WYOMING MOUNTAIN LION MORTALITY REPORT

HARVEST YEARS: 2016–2018

1 September, 2016 – 31 March, 2019

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INTRODUCTION

The following report contains a synthesis of material related to mountain lion management for Wyoming from 1 September 2016 (Harvest Year [HY] 2016) through 31 March 2019 (HY 2018). The results represent an analysis of the current (4^{th}) 3-year cycle of mountain lion management in Wyoming since Commission approval of the Wyoming Game and Fish Department (WGFD) Mountain Lion Management Plan in 2006 (WGFD 2006). Data will be presented by hunt area to estimate local sub-population function, and summarized for Mountain Lion Management Units (MLMU) or Data Analysis Sub-units (DAU; units within the large West MLMU) and statewide via population-level harvest data and synthesizing trend data from the hunt area and management unit level. These data are intended to assess trend of mountain lion population status and to evaluate the efficacy of management strategies. These management strategies relate to mountain lion mortality, population status and viability, as well as how harvest relates to other issues pertaining to mountain lion ecology in Wyoming. Tabulated data applicable to the current management cycle is also provided in Appendices D & E.

Mountain lion mortality data were gathered annually from 32 hunt areas grouped into five MLMUs (Figure 1). The boundaries of MLMUs encompassed large areas with contiguous habitat and topographic features indicative of high quality mountain lion habitat which represent landscape-level mountain lion populations. Within hunt areas, mortality limits are developed based upon the desired local population trend. If a mortality limit was reached, the hunt area automatically closed; otherwise hunt area closure occurred at the end of the harvest season.

During mandatory inspections of harvested animals, many variables were recorded including: harvest date, location, sex, lactation status, estimated age, number of days spent hunting, use of dogs, other lions observed, as well as several other parameters. Skulls and pelts were generally presented in unfrozen condition so teeth could be removed and to provide evidence of sex and lactation status. Lactation status was used to determine age class for female mountain lions. The information gathered during inspection was used to assess sex/age structure of harvested animals. In addition to harvest data, all known mortalities were documented and quantified to better assess trends related to mountain lion mortality and determine a total impact related to human-caused mortality of mountain lions throughout Wyoming.

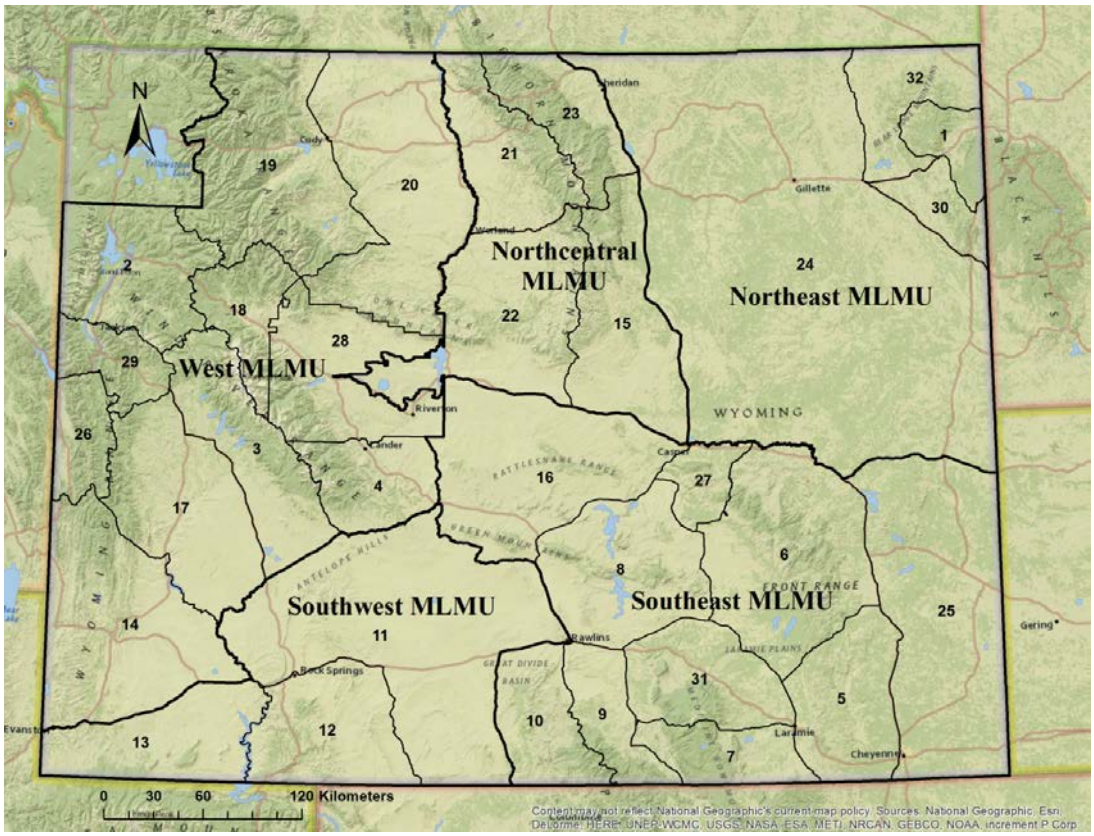


Figure 1. Hunt area and management unit map for mountain lions in Wyoming, HY2016-HY2018. Due to the large size of the West MLMU, this unit is separated into three Data Analysis Units (DAUs) including the Absaroka DAU (HAs 19 and 20), Wind River DAU (HAs 3, 4, 18, and 28), and Wyoming Range DAU (HAs 2, 14, 17, 26, and 29).

The Wyoming Mountain Lion Management Plan supports an adaptive management process, enabling Department personnel the ability to evaluate management changes as they occur by maintaining mountain lion populations in core habitat at varying densities depending on management objectives across the state. For a more in-depth explanation of data analysis techniques, harvest criteria, and discussions on statewide mountain lion management, refer to the Mountain Lion Management Plan (WGFD 2006) available through the WGFD website: http://wgfd.wyo.gov.

WGFD does not estimate mountain lion abundance or densities to manage populations. Rather, population trends are assessed through sex and age composition of mortality data (Anderson and Lindzey 2005) and an evaluation of the total mortality documented in relation to overall suitable mountain lion habitat. The density of mortality quantified by high-quality winter habitat is the

driver of the monitoring criteria used to evaluate management. Management objectives for hunt areas and MLMUs are determined by balancing mountain lion life history and ecology, public input, and biological requirements for sustainable mountain lion populations across the landscape. The sex and age composition of harvested mountain lions is compiled and analyzed for each hunt area, MLMU, DAU and statewide. Analyzing data by management units allows managers to evaluate harvest within specific hunt areas and assess the effects of harvest on regional populations. If observed trends are consistent with objectives set forth for each hunt area, changes in mortality limits are not necessary. However, if trends deviate from hunt area objectives, mortality limit fluctuations may be recommended for the next 3-year management cycle. The 3-year management cycle is utilized in order to allow enough time for mountain lion populations to respond to potential management changes and to identify trends from data collected.

WGFD utilizes a regional management strategy based on Source/Sink/Stable population dynamics (CMWG 2005) for managing mountain lions. These terms were developed by researchers and managers based on natural movements and populations of mountain lion populations at a landscape level, where Source management is akin to low levels of human-caused mountain lion mortality in order to allow for natural emigration of mountain lions. Conversely, the objective of Sink management is to reduce a local population. As in all facets of wildlife management, quantification of categorical data does not necessarily fit a black and white viewpoint, but rather is more indicative of a color spectrum; therefore categorization of hunt areas occurs on a continuum from Source → Sink based on documented mortality levels and population composition. Managing for a combination of increasing, stabilizing, or decreasing mountain lion subpopulations within MLMUs (i.e., at the hunt area level) provides flexibility to address local management concerns, while maintaining overall population viability at a landscape level. The Wyoming Mountain Lion Management Plan suggests managers strive toward a combination of Source, Stable, and Sink hunt area objectives in order to maintain population viability at landscape (i.e., MLMU) and statewide levels (WGFD 2006). Hunt area management objectives include:

1. Sink management: REDUCE local mountain lion densities.
    a) Maintain density of human-caused mortality >8 mountain lions/1,000 km^2 (386 mi^2) suitable habitat.
    b) Achieve adult female harvest >25% of total harvest for two seasons.
    c) Progression in mean age of harvested adult females should decline to <5 years old.
2. Stable management: STABILIZE local mountain lion densities.
    a) Maintain human-caused mortality density between 5-8 mountain lions/1,000 km^2 (386 mi^2) suitable habitat.
    b) Adult female harvest should not exceed 25% of total harvest for more than one season.
    c) Maintain intermediate aged adult females (mean approx. 4-6 years old) in the harvest. Adequate age evaluation may require averaging age data over time to achieve meaningful sample sizes.
3. Source management: MAINTAIN OR AUGMENT local mountain lion densities.
    b) Maintain density of human-caused mortality <5 mountain lions/1,000 km^2 (386 mi^2) suitable habitat.
    c) Maintain adult female harvest <20% of total harvest.
    d) Maintain older-age adult females in the population (>5 years old). This will be difficult to identify without additional sampling due to low sample size from harvest, but would be expected for lightly hunted populations.

It is important to note that monitoring criteria (mortality density, proportion of adult females in the harvest, average age of adult females harvested) used to assess population status cannot be used singly when evaluating management objectives. Density of human-caused mountain lion mortality, when coupled with percentage of adult females harvested and their subsequent age, is the most effective way to assess if a hunt area is moving toward a desired management direction over a 3-year period. The quantification of hunt area status is derived from an assessment of the three monitoring criteria in combination and additional pertinent data related to immigration/emigration from adjacent lion populations and habitat availability. Finally, the Large Carnivore Section (LCS) continues to collect new harvest information (i.e., lab results), correct any errors, incorporate compelling data sources, and update habitat estimates. Therefore,

information in this report supersedes previous reporting as the most current and up to date information on mountain lion management in Wyoming.

Acknowledging that managers rarely have precise information to measure success of management objectives, that mountain lion densities vary regionally, and that the criteria proposed here are general guidelines; these criteria should be compared to one another and applied adaptively to evaluate efficacy of management prescriptions. Applying management objectives in an adaptive management framework, where density of human-caused mortality, harvest composition, and age of harvested adult females are monitored relative to expectations (criteria above) allows assessment of whether or not management objectives are being achieved and if management strategies need to be modified to produce desired outcomes.

Relevant Changes Implemented for the 4th Management Cycle (HY 2016 – HY 2018)

It is important to note changes that have occurred in management criteria and regulations which impact mountain lion management in the state. Scientifically assessing and quantifying the impacts of harvest on mountain lion populations, in addition to how lion management relates to other issues relevant to wildlife management in Wyoming are essential for sound decision making. Evaluating and adapting management strategies (adjustment of mortality limits, season length) is the basis of adaptive harvest management. Primary changes related to general harvest regulations incurred for HY 2016-2018 were:

- The incorporation of HA 33 into HA 11 in the Southwestern MLMU (Fig. 2). The harvest limit of two for each hunt area was also combined for a new limit of four in HA 11 beginning in HY 2016. Both areas hold minimal suitable habitat and likely do not provide a strong contribution to Source/Stable/Sink population dynamics.

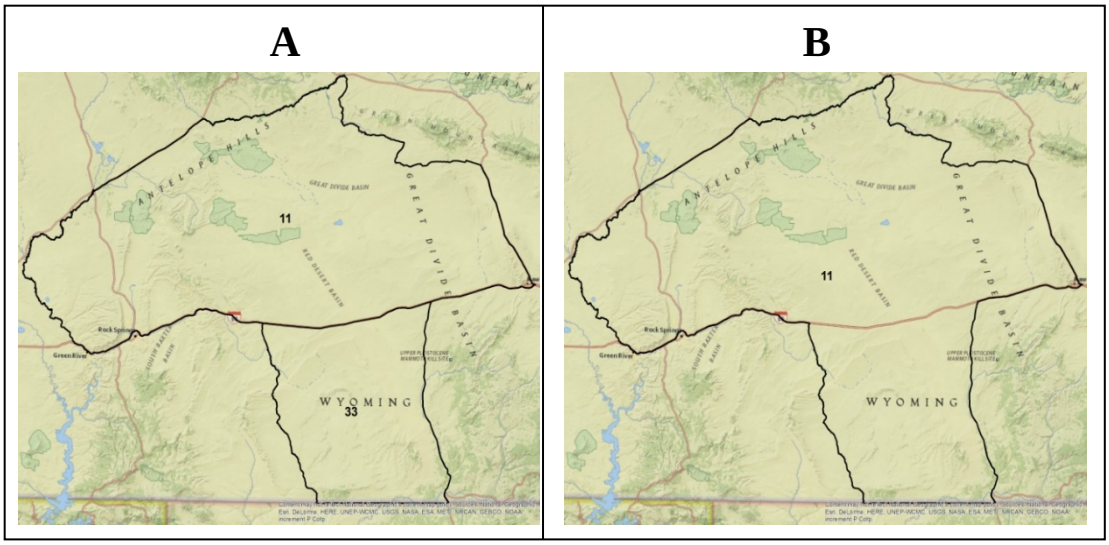


Figure 2. Combining hunt areas 11 and 33. (A) Hunt areas prior to HY 2016. (B) Merged hunt areas into new hunt area 11.

- Boundary changes for HA 19 and HA 20 within the Absaroka DAU of the West MLMU. Previously, HA 19 was oriented to the north of HA 20, with both hunt areas including areas of the Absaroka Front Range as well as considerable portions of the Bighorn Basin. These boundaries were redrawn to include most of the Absaroka front within HA 19 to be managed as a Stable/Source population. HA 20 included more of the Bighorn Basin with less suitable habitat, as well as more conflict prone areas along the northern portion of the Owl Creek Range (Fig. 3).

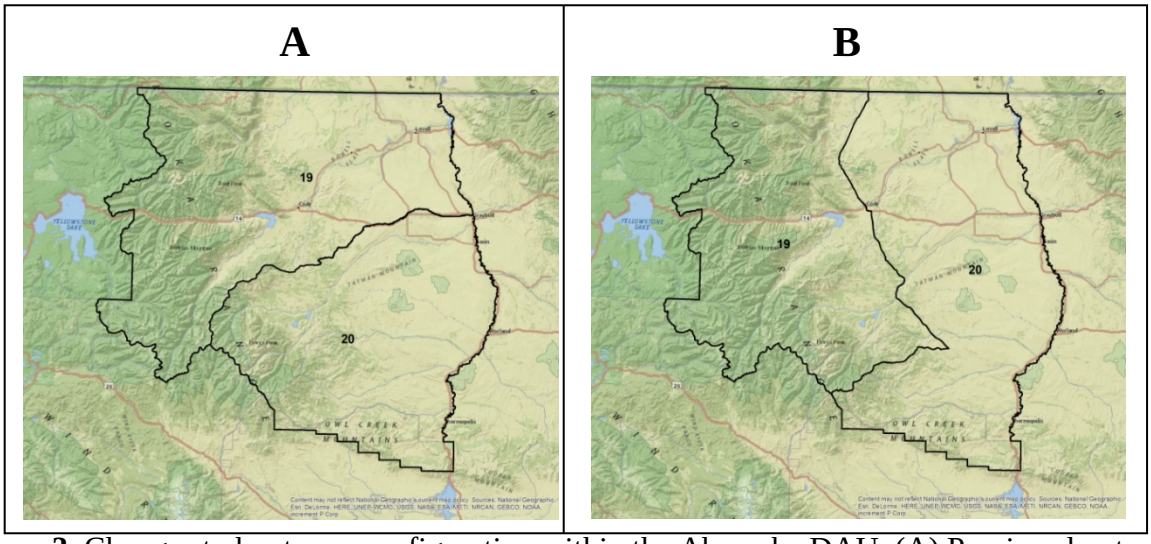


Figure 3. Changes to hunt area configuration within the Absaroka DAU. (A) Previous hunt areas represent a general north-south orientation. (B) New configuration for hunt areas 19 and 20 holding mostly the front range of the Absaroka Mountains and the Bighorn Basin, respectively.

- Slight edits were made within the Mountain Lion Hunting Regulations to clarify that female mountain lions with dependent young should not only be excluded from harvest, but not be pursued, falling under the general hunting regulation definition of “take”.
- In 2017, the Wyoming State Legislature passed House Enrolled Act (HEA) 0097, directing the Wyoming Game and Fish Commission to determine the allocation of resident and nonresident mountain lion harvest. Due to hunter overcrowding and competition for harvest, a marked increase in nonresident harvest, and mortality limits being reached quickly, the Commission approved mortality limit changes in HA 1 specific to residents and nonresidents. The new allocation directed the 24 allowable harvests to be separated so that 4 non-resident (~16%) and 20 resident harvests would be allowed in HA 1. In addition, reporting a harvest from HA 1 within 24 hours was required.

Statewide mountain lion habitat evaluation

According to WGFD’s Mountain Lion Management Plan (2006), key criteria used to estimate population trend are derived from quantifying the number of human-caused mountain lion mortalities per unit area of suitable winter habitat. Therefore, much of the current methodology is dependent on estimates of suitable winter mountain lion habitat using the most current and robust available data. Suitable habitat for much of the state has been derived from resource selection models that use model parameters such as distances to ecotones or habitat edges, slope, elevation, and aspect to predict high-quality mountain lion habitats.

These models align well to areas of Wyoming similar to the study areas used in model construction, but a variety of habitats occur across Wyoming not analagous to the habitats that the original model was derived from. Therefore, a combination of habitat modeling and local manager perspectives are used to predict high-quality winter habitat across the state, and are verified using historic winter harvest locations and mountain lion location data. We are tasked with continuing to update, improve, and refine techniques and estimates as data become available (WGFD 2006). Winter suitable habitat estimates have been updated due to recent monitoring efforts and increased availability of mountain lion spatial data (Figure 4). In this

report, updated habitat estimates are used throughout previous harvest years in order to accurately follow trends in mortality density estimates through time. Updates in mountain lion habitat do not change regional management objectives or harvest strategies, but rather allow for better assessment of population status based on the best available data.

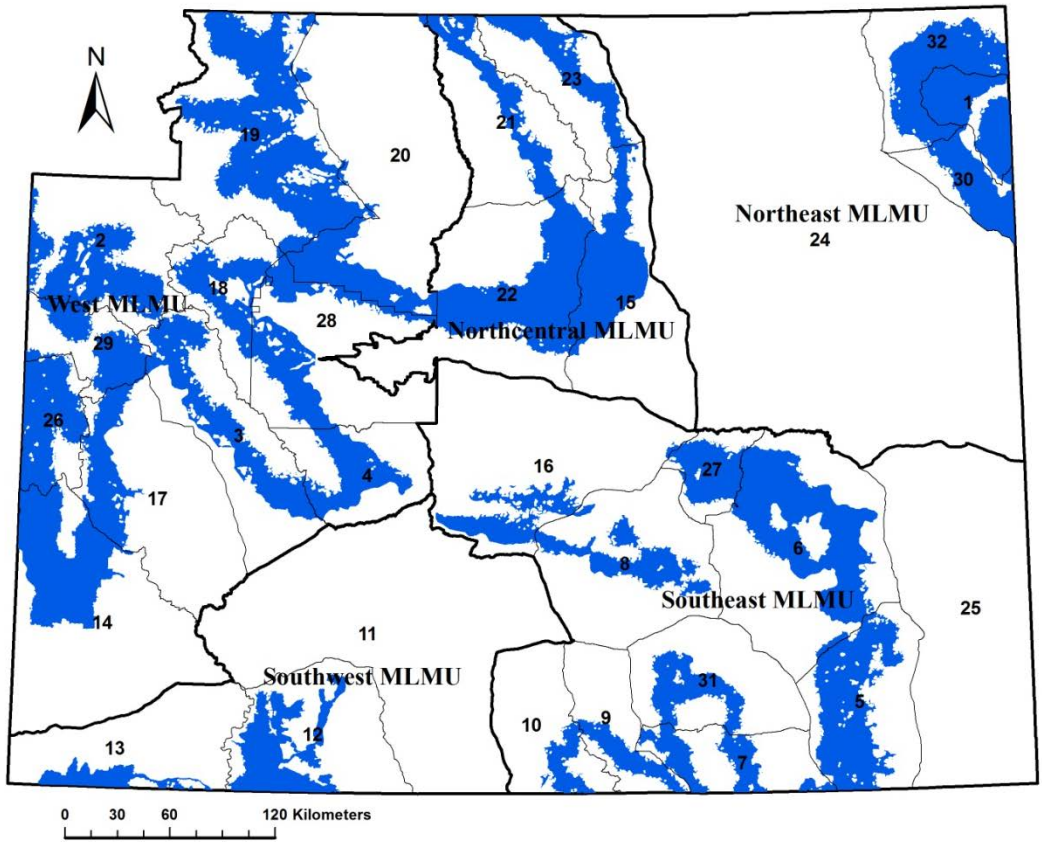


Figure 4. Current map of estimated mountain lion winter habitat in Wyoming, 2018. Habitat validation included harvest locations (n = 2,840) over 10 years (HY2007-HY2017), with a hunt area average of 86% of locations within estimated habitat.

The Source/Stable/Sink management strategy is relient upon identifying large tracts of contiguous, high-quality winter mountain lion habitat that support ecological processes such as reproduction and dispersal. Therefore, one of the adaptations during habitat assessment was to refine the map to better define large contiguous tracts of habitat. While HAs 11, 24, and 25 have habitats used by mountain lions, and do incur harvest, mortality density estimates for these areas are not calculated due to minimal habitat estimates coupled with a lack of contiguous habitat required to drive population dynamics (WGFD 2006). For most hunt areas, changes resulted in

cleaner and well-defined habitat polygons and did not significantly change predicted area or influence mortality density calculations (Appendix B. These changes increase our understanding of mountain lion habitat quality and harvest availability (Figure 5). While changes more accurately reflect mountain lion habitat use, it is important for managers to consider how mortality density thresholds in the management plan (Source < 5.0, Stable 5.0 – 8.0, Sink > 8.0) apply to each hunt area. Areas with lower mountain lion densities require lower mortality thresholds to drive trends, while areas with higher mountain lion densities can sustain higher mortality. Because of this, thoughout this report we emphasize the value of the additional monitoring metrics within the plan including the age and sex structure of harvested animals that provide key information, and mangement decisions should only be made after consideration of multiple criteria and monitoring data assessment.

HUNT AREA ASSESSMENTS

In the following assessments, each MLMU or DAU includes panel figures with data showing large-scale MLMU/DAU summary metrics (Table 1) followed by a brief overview of population level function based on subsequent hunt area level assessments that contribute to Source/Stable/Sink dynamics.

Table 1. Description of panel figures for MLMU or DAU overviews.

Mountain lion mortality and limits*	Non-harvest mortality by type
Reported mountain lion conflicts (behavioral conflict or depredation/property damage), proximity reports, and non-conflict encounters	Land status of harvests
Age/sex composition of harvest	% Males in harvest (5+ years)

* Some areas allow unlimited harvest, and are therefore represented by the last applicable and numerical limit.

