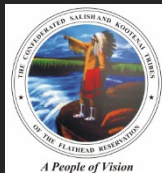


Grizzly Bear Mortality Overview

Mark Haroldson, Cecily Costello, Hilary Cooley



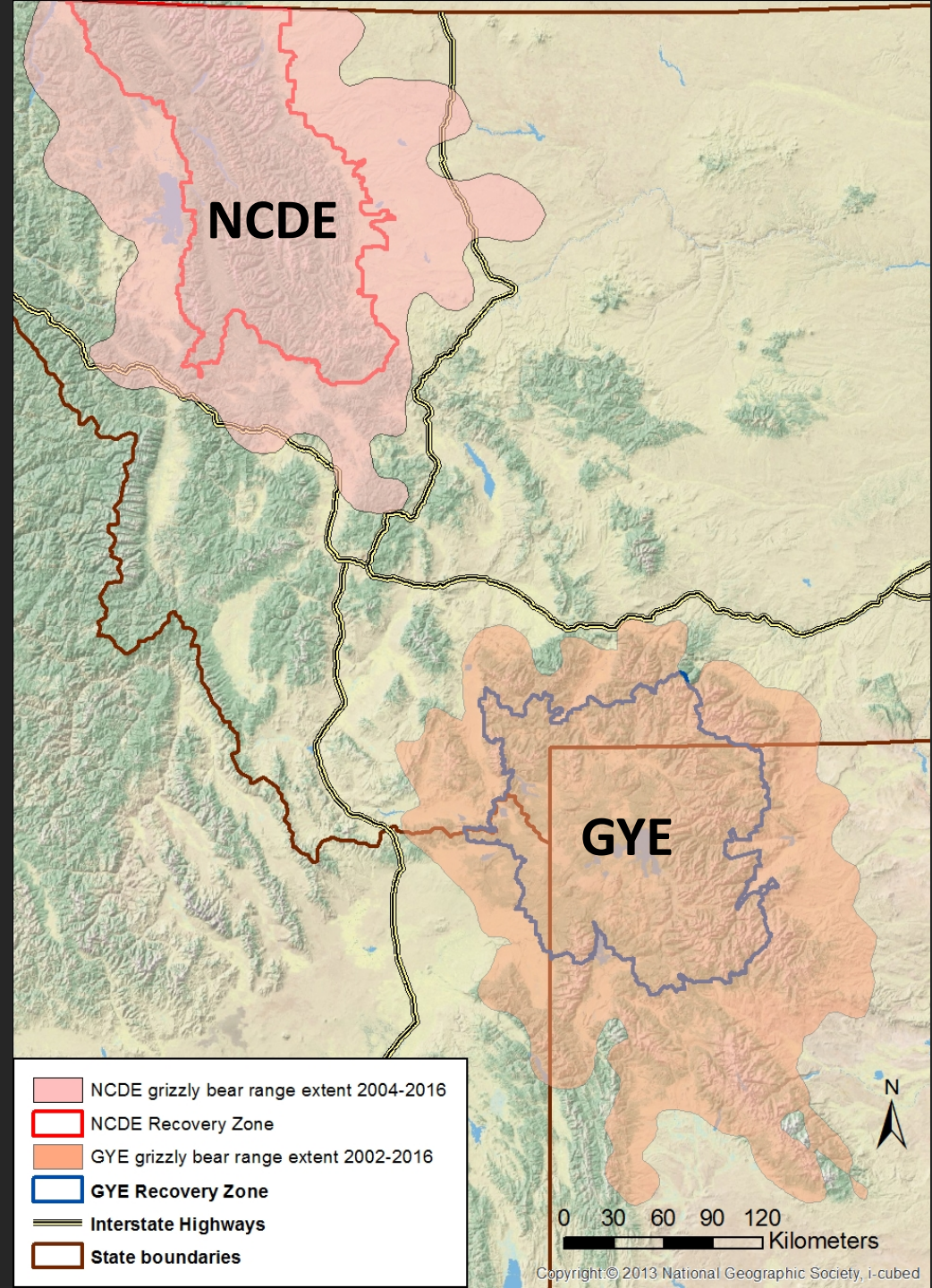
By Madelon Martin



This information is preliminary and is subject to revision. It is being provided to meet the need for timely best science. The information is provided on the condition that neither the U.S. Geological Survey nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the information.

Current Range

Northern Continental Divide Ecosystem & Greater Yellowstone Ecosystem



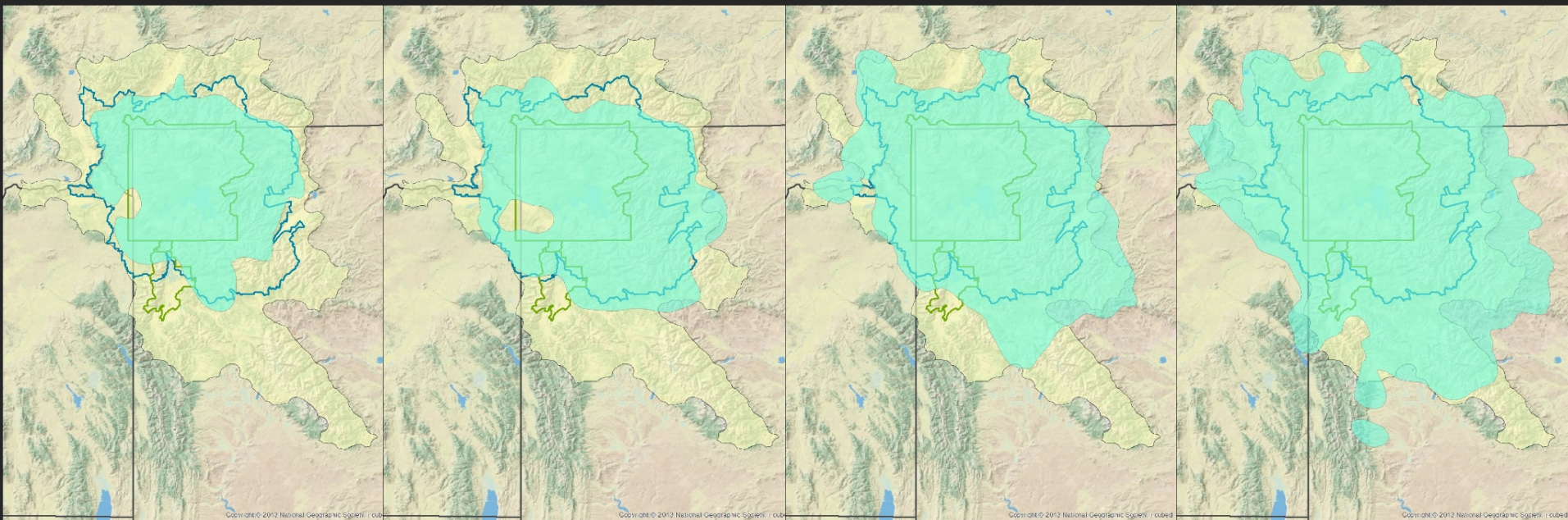
Greater Yellowstone Ecosystem

- Primary Conservation Area/Recovery Zone = 23,828 km²
 - 98% public land
- Demographic Monitoring Area (DMA) = 49,931 km²
 - 92% public land



