Effects of roads on mule deer migration and movement corridors in Wyoming

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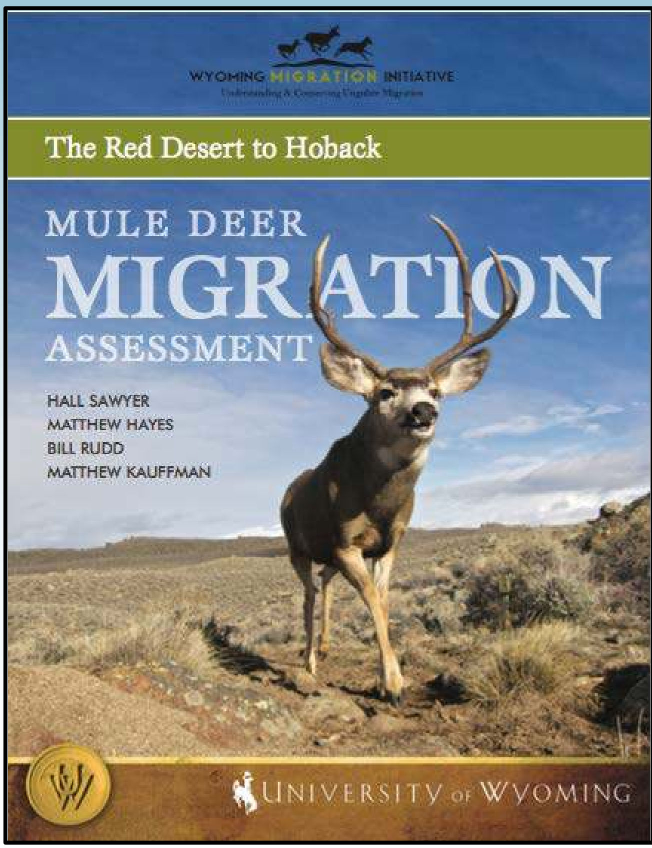
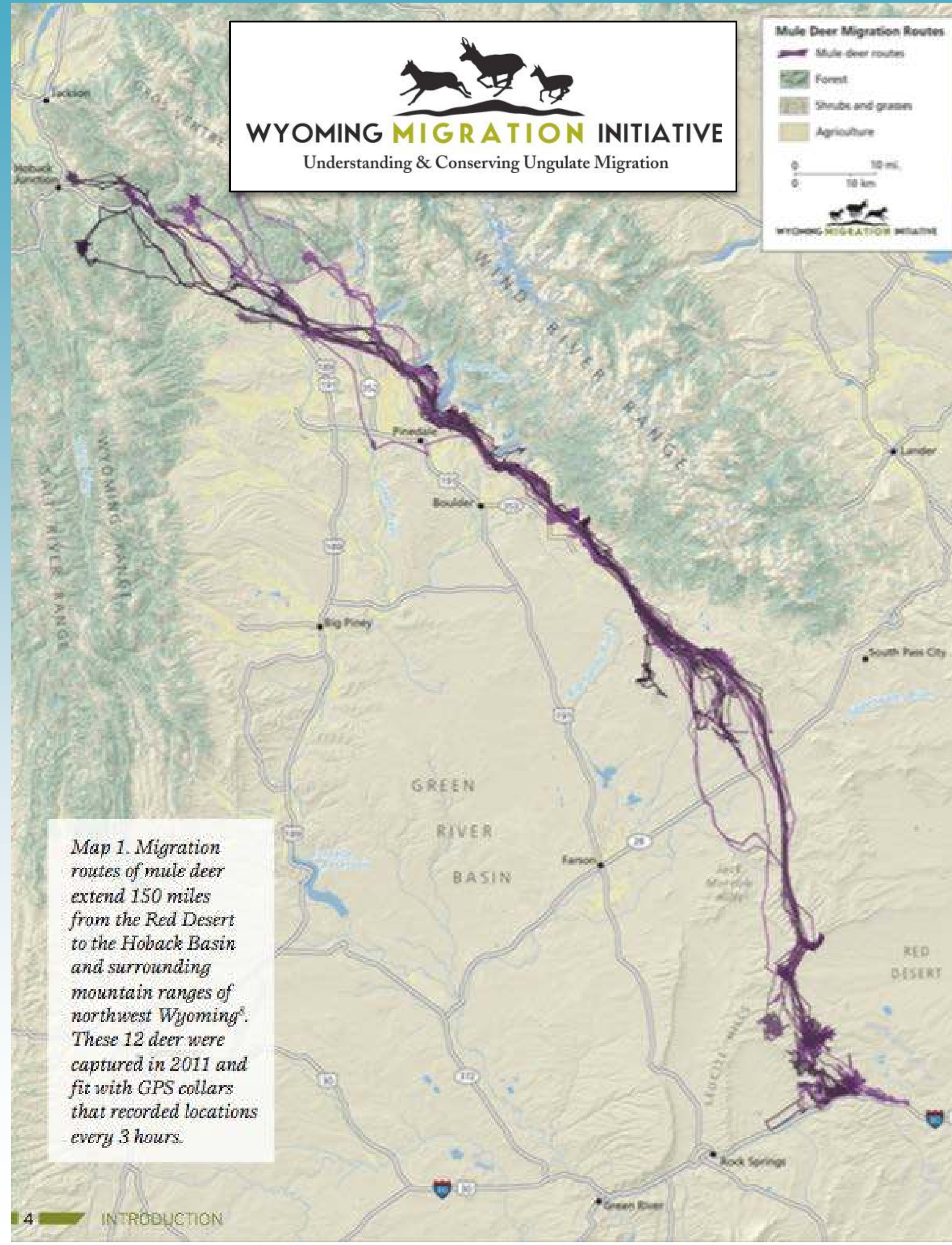
Mule Deer Migrations in Wyoming