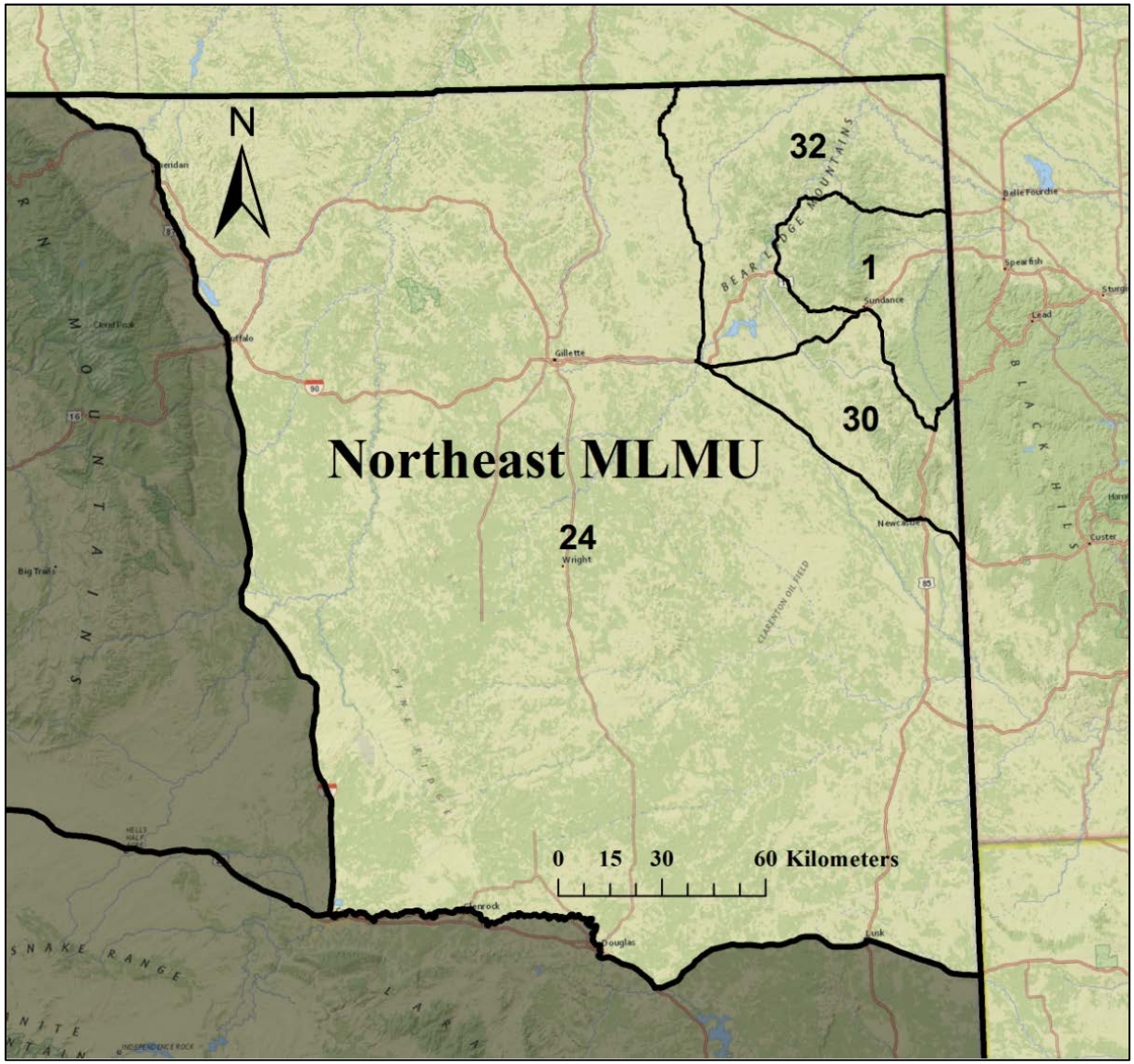
For more detailed hunt area metrics and information within MLMU/DAUs, standard panel figures by hunt area are intended to provide trend data by harvest year (HY), and include the primary mountain lion monitoring criterion #1- #3 as well as other pertinent information that lends to determining hunt area function (Table 2). Due to the large amount of information provided in this report, panel figures are not indexed within the Table of Contents.

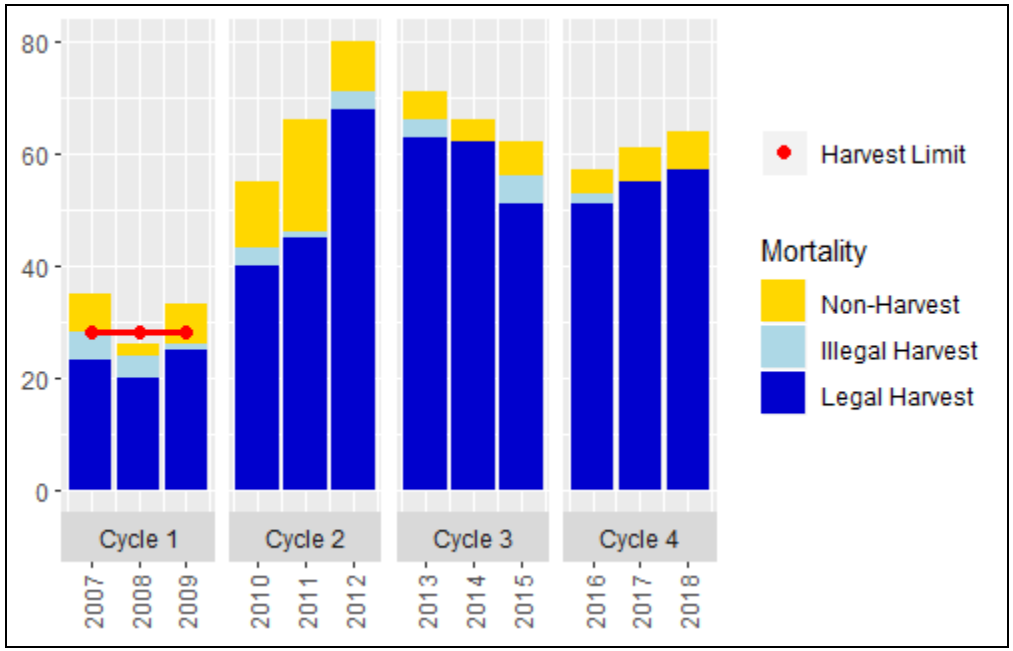
Table 2. Description of panel figures used to assess local hunt area trends. Monitoring criteria thresholds are shaded green = Source, blue = Stable, and red = Sink indicative of local population function. Red crosses throughout figures indicate the 3-year cycle average.

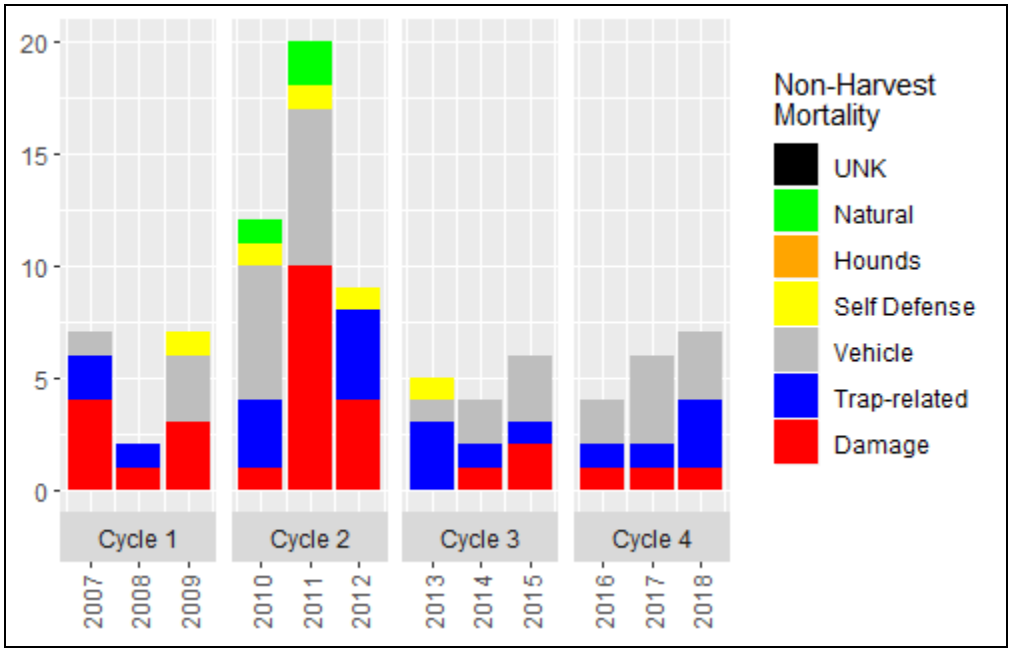
Mountain lion mortality and limits*	Mortality density – human-caused mortality/1000 km^2 habitat (Criterion #1)
% Adult females harvested (Criterion #2)	Average age of adult females harvested (Criterion #3)
Age/sex composition of harvest	Mean age of harvested animals
% Males in harvest (5+ years)	Resident/non-resident harvest

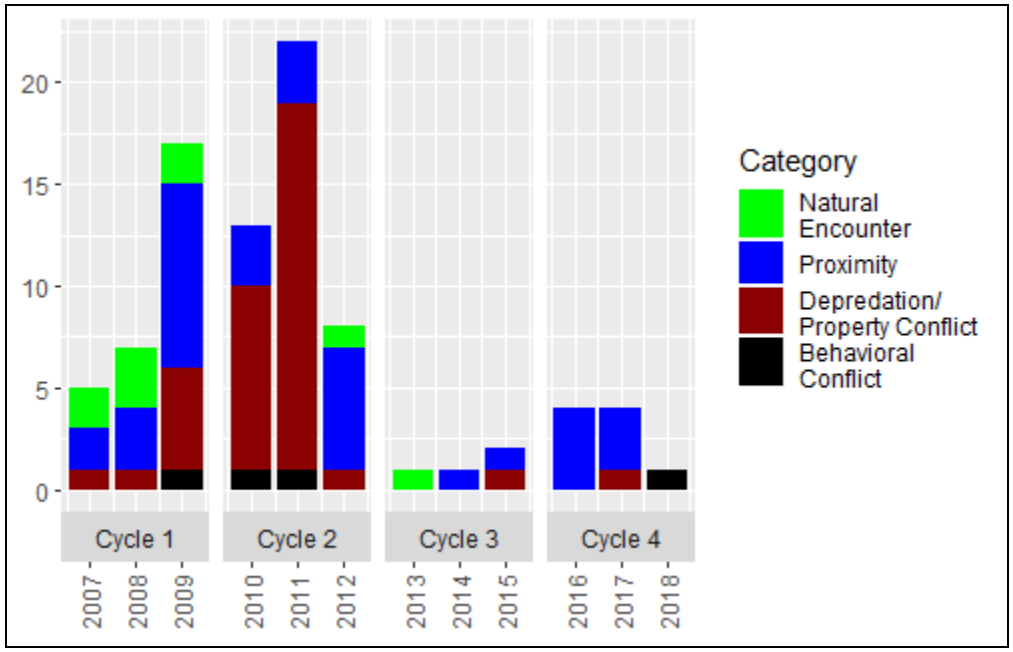
* Some areas allow unlimited harvest, and are therefore represented by the last applicable and numerical limit.

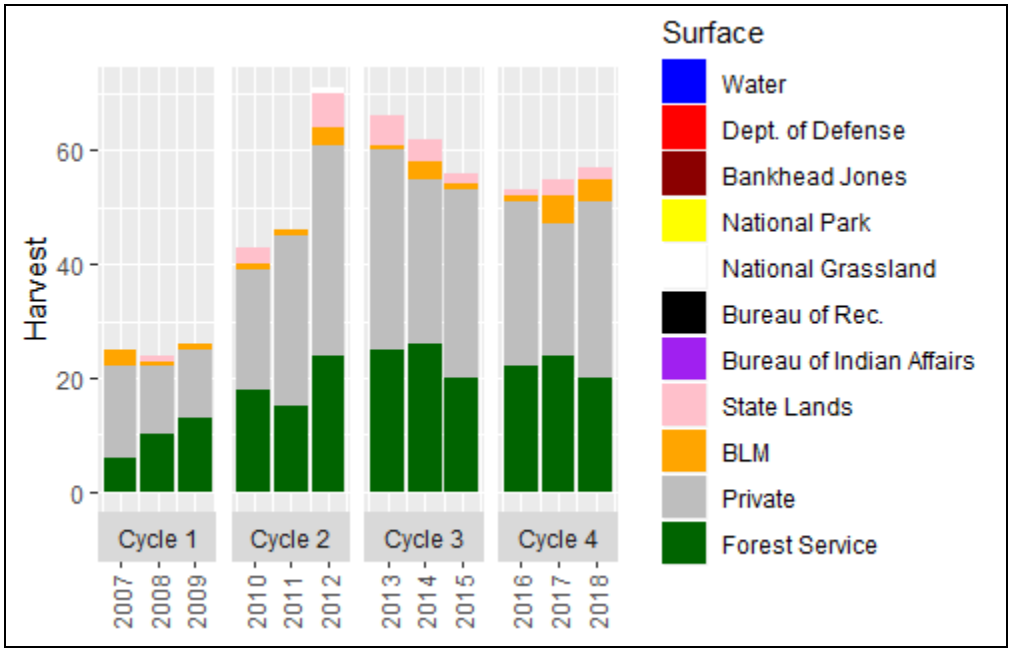
NORTHEAST MLMU

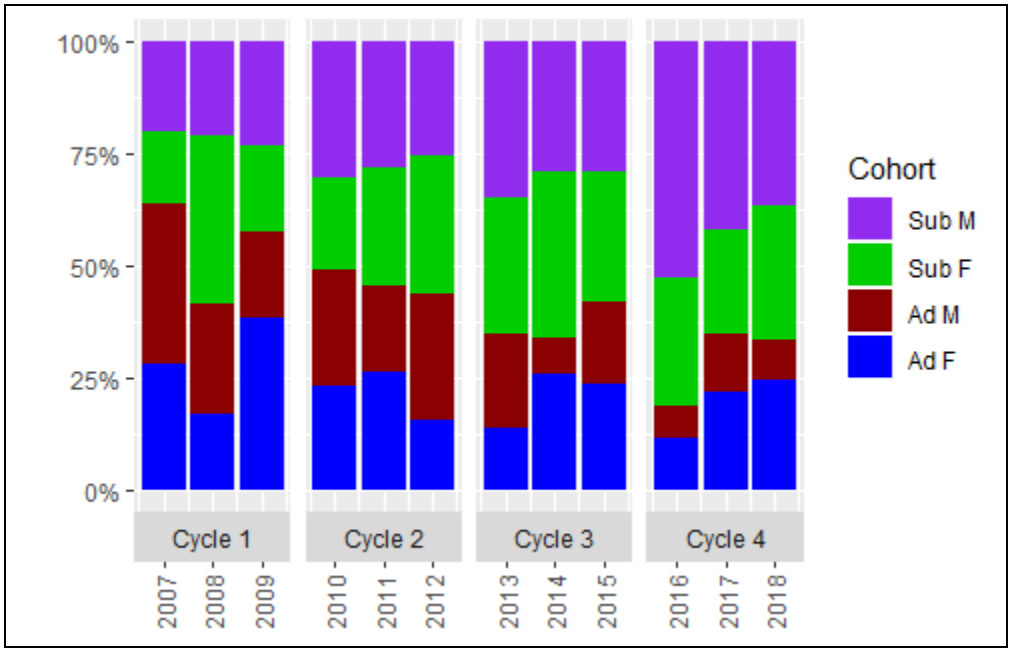


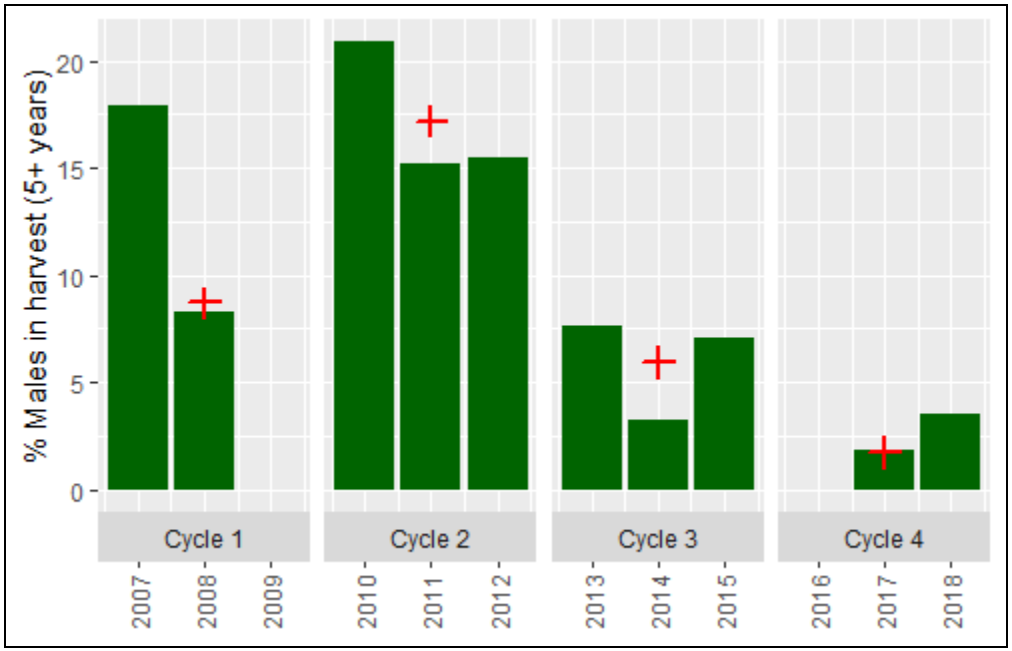

80
60
40
20
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest


20
15
10
5
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Non-Harvest Mortality
UNK
Natural
Hounds
Self Defense
Vehicle
Trap-related
Damage


20
15
10
5
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Category
Natural Encounter
Proximity
Depredation/ Property Conflict
Behavioral Conflict


Harvest
60
40
20
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Surface
Water
Dept. of Defense
Bankhead Jones
National Park
National Grassland
Bureau of Rec.
Bureau of Indian Affairs
State Lands
BLM
Private
Forest Service

