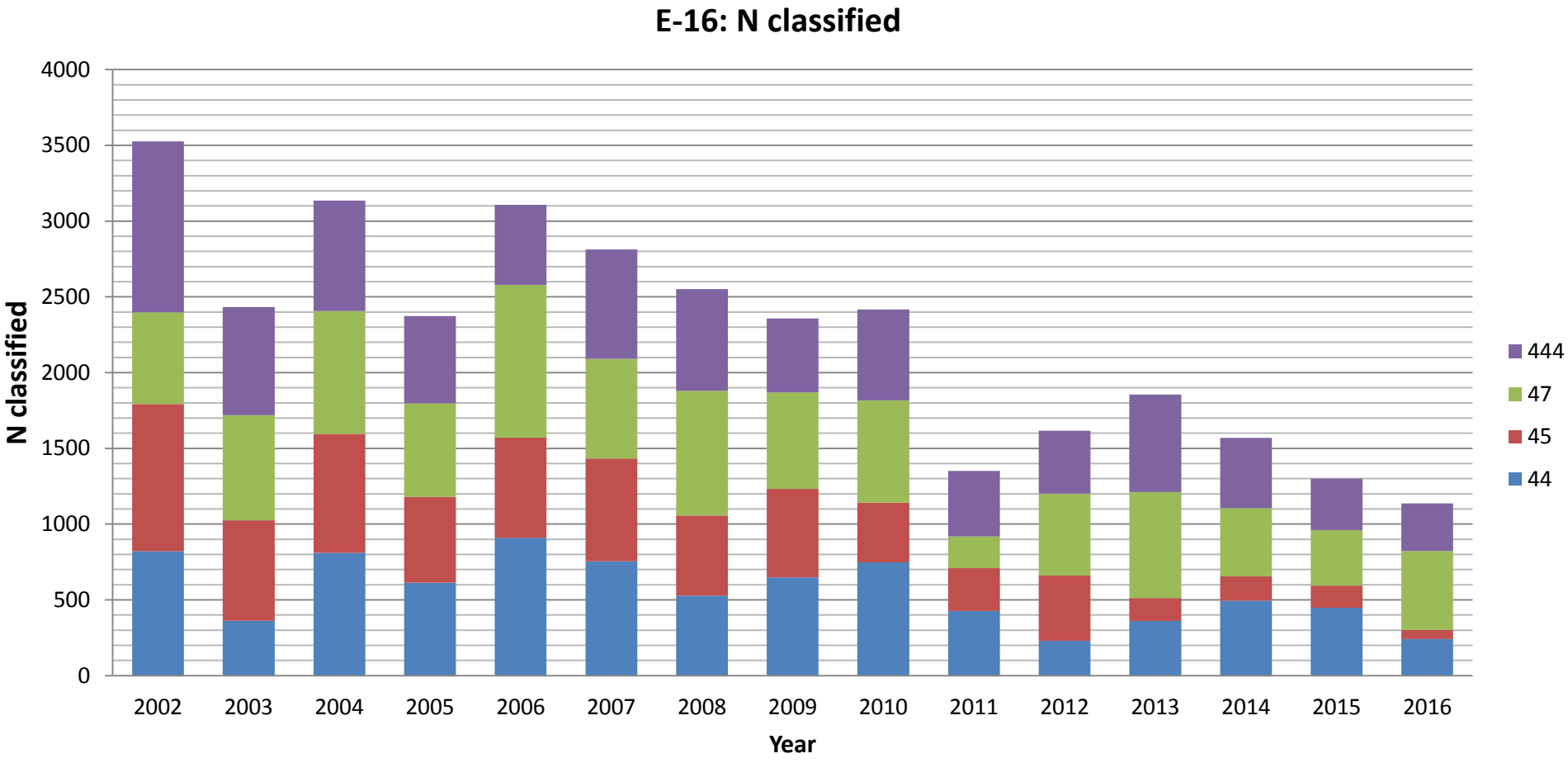
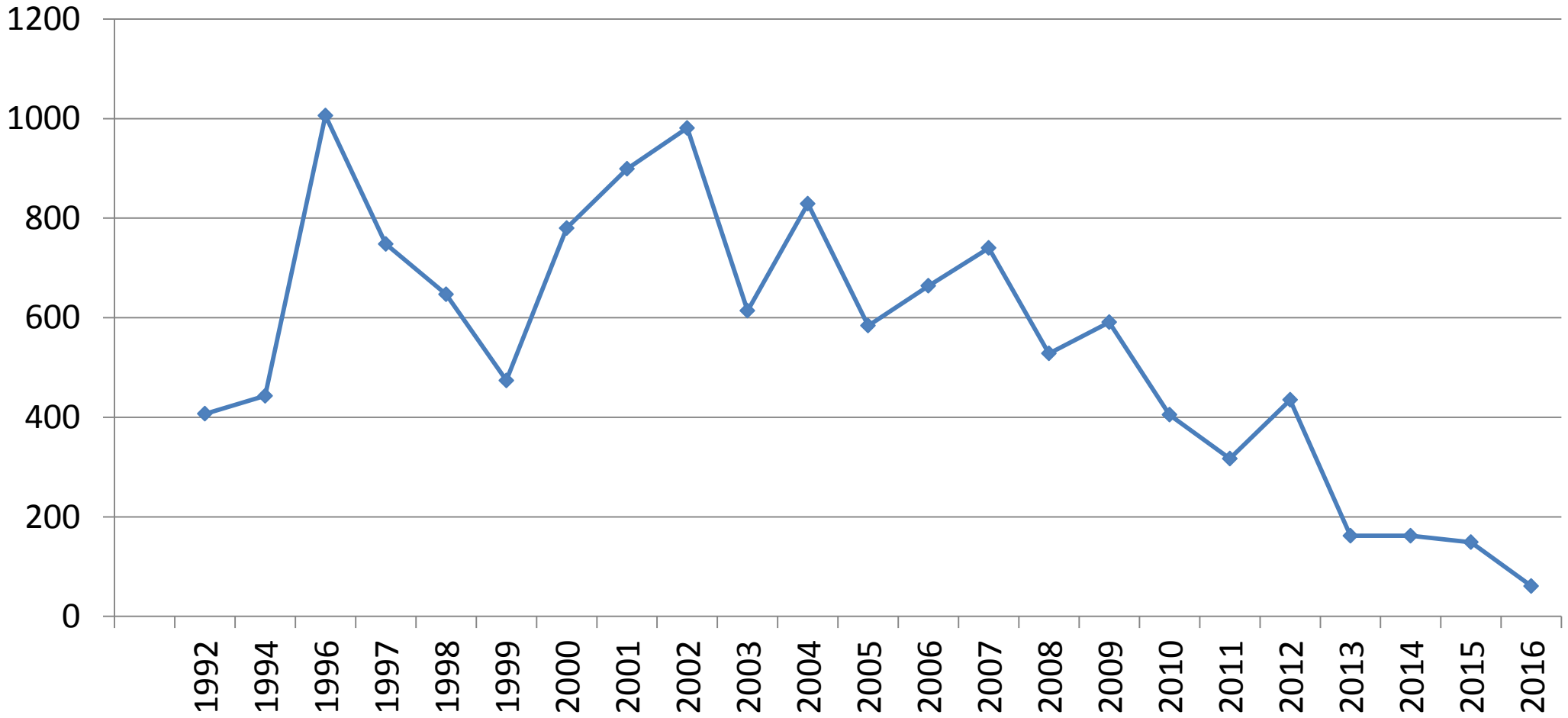
Elk Aerial classification