Wildlife and Roads

- Bad for wildlife (mostly deer)
  - Stress
  - Mortality (~6,000 per year)
  - Impaired movements

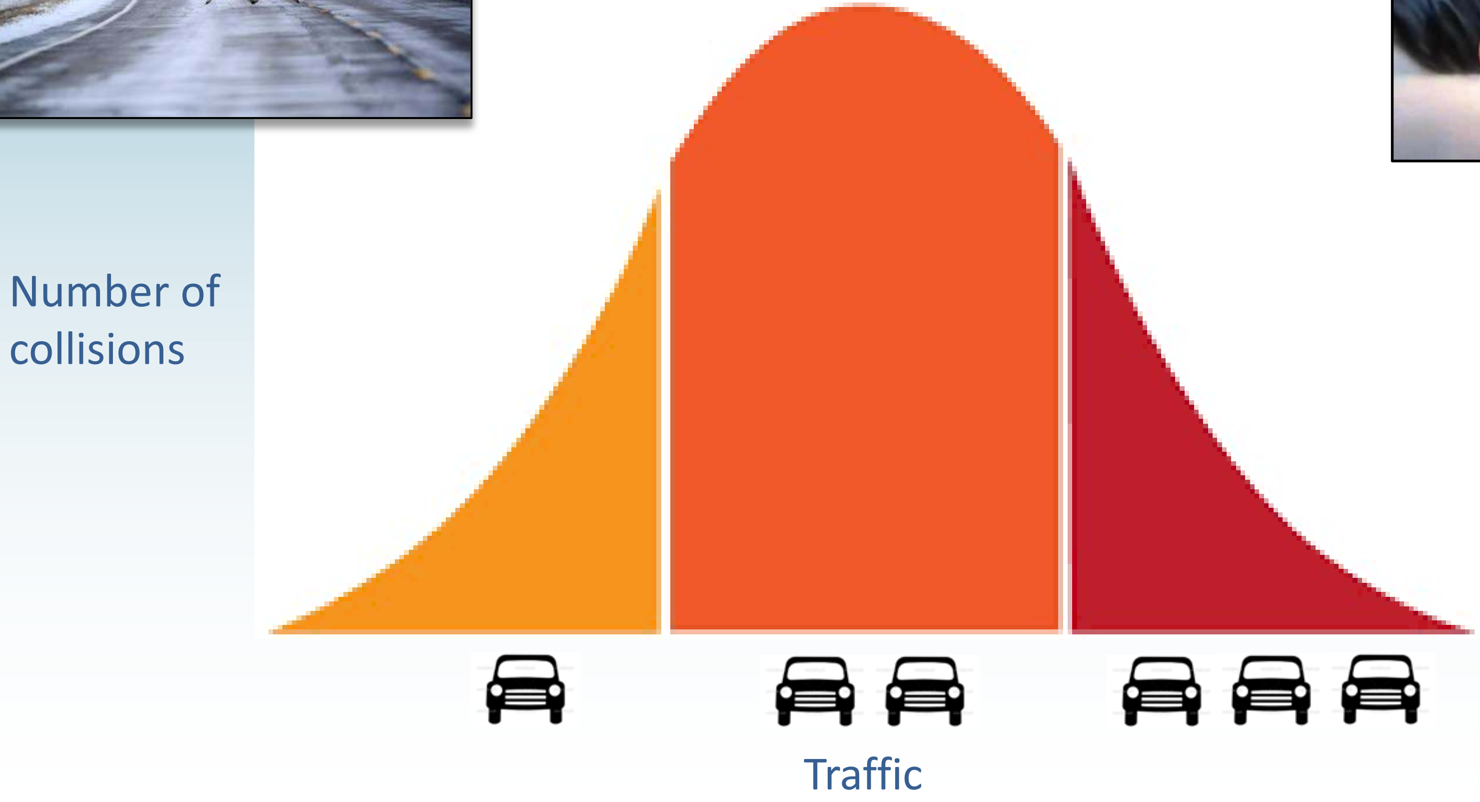
- Dangerous
- Expensive

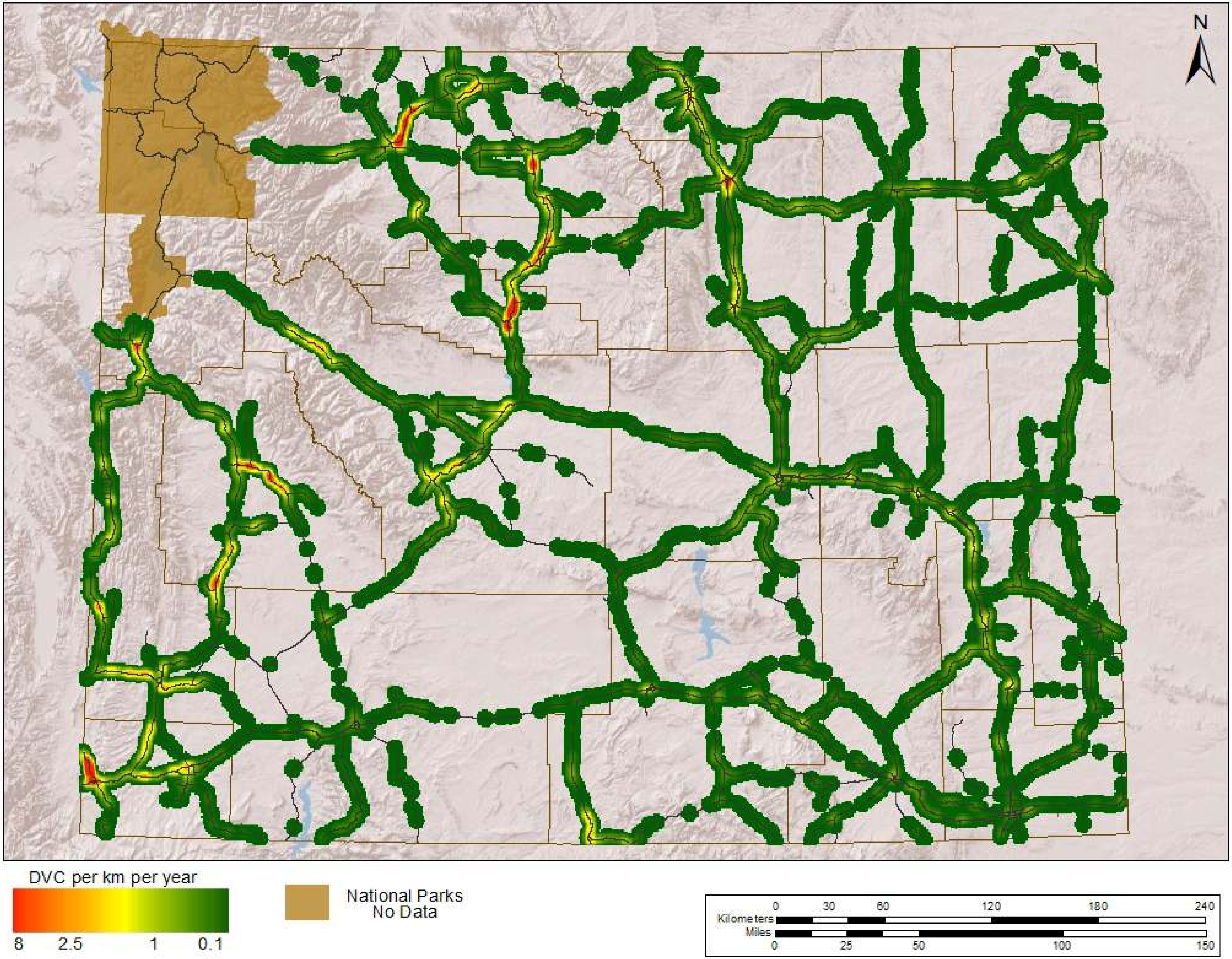
What Do We Need to Know?