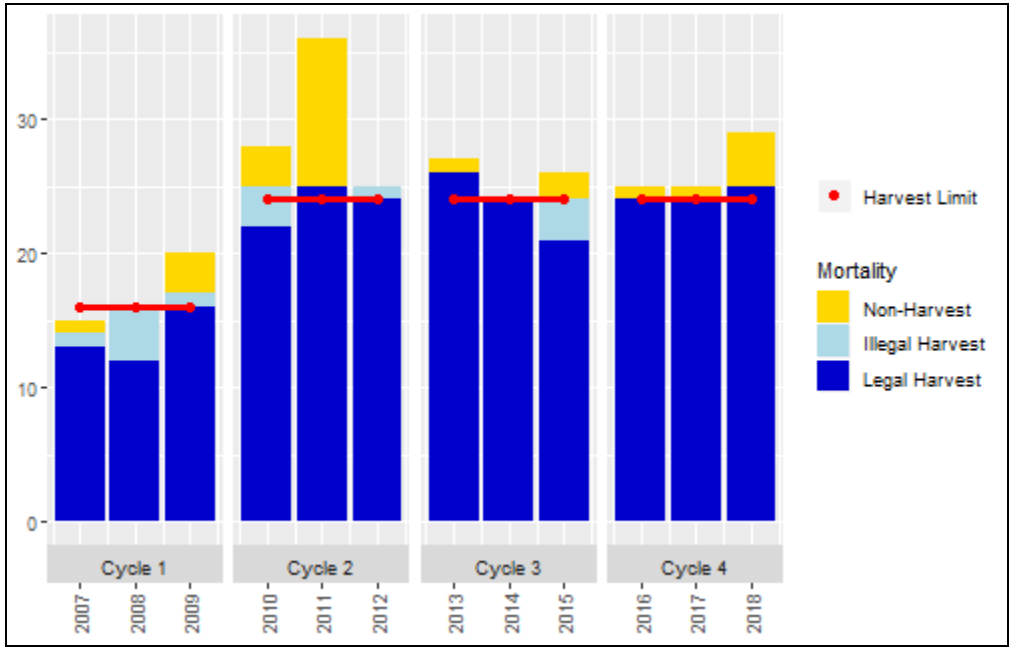


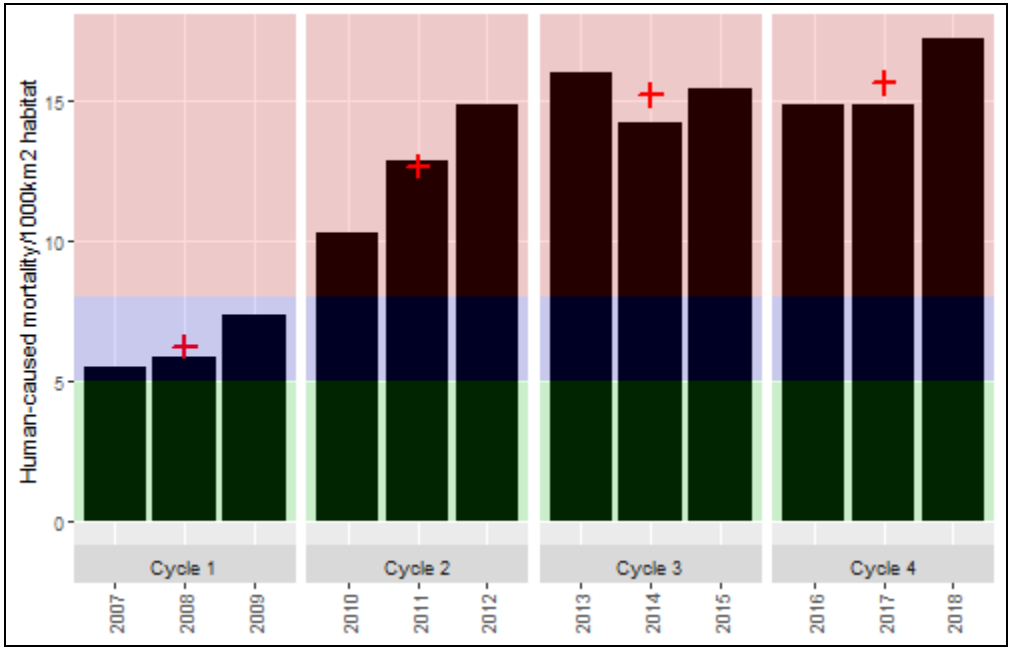


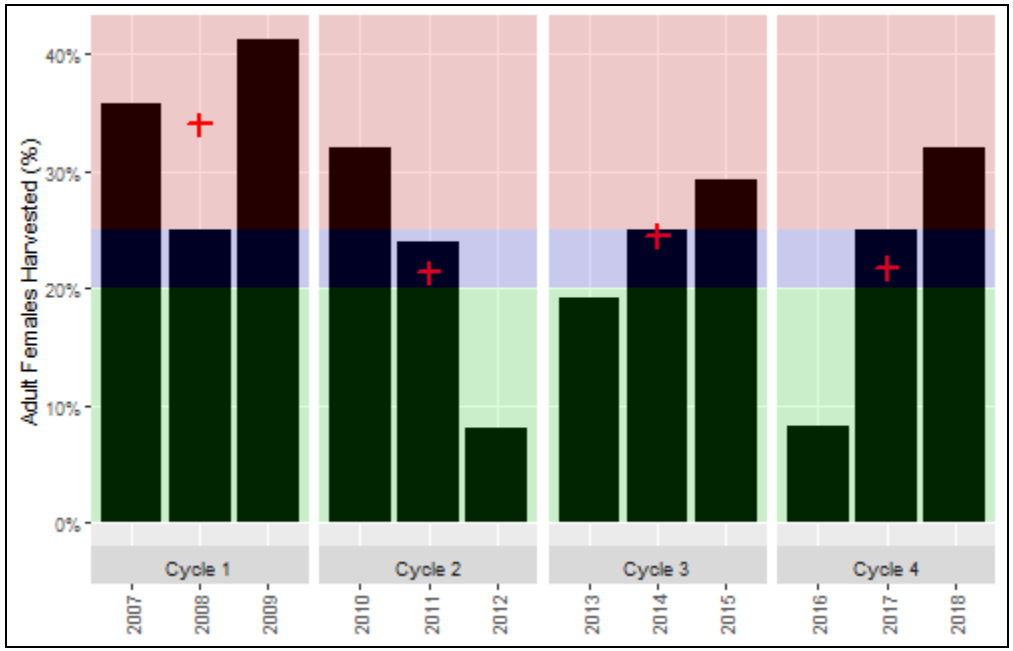
Overview

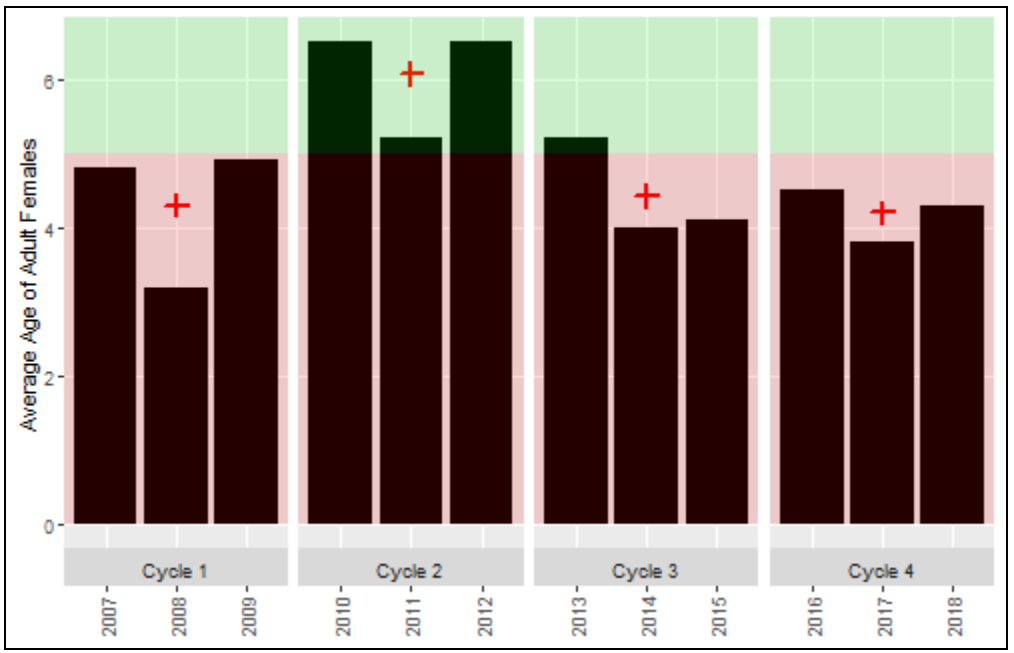
The Northeast MLMU continues to demonstrate suppressed mountain lion populations, driven by increased allowable harvest implemented during the 2nd and 3rd management cycle. HAs 1, 30, and 32 all show shifting age structure to younger mountain lions and younger adult females - harvested shortly after reaching maturity and producing offspring. HA 1 continues to reach mortality limits, while HAs 30 and 32 did not reach harvest limits during this cycle. These data indicate that objectives to reduce mountain lion densities have been successful, and HA 1, 30, and 32 are classified as Sink hunt areas. In general, immigration from a Source population in South Dakota will likely continue to supply young animals via immigration into the hunt areas in Northeast Wyoming.

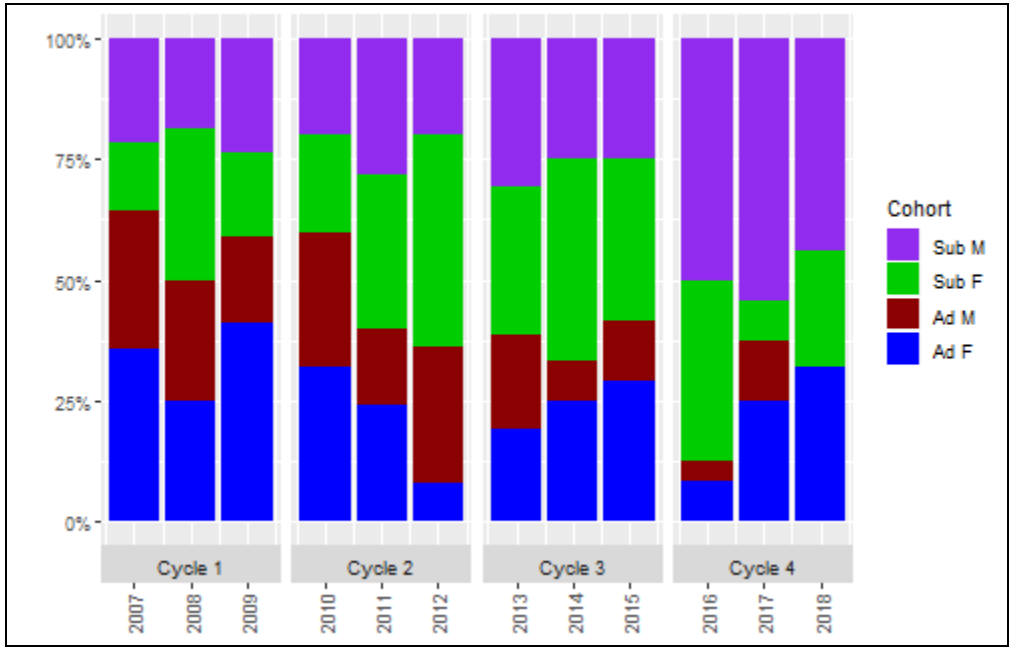
Hunt Area 1.

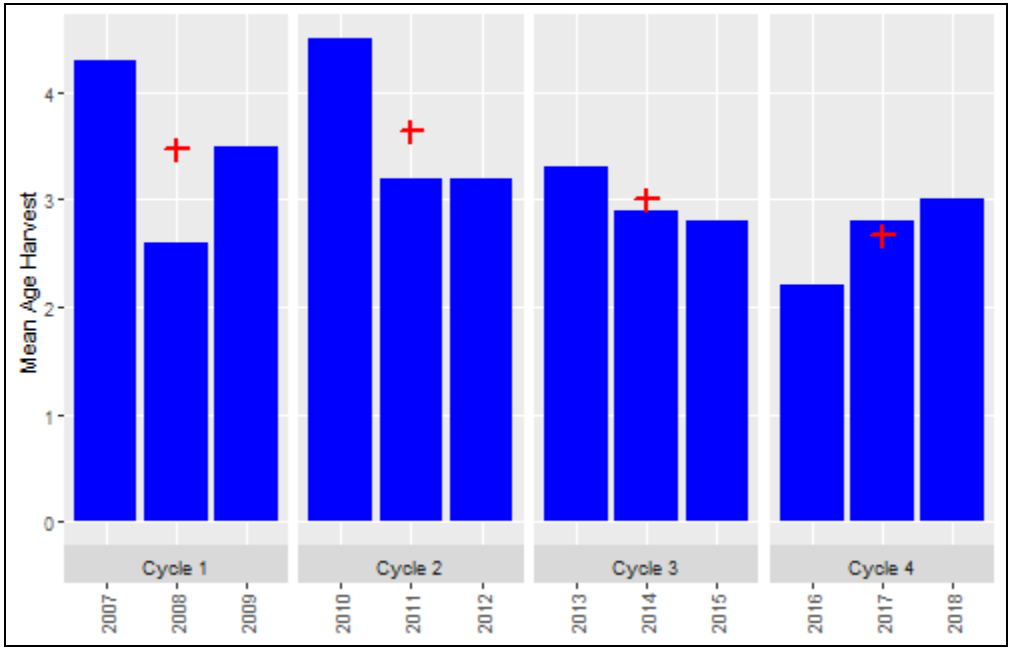

30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest

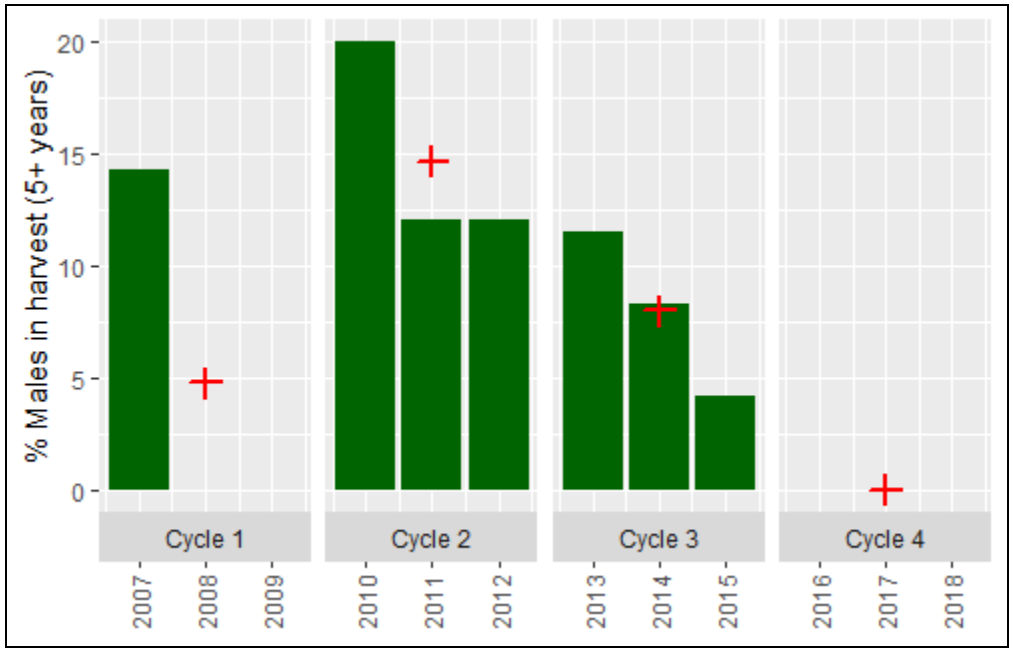

Human-caused mortality/1000km2 habitat
15
10
5
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

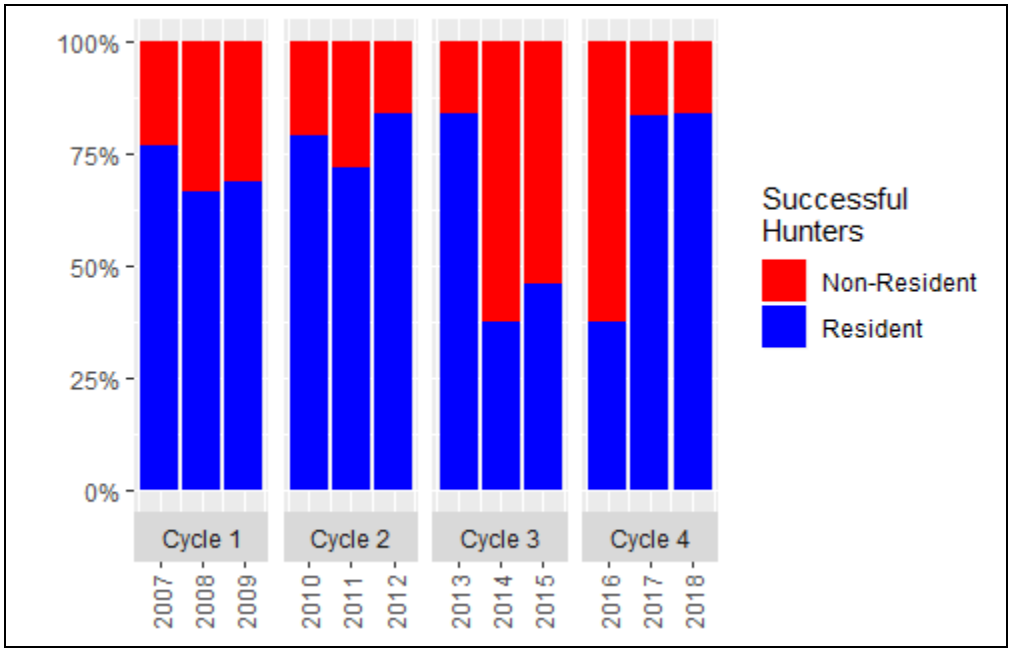

Adult Females Harvested (%)
40%
30%
20%
10%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Average Age of Adult Females
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
20
15
10
5
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

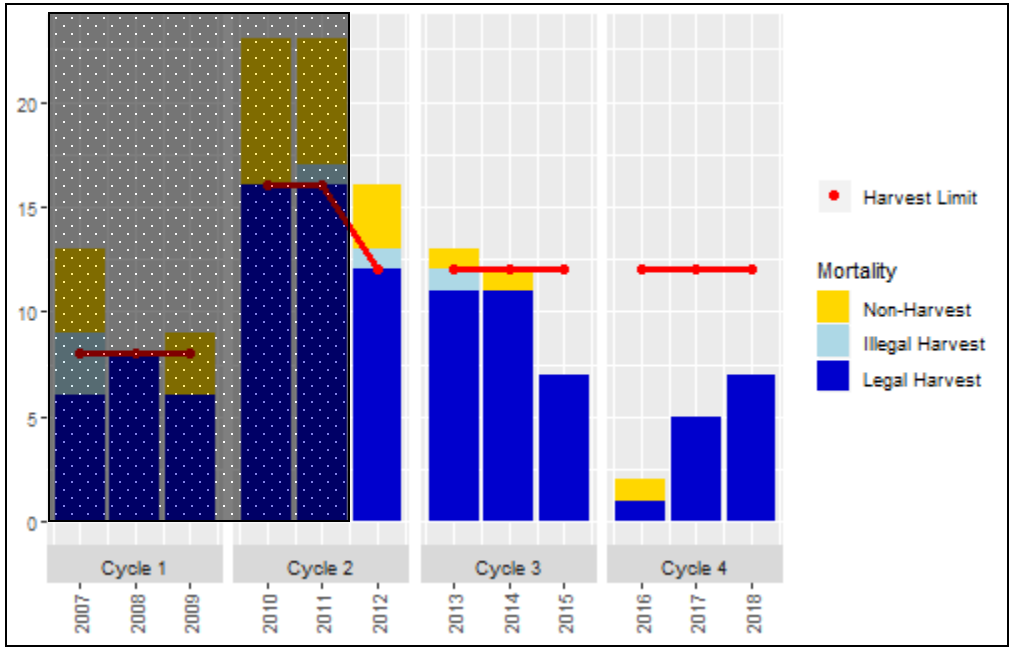
Hunt Area 1. (cont.)

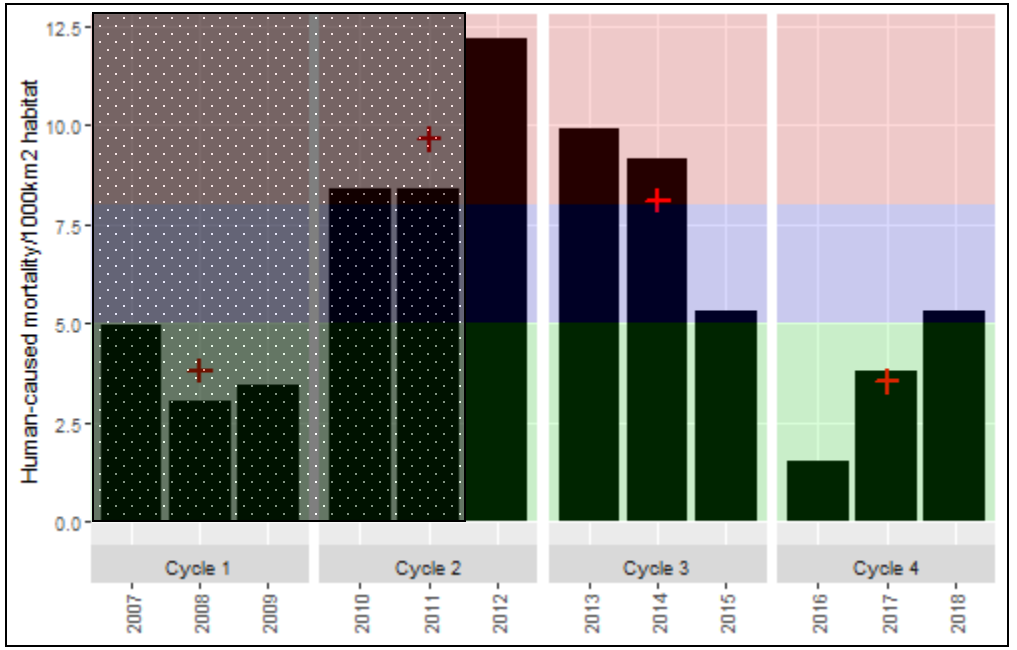
HY2016-HY2018 Regional Objective : Sink management

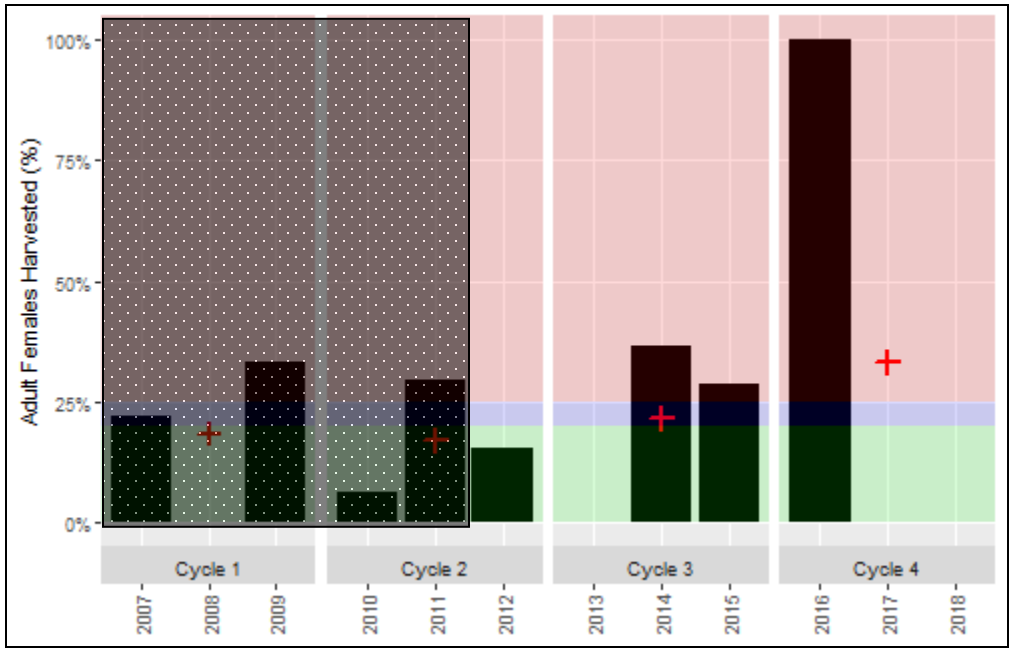
Assessment

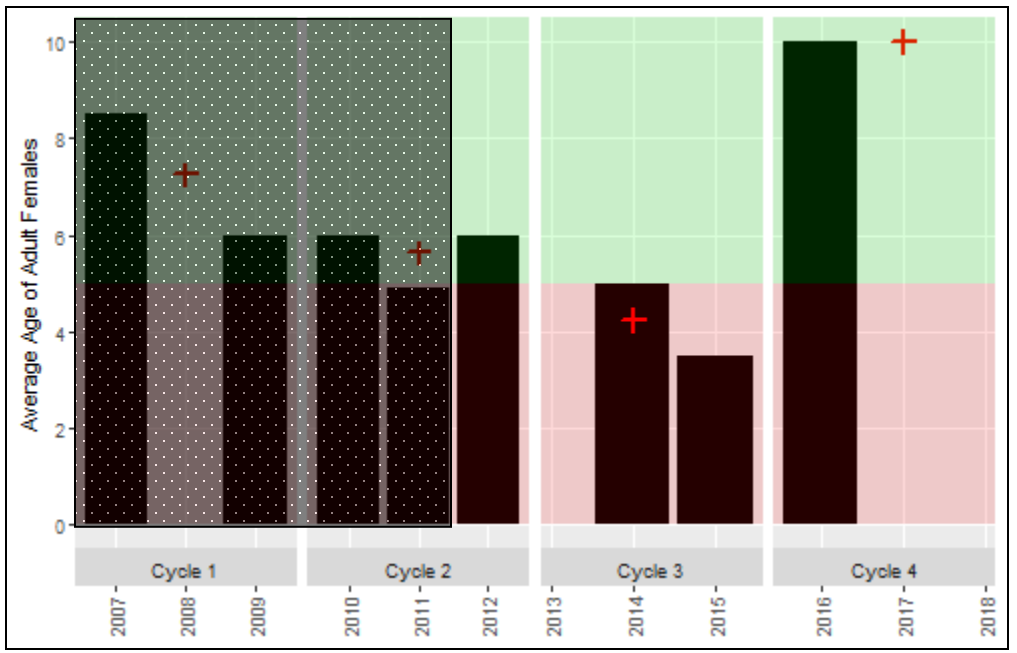
SINK: Mortality densities in HA 1 remained high and harvest limits were reached or exceeded each year since HY 2010. High harvest of adult females occurred from 2007-2010 (high of over 40%), and adult female ages have remain low, indicating less reproductive opportunity before harvest occurs. The age/sex structure in HA 1 is dominated by sub-adult animals at nearly a 75% margin for this management cycle as the overall average age for the cycle continues to decline. No adult males (> 3 year) were harvested in HY 2018 and no males 5 years or older were harvested in HA 1 during the 4th management cycle. Data indicates the objective for Sink management in this hunt area is effective. Although HA 1 is not sustaining a diverse age structure, it will continue to serve to maximize hunter opportunity via immigration of young mountain lions from the Black Hills in South Dakota that function as a Source for HA 1. Also, high road density and accessibility within HA1 allows hunter harvest to occur at relatively high rates due to the general life history and wide ranging nature of mountain lions.