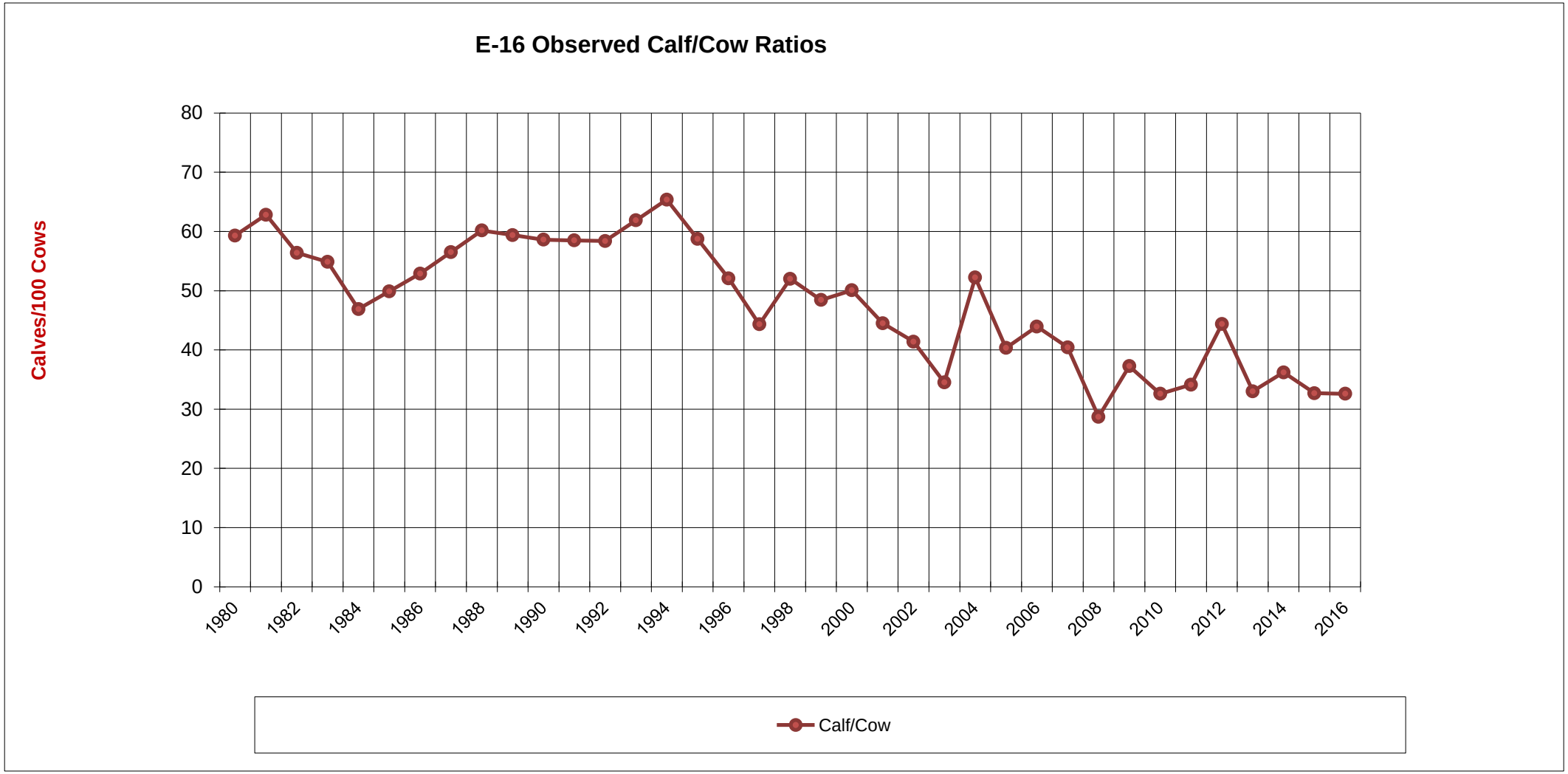
Number of elk classified by helicopter



Unit 45 # of elk classified by helicopter