Greater Yellowstone Ecosystem

Estimated range extent decade since listing under ESA



1975 - 1984

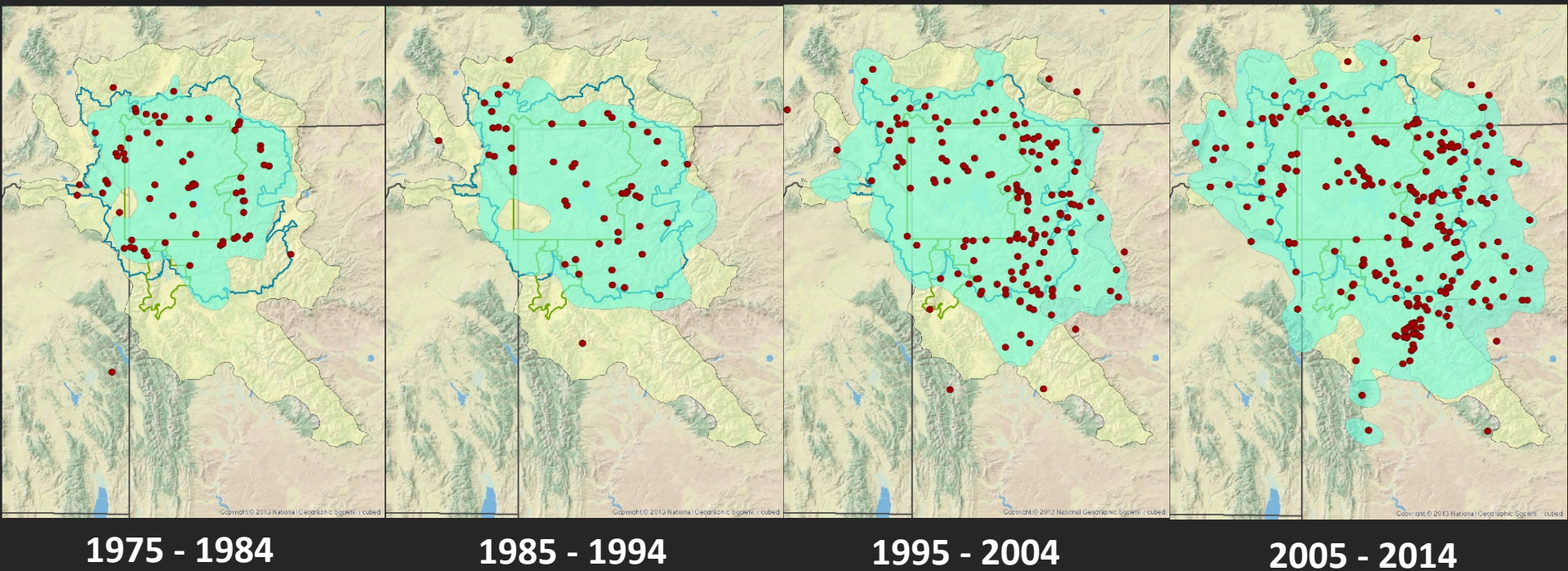
1985 - 1994

1995 - 2004

2005 - 2014

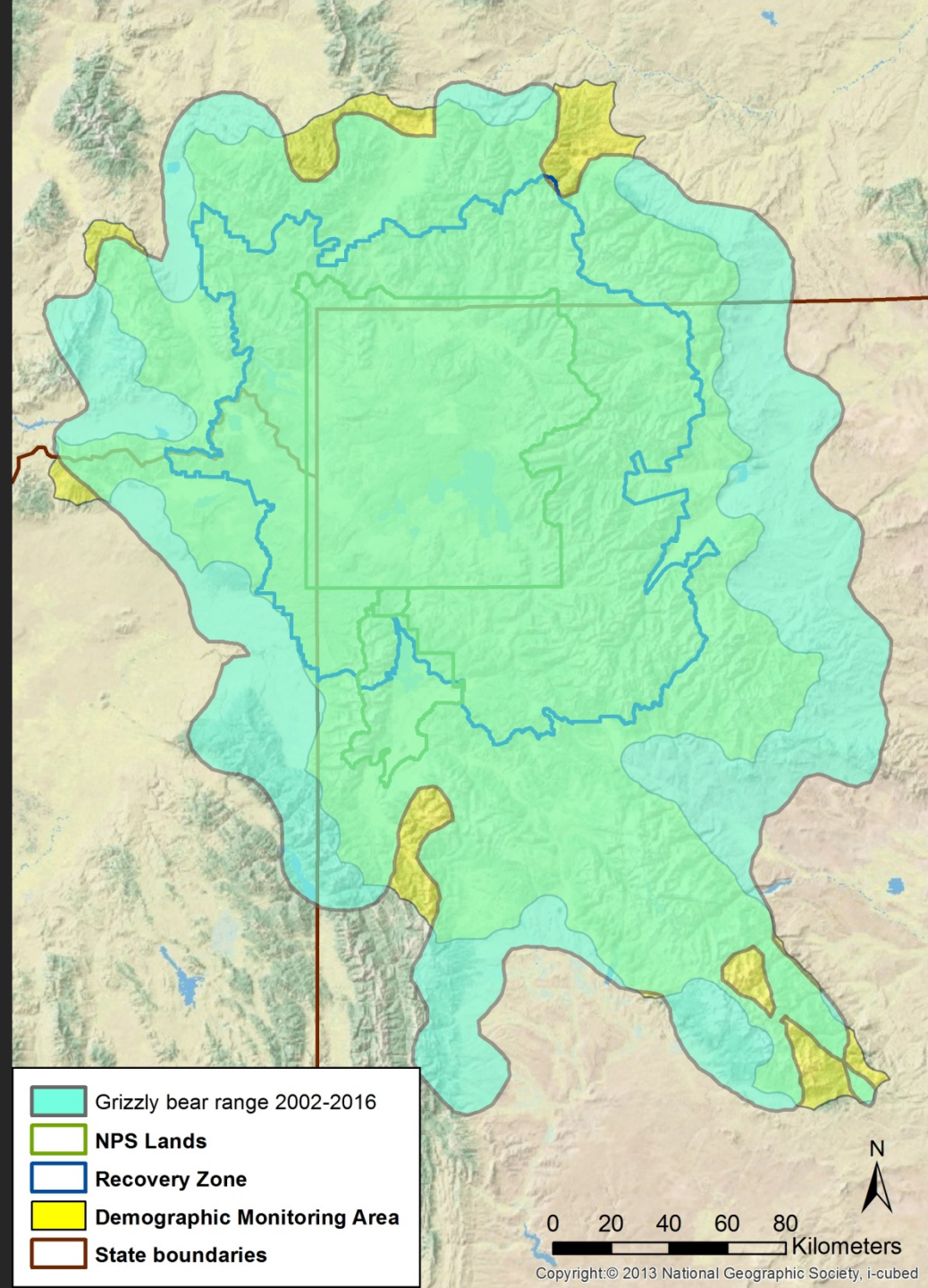
Greater Yellowstone Ecosystem

Estimated range extent by with known and probable mortalities
for independent aged bears



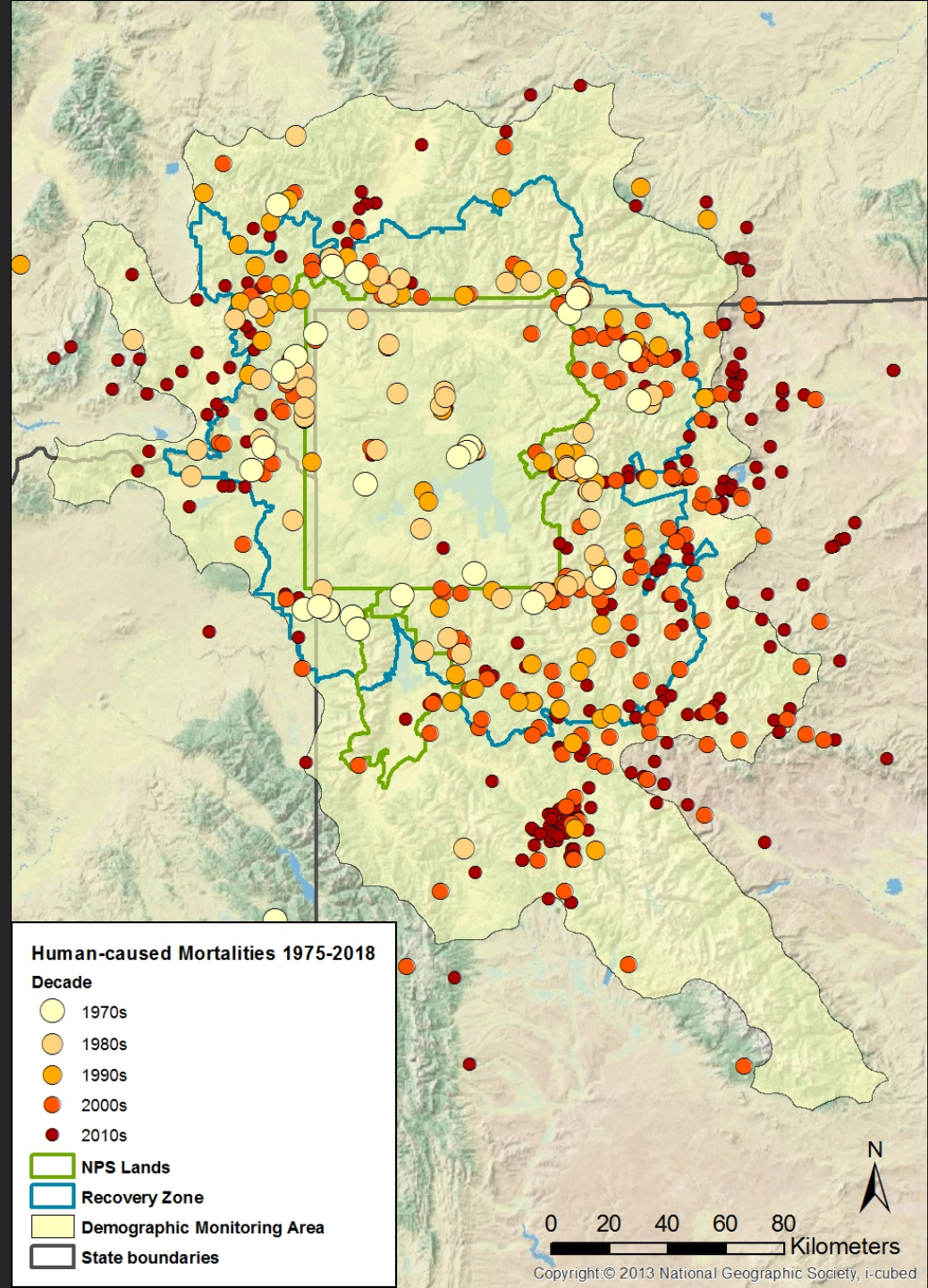
Greater Yellowstone Ecosystem

- Occupied range (2002-2016) = 64,849 km²
- 27.3% of occupied range is outside the DMA
- 15.4% of occupied range occurs on private lands