1. Where, when, and why are animal movements most impacted by roads?

2. What are the options for ensuring safe crossings and habitat connectivity?

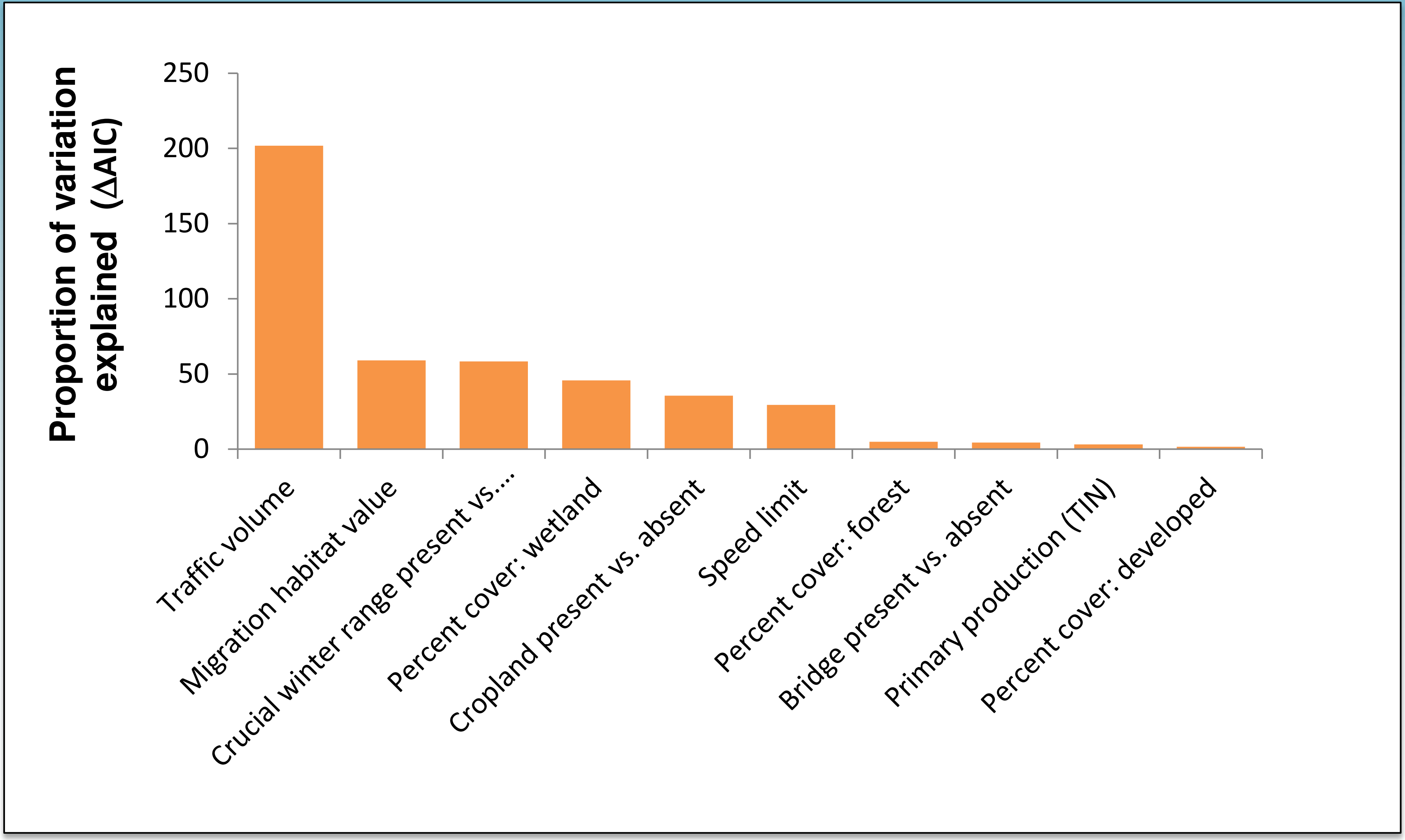
Traffic and Wildlife-Vehicle Collisions (WVC or DVC)