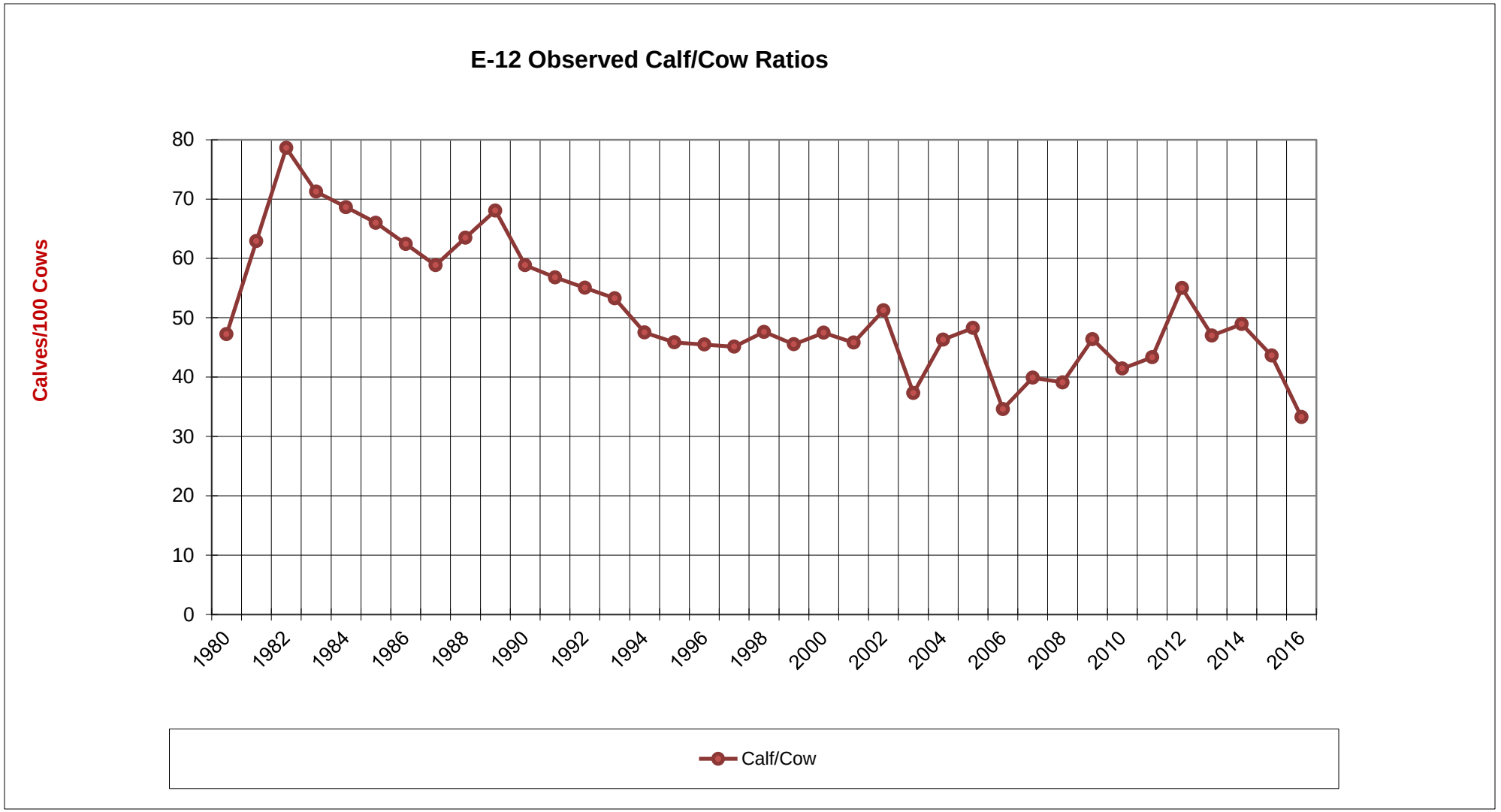
E16 calves per 100 cows



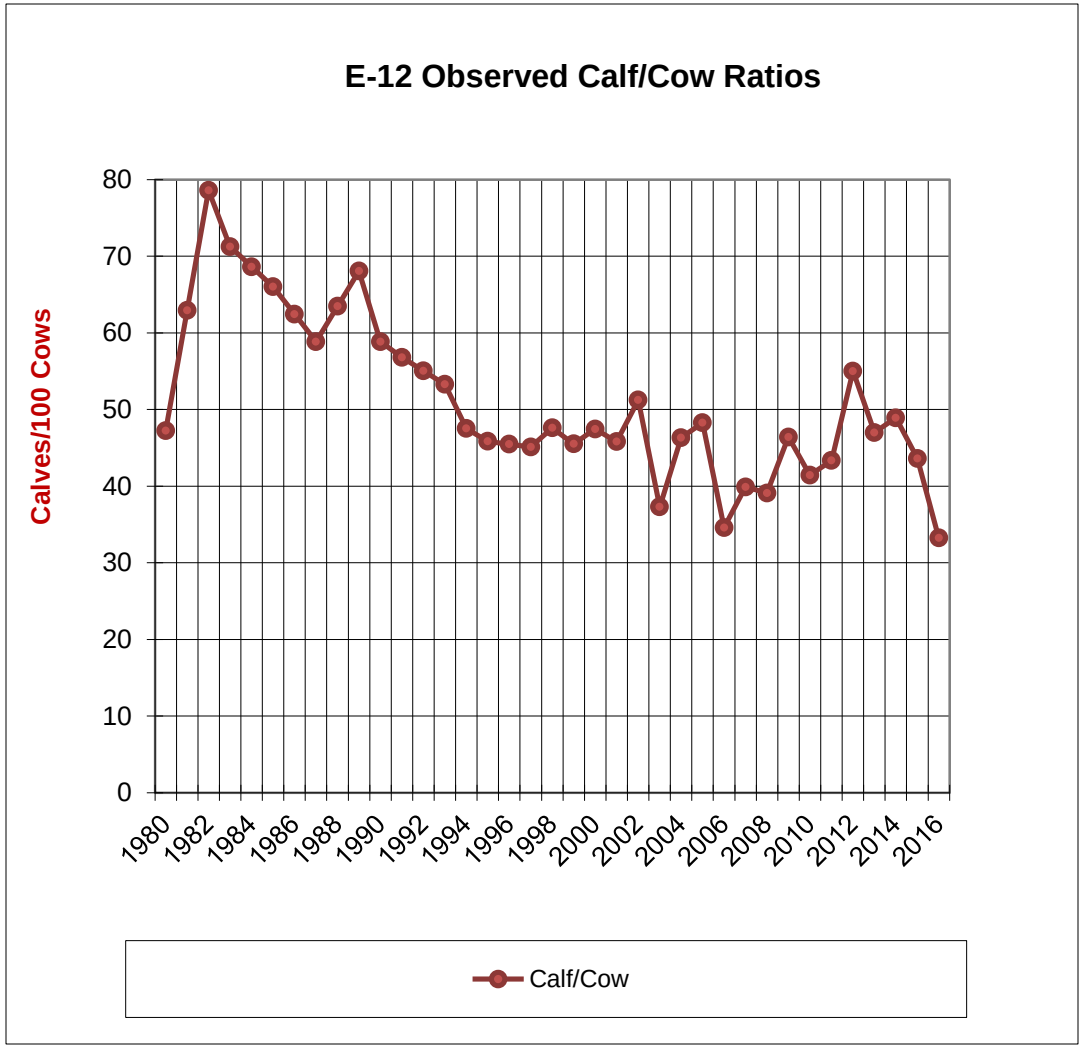
Human Disturbance Impacts on Elk Calving

