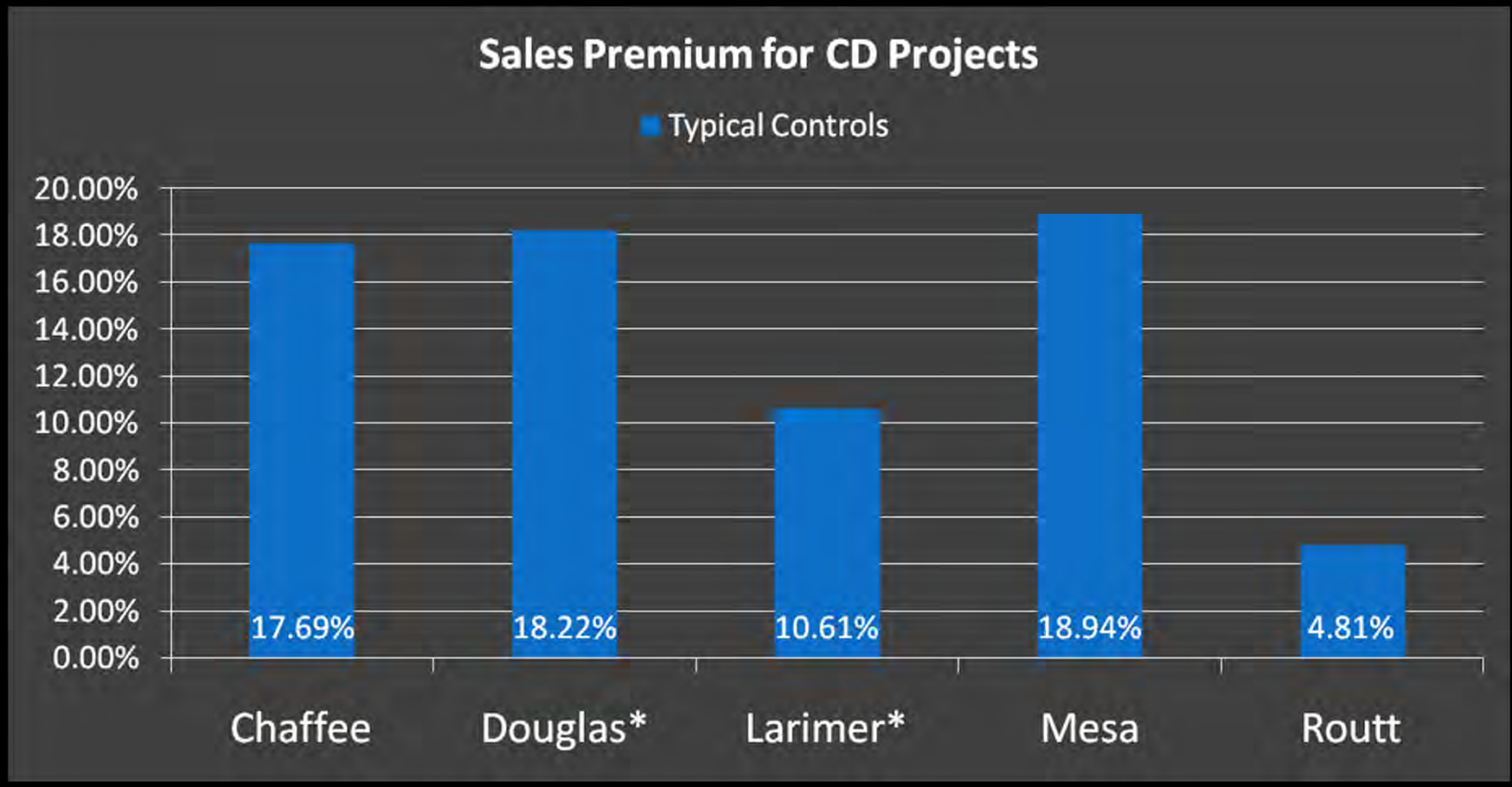
COMPARATIVE ANALYSIS: SALES TRANSACTIONS - METHODS

- Characteristics which constitutes an amenity should contribute to the sales price of the home with 'willingness-to-pay' estimated from a regression of sales price on housing characteristics
- This project tests whether CD constitutes such an amenity by estimating WTP using hedonic estimation
- Merged national dataset of homesales (Core-Logic) with the CD and Comparative Subdivisions Database
  - 1.9 million sales transactions in Colorado
  - 7,638 transactions across 385 projects initially identified
  - 2,887 transactions across 220 projects included

Note: Projects were excluded from analysis due to lack of sales transactions or incomplete data.