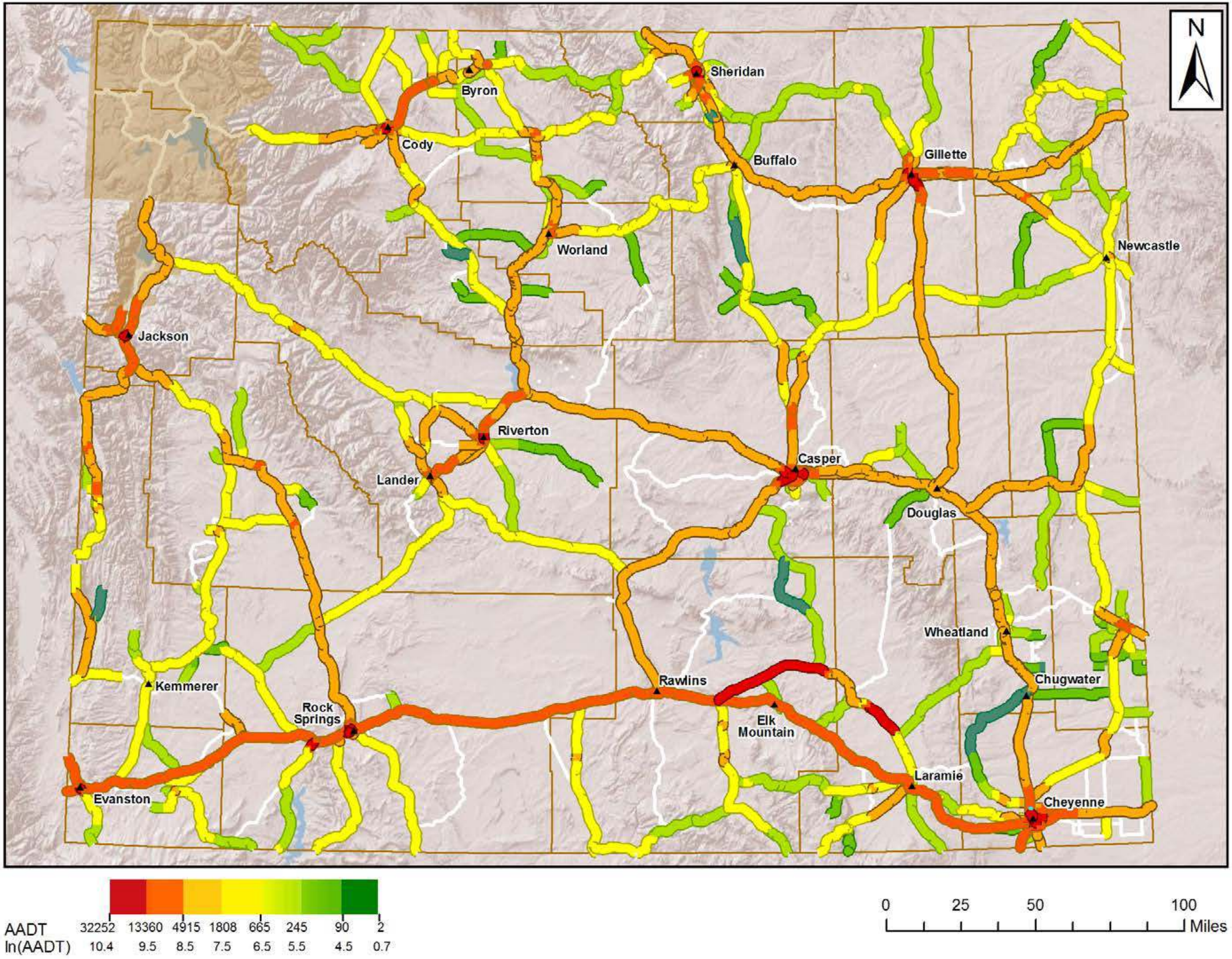


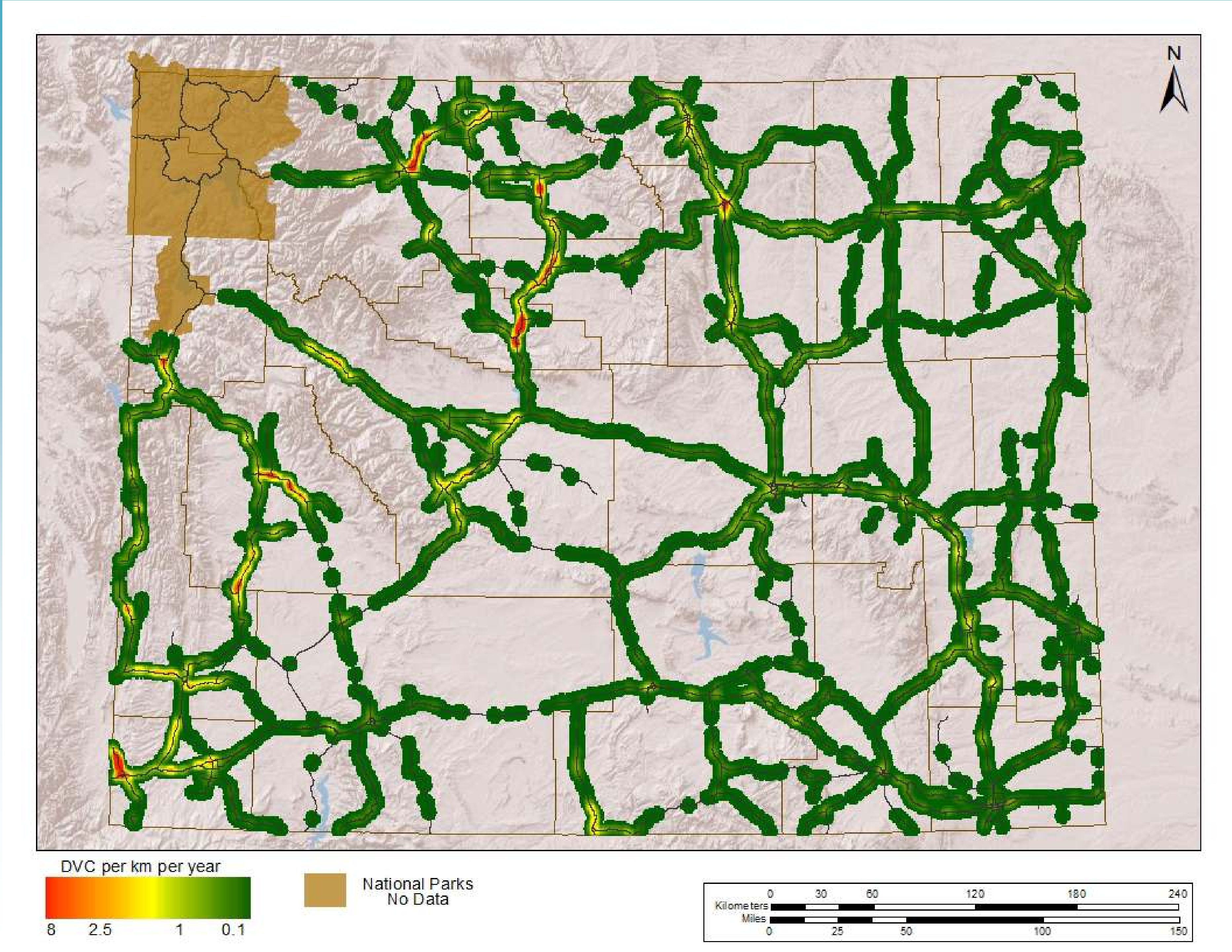


N
DVC per km per year
8
2.5
1
0.1
National Parks
No Data
0
30
60
120
180
240
Kilometers
Miles
0
25
50
100
150