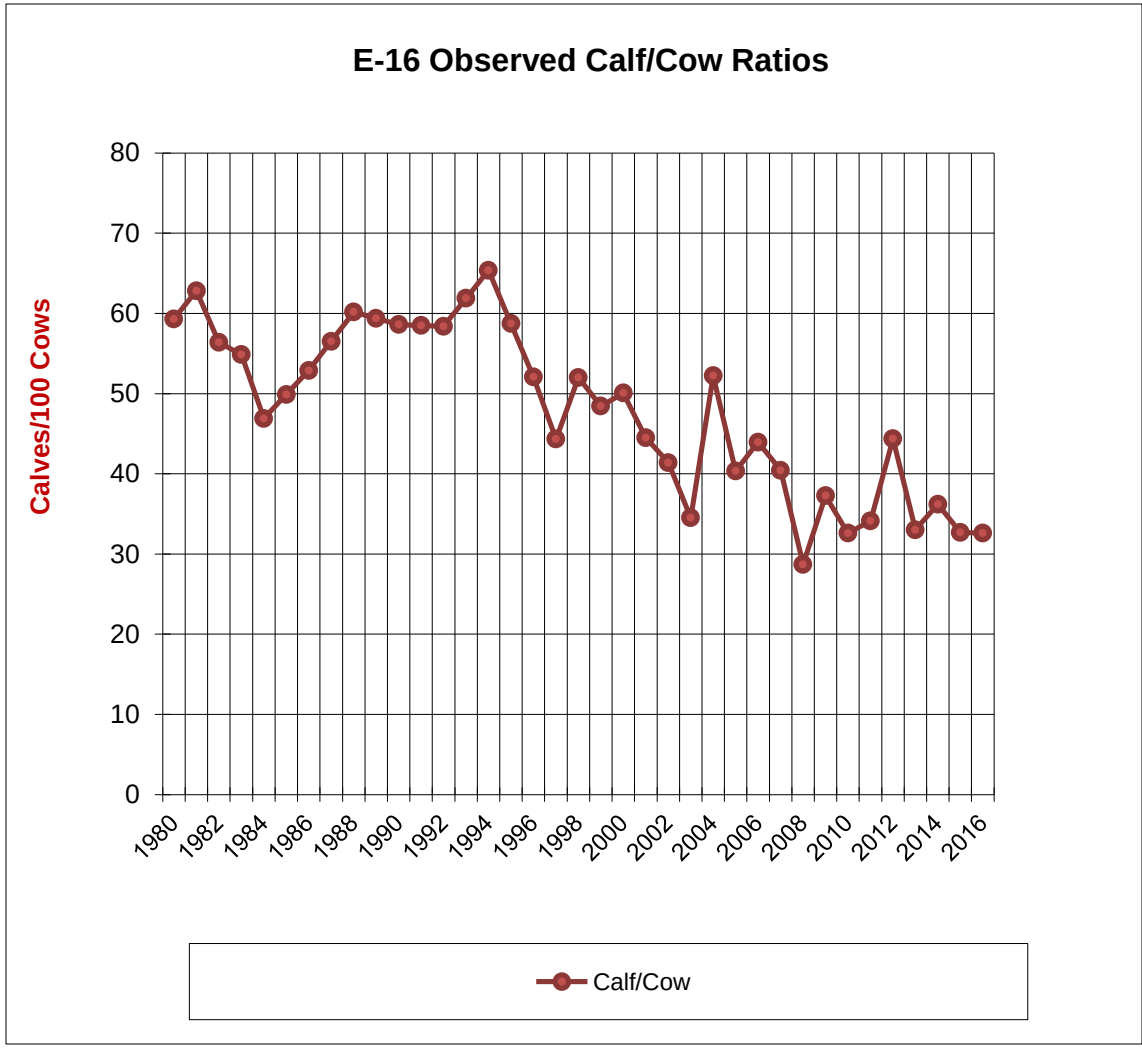
- Study done in the Eagle Valley on: The Effects of Human Induced Disturbance During Calving Season on Reproductive Success of Elk, (Phillips and Alldredge 2000). Demonstrated that calf/cow ratios for elk declined by approximately 40% (from 64.6 calves per 100 cows to 39.8 calves per 100 cows) as a result of human induced disturbance during the calving season (Phillips and Alldredge 2000, Shively et al. 2005). Reproduction levels during the treatment period were determined to be insufficient to maintain a stable elk population. The second half of the study involved removing the human disturbance component. With the human disturbance removed the calf/cow ratios rebounded to their pre treatment levels (Shively et al. 2005).
- Using data from this same study we developed an index that showed we counted 41.8% of the elk during a flight in BGU 45. The baseline data was for 1994, 1996,1997 and the population estimate was 1771 elk.
- The average population estimate for 2012, 2013, 2014 was 604 elk.
- The average population estimate for 2014, 2015, 2016 was 296 elk.
- This is during a time period where cow licenses were reduced by 75%.