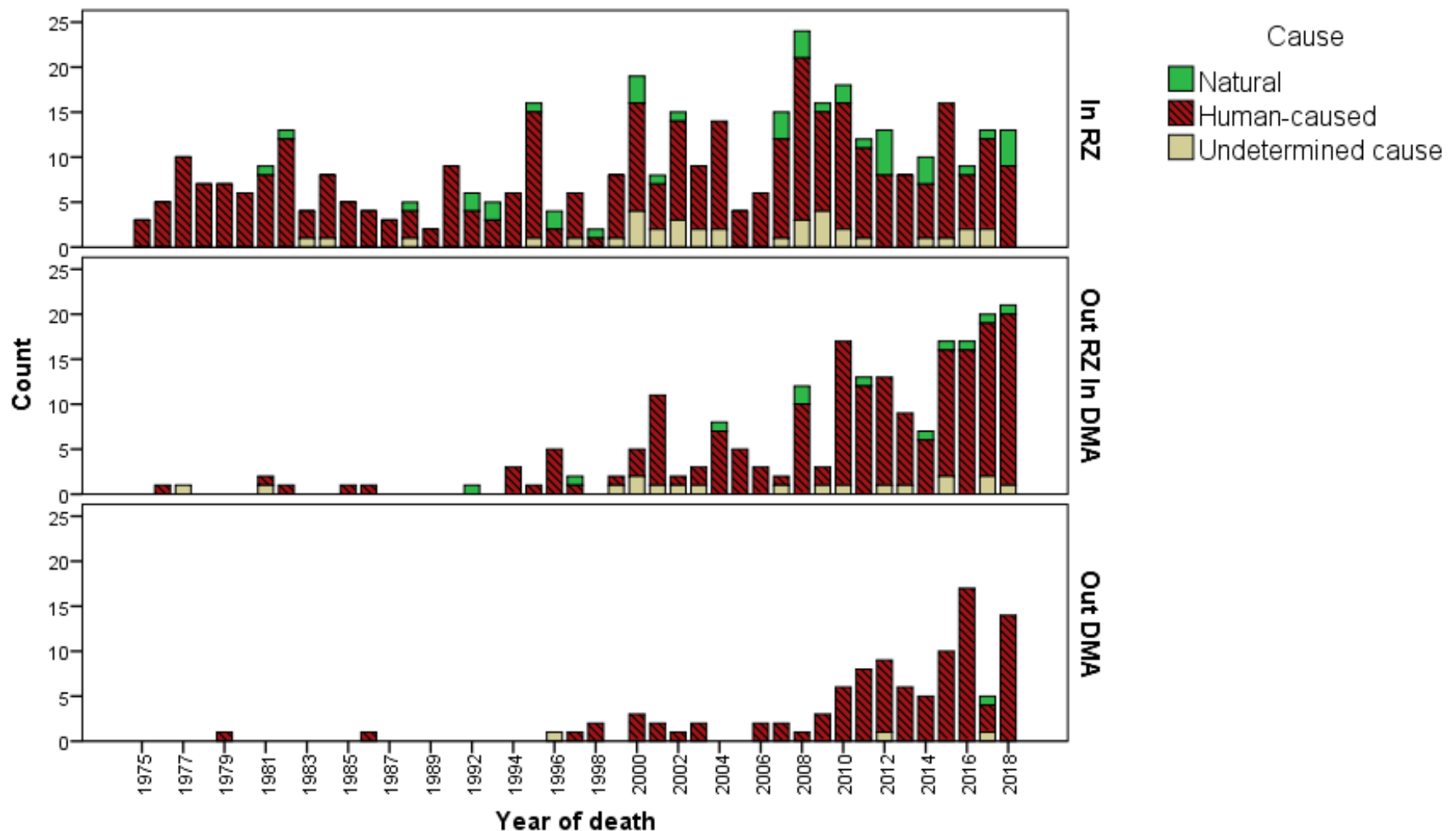


Human-Caused Mortalities in GYE 1975-2018

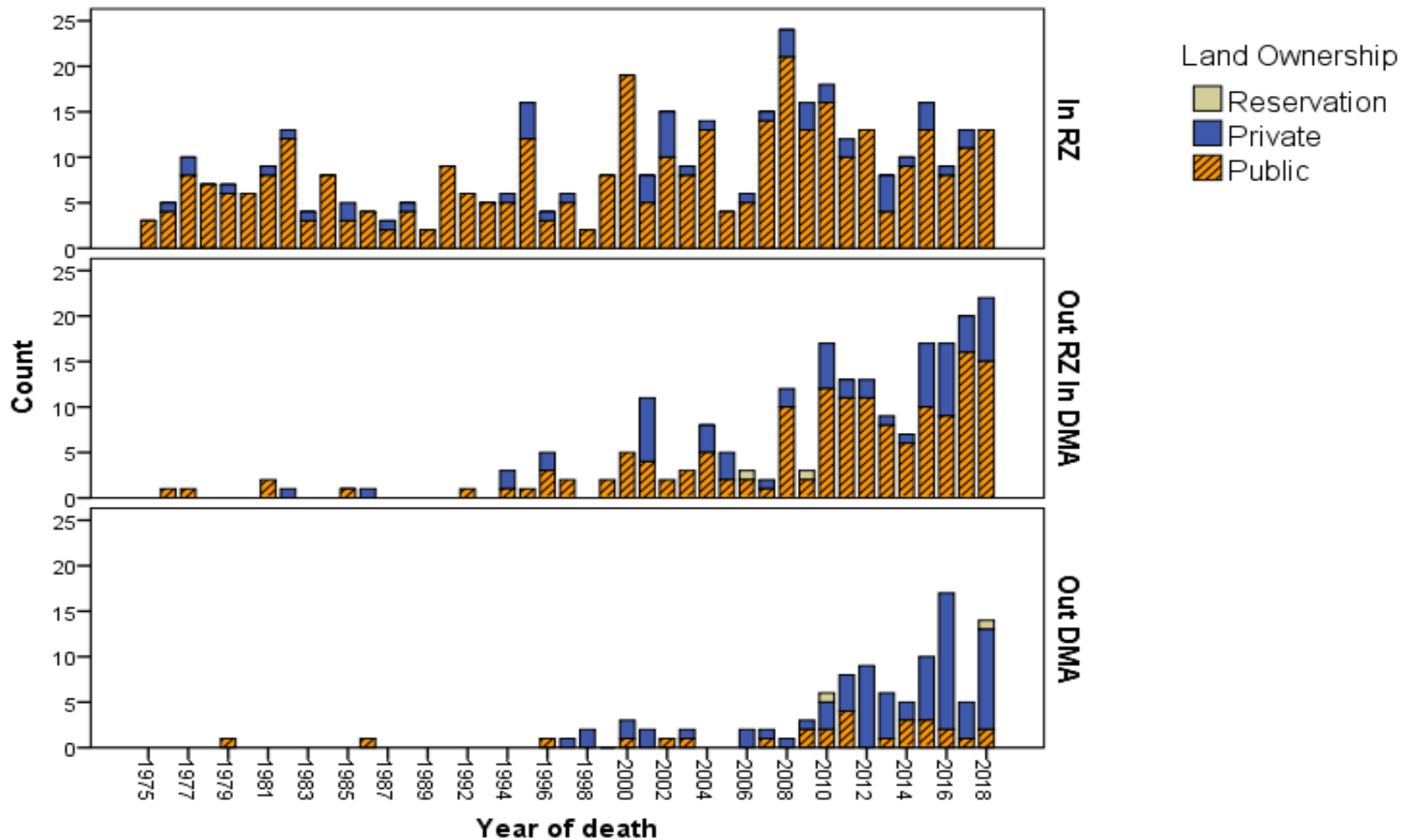
- Probable and known
- Independent aged



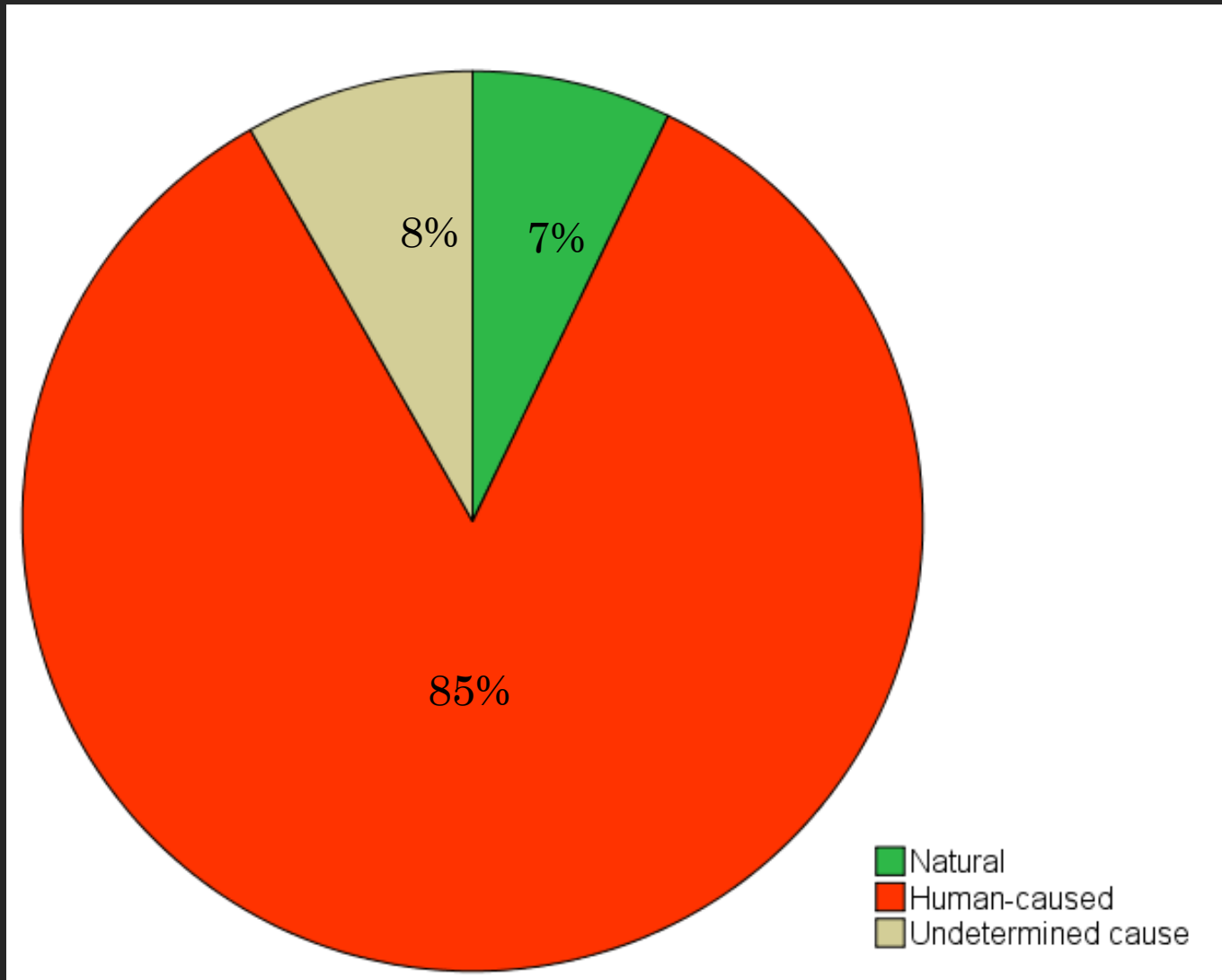
Documented mortalities for independent aged grizzly bears by cause and area in the GYE, 1975-2018



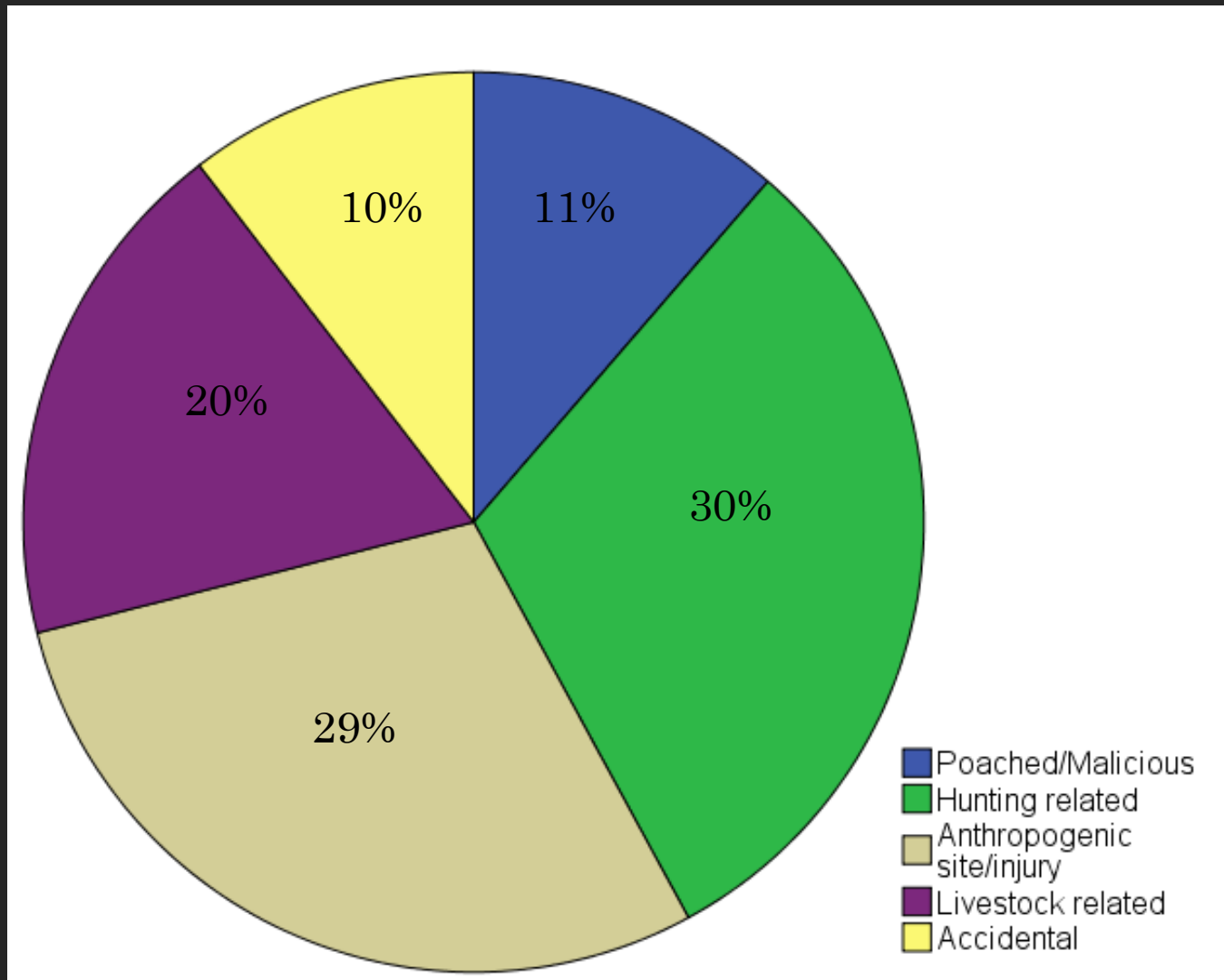
Documented mortalities for independent aged grizzly bears by land ownership and area in the GYE, 1975-2018