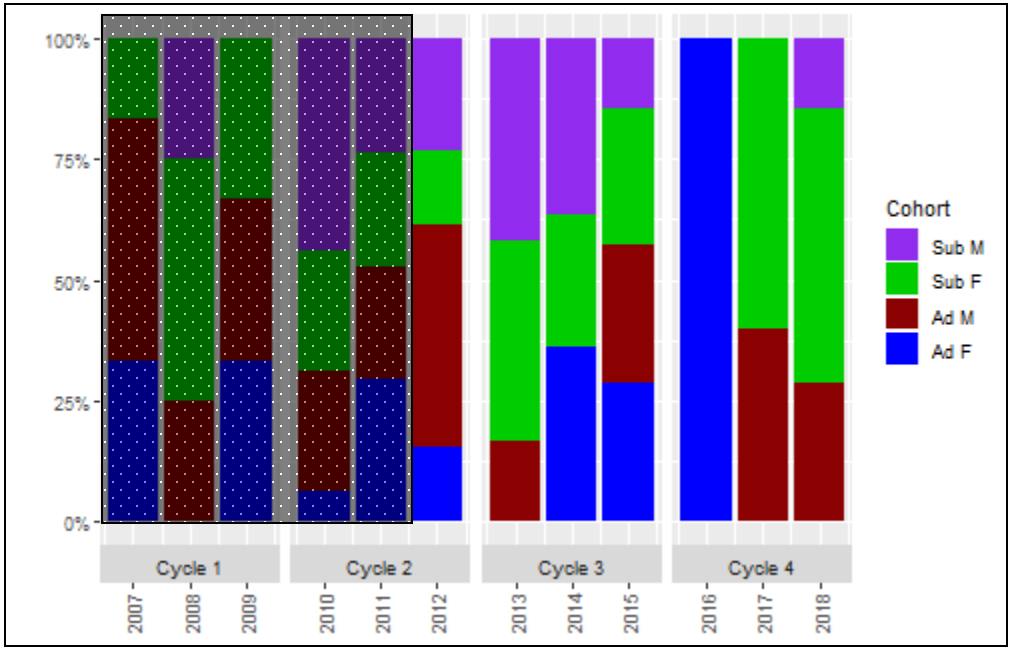
Hunt Area 30.

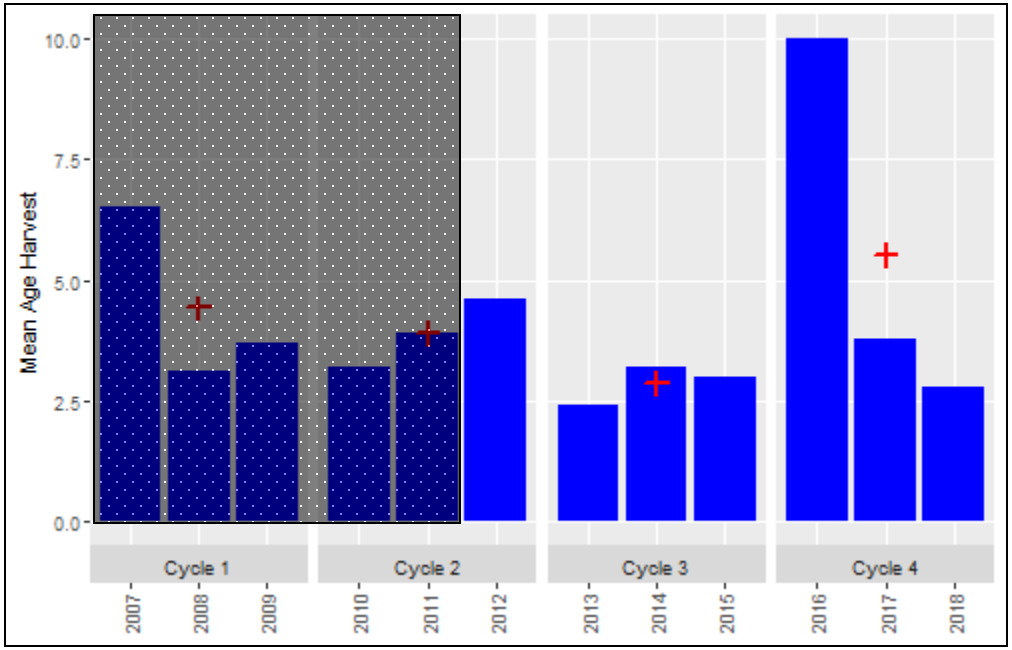

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

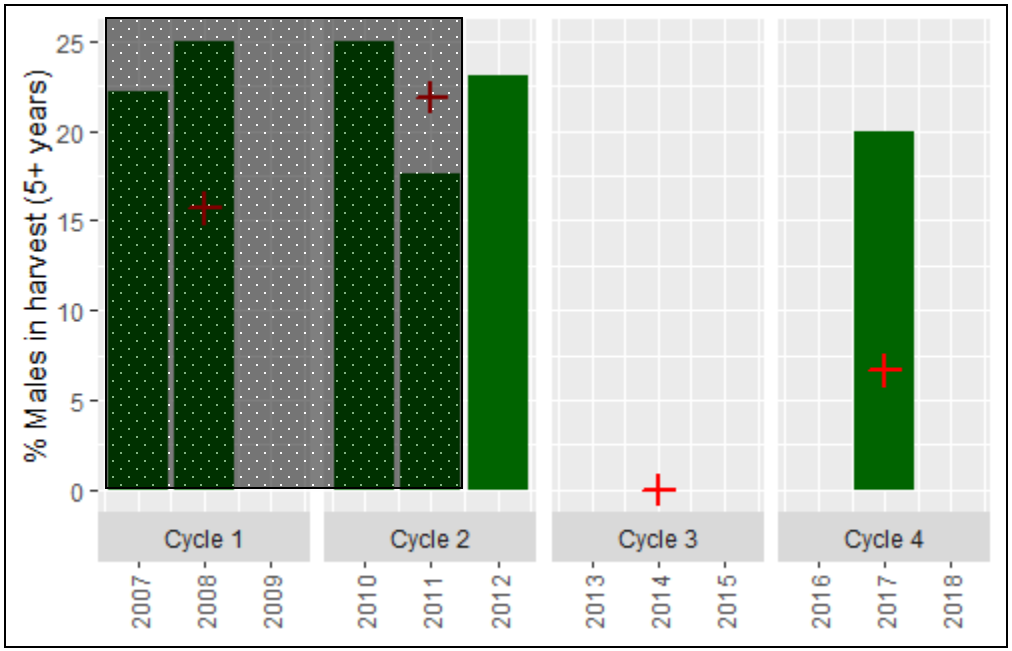

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

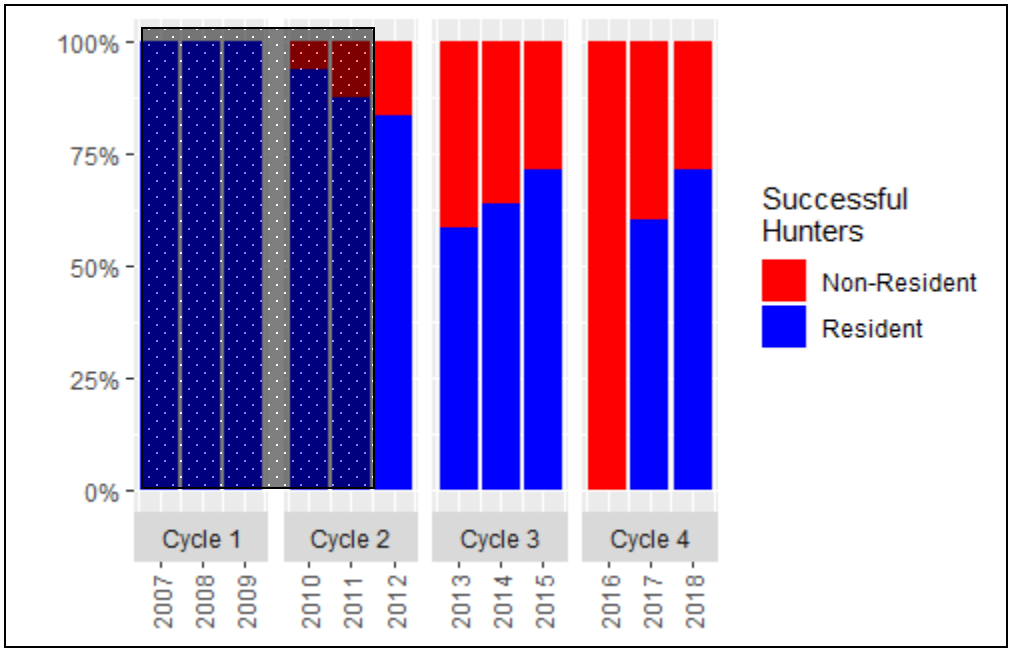

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
10.0
7.5
5.0
2.5
0.0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
25
20
15
10
5
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

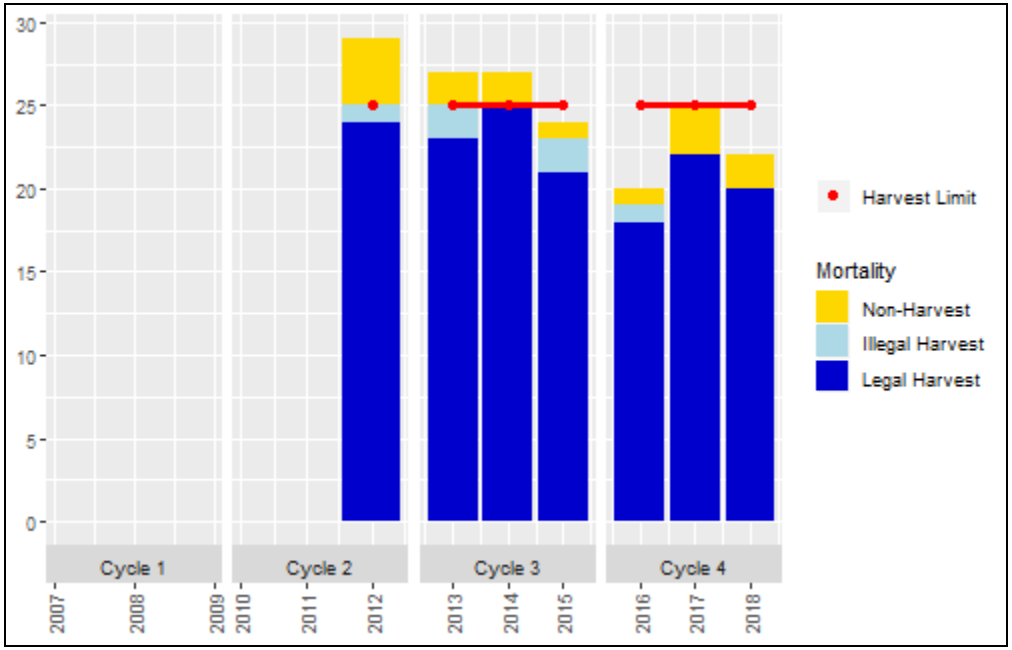
Hunt Area 30. (cont.)

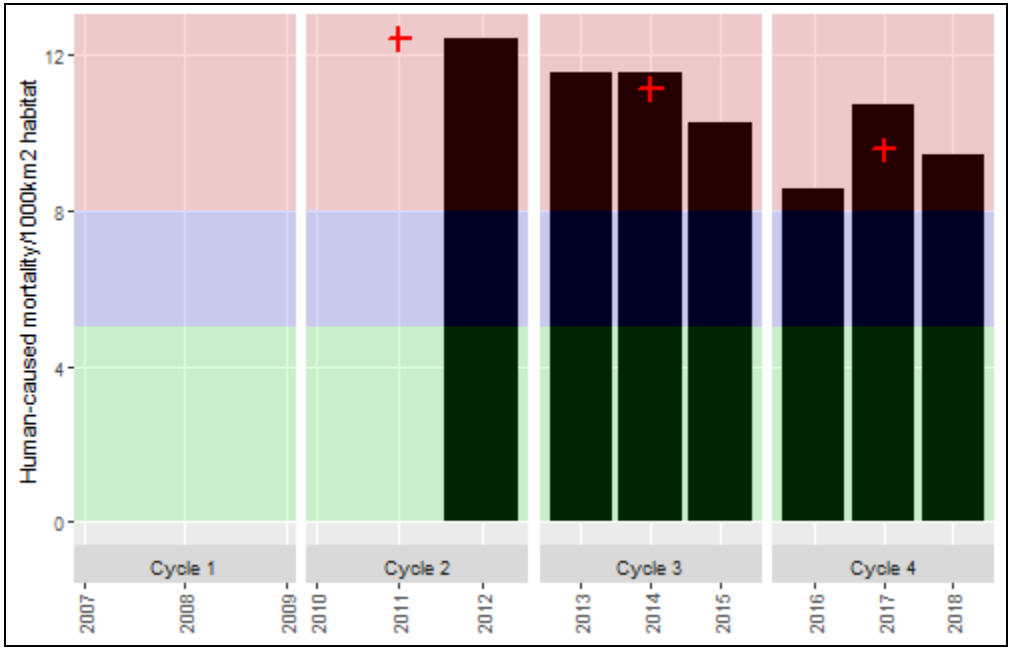
HY2016-HY2018 Regional Objective : Sink management

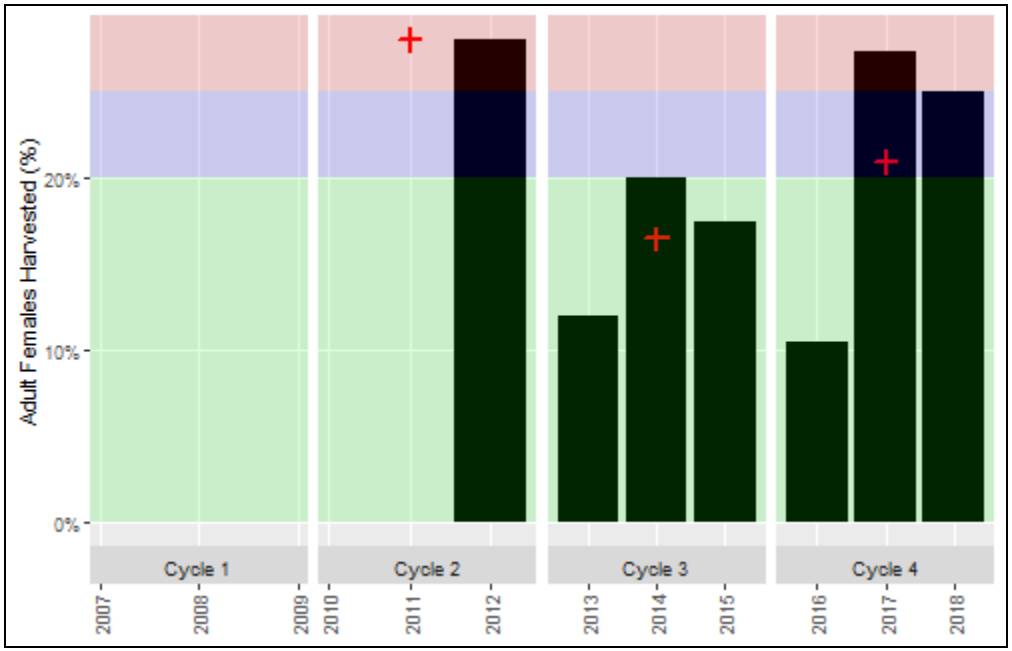
Assessment

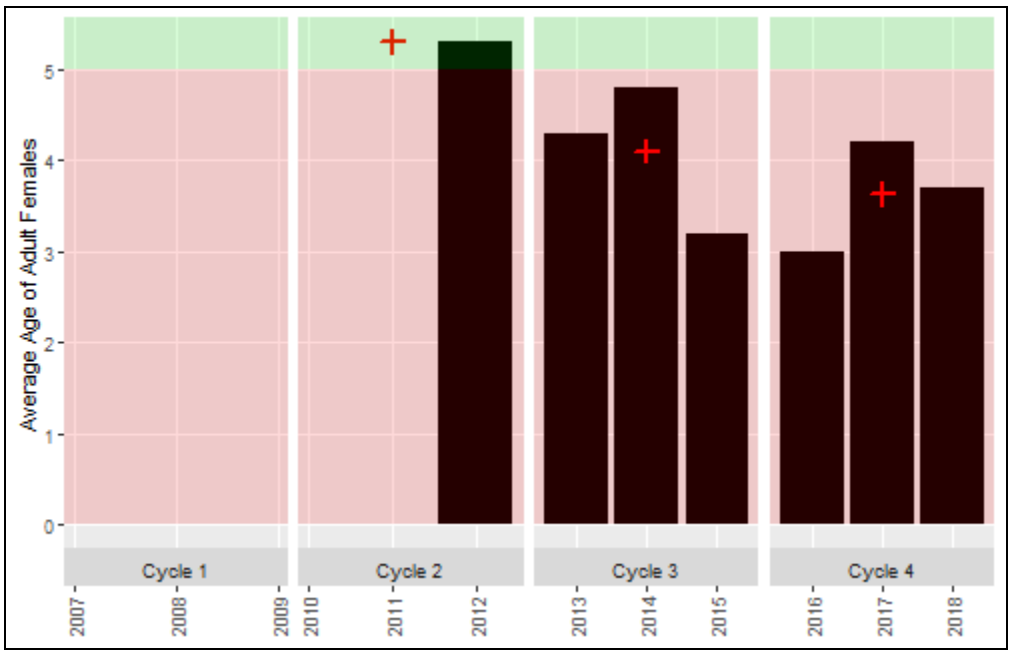
SINK: The evaluation for HA 30 added slightly more suitable habitat and may have brought mortality density estimates closer to what would be expected to drive population trends. Hunting pressure in the 2nd and 3rd management cycles coincided with higher proportions of adult females harvested and a decrease in the average age of those adult females - indicating Sink trend in HA 30. Mortality for the current management cycle is the lowest reported (e.g., 2 total mortalities in HY2016), and mortality limits have not been reached since the first two years after the partition of HA 30 forming HA 32 in HY 2012. Sporadic age/sex metrics have resulted from the low sample sizes due to generally less mountain lions on the landscape. The objective of Sink management in this area is being met. Similar to HA 1, mountain lion densities in this area are likely driven primarily by dispersal of mountain lions from South Dakota, evidenced by an evenly distributed harvest in the 3rd management cycle across the hunt area while during the 4th cycle over half of harvests occurred adjacent to the state line (within two miles). HA 30 is not likely to have the same immigration potential as HA 1, and maintaining hunting pressure will likely continue to suppress densities in the area and achieve management objectives for fewer mountain lions.

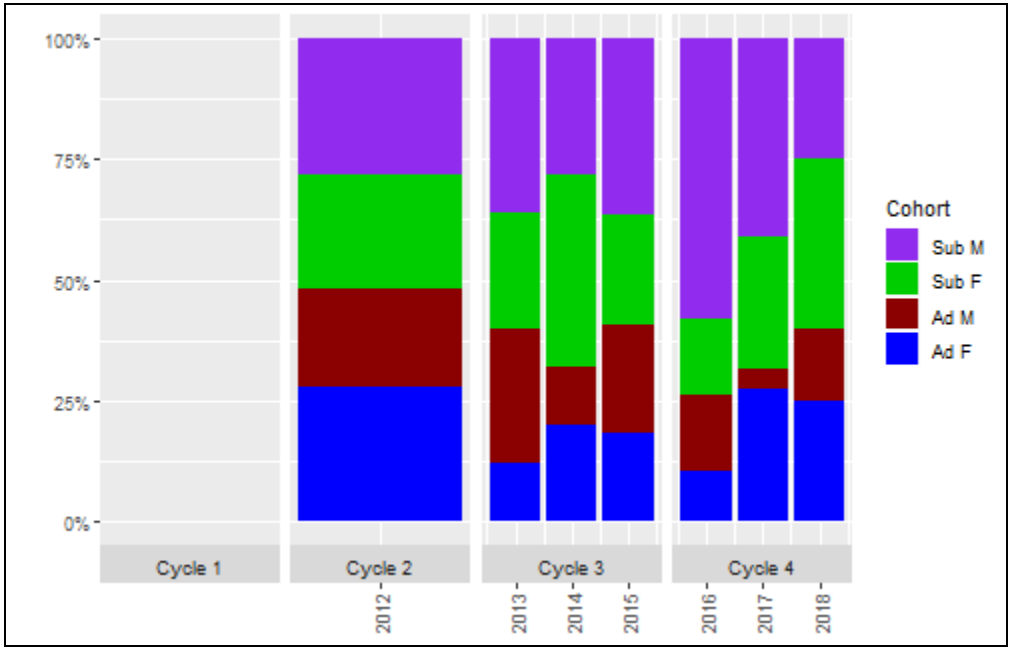
Hunt Area 32.