E12 calves per 100 cows

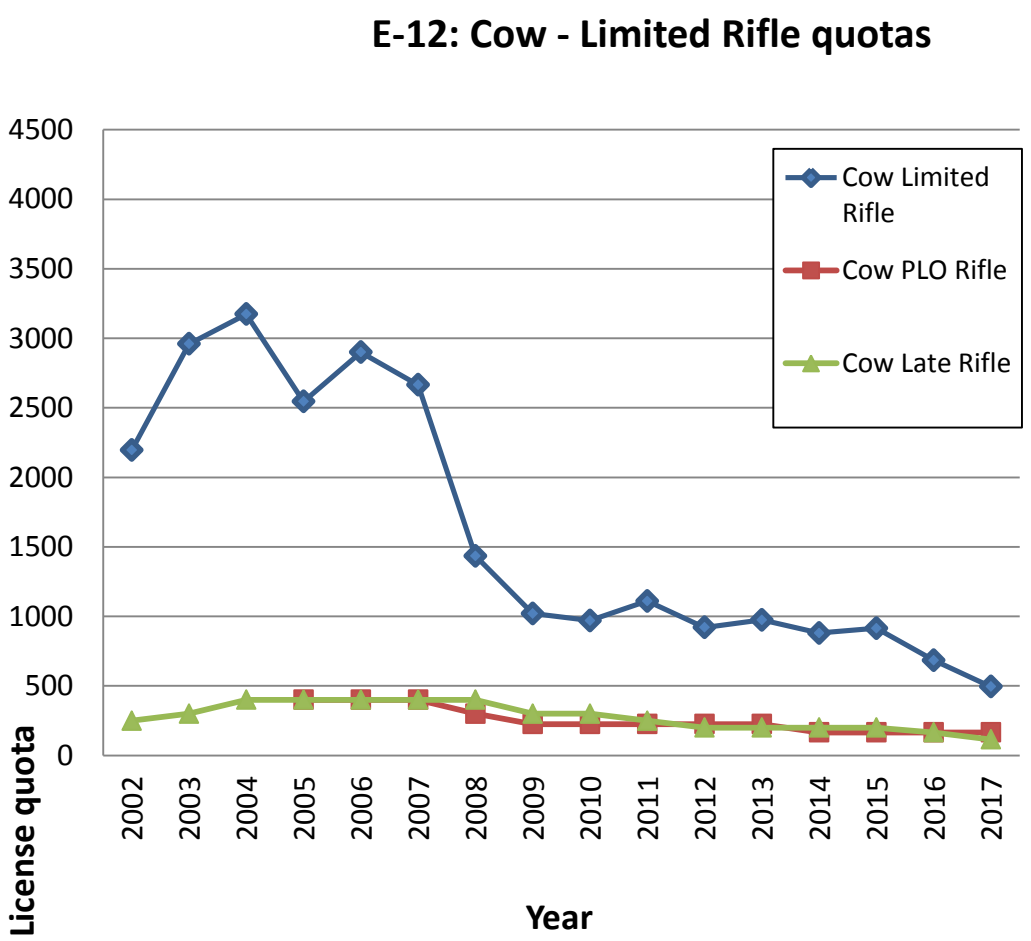


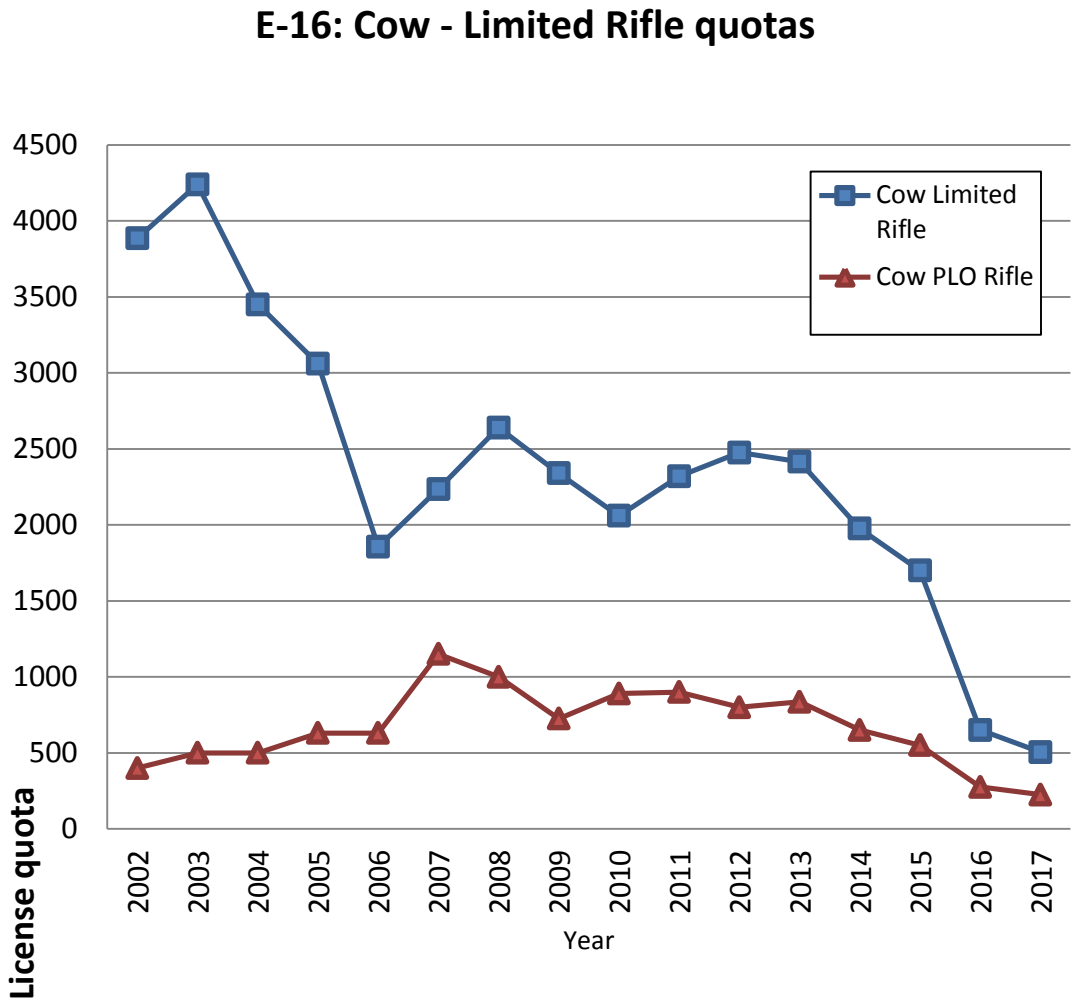
E12 vs. E16 Calf/cow ratio



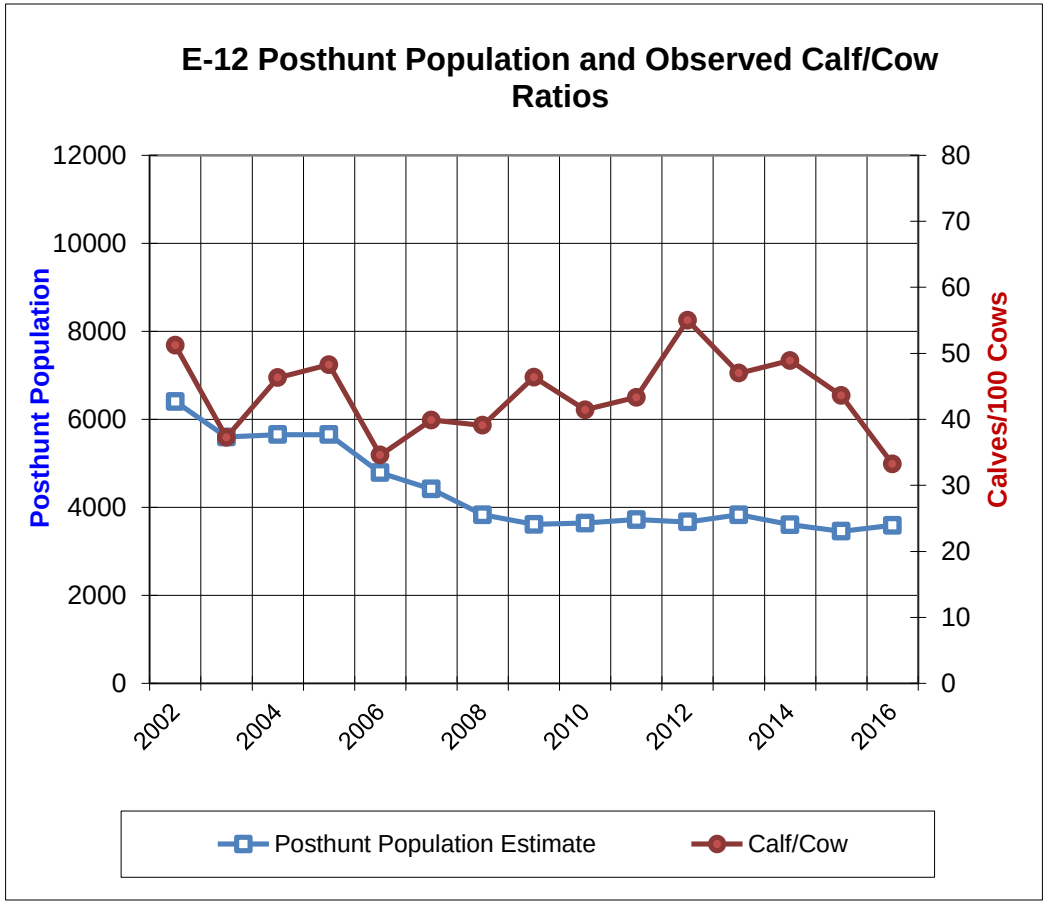


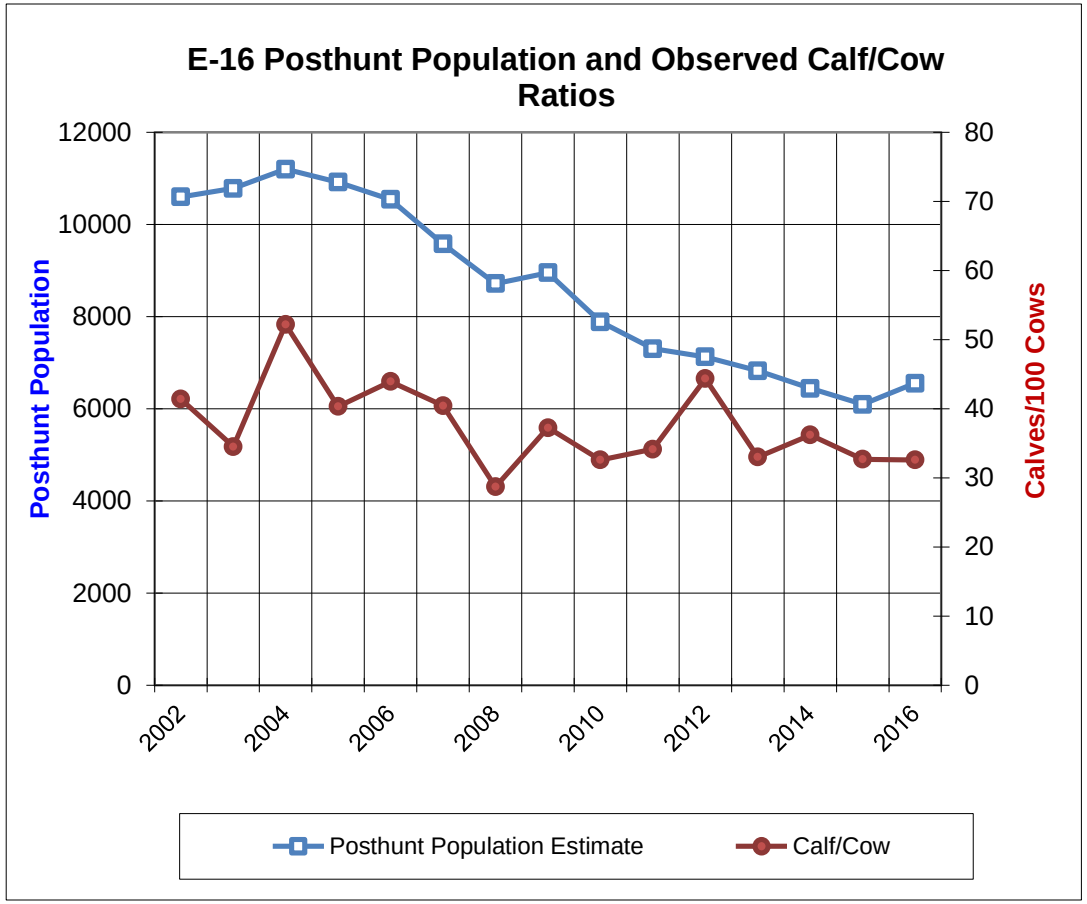
Cow licenses E12 vs. E16





Comparison of E12 vs. E16





Mule Deer

- The DAU plan for D8 has shown a steady decline in population since the 1980's.
- For most of the 1980's the DAU population objective was 26,000 deer,
- in 1988 it was reduced to 21,000 deer,
- in 2008 it was reduced to 13,500 to 16,500 deer.
- These population objectives were reduced based on several factors (loss of habitat, increased recreation pressure, weather, predators and quality of habitat).

Bighorn Sheep

Bighorn Sheep

An important part of the winter range for this herd is within or adjacent to the Town of Vail and I-70 in the East Vail area. This herd was a native herd but there was a transplant of 7 sheep done in 1948.