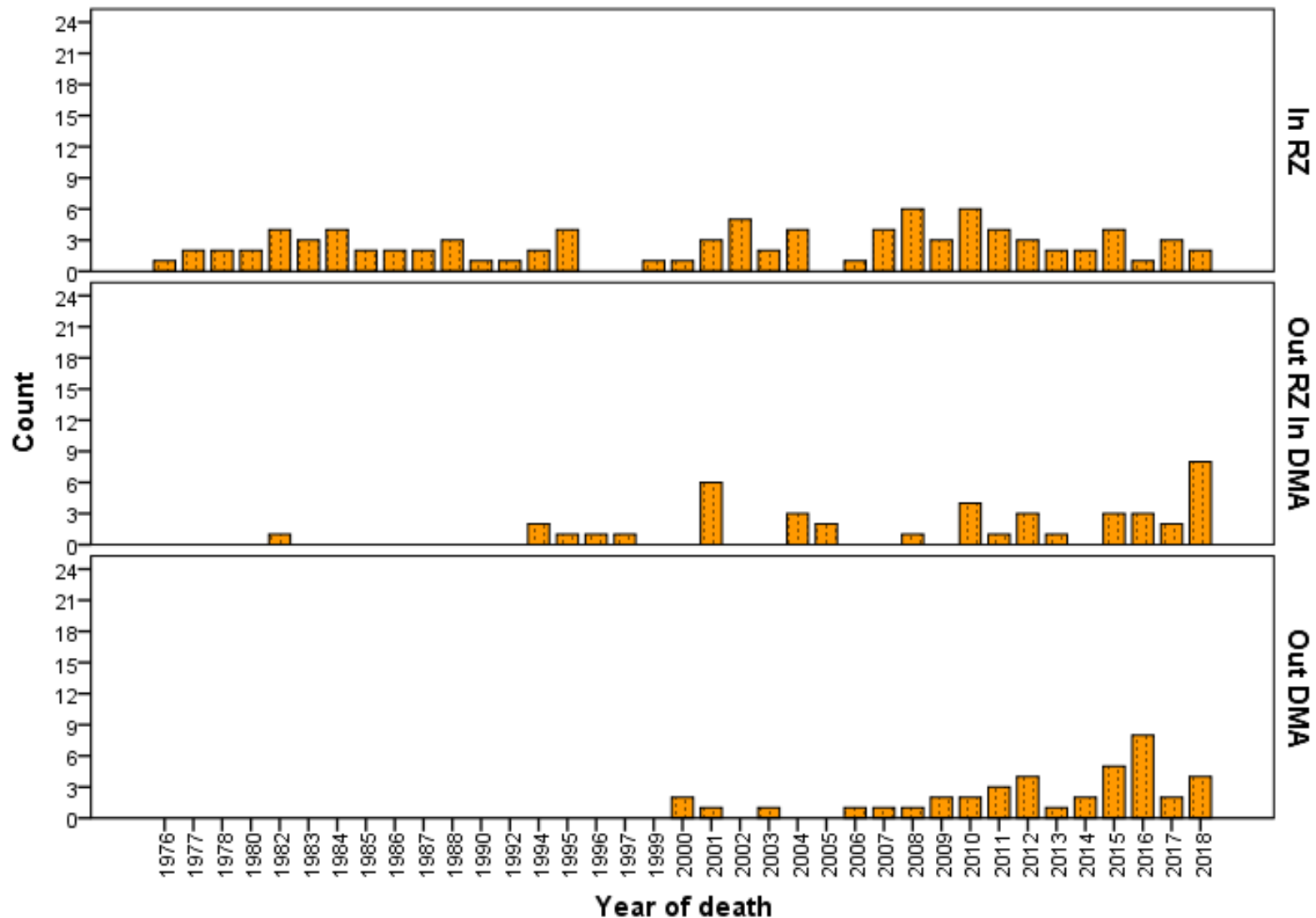
Documented mortalities by cause for independent aged grizzly bears in the GYE 1975-2018



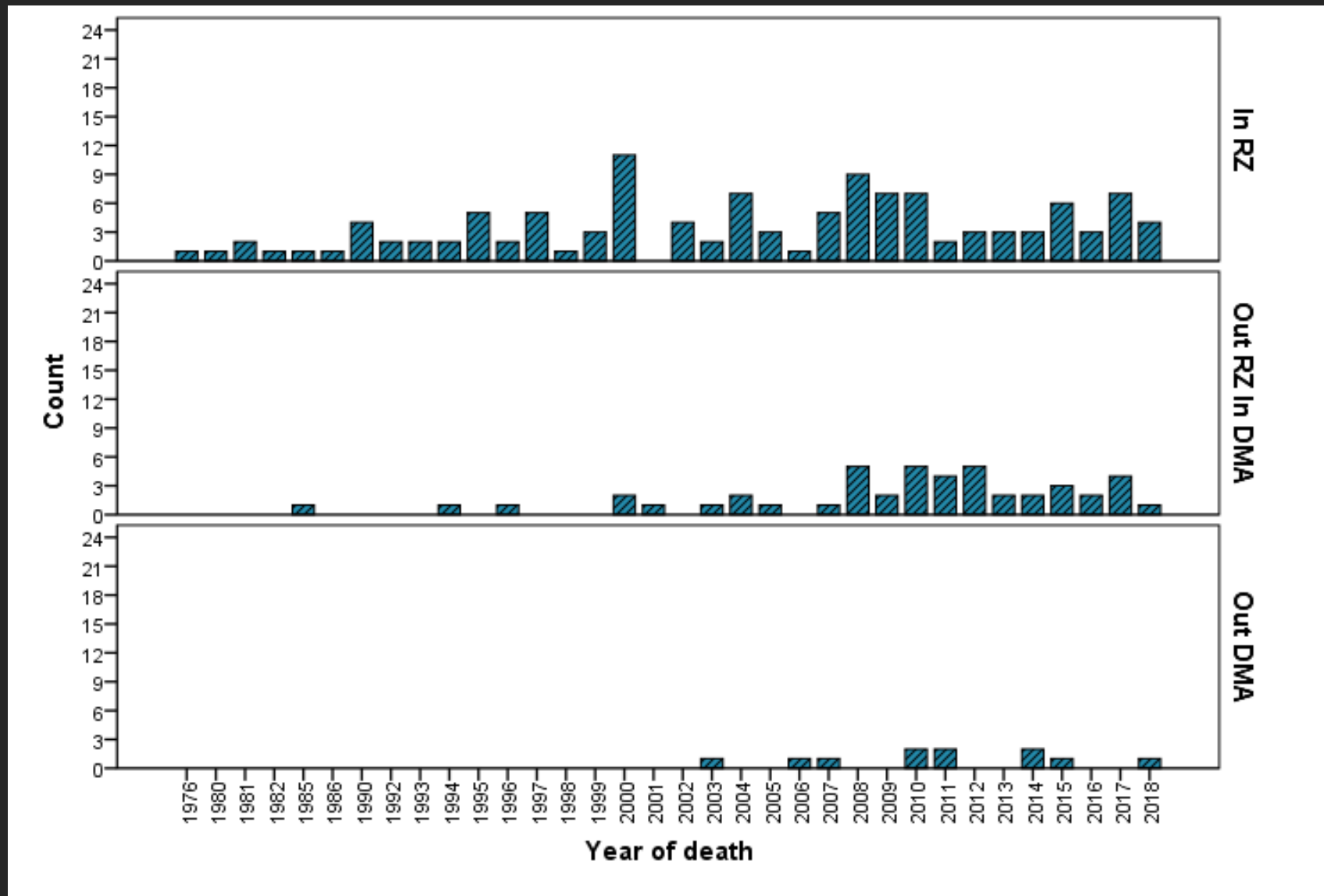
Primary sources of human-caused mortalities for independent aged grizzly bears in the GYE 1975-2018



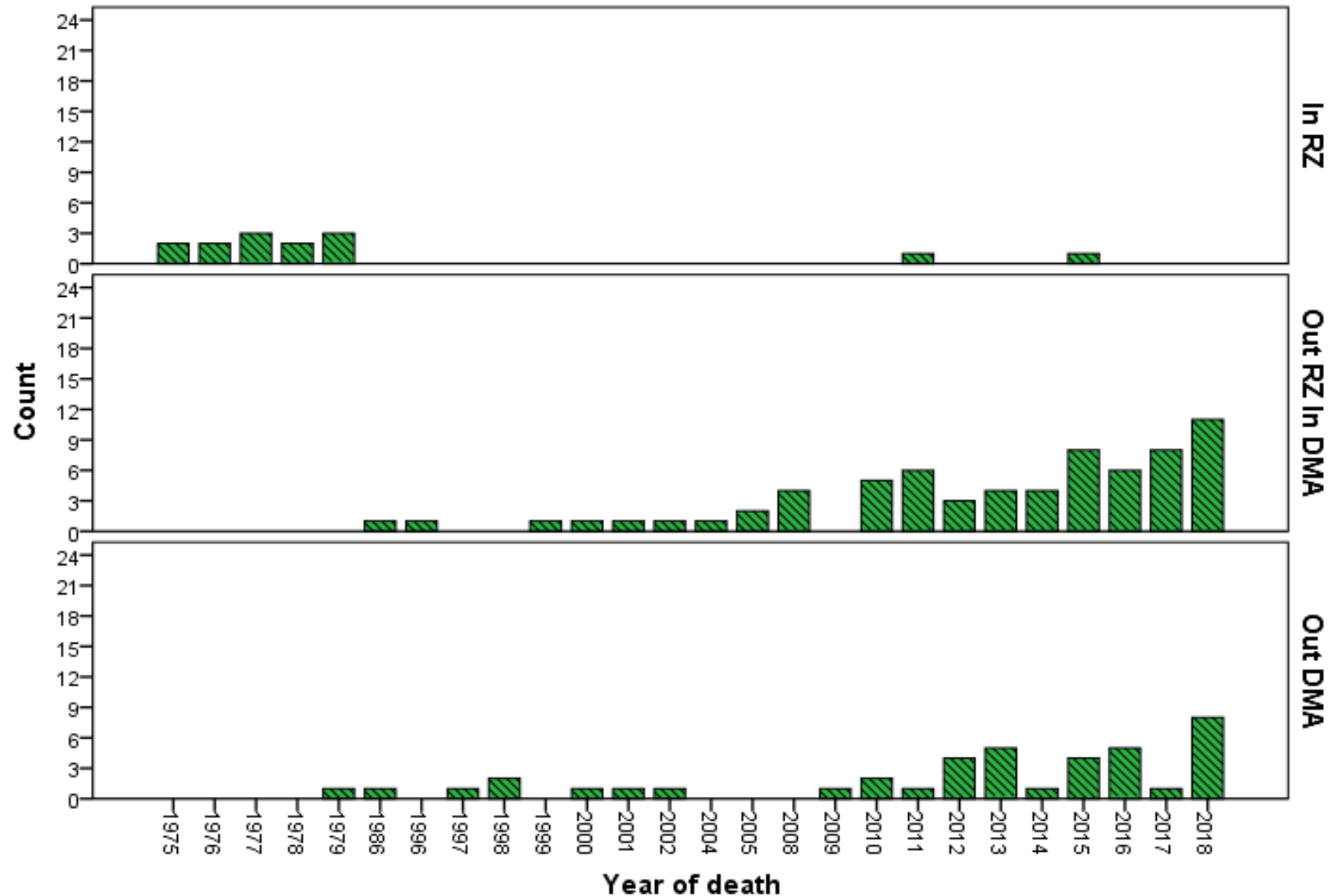
Counts of anthropogenic site mortalities by area for independent aged grizzly bears in the GYE 1975-2018



Counts of hunting related mortalities by area for independent aged grizzly bears in the GYE 1975-2018



Counts of livestock related mortalities by area for independent aged grizzly bears in the GYE 1975-2018



Estimated percent mortality for independent aged (≥ 2) female grizzly bears in GYE, 2002–2018 (DMA only)