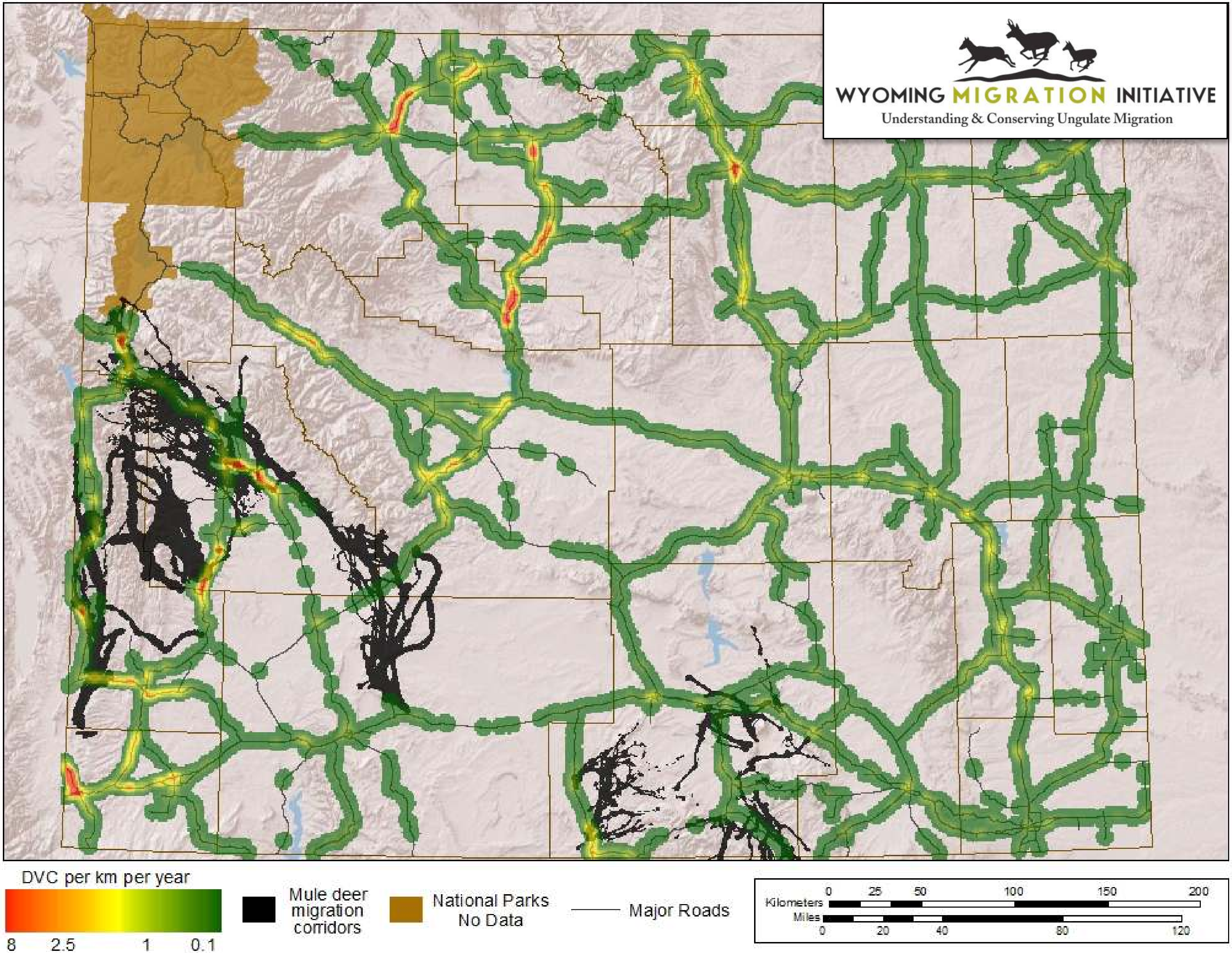
Variables Associated with High WVC Rates