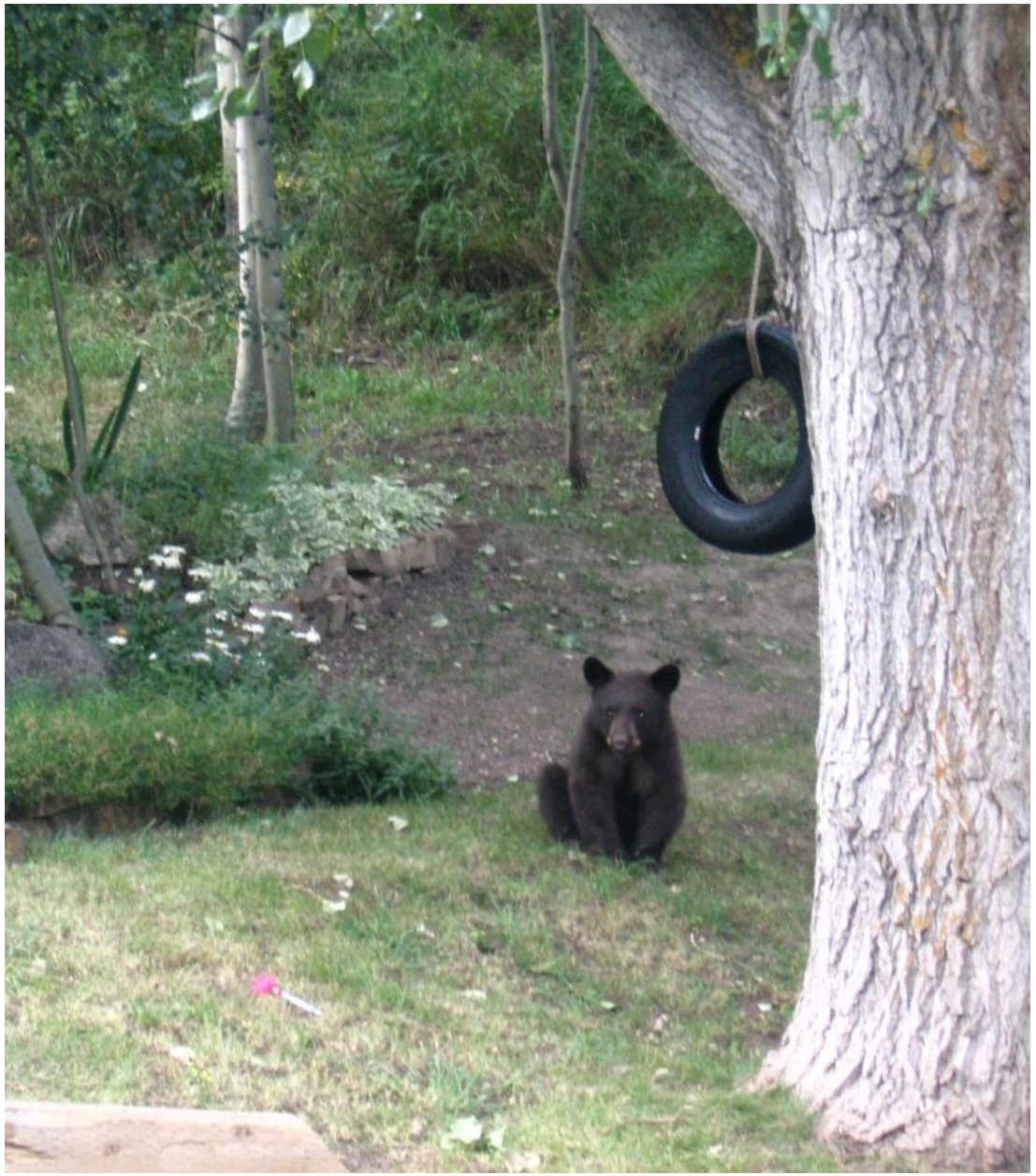
In the 1950's the population was estimated to be 30,

This herd was studied most recently from 1989 to 1991 when CPW marked 24 BHS on the Booth Creek cliffs.

1990's the population was estimated to be 80-100,

The current population estimate is 40.

Bears



Bears

- Bear human conflicts have been rising since 1990.
- In 1992 CDOW held the first human bear conflict meeting in Colorado. Bringing the 1st bear resistant trash cans to Colorado.
- Bear calls have become a way of life especially in year of berry crop failures. Over 350 this year in Eagle County.

Lions

- Lion calls have also significantly increased in the last 3 years
- 2014 did not even keep track of calls
- 2015 - 11
- 2016 - 56
- 2017 – 64

  Excellent food source in towns and developments, coons, fox, pets, small mammals.