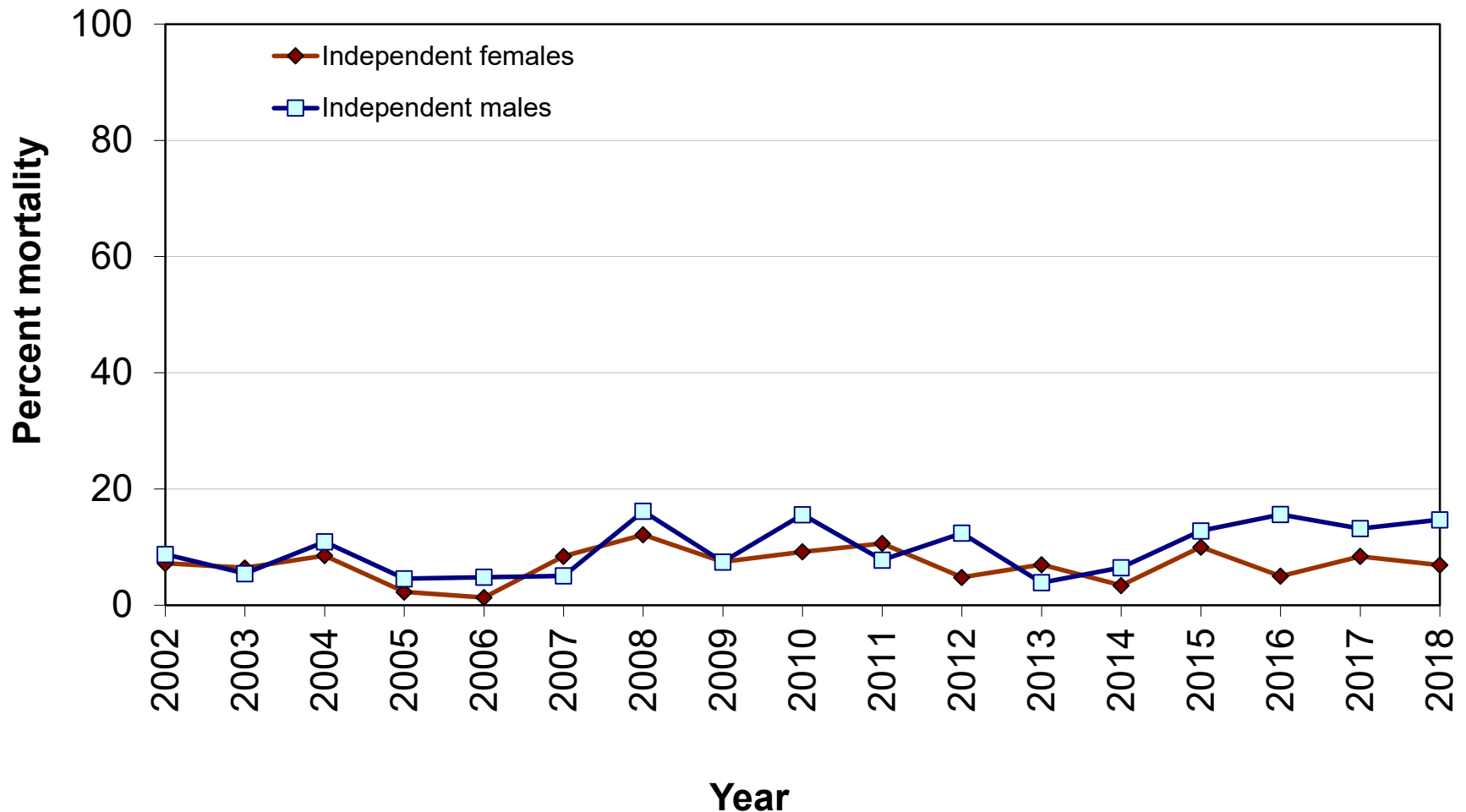
Year	Estimated	N Documented mortality	Estimated total mortality	Estimate % mortality
2002	194	8	14	7.2
2003	202	5	13	6.4
2004	211	10	18	8.5
2005	220	2	5	2.3
2006	229	2	3	1.3
2007	238	11	20	8.4
2008	248	14	30	12.1
2009	242	9	18	7.4
2010	250	14	23	9.2
2011	245	12	26	10.6
2012	250	8	12	4.8
2013	258	10	18	7.0
2014	263	5	9	3.4
2015	249	12	25	10.0
2016	240	6	12	5.0
2017	250	12	21	8.4
2018	246	13	17	6.9
Average =				7.0

Note:
Estimated
numbers
from human-
caused
mortalities
only.

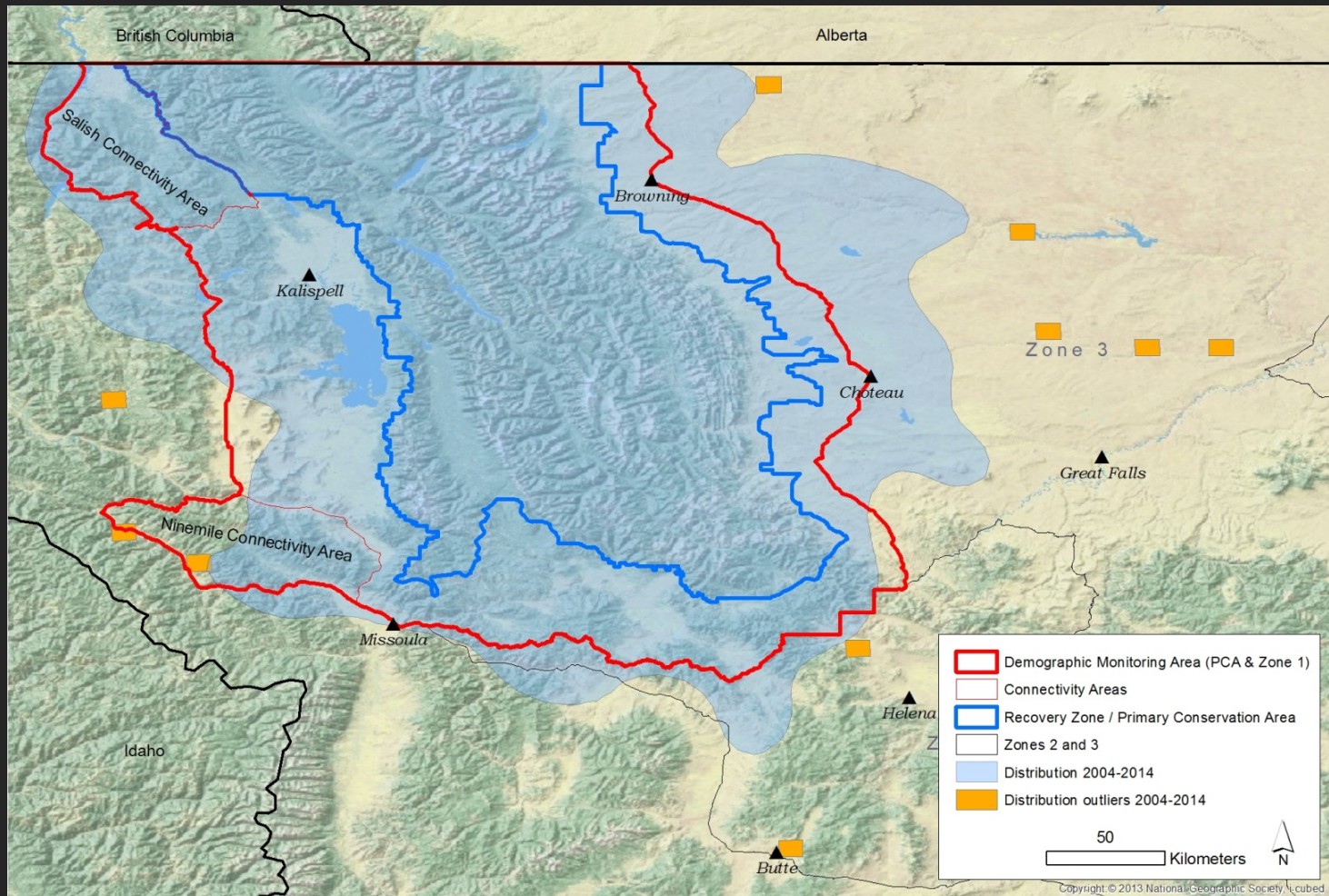
Estimated percent mortality for independent aged (≥ 2) male grizzly bears in GYE, 2002–2018 (DMA only)

Year	Estimated	N Documented mortality	Estimated total mortality	Estimate % mortality
2002	194	9	17	8.8
2003	202	7	11	5.4
2004	211	12	23	10.9
2005	220	7	10	4.6
2006	229	7	11	4.8
2007	238	6	12	5.1
2008	248	22	40	16.2
2009	242	10	18	7.4
2010	250	21	39	15.6
2011	245	13	19	7.8
2012	250	18	31	12.4
2013	258	7	10	3.9
2014	263	11	17	6.5
2015	249	21	32	12.8
2016	240	19	37	15.6
2017	250	20	33	13.2
2018	246	23	36	14.7
Average =				9.7

Estimated percent mortality for independent aged (≥ 2) female and male grizzly bears in GYE, 2002–2018 (DMA only)



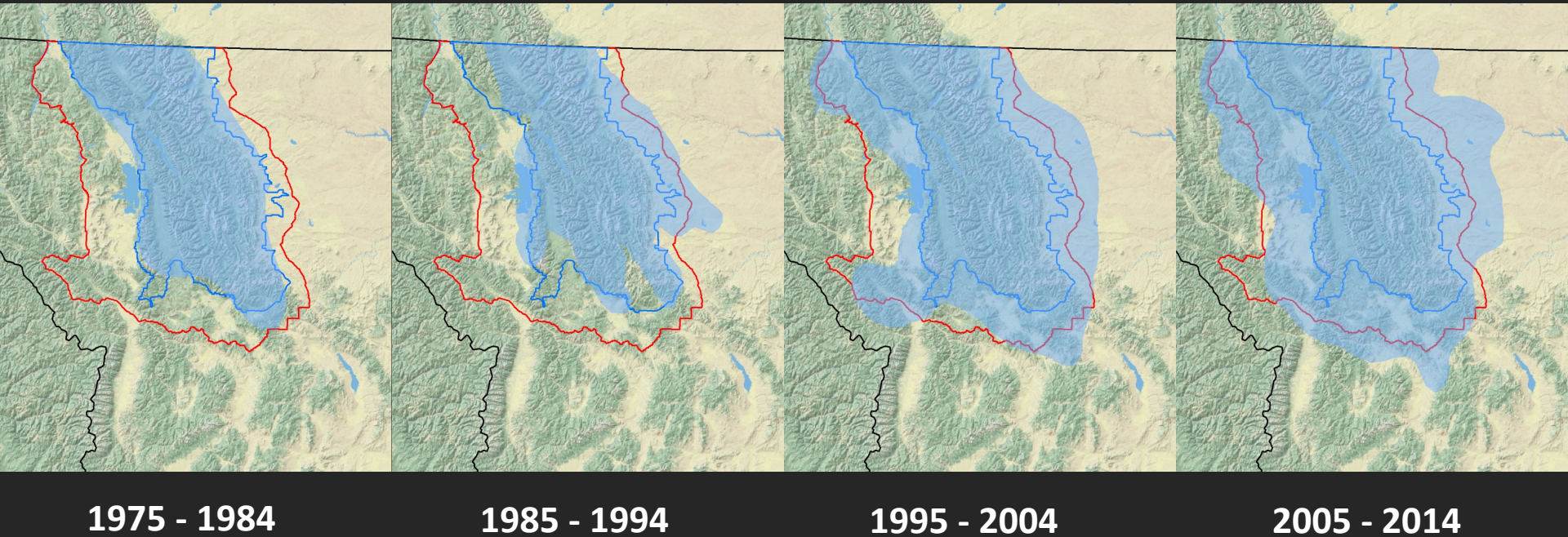
Northern Continental Divide Ecosystem



- National Parks = 1,536 km²
- PCA/Recovery Zone = 23,118 km² : 92% public land
- DMA = 42,578 km² : 62% public land