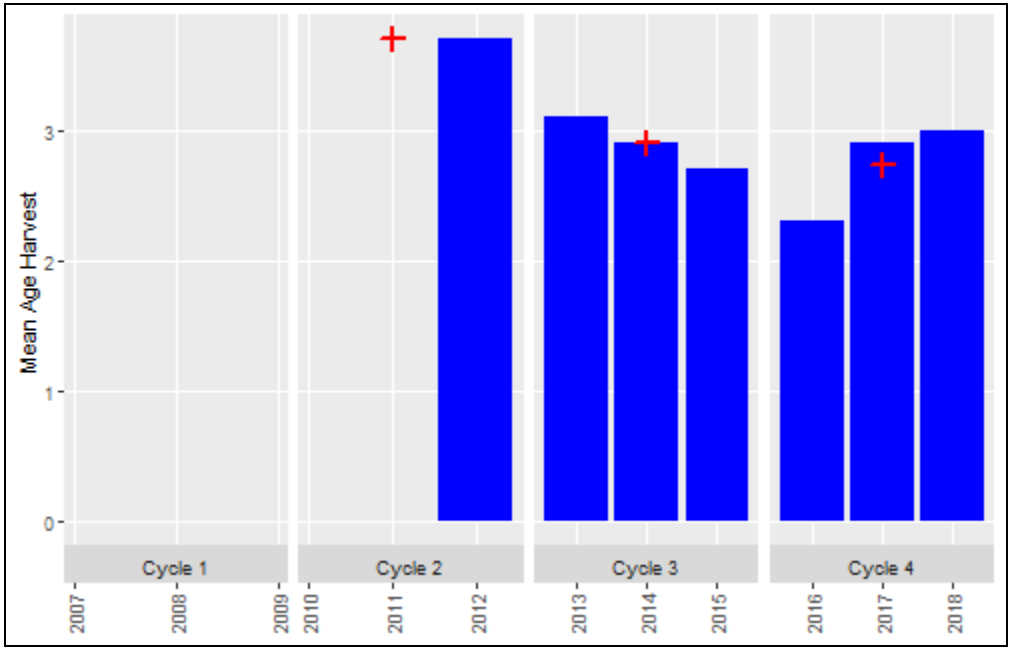

30
25
20
15
10
5
0
Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

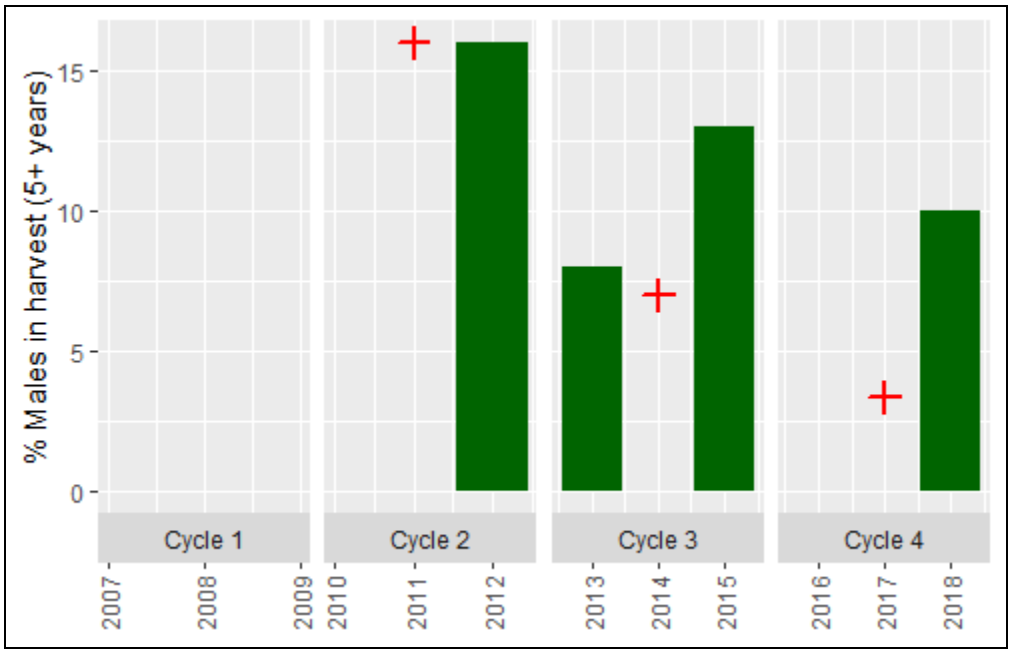

Human-caused mortality/1000km2 habitat
12
8
4
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

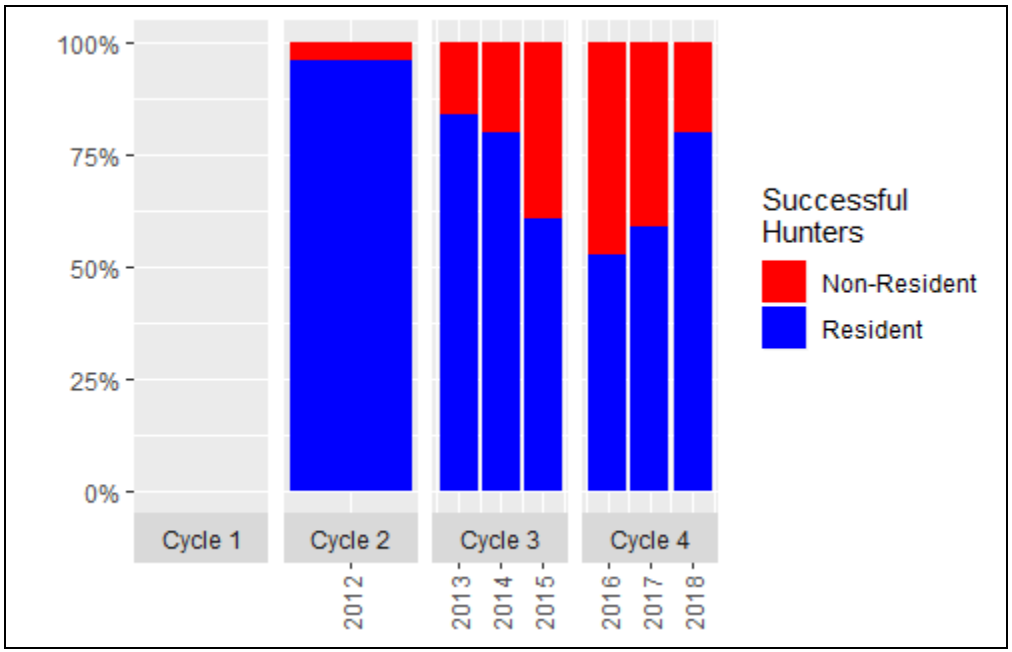

Adult Females Harvested (%)
20%
10%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Average Age of Adult Females
5
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2012
2013
2014
2015
2016
2017
2018
Cohort
Sub M
Sub F
Ad M
Ad F


Mean Age Harvest
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
15
10
5
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2012
2013
2014
2015
2016
2017
2018
Successful Hunters
Non-Resident
Resident

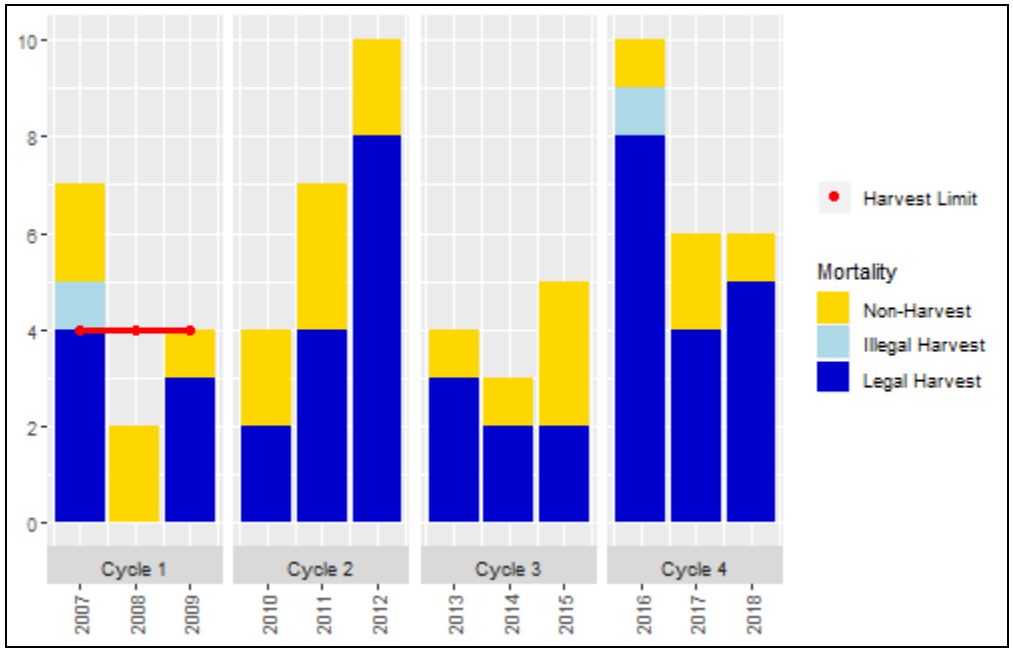
Hunt Area 32. (cont.)

HY2016-HY2018 Regional Objective : Sink management

Assessment

SINK: HA 32 was created from a partition of the northern portion of HA 30 beginning in HY 2012, with an objective to reduce local mountain lion densities in an area with mostly private land status. Proportion of adult females harvested during the current cycle were at or above 25% for the last two years, and the age of adult females, all harvested animals, and the proportion of older aged males have all decreased. HA 32 is likely functioning in similar fashion as HA 30, but due to a larger area and higher amount of suitable habitat may respond slower to harvest pressure. Data indicate the objective to direct harvest on to private lands and reduce mountain lion densities is being met.

Hunt Area 24.

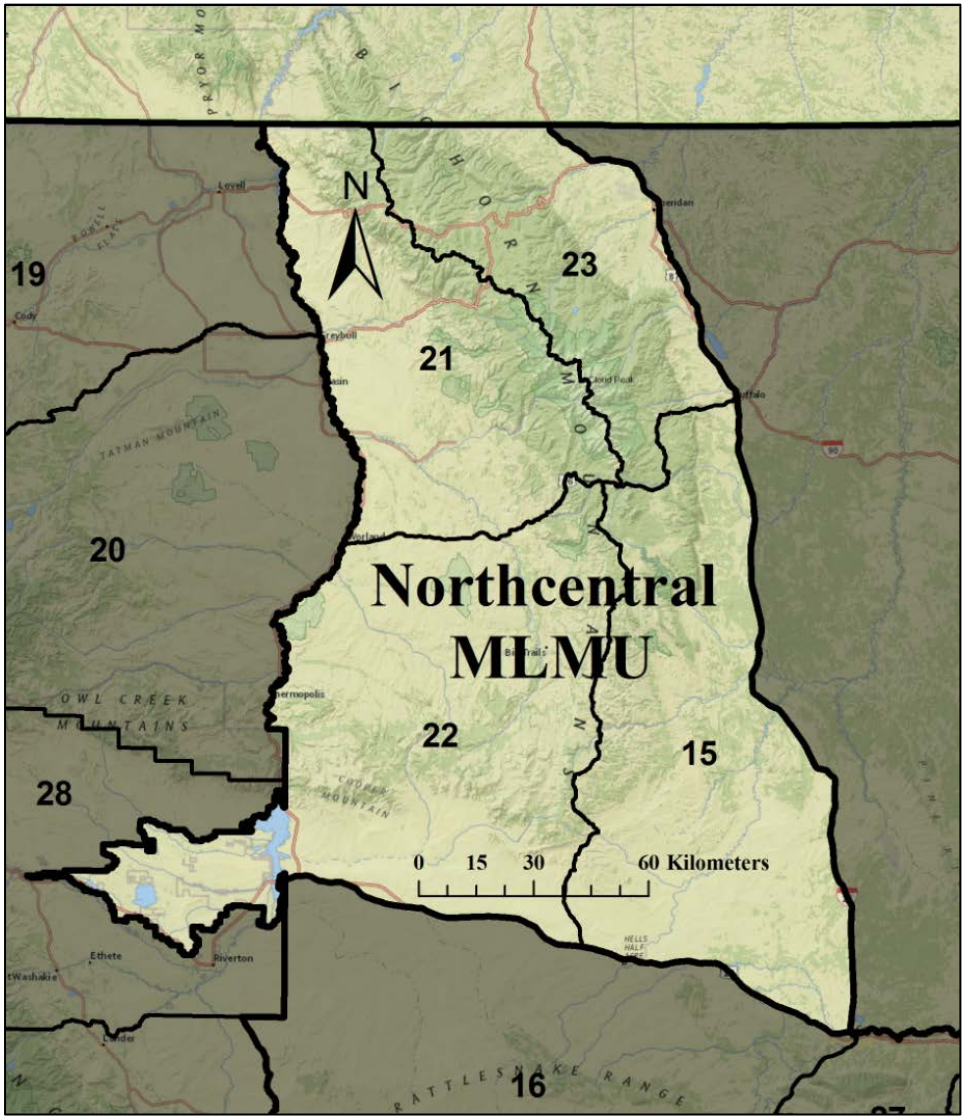


HY2016-HY2018 Regional Objective : N/A

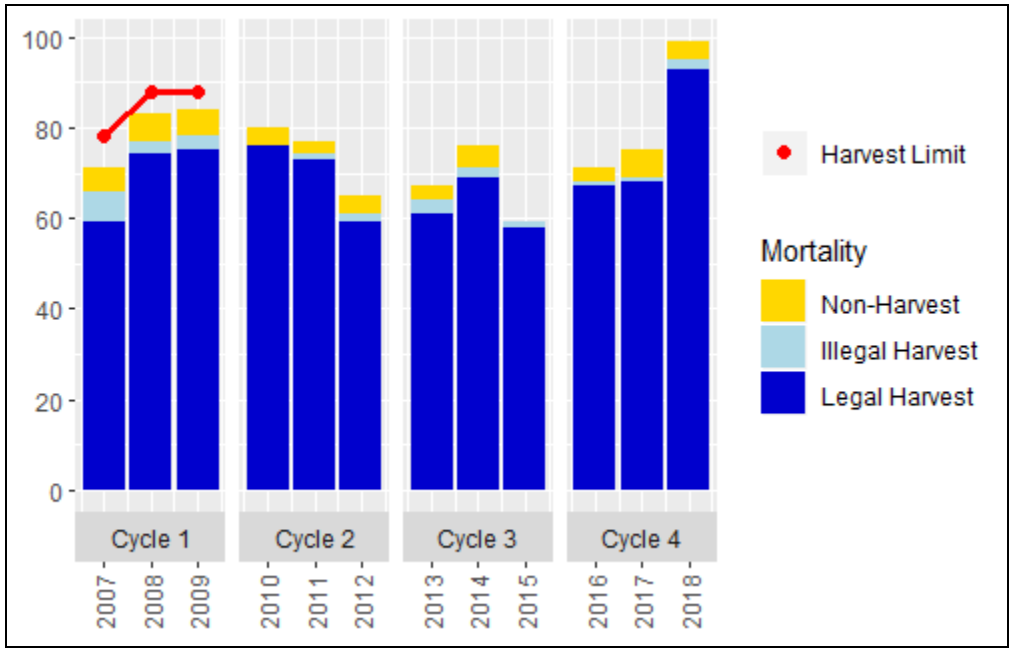
Assessment

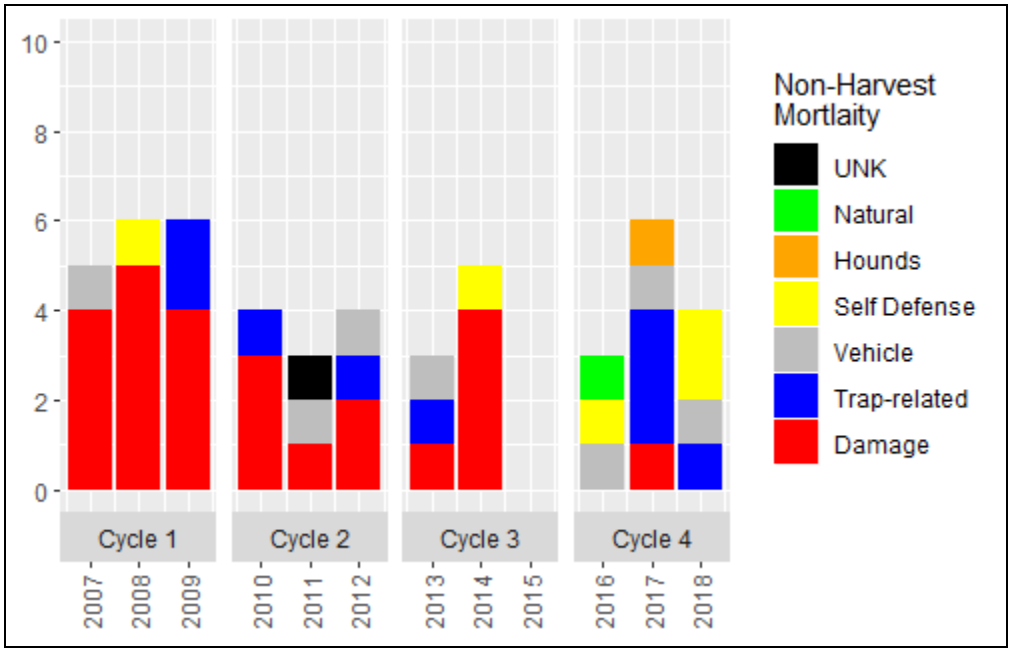
N/A: HA 24 had increased mortality during the 4th cycle. HA 24 allows unlimited harvest, has low levels of dispersed habitat throughout the area, and is not currently managed for population viability.