1. HABITAT CONNECTIVITY

- Viable terrestrial wildlife movements needed to access all seasonal habitats within a home range.
- Wide-ranging spp. - deer, elk, & lynx.
- Habitats required to conduct movements varies by spp. - must be:
  - Unobstructed,
  - Continuous, &
  - Of sufficient width.

HABITAT CONNECTIVITY

- HC Bottlenecks = migration corridors
- Protecting corridors – design for target species
- Elk – minimum widths:
  - ≥ 700-800 ft. in forest
  - ≥ 1,000-1,200 ft. in open habitat


818 ft.
691 ft.
851 ft.
E Timber Draw
W Timber Draw
Saddle Ridge
Rodeo Dr
Sundance Ln
Fairway Ln
Bluegrass Ct
Penncross Ln
Gottage Ct
Club House Dr
Fenno Dr
Bermuda Dr
Forest Trail
Elk Springs
© 2018 Google
Google earth
1999
13 S 356719.21 m E 4387151.10 m N elev 8324 ft
Eye alt 12842 ft

HABITAT CONNECTIVITY

- Need sufficient interior habitat to provide other than a corridor function.

- Have been fairly successful retrofitting corridors through & around early Eagle Valley developments.

- Shortcoming – not many large undeveloped habitat blocks along the corridor system.

2. IMPACTS OF DEVELOPMENT ON WILDLIFE

- Varies by species, habitat affected, and type and extent of development

- Smaller spp. and those with smaller home ranges gen. less affected

- Different habitat values: riparian, mature aspen, mountain shrub vs. hayfields, gravel pits:

IMPACTS OF DEVELOPMENT ON WILDLIFE

- What are the impacts?
  - Direct habitat loss
  - Indirect habitat loss – avoidance of human acidity areas – can be larger than direct effects = reduced habitat effectiveness
  - Off-site effects – road-kill, displacement from habitat adjacent to trails, etc.
  - Animals displaced go somewhere else where they compete with animals already there
  - Cumulative effects

3. MINIMIZING DEVELOPMENT EFFECTS

- All parcels, their settings, the habitats, and the wildlife communities they support are different.

- What may be true for one parcel may not be true for a neighboring parcel.

- Each parcel requires a customized approach.

MINIMIZING DEVELOPMENT EFFECTS

PARCEL SETTING/ WILDLIFE ANALYSIS:

- Isolated and unaffected by human development? or
- In Town, surrounded by human development 24/7, and isolated from native habitat?
- Habitats/ Wildlife community present?
- Habitat effectiveness?
- Context of parcel in surrounding landscape?
- Prioritize habitat/ wildlife values to maintain → Location, Type, & Level of development

MINIMIZING DEVELOPMENT EFFECTS

IDEAL APPROACH:

- Avoid, minimize, & compensate potential impacts.
- Reality?

A. Avoid and minimize = Development design

- Locate development:
  - Non-native or lower value habitat – hayfield vs. mountain shrub; avoid high value habitats.
  - Within or adjacent to an existing human activity area – in Town, adjacent to I-70 ROW, inholding surrounded by development.

MINIMIZING DEVELOPMENT EFFECTS

- Locate development (con't):
  - In corner of parcel vs. in center
  - Building envelopes - limits on the extent of vegetative manipulation on lots
- Cluster development:
  - 1st home has the biggest effect
  - Minimize development footprint = minimize habitat loss
  - Maximize habitat block size

MINIMIZING DEVELOPMENT EFFECTS

- **Buffer development:**
  - **Distance**
  - **Intervening vegetation & topography**
- **Preserve and connect movement corridors**
- **Minimize fencing – restricts terrestrial wildlife movements, entanglement**
- **Develop a Wildlife Mitigation Plan:**
  - **Resident education – brochure, Plan, website.**
  - **Trash handling – bears & nuisance spp.**
  - **Dog and pet control**

MINIMIZING DEVELOPMENT EFFECTS

- Wildlife Mitigation Plan (con't):
  - Landscaping
  - Fencing
  - Wildlife mortality on local roads
  - Mountain lions
  - Feeding wildlife
  - Weed management
  - Enforcement

MINIMIZING DEVELOPMENT EFFECTS

B. Compensate

- Onsite habitat enhancement - best
- Winter range approaches:
  - Aerial fertilization, cut/burn, brush hogs.
  - Colorado Wildlife Heritage Foundation

MQ1

WHAT IS AN IMPACT?

MQ1

- **Big game on winter range are starving.**

- **Ungulates respond less to recreationists when:**
  - **snow is deep,**
  - **forage inaccessible,**
  - **temperatures are lowest,**
  - **body reserves are depleted, and**
  - **energy conservation is decisive for survival.**

MQ1

REC. IMPACTS ON WINTERING BIG GAME

1. Elevated heart rates
2. Reduced forage intake and resting time
3. Habitat avoidance
4. Greater energy expenditures
5. Lowered body weight
6. Increased starvation probabilities
7. Increased susceptibility to predators
8. Smaller pre-winter body mass of offspring


MQ2
TRAIL CLOSED
WILDROSE TRAIL TO
FILOHA MEADOW
CLOSED FROM
OCTOBER 1st
TO JUNE 30th
TO PROTECT
CRITICAL WILDLIFE
HAB-TAT

MQ2

DEVELOPMENT vs. RECREATION

- **Dev. - 24/7 Habitat loss and ↓ H. effectiveness.**

- **Rec. – Mostly diurnal ↓ H. effectiveness.**
  - **– Direct habitat losses gen. insignificant.**
  - **– Wildlife avoid the activity, not the trail.**

MQ2

REC. AFFECTS ON WILDLIFE

- Displacement distance and duration varies by sp.
  - Birds – short distance and duration
  - Big Game - hundreds of yards and over a ridge
    - Case study e.gs.,
      - Mule deer avoided people on foot 103-365 yds. away
      - Elk avoided hikers, skiers, and bikers 550, 711, and 1,640 yds. away, resp.
      - More studies needed.

MQ2

FUTURE REC./ WILDLIFE STUDIES

- Must recognize the different distances that recreationist groups travel - ignored in virtually all studies.
- E.g., even if hiker vs. biker impacts per animal encounter are equal, because bikers typically travel several times as far as hikers, bikers have the opportunity to disturb more wildlife per unit of time and, therefore, can have several times as much impact on wildlife as hikers if total incidents and area of habitat affected are considered.