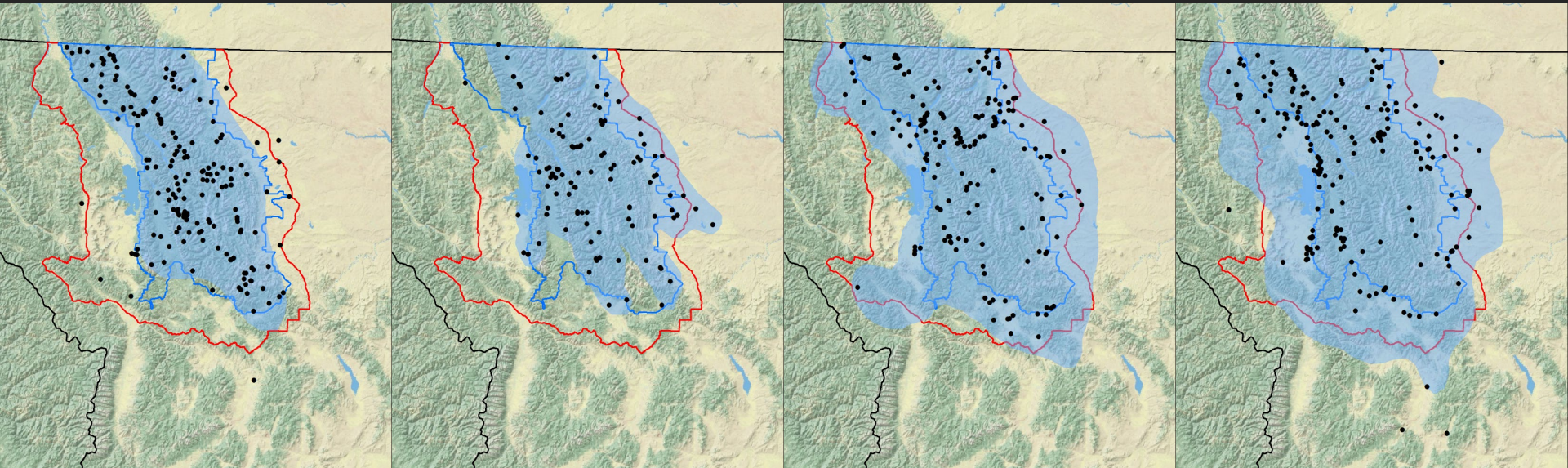
Northern Continental Divide Ecosystem

Estimated range extent decade since listing under ESA



Northern Continental Divide Ecosystem

Estimated range extent by with known and probable mortalities
for independent aged bears