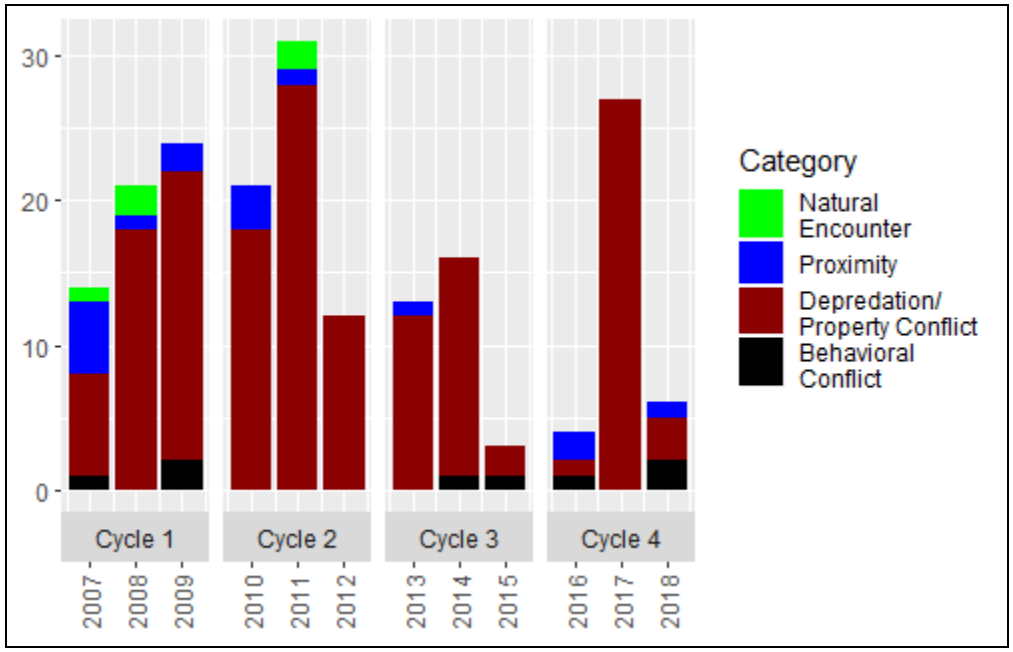
NORTHCENTRAL MLMU

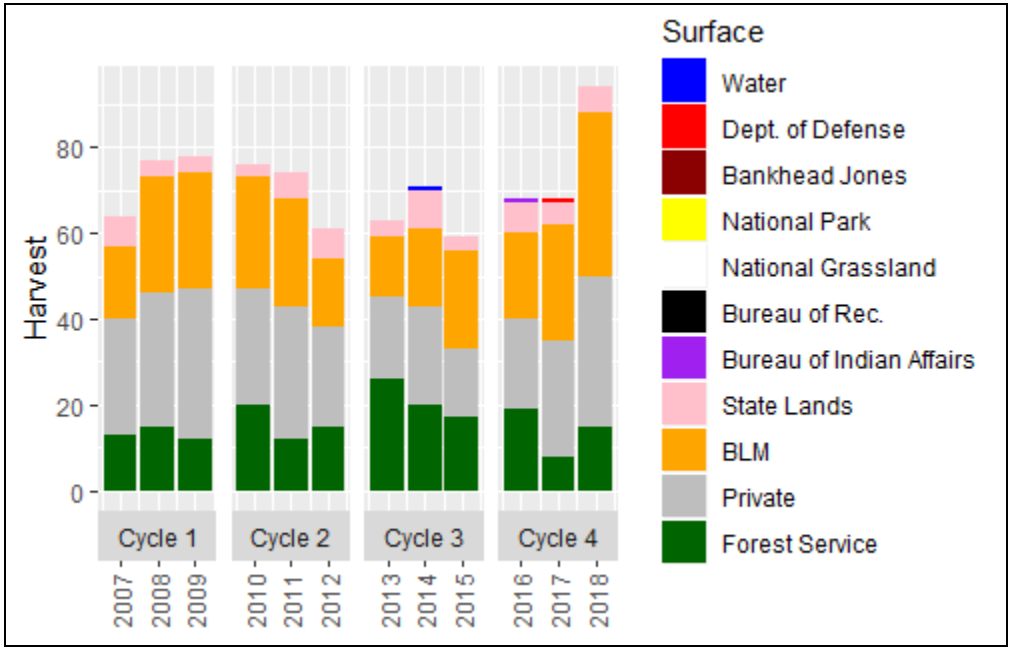


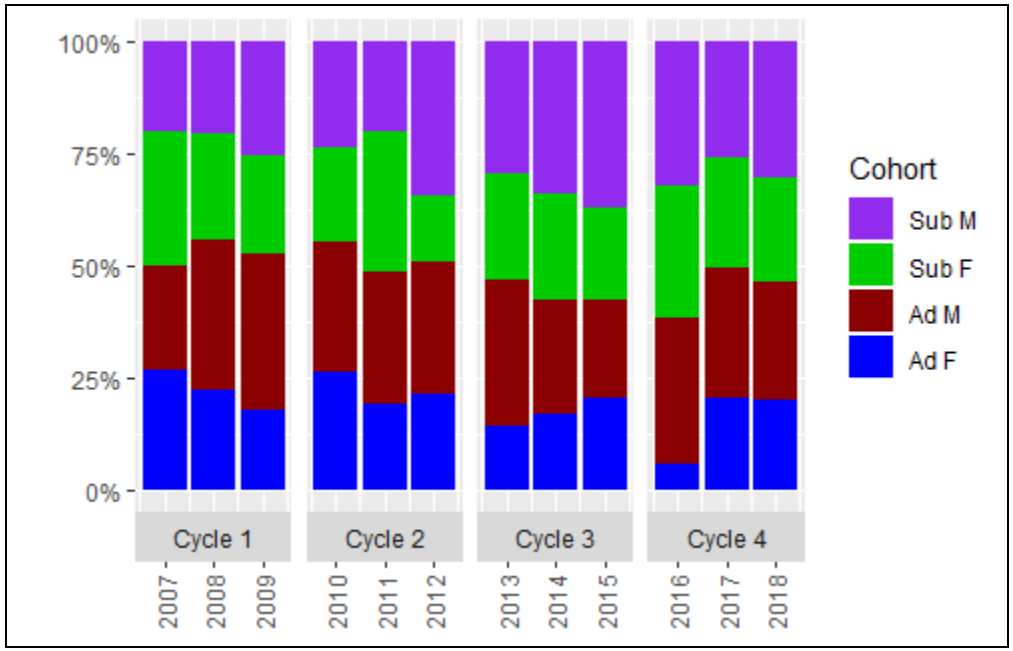
Northcentral MLMU

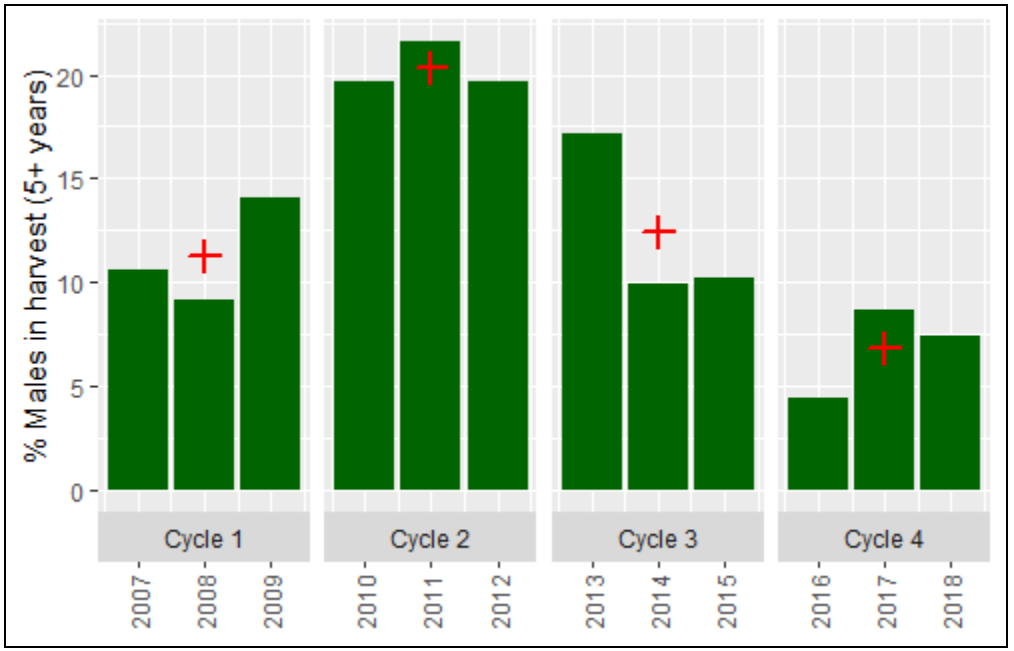








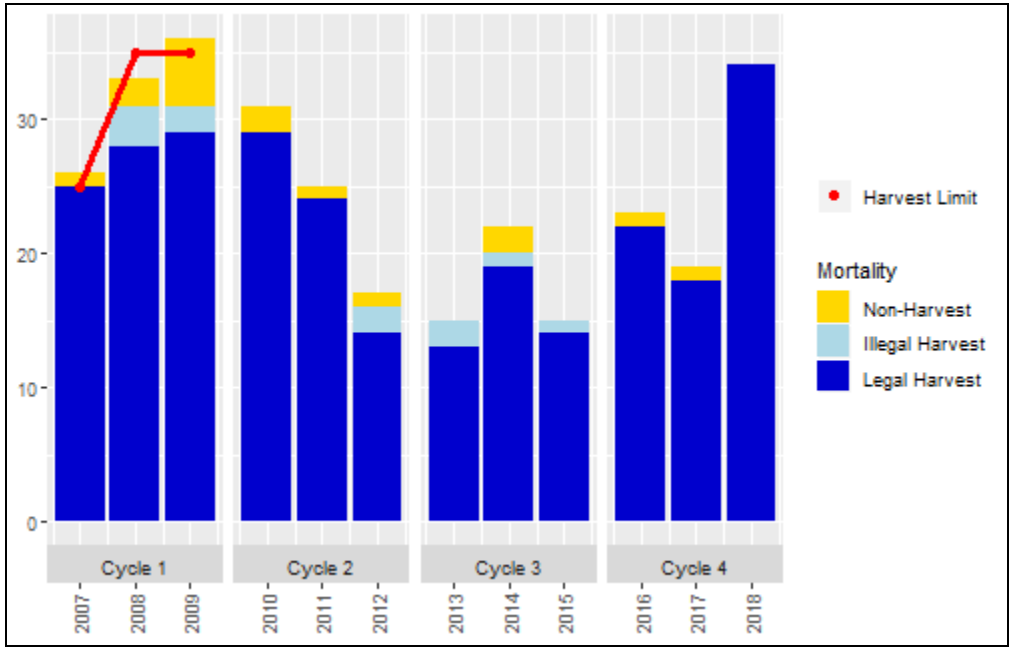


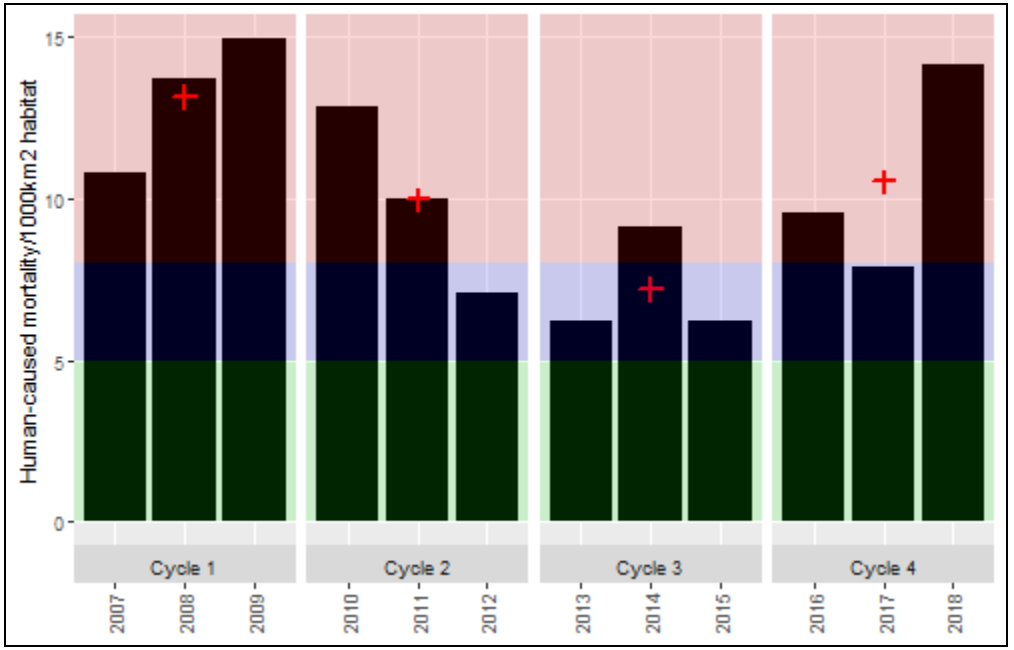


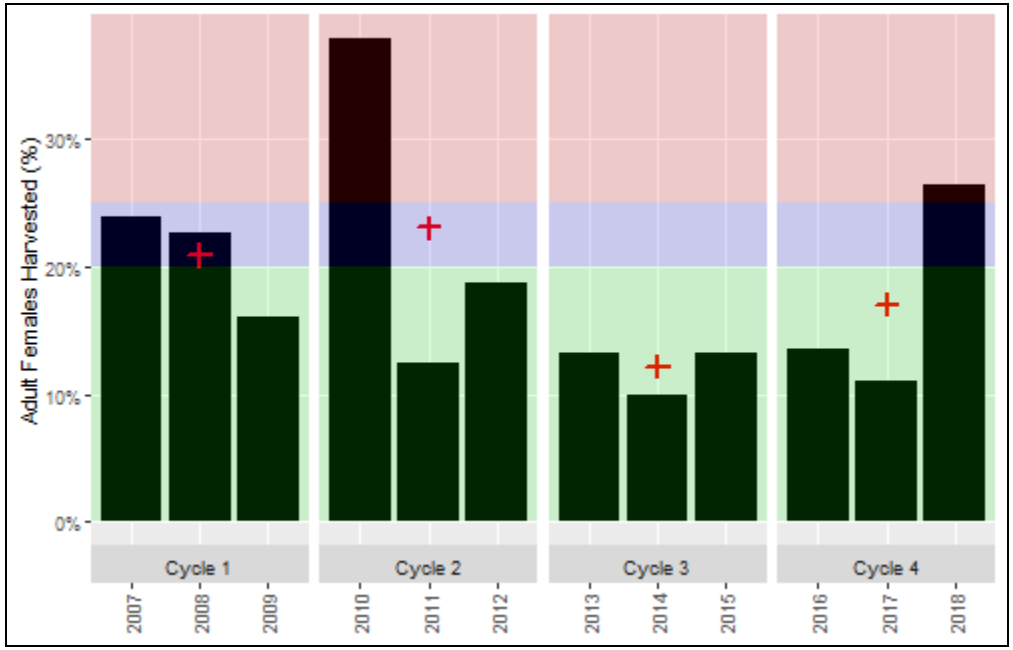
Overview

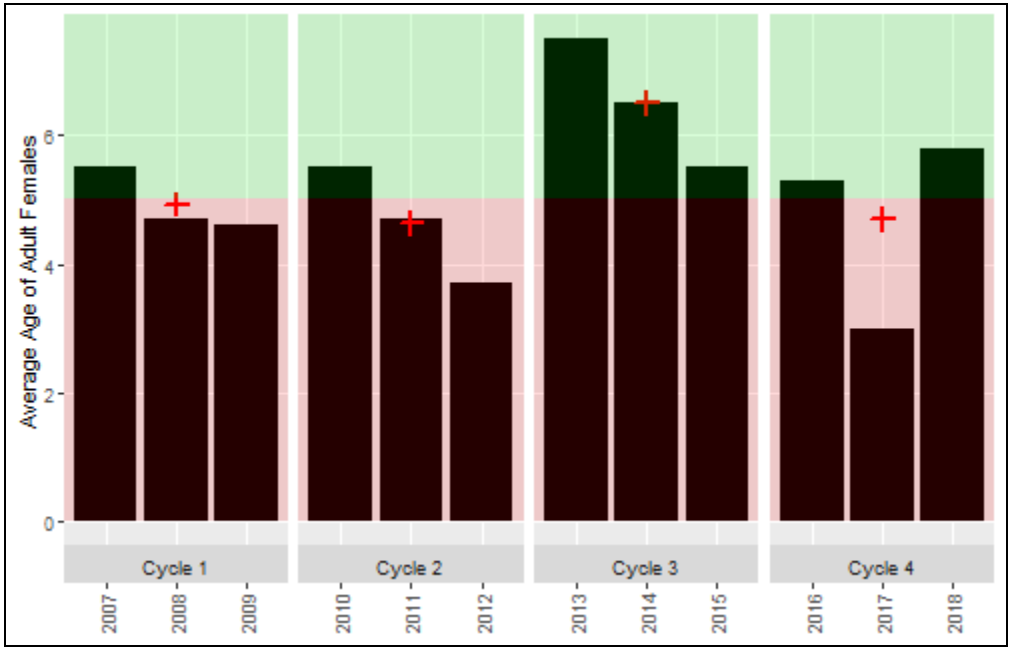
The Northcentral MLMU has most suitable habitat in the southern portion of the unit (~70%), and therefore can sustain higher harvest rates in southern HAs 15 and 22. HA 15 began allowing unlimited harvest in 2010 that resulted in high harvest pressure to reduce populations primarily related to conflict potential with sheep grazing operations; however, this area saw multiple years of low harvest rates after implementation of unlimited harvest potential. HA 22 has shown trends toward more stability in age structures through time, and an increase in harvest over the past few years continues to move HA 22 toward younger aged animals. HAs 21 and 23 in the northern Bighorn Mountains have been slowly shifting age structure toward younger animals as well, although HA 23 to a higher degree.

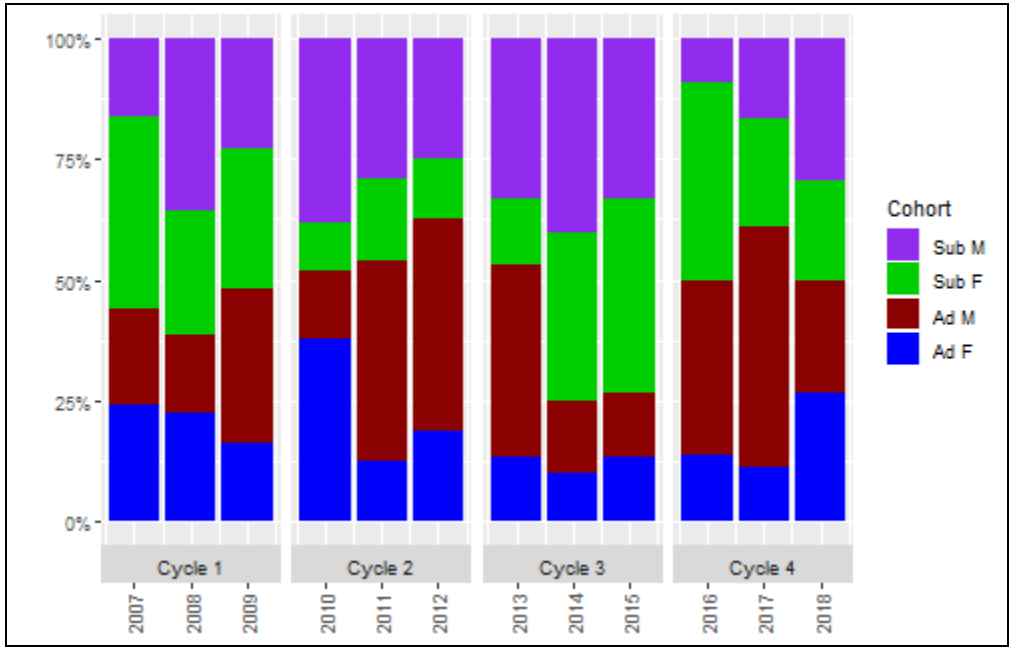
Hunt Area 15.

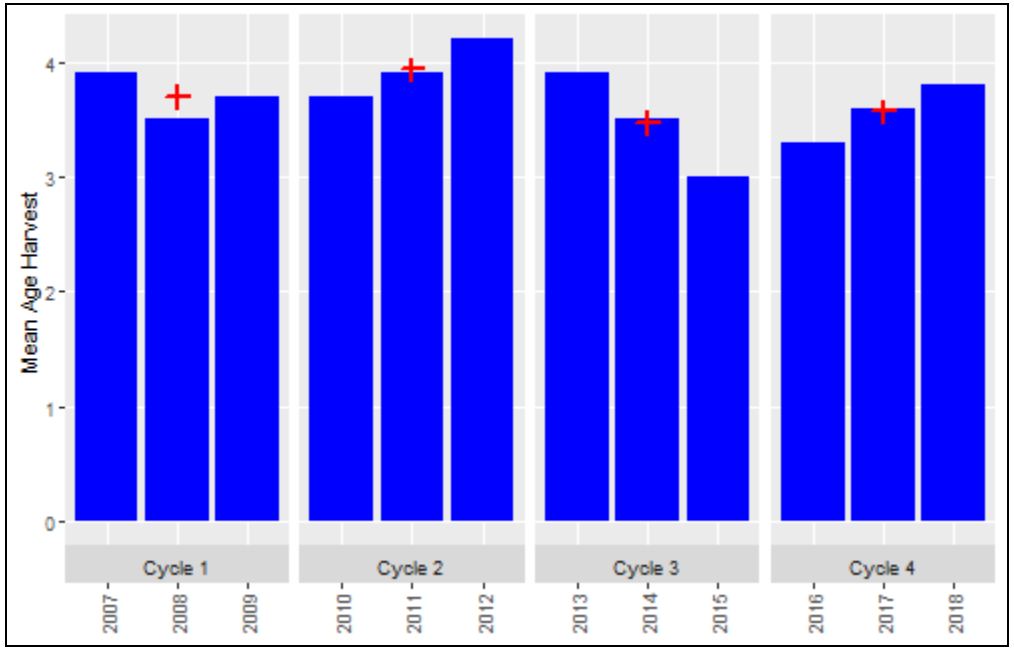

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

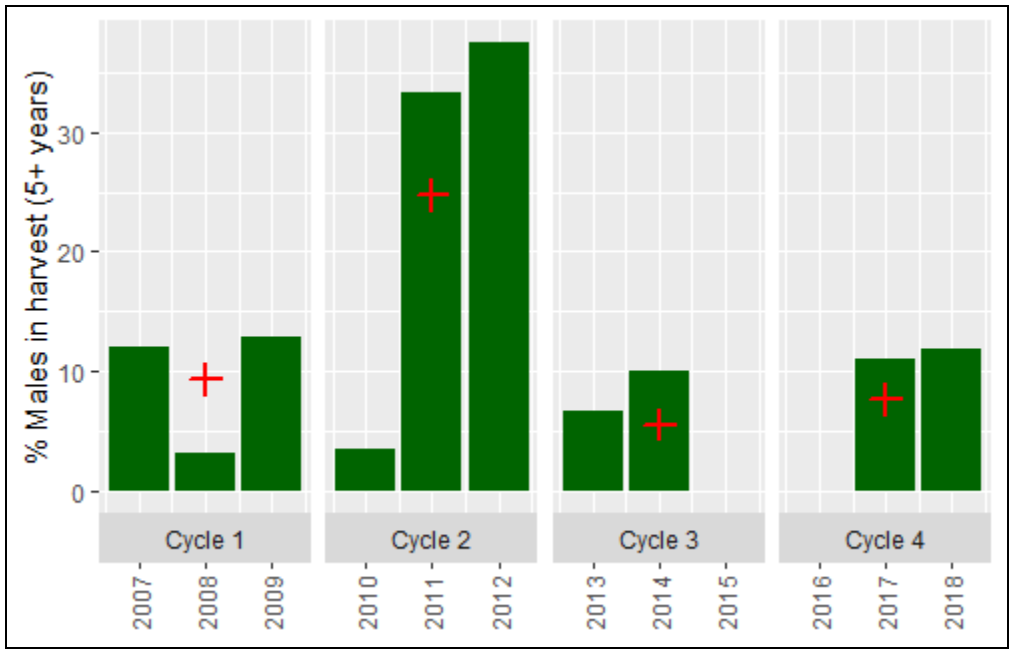

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

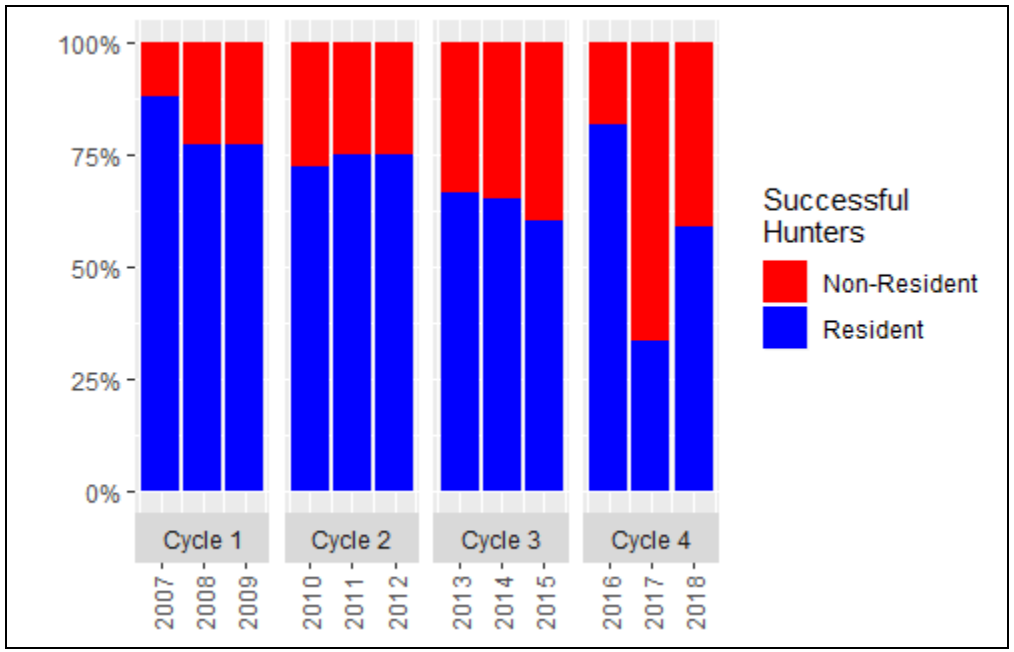

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Cohort
Sub M
Sub F
Ad M
Ad F


Mean Age Harvest
0
1
2
3
4
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
0
10
20
30
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Successful Hunters
Non-Resident
Resident

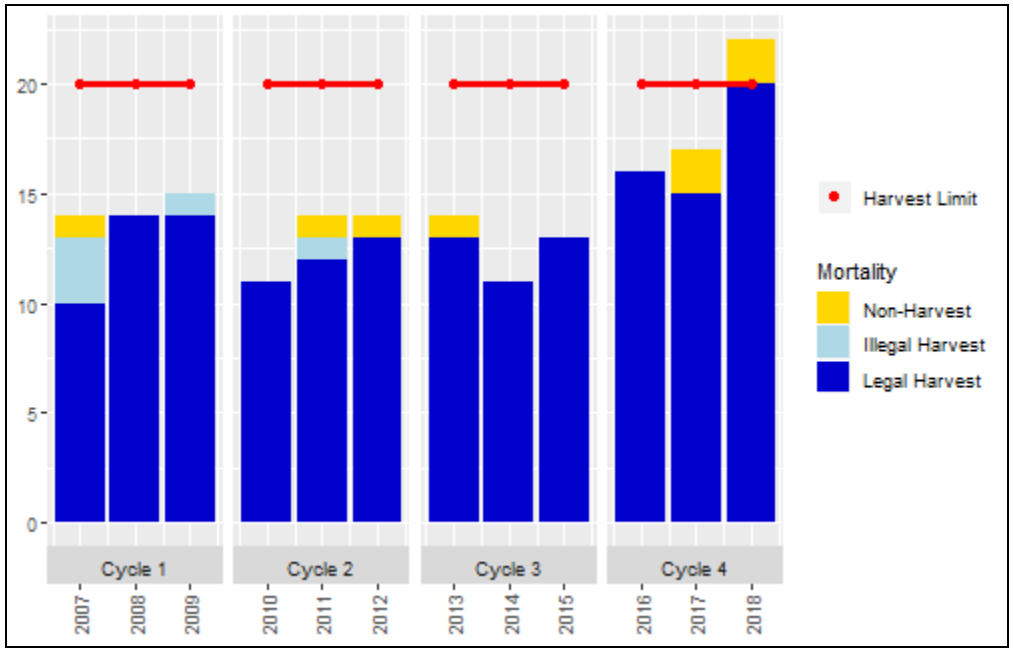
Hunt Area 15. (cont.)