COMPARATIVE ANALYSIS: SALES TRANSACTIONS - FINDINGS

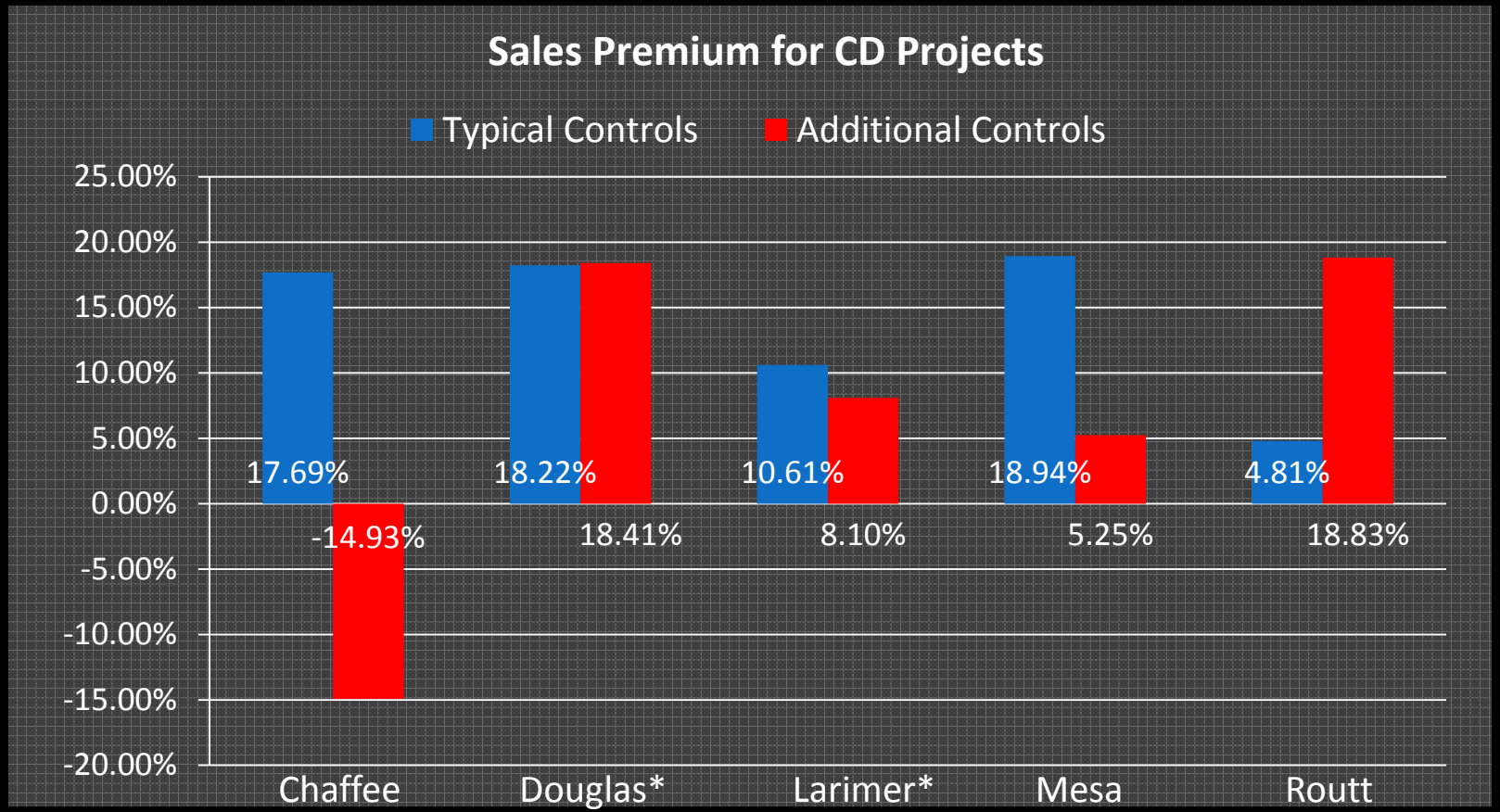
- Results suggest up to a 19% price premium associated – directly or indirectly – with location within a conservation development.



** Results are statistically significant (α=0.05); controls include living area, lot area, age of home, number of baths, distance to town*

COMPARATIVE ANALYSIS: SALES TRANSACTIONS - FINDINGS

- With increased controls, sales premiums change, though still generally remains positive (note Chaffee only has 42 transactions)



** Results are statistically significant (α=0.05); additional controls include bedrooms, basement sq. ft., central air, garage, waterfront*

COMPARATIVE ANALYSIS: SALES TRANSACTIONS - FINDINGS

- Strongly supports the idea that conservation developments provide a tangible amenity benefit
- CD subdivisions differ from non-CD subdivisions in the impact of:
  - Lot square footage: a larger lot in a CD implies a smaller proportion of the development dedicated to conservation. Sales prices decline.
  - Age: CD homes seem to lose value slightly more rapidly with age than other types.
  - Distance from Town: CD and Unregulated CD homes, unlike Large Lot homes, do not experience sales price declines as distance from town increases – possibly because of self-selection of consumers

SUMMARY & NEXT STEPS

- **Key Finding** – Open space protection is occurring across the state, almost 50,000 acres in Colorado have been protected through CD regulations (over 78 square miles of land)
  - *Next steps:* (1) Begin to understand the quality of open space protected within the conserved area, and
  - *(2)* Assess the distribution of CD projects relative to regional land-use patterns and conservation priorities

- **Key Finding** – There is a sales premium (up to 19%) for CD
  - *Next steps:* Evaluate other economic aspects, such as absorption rates

- **Key Finding** – We know much more about CD projects in Colorado
  - *Next steps:* What about the people and institutional contexts behind the CD projects?

Conservation Development Learning Network

Vision: To engage representatives from the various CD perspectives to collaboratively develop an outreach network that will ***cultivate cross-boundary communication*** and expertise in CD practice.

Current Steps:

- Assembling an advisory board diverse group of stakeholders
- Conducting interviews of CD practitioners
- Online survey to broader audience to prioritize concepts

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CSU CENTER FOR COLLABORATIVE CONSERVATION

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Questions for Discussion

1. From your perspective, how would you define success in a Conservation Development project?

2. What do you think are the key barriers and opportunities to more widespread implementation of Conservation Development?

3. What critical ecological, economic, social and/or policy questions related to conservation development have emerged from today's session?

4. Can you offer suggestions for potential individuals or organizations that might be interested in partnering on conservation development research and outreach?

5. Could you benefit from a learning network on conservation development? If so, what content would you be most interested in and what platforms should we explore?

Conservation Development in the West:
Trends in Regulation and Practice

SARAH REED, LIBA PEJCHAR & LINDSAY EX

Colorado State University

WILDLIFE CONSERVATION SOCIETY

CENTER FOR COLLABORATIVE conservation

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