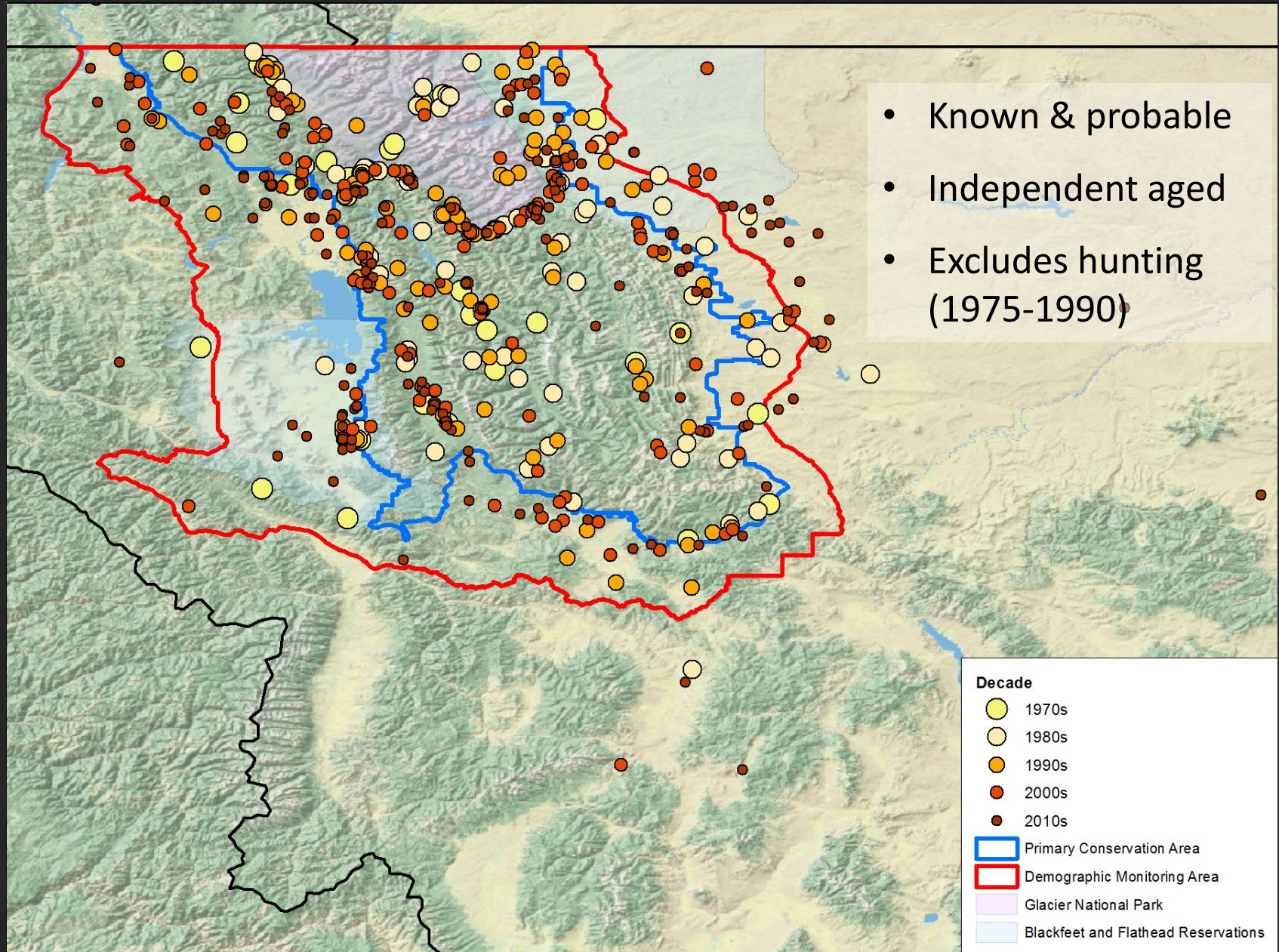
1975 - 1984

1985 - 1994

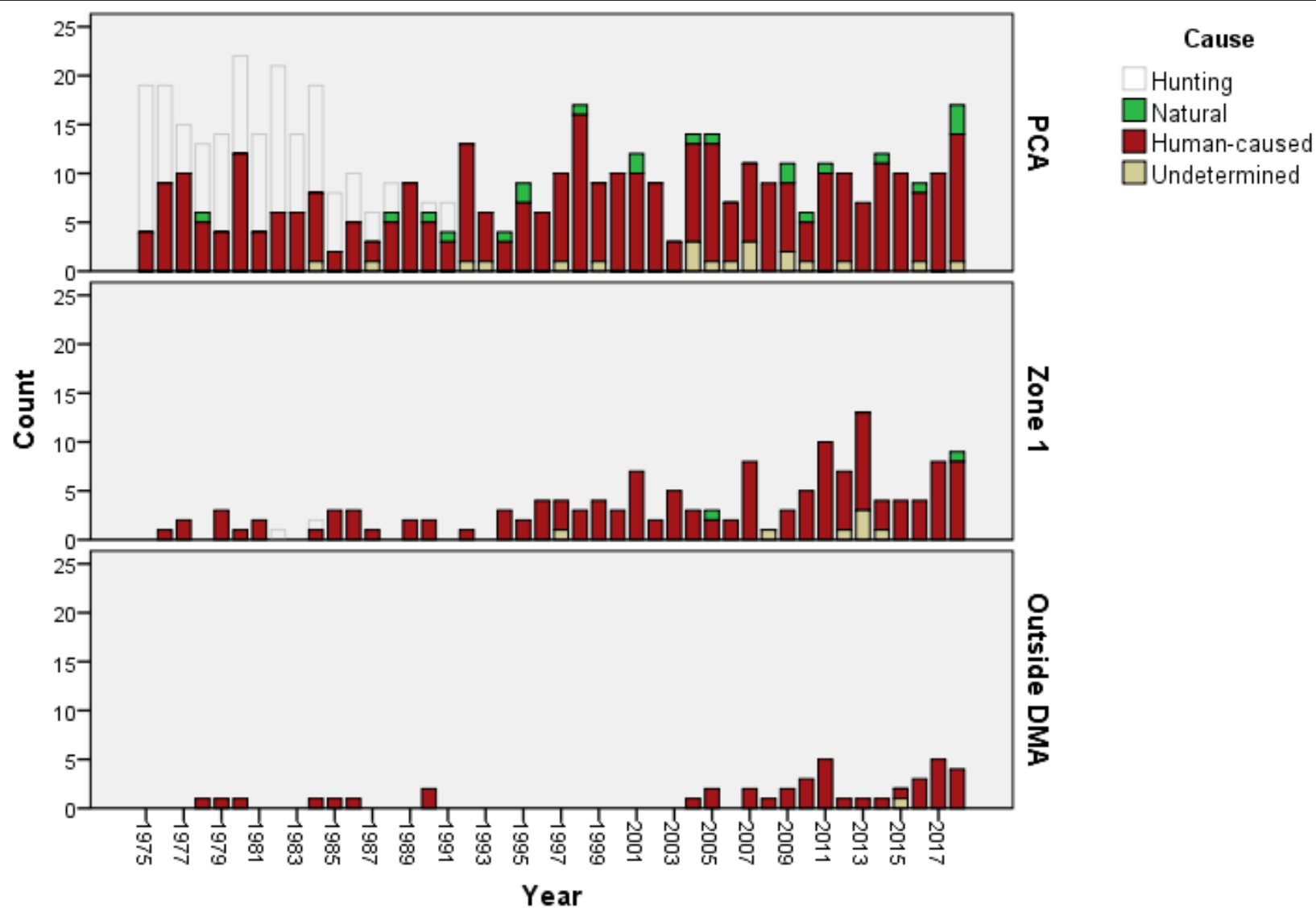
1995 - 2004

2005 - 2014

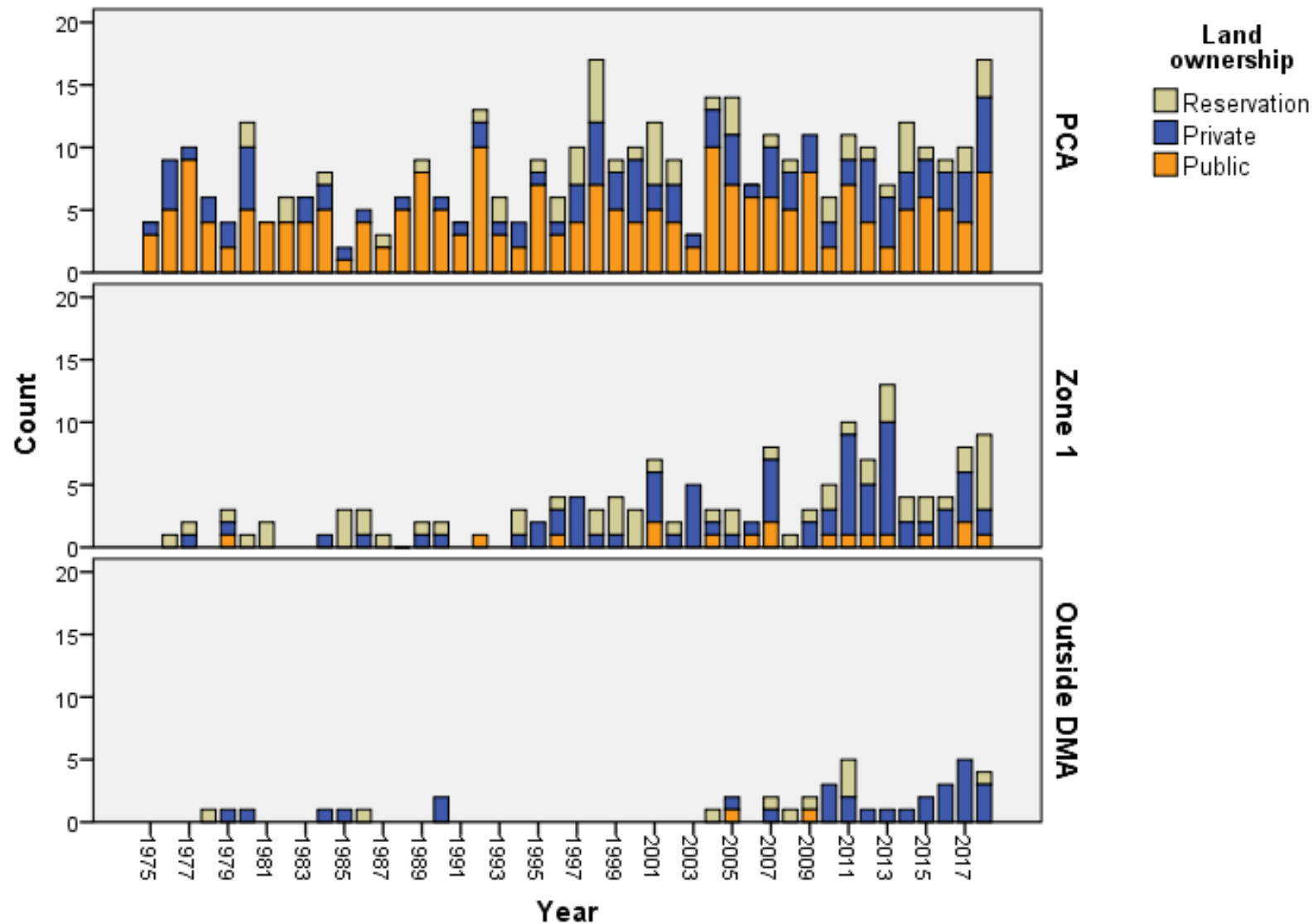
Human-caused mortalities in NCDE, 1975-2018



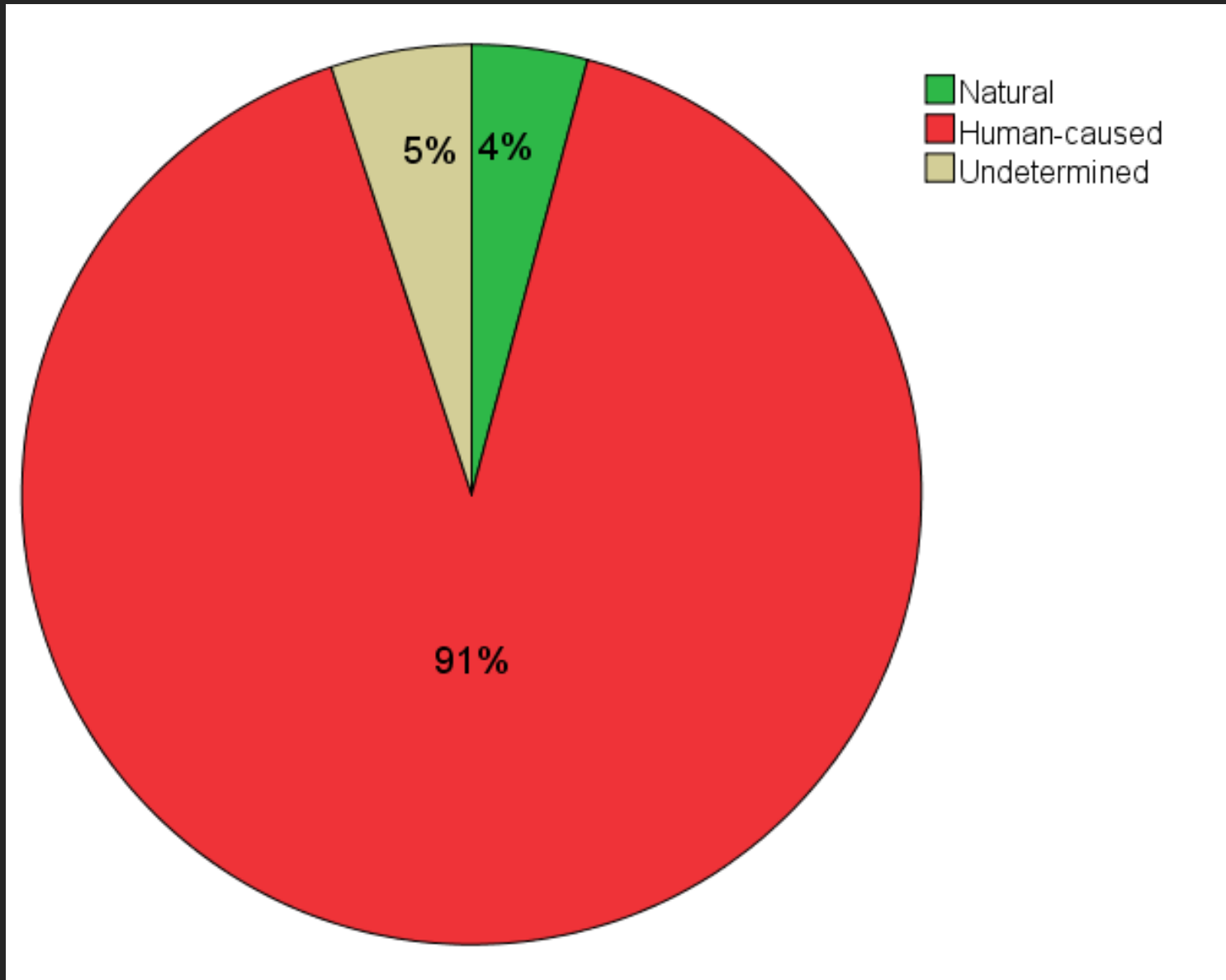
Documented mortalities for independent aged grizzly bears by cause and area in the NCDE, 1975-2018



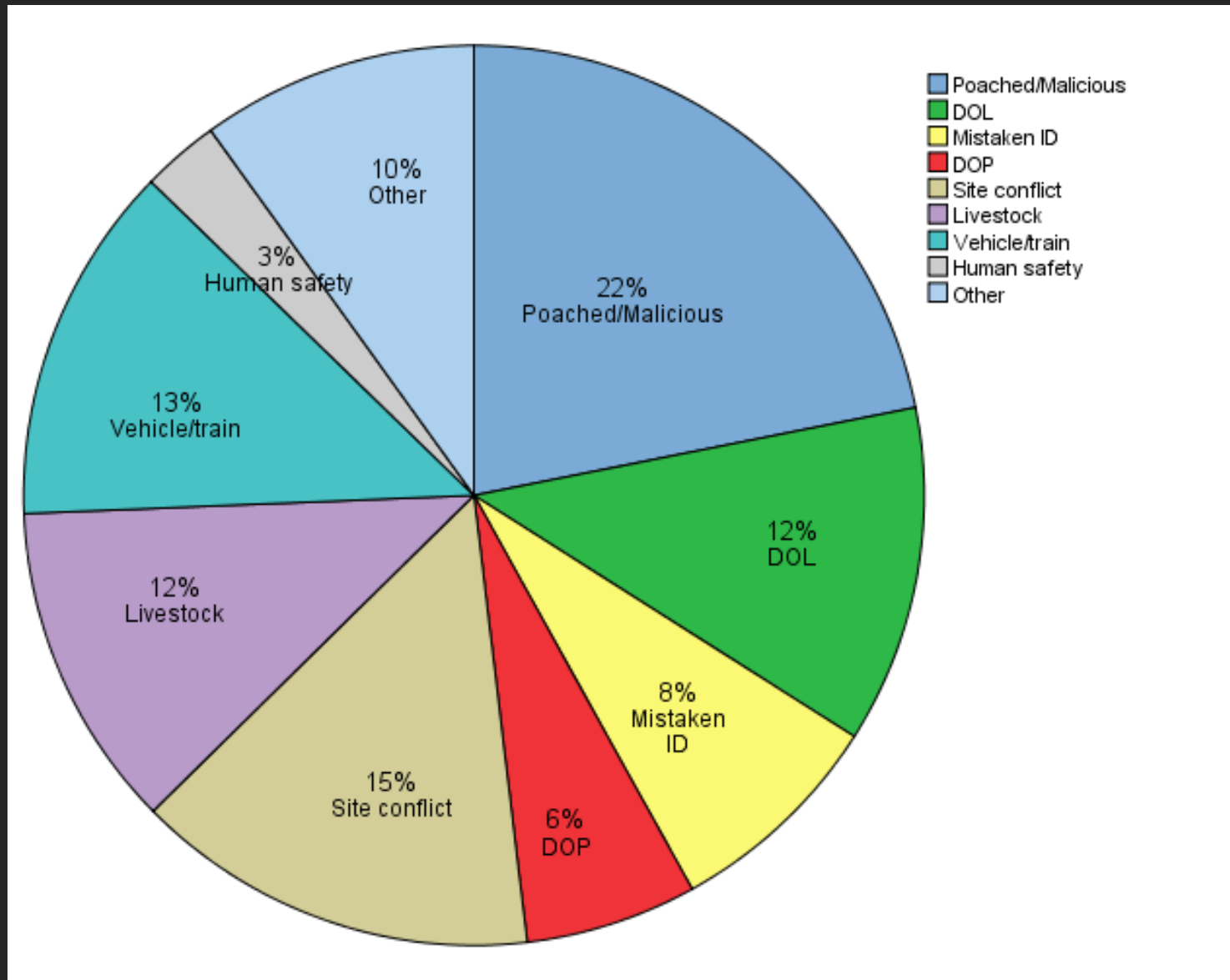
Documented mortalities for independent aged grizzly bears by land ownership and area in the NCDE, 1975-2018