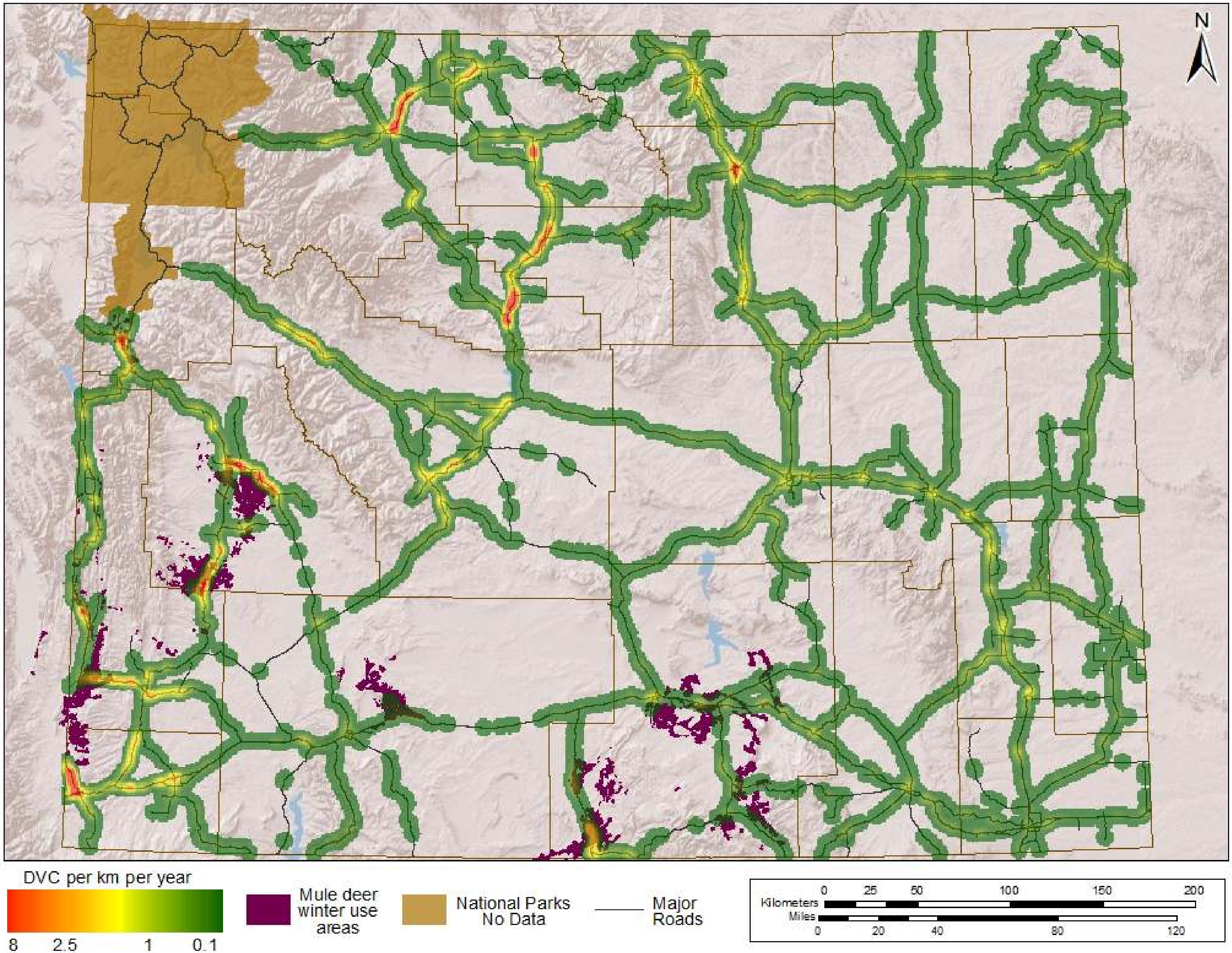

N
Sheridan
Byron
Cody
Buffalo
Gillette
Worland
Newcastle
Jackson
Riverton
Casper
Lander
Douglas
Wheatland
Chugwater
Kemmerer
Rawlins
Rock Springs
Elk Mountain
Laramie
Evanston
Cheyenne
AADT
ln(AADT)
32252 13360 4915 1808 665 245 90 2
10.4 9.5 8.5 7.5 6.5 5.5 4.5 0.7
0 25 50 100
Miles