MQ2

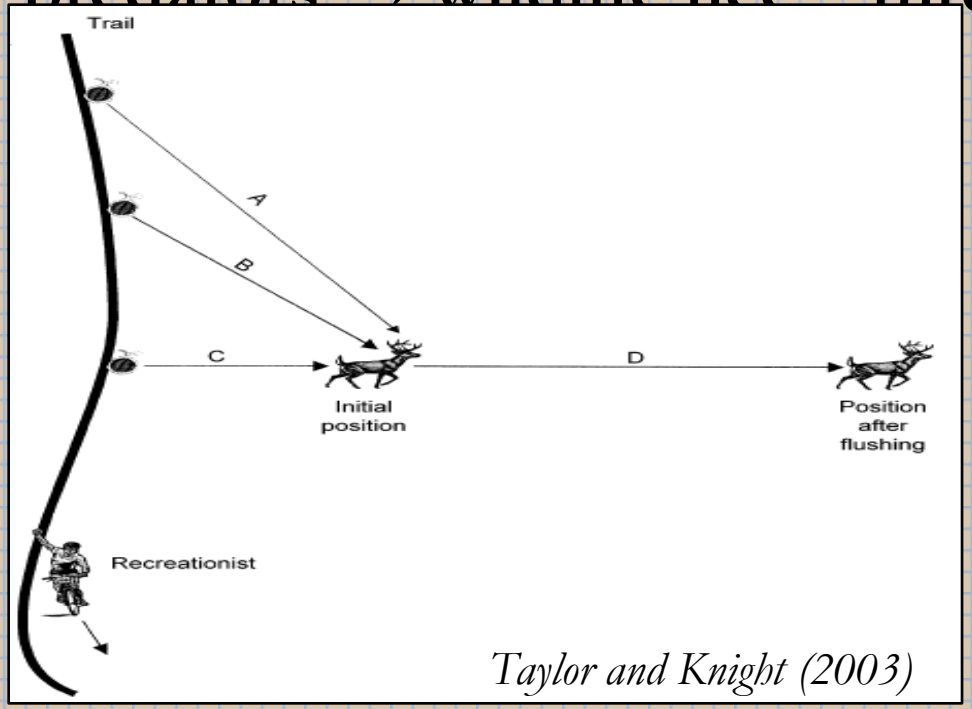
∑ EFFECTS OF REC. USE ON WILDLIFE

- **Recreationists rarely view themselves as having a degrading effect on the environment.**
- **Management plans attempt to allow coexistence.**
- **Managers know what works, what doesn't, and why.**
- **When trail siting and management don't work, the trail and associated wildlife impacts generally remain.**
- **It is rare for trails once built to be decommissioned, even when negative effects are known and documented.**

MQ2

REC. USE ON WILDLIFE

- All types of recreation can negatively affect wildlife.
- Humans = predators → wildlife flee – threat reduced.



Taylor and Knight (2003)

MQ3

NO LAST STRAW

- But, what some straws are:
  - Habitat loss
  - Reduced habitat effectiveness
  - Severe winter
  - Blocked corridors
  - Disease
  - Predation
  - Highway mortality
  - Other factors that affect populations

MQ4

TOOLS TO ↓ IMPACTS

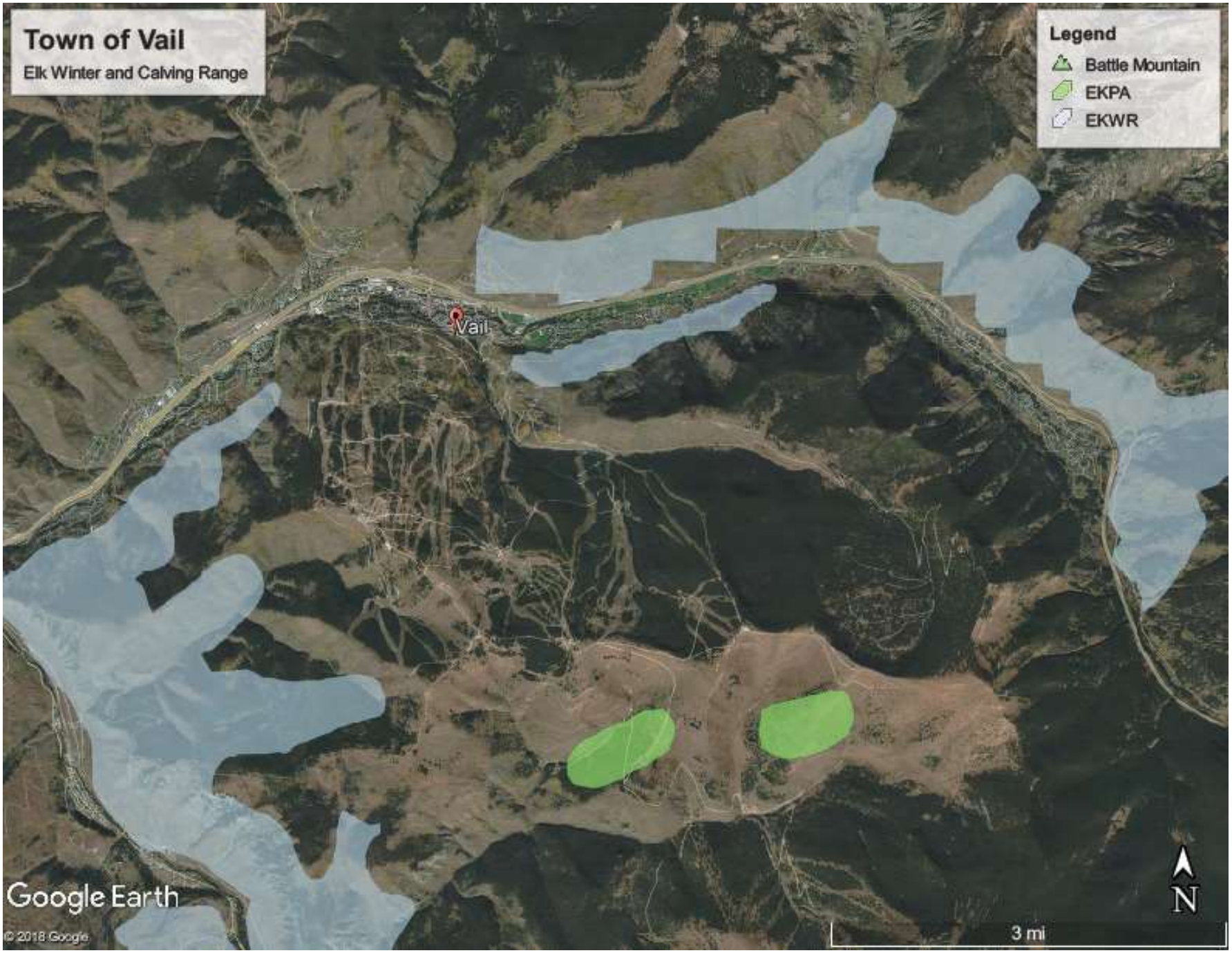
- **Development:**
  - **Education of all parties**
  - **Planning – early wildlife considerations in development process**
  - **Existing tools effective, but even optimally designed projects result in the further inevitable loss of wildlife habitat and contribute to the considerable losses that have already occurred.**

MQ4

TOOLS TO ↓ IMPACTS

- **Recreation:**
  - **NEPA**
  - **Better communication between USFS and CPW in project proposals.**
  - **Better enforcement of seasonal closures.**
  - **Existing tools effective, but still further loss of wildlife.**


CH


Town of Vail
Elk Winter and Calving Range
Legend
Battle Mountain
EKPA
EKWR
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