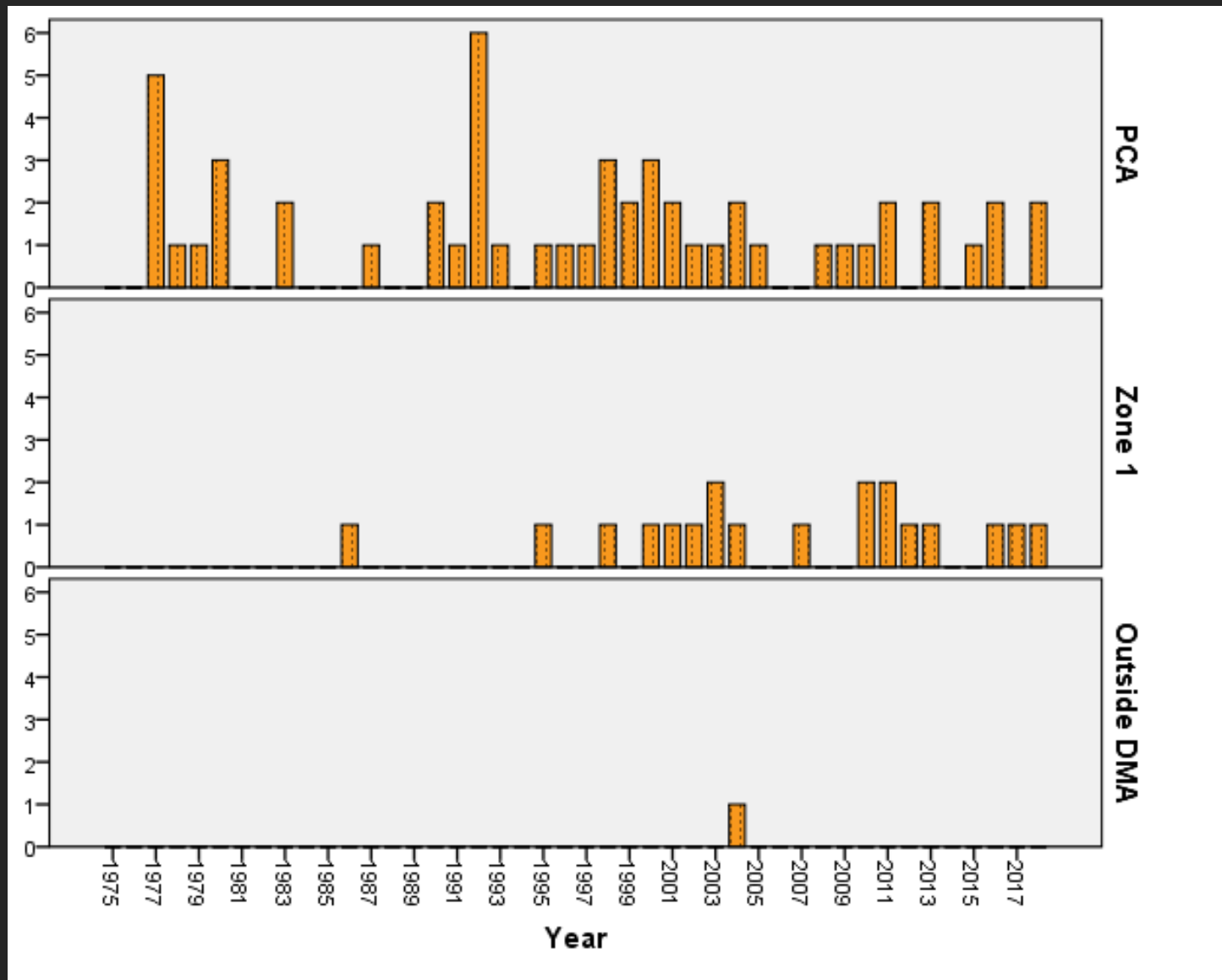
Documented mortalities by cause for independent aged bears in the NCDE 1975-2018



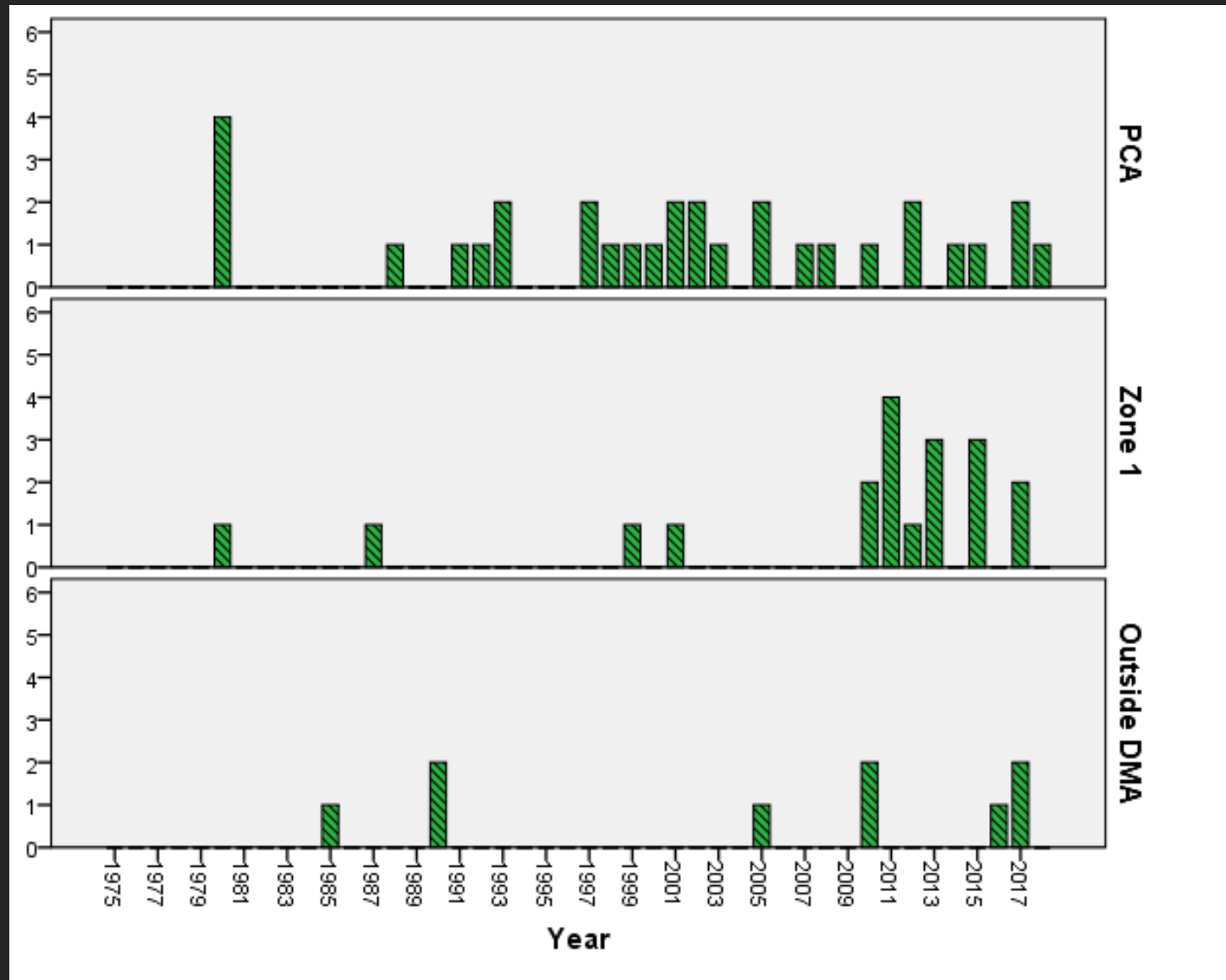
Primary sources of human-caused mortalities for independent aged grizzly bears in the NCDE, 1975-2018



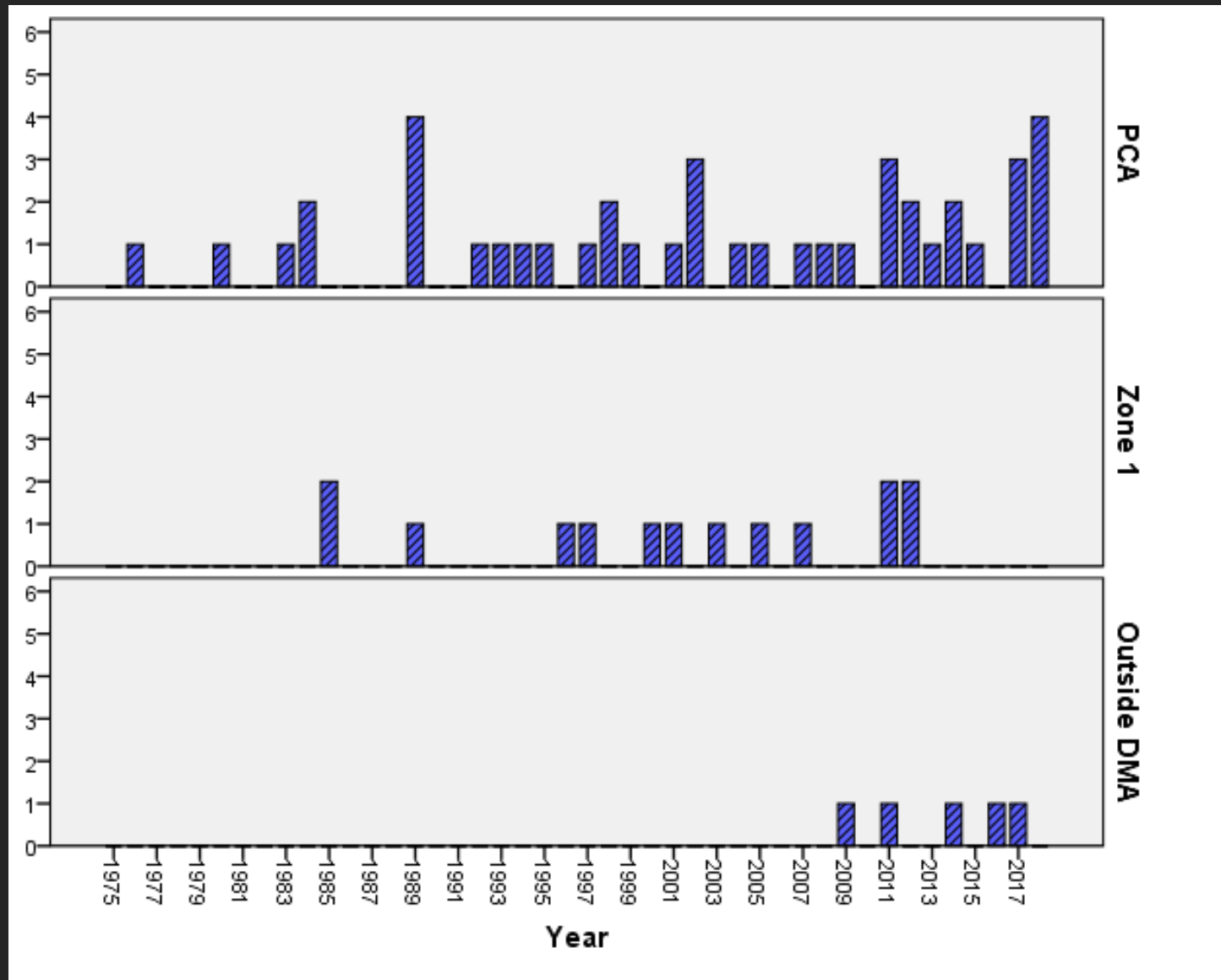
Counts of anthropogenic site mortalities by area for independent aged grizzly bears in the NCDE 1975-2018



Counts of livestock related mortalities by area for independent aged grizzly bears in the NCDE 1975-2018



Counts of defense-of-life related mortalities by area for independent aged grizzly bears in the NCDE 1975-2018



Estimated percent mortality for independent aged (≥ 2) grizzly bears in NCDE, 2014–2018 (DMA only)

Year	Estimated Population Size	Documented Mortality	Estimated Total Mortality	Mortality Rate
2004	765	17	33	4.3%
2005	782	17	39	5.0%
2006	801	9	20	2.5%
2007	819	19	32	3.9%
2008	837	10	16	1.9%
2009	855	14	24	2.8%
2010	875	11	16	1.8%
2011	894	21	28	3.1%
2012	916	17	29	3.2%
2013	937	20	38	4.1%
2014	960	16	43	4.5%
2015	982	14	25	2.5%
2016	1005	13	22	2.2%
2017	1029	19	39	3.8%
2018	1047	26	43	4.1%
Average				3.3%

Yellowstone Mortality and Conflicts Reduction Report

IGBST, 2009

- Nov 2008: YGCC directed IGBST to complete report.
 - 33 recommendations:
 - Hunter conflict-related mortalities
 - Mistaken ID mortalities
 - Other causes (livestock, front country conflicts, etc)
 - 11 with highest probability of success
- April 2009: Agency review of report:
 - Many agencies implementing several recommendations; likely some redundancies
 - Need action list with agencies agreeing to themes
 - Focus actions on the levels and causes of mortality
- YGCC Proposal: Each agency provide chair with 1 and 5-year actions they will pursue.
 - 5-year plans incorporate conflict reduction now (in most ecosystems)
 - Review and check-in needed?

Final Considerations

- 1) Subcommittees review 5-yr plans to ensure conflict reduction efforts are incorporated
 - Agencies agree to focus on themes
 - Actions should target highest conflict sources
- 2) Subcommittees track conflict data on an annual basis and in a consistent manner.