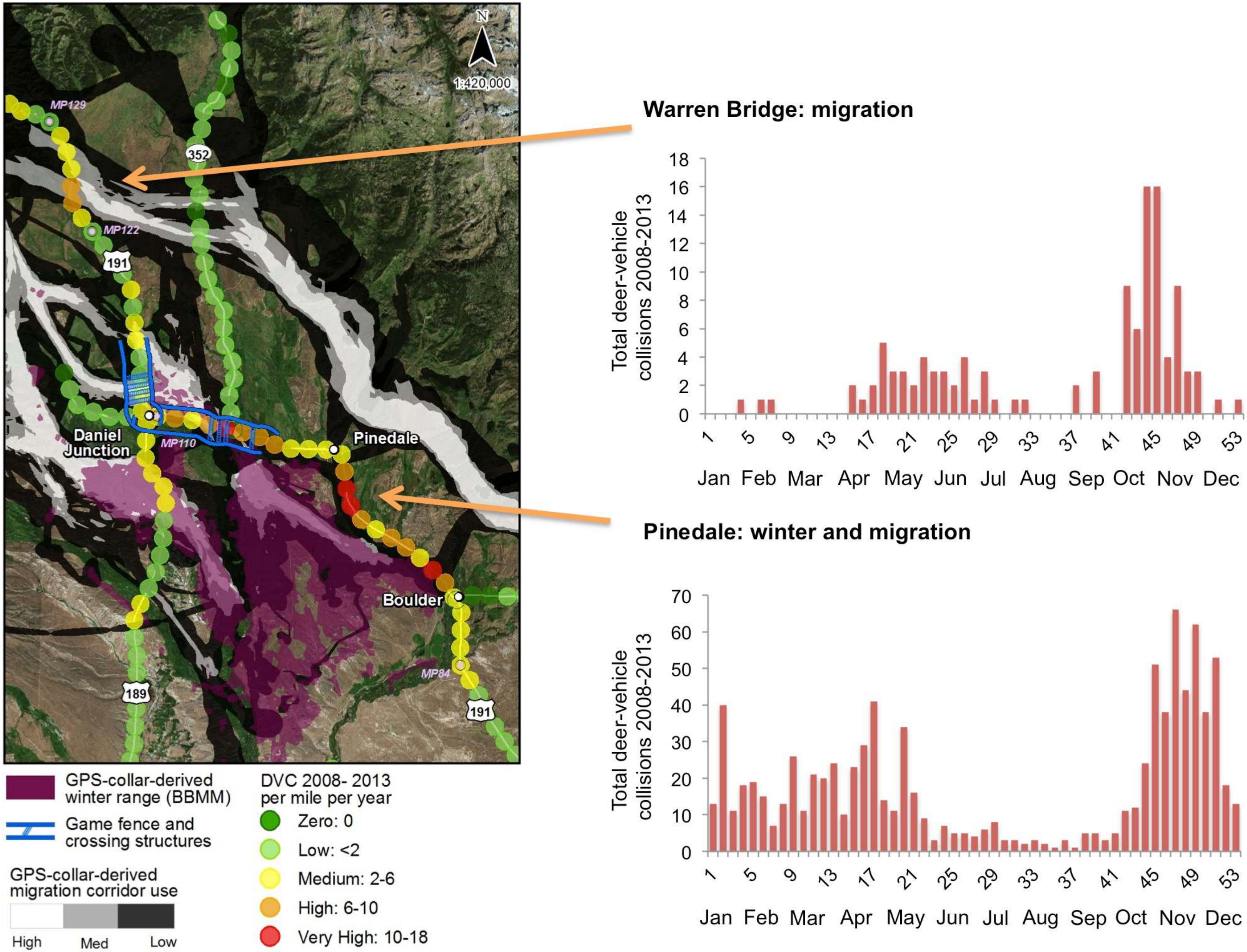
N
DVC per km per year
8
2.5
1
0.1
National Parks
No Data
Kilometers
0
30
60
120
180
240
Miles
0
25
50
100
150



WYOMING MIGRATION INITIATIVE
Understanding & Conserving Ungulate Migration
DVC per km per year
8
2.5
1
0.1
Mule deer migration corridors
National Parks No Data
Major Roads
Kilometers
0
25
50
100
150
200
Miles
0
20
40
80
120



N
DVC per km per year
8
2.5
1
0.1
Mule deer winter use areas
National Parks No Data
Major Roads
Kilometers
0
25
50
100
150
200
Miles
0
20
40
80
120



N
1:420,000
MP129
352
MP122
191
Daniel Junction
MP110
Pinedale
Boulder
MP84
189
191
GPS-collar-derived winter range (BBMM)
Game fence and crossing structures
GPS-collar-derived migration corridor use
High
Med
Low
DVC 2008- 2013 per mile per year
Zero: 0
Low: <2
Medium: 2-6
High: 6-10
Very High: 10-18
Warren Bridge: migration
Total deer-vehicle collisions 2008-2013
0
2
4
6
8
10
12
14
16
18
1
5
9
13
17
21
25
29
33
37
41
45
49
53
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Pinedale: winter and migration
Total deer-vehicle collisions 2008-2013
0
10
20
30
40
50
60
70
1
5
9
13
17
21
25
29
33
37
41
45
49
53
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Mitigation Options

Separated Crossings

- Under- and over-passes with wildlife exclusion fencing
- Permanent
- >80% effective, expensive

Hall Sawyer

At-Grade Crossings

- Signs warning drivers
- Reduced speed limit
- Crosswalks (+ fencing + signs)
- Animal detection systems (+ signs)
- 0-80% effective
- All rely on modifying driver behavior
- Highest effectiveness when seasonal

Conclusions

- Collision and animal movement data together indicate where roads are movement barriers
- Combined information suggests most appropriate mitigations
- Need to better understand role of traffic


The Nature Conservancy
Wyoming
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Understanding & Conserving Ungulate Migration
WYOMING TRANSPORTATION DEPARTMENT
NATIONAL FISH AND WILDLIFE FOUNDATION
NFWF