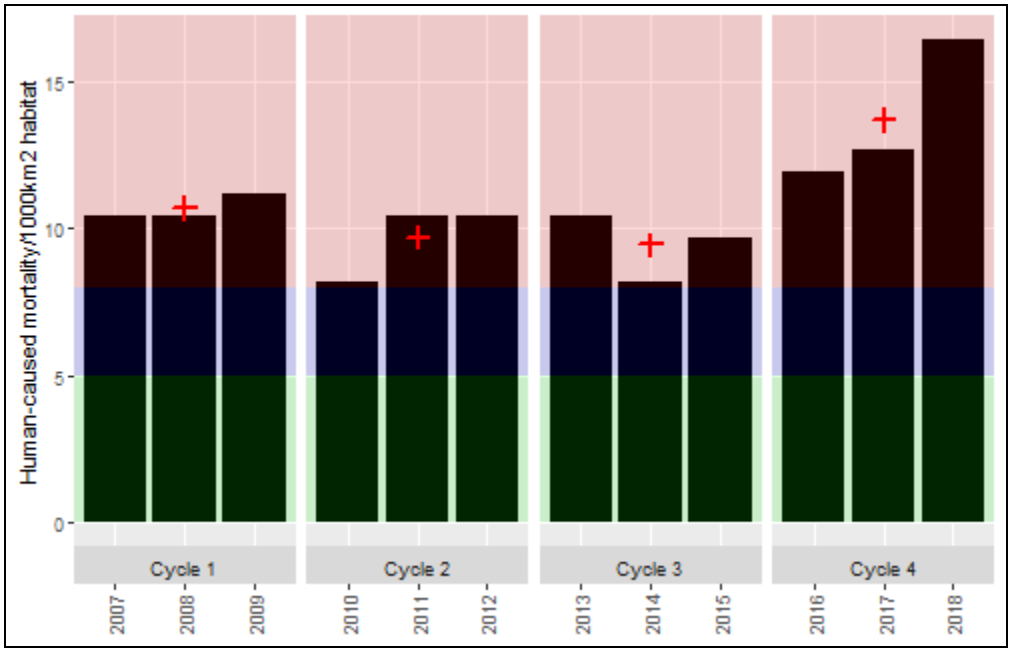
HY2016-HY2018 Regional Objective : Sink management

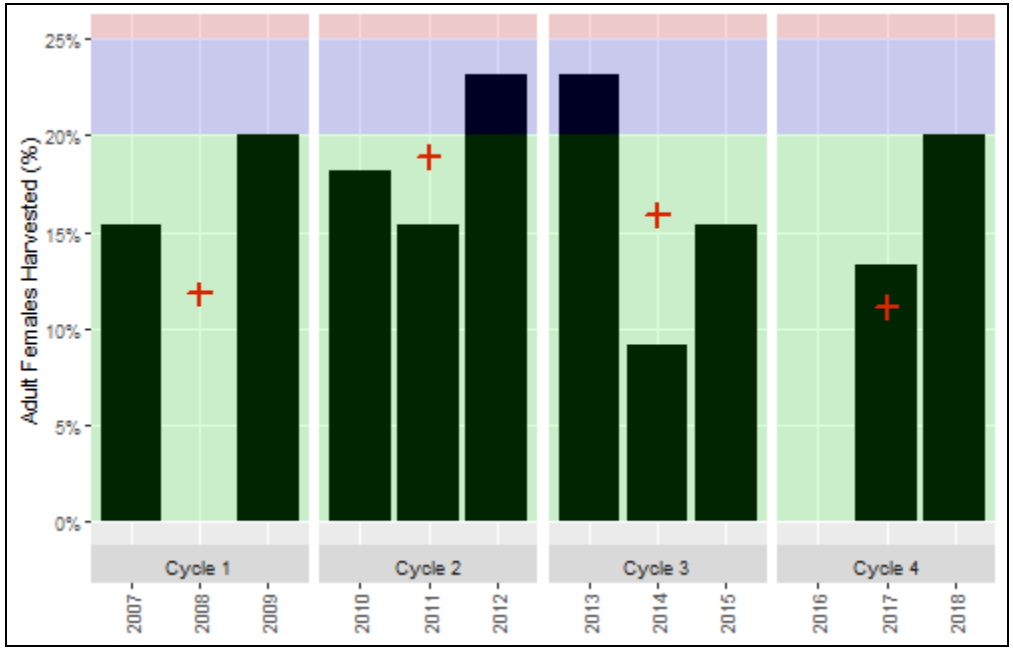
Assessment

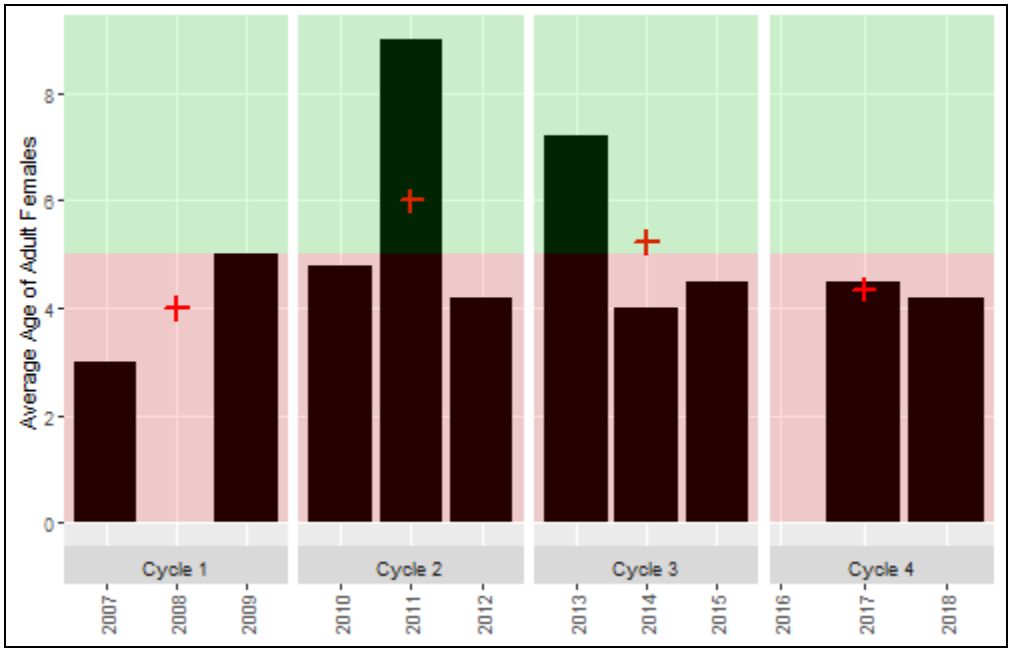
SINK: Updated habitat estimates for HA 15 better align mortality densities with population trend for HA 15. Allowable harvest increased to 35 in HY 2008 and changed to unlimited allowable harvest starting in HY 2010. Adult females were pressured previous to HY 2007 and again heavily in HY 2010 (a particularly high impact due to 38% adult female harvest during harvest near 30 animals). Subsequently the proportion of adult females decreased steadily, indicating a density reduction in the hunt area during that time. Harvest remained at lower levels throughout the 3rd and into the 4th management cycle. However, as of this report HY 2018 harvest increased to a high of 34 animals with more than 25% adult females. Potential increased hunting pressure and favorable tracking conditions may account for this increase and/or a potential rebound in densities during lower harvest years from HY 2012 – HY 2017. Guided hunts increased the last two years (>60%) as well as non-resident harvest.

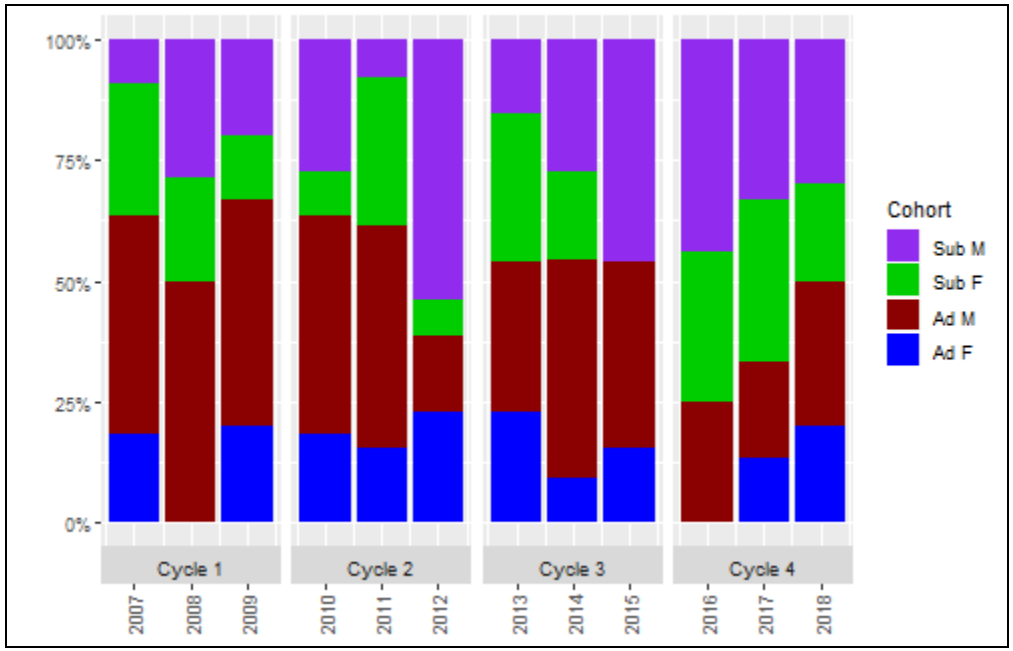
Hunt Area 21.

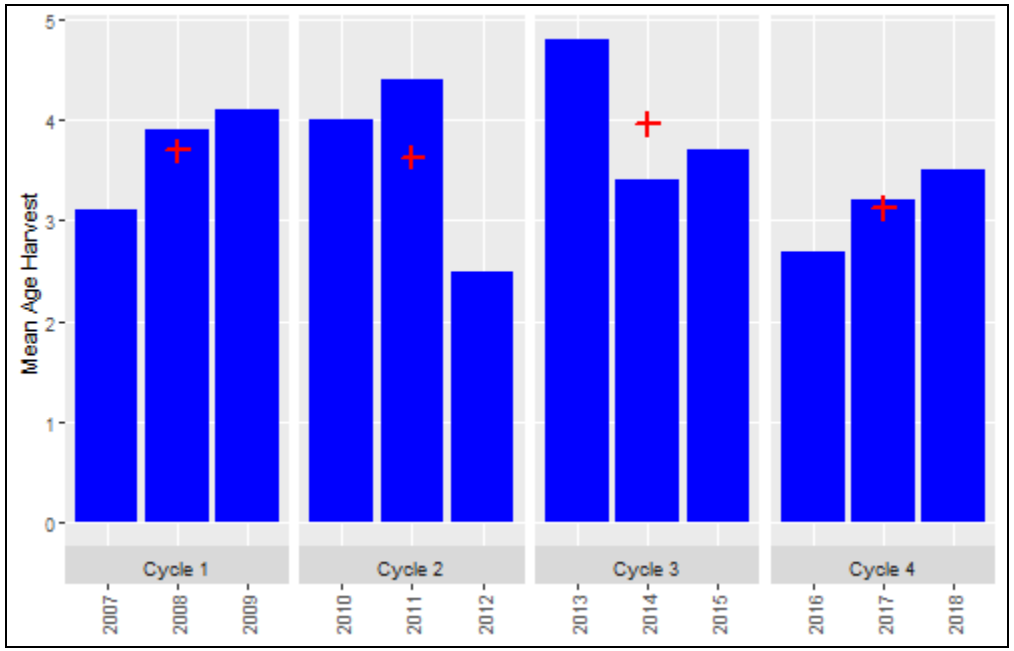

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

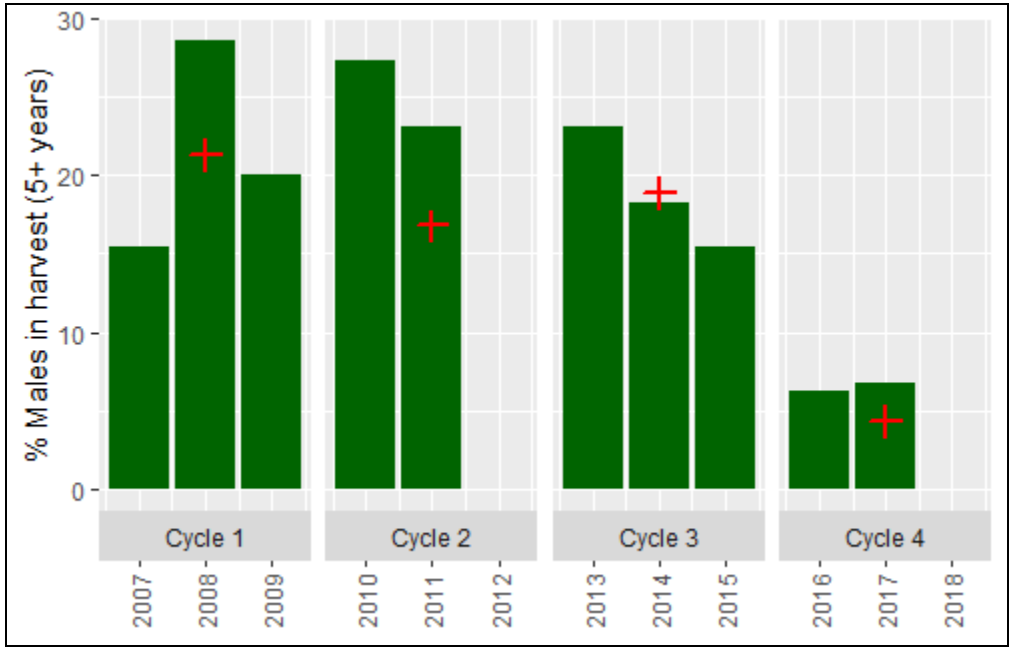

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

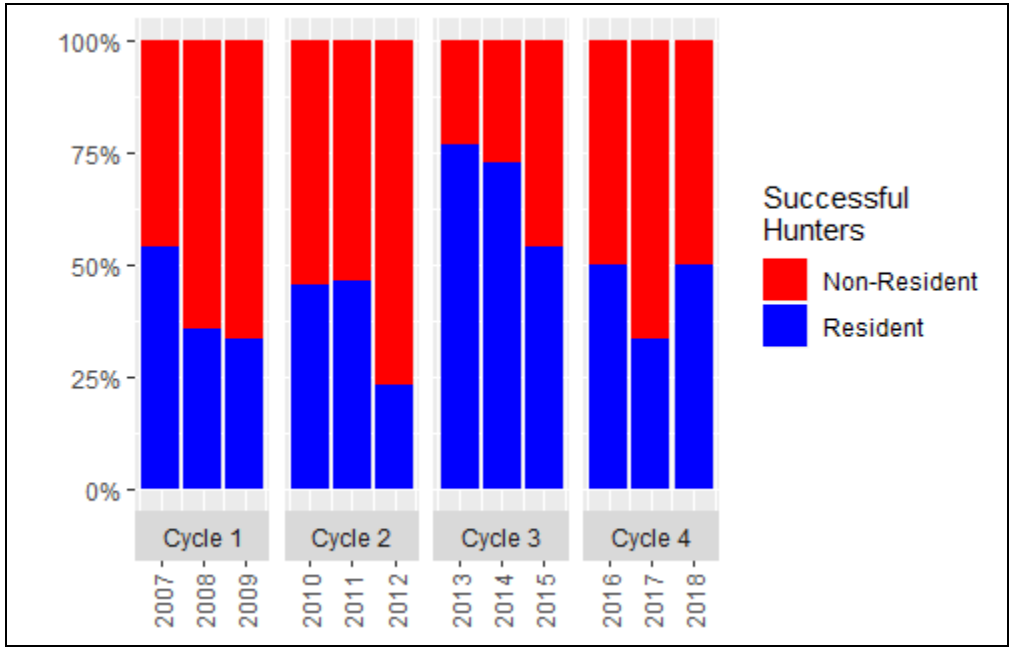

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Cohort
Sub M
Sub F
Ad M
Ad F


Mean Age Harvest
5
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Successful Hunters
Non-Resident
Resident

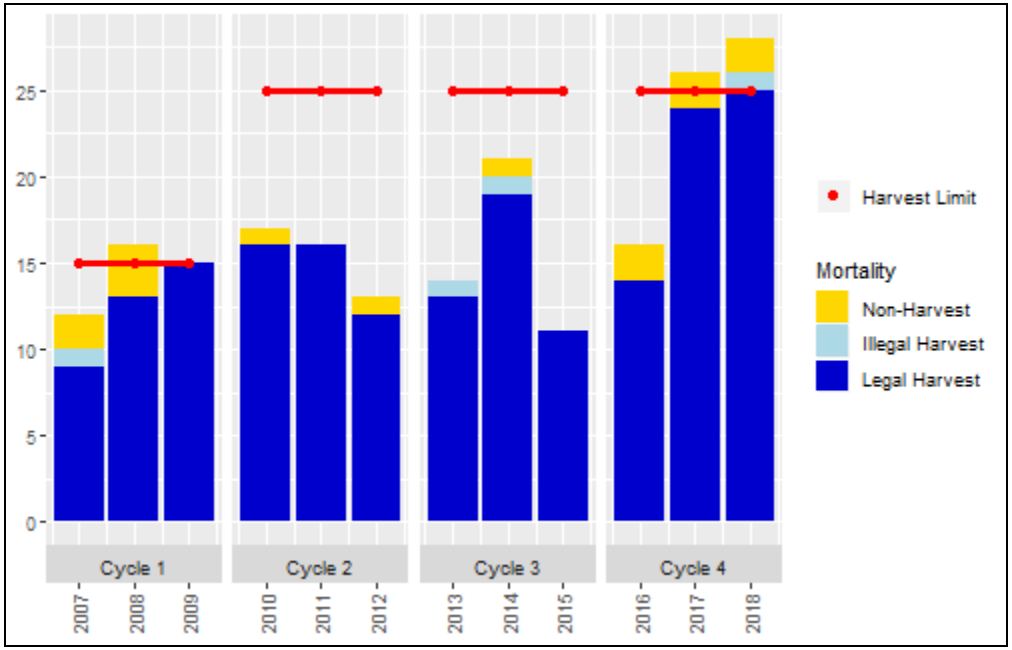
Hunt Area 21. (cont.)

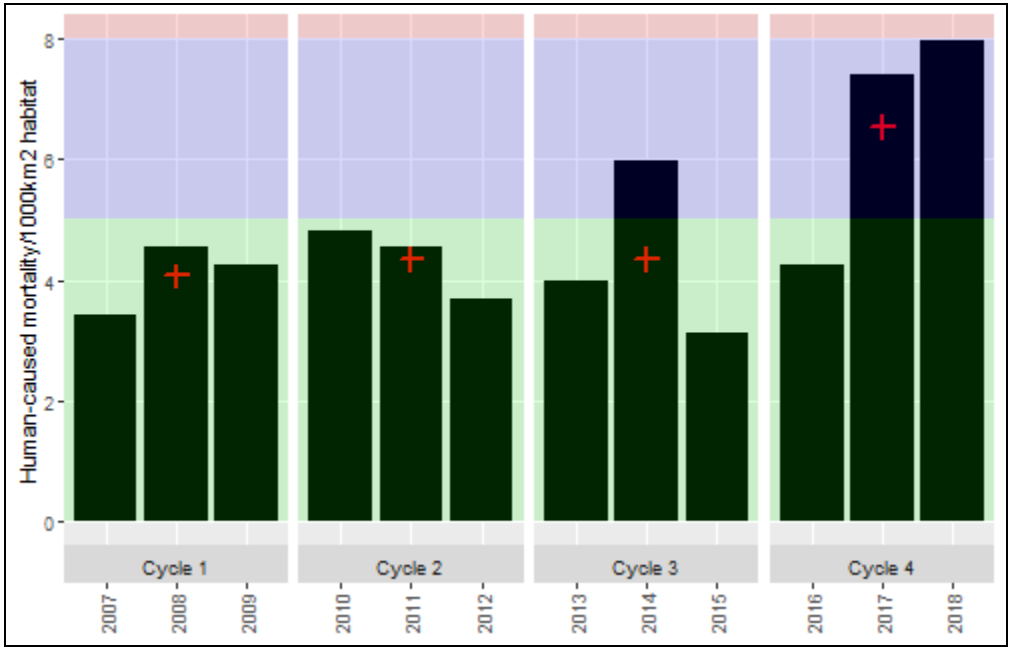
HY2016-HY2018 Regional Objective : Sink management

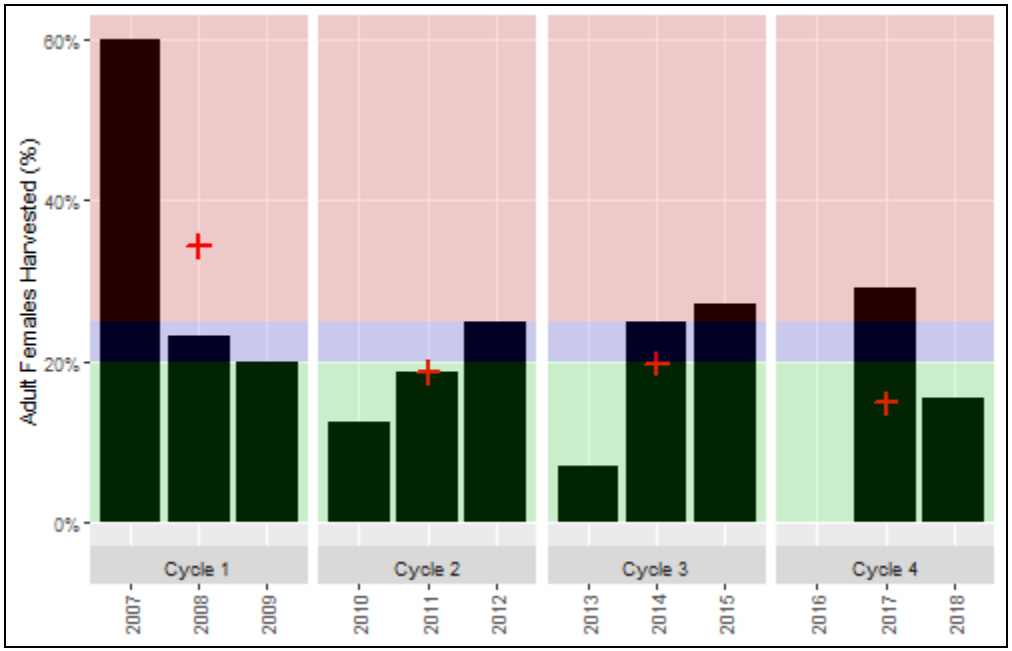
Assessment

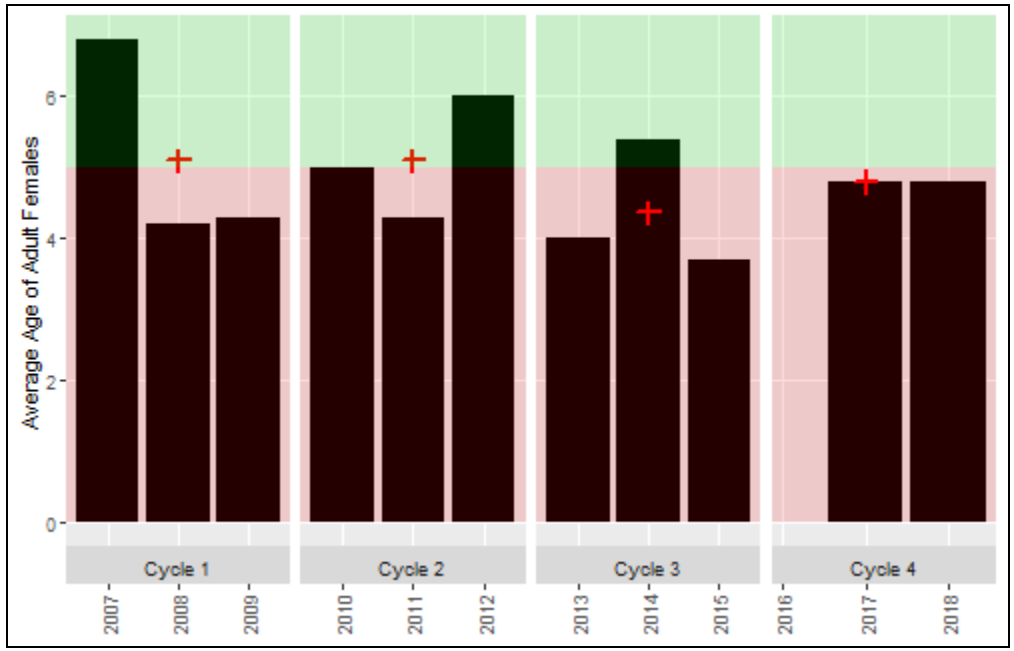
STABLE/SINK: The first three management cycles in HA 21 indicated a mix of Stable and Sink criteria, with Sink-level mortality density but other metrics indicating stability in adult female harvest and in age/sex structure. The current cycle likely moved this area more toward the objective for Sink management via increased mortality and the harvest limit of 20 animals being reached for the first time in HY2018. Other criteria correlate with a recent reduction in the average age of adult females, in overall age of harvest, and in the proportion of older males. The age/sex structure in this area is therefore trending toward more sub-adult animals representing this local population. Even with age structure changes this area maintains stability, potentially due to some of the rugged terrain in the northern portion of the area. Hunters report moderate selectivity (40-60%) in HA 21. Public land harvest (USFS and BLM) is very high, with only ~10% occurring on private land.

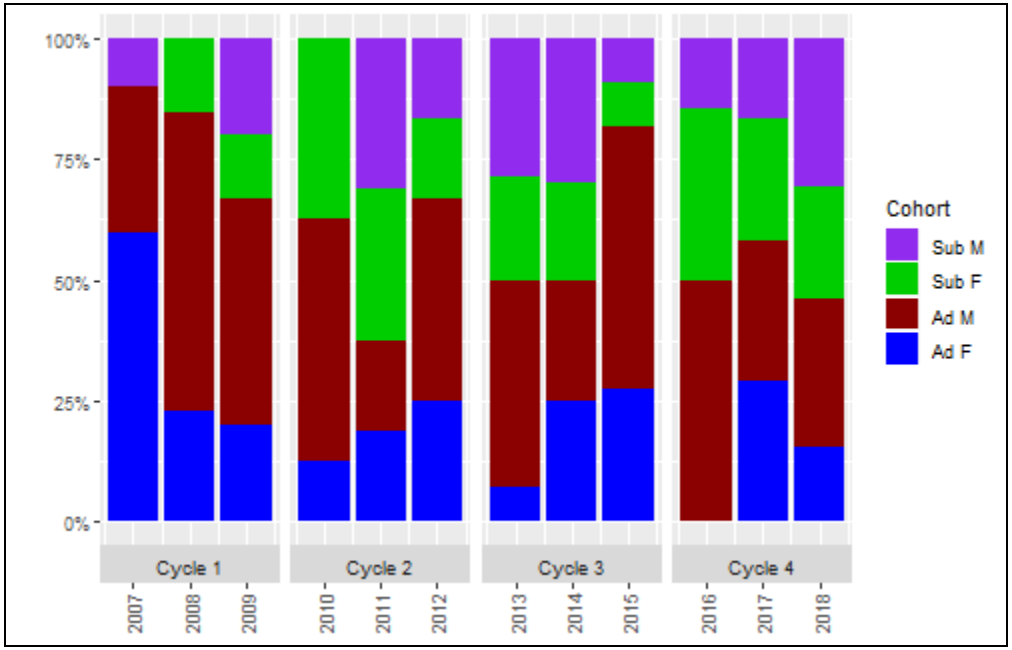
Hunt Area 22.

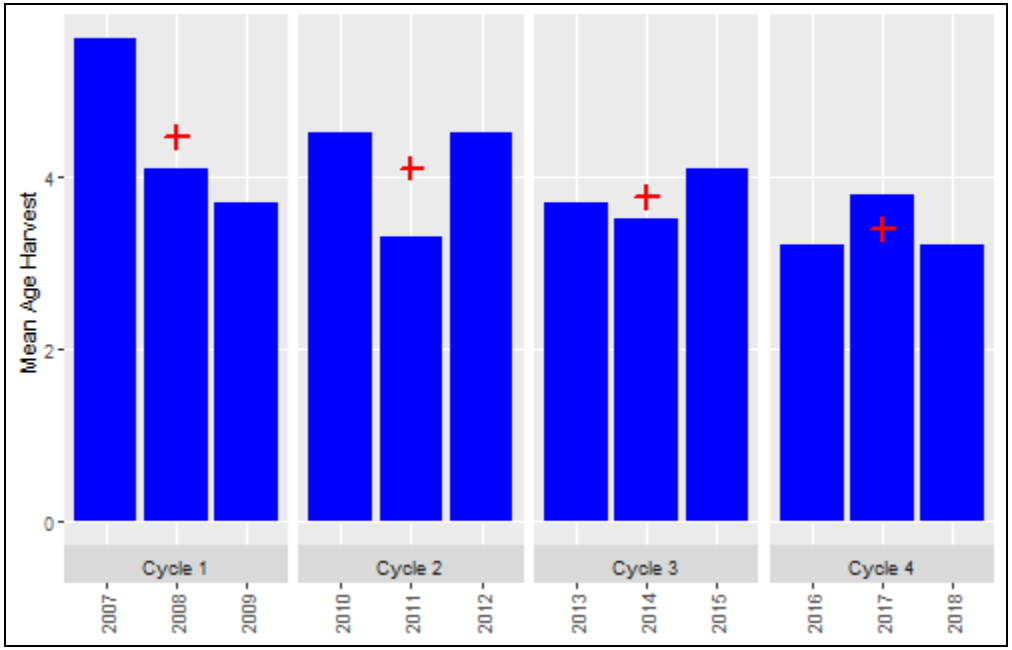

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

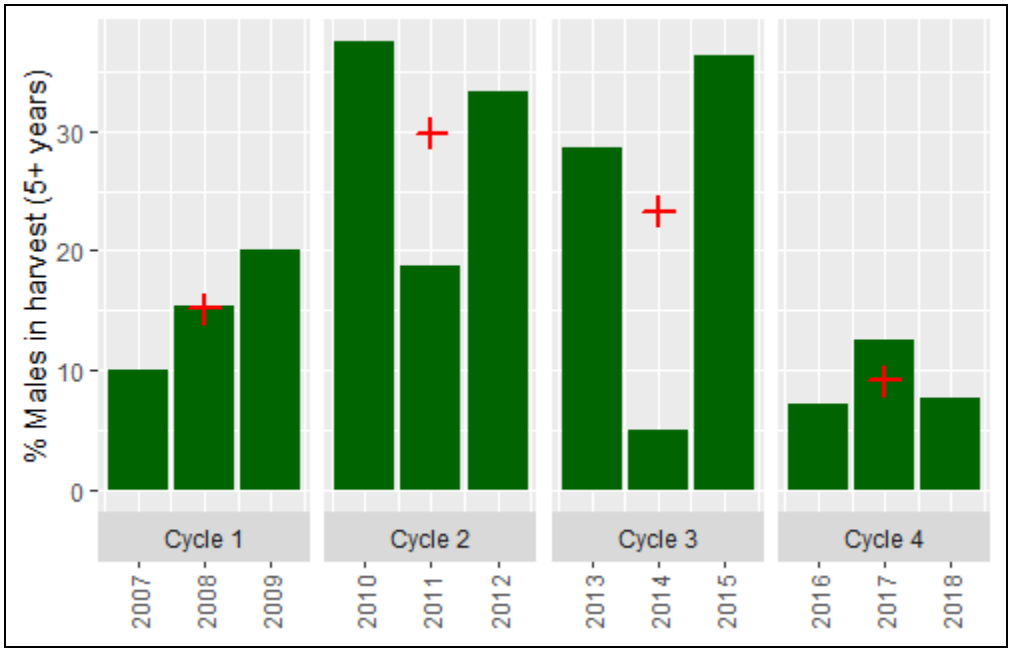

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

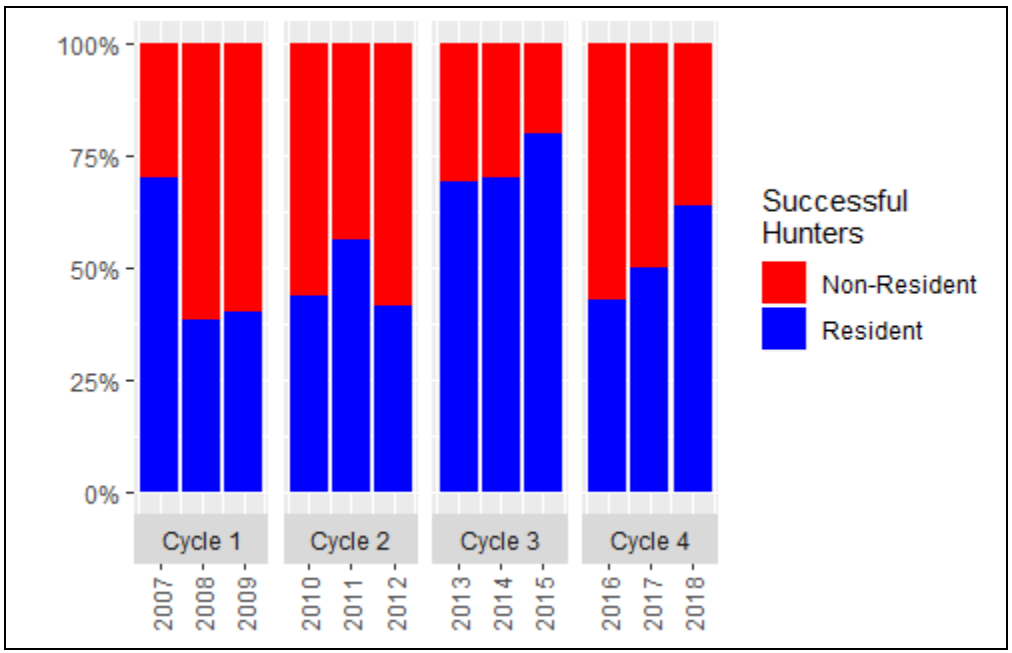

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

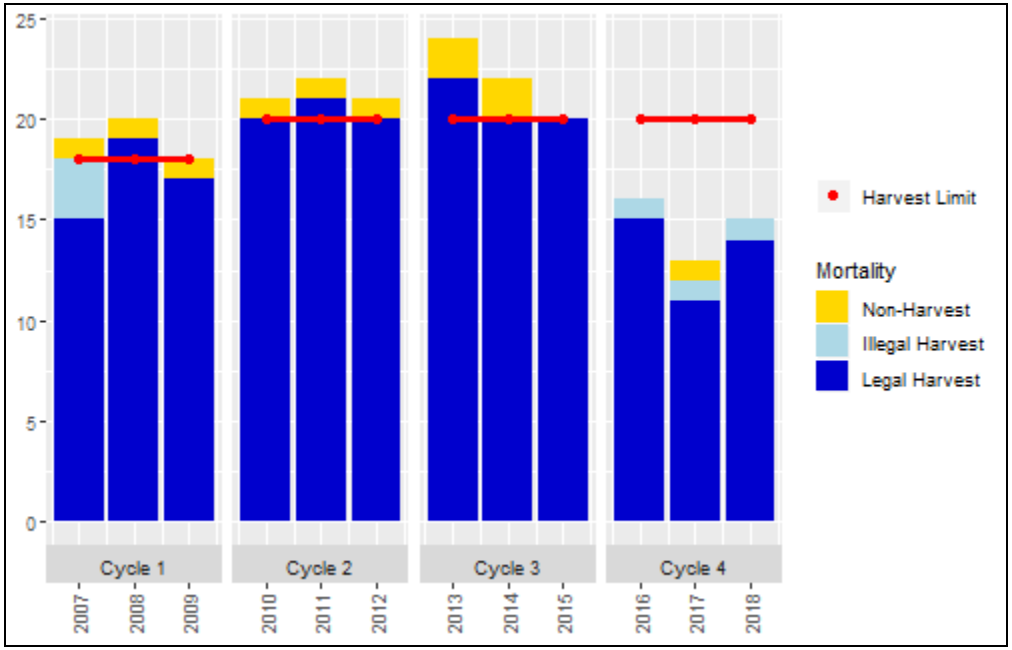
Hunt Area 22. (cont.)

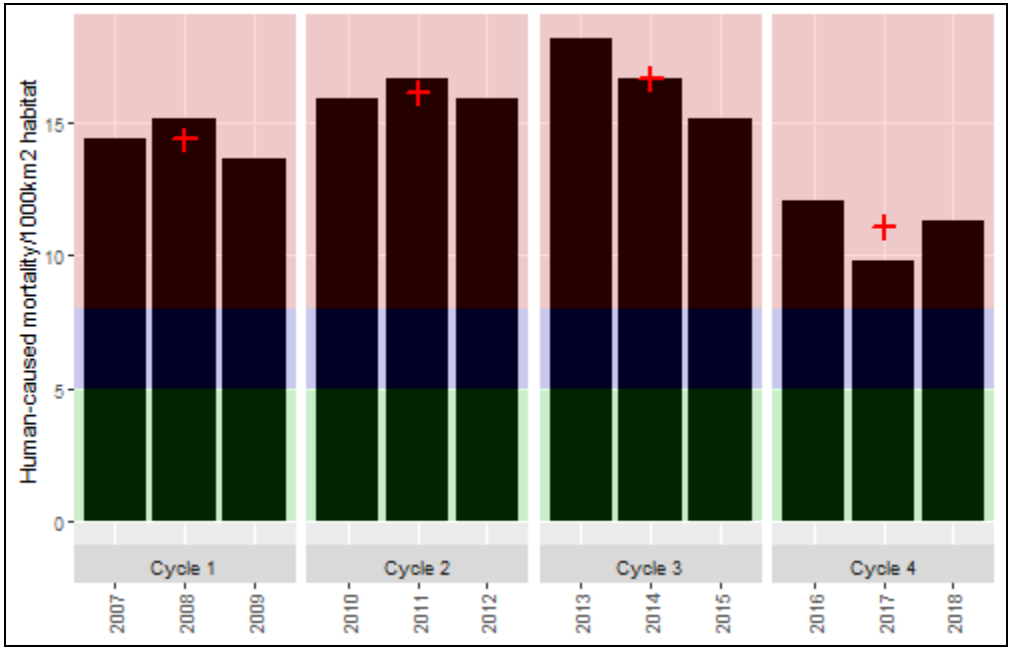
HY2016-HY2018 Regional Objective : Sink management

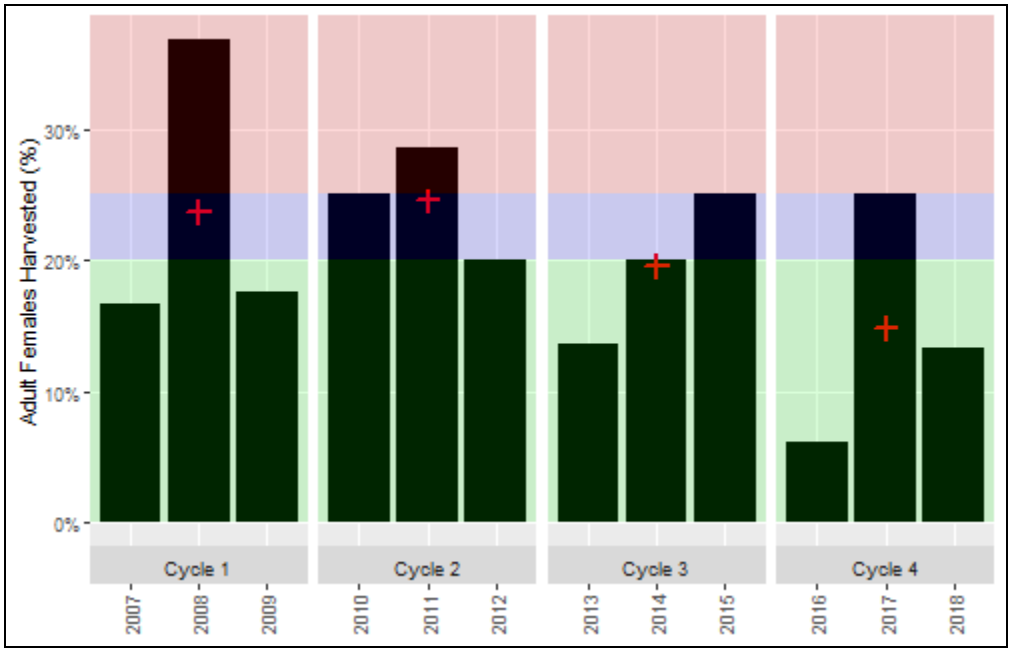
Assessment

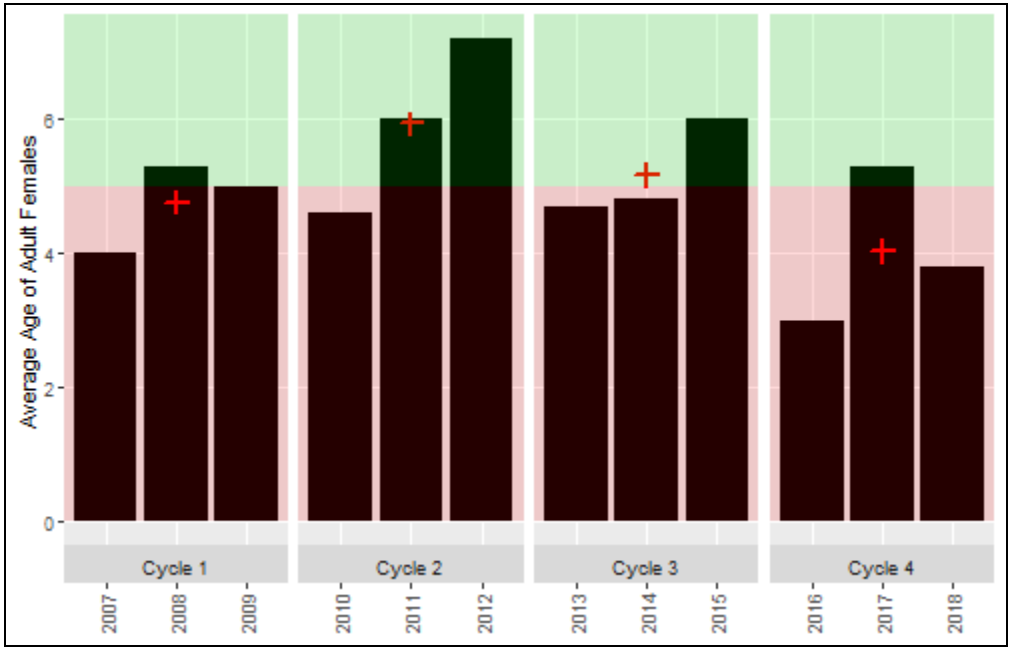
STABLE/SINK: Suitable habitat within HA 22 is probably overestimated, as previous estimates showed stability in the area while other metrics showed slight reductions in average age of adult females, overall age of harvest, and a reduction of adult animals in the age/sex composition that stabilized around 50%. The increased harvest of the last two years coupled with the removal of adult females in HY 2017 continues to drive trends toward the objective for Sink management. If harvest continues to reach current limits we should expect trends to continue toward functioning as Sink. Hunters are trending toward less selectivity throughout management cycles in HA 22.

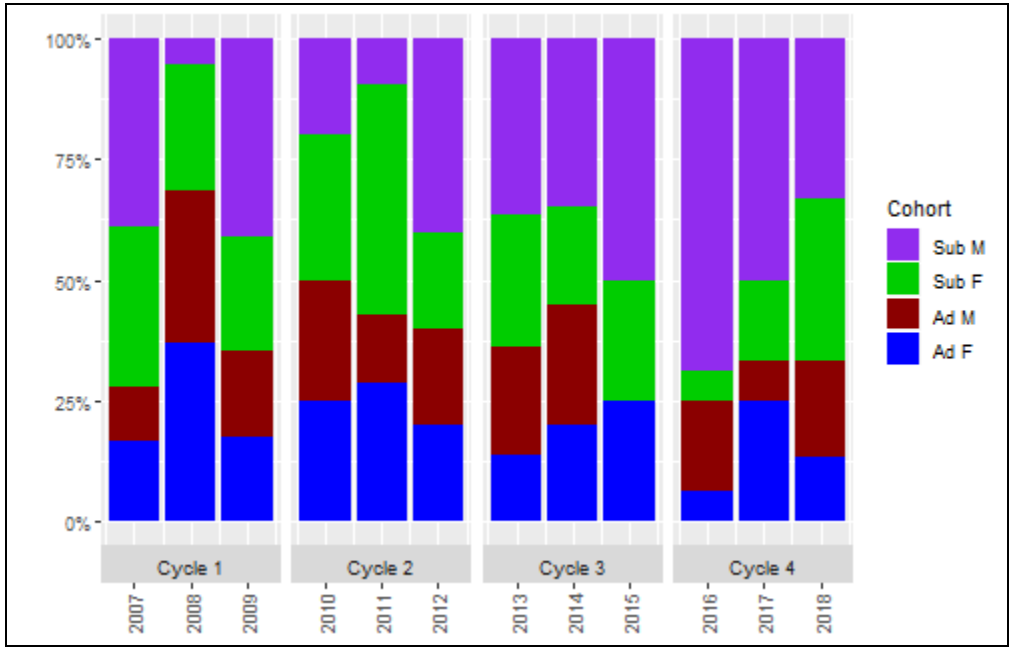
Hunt Area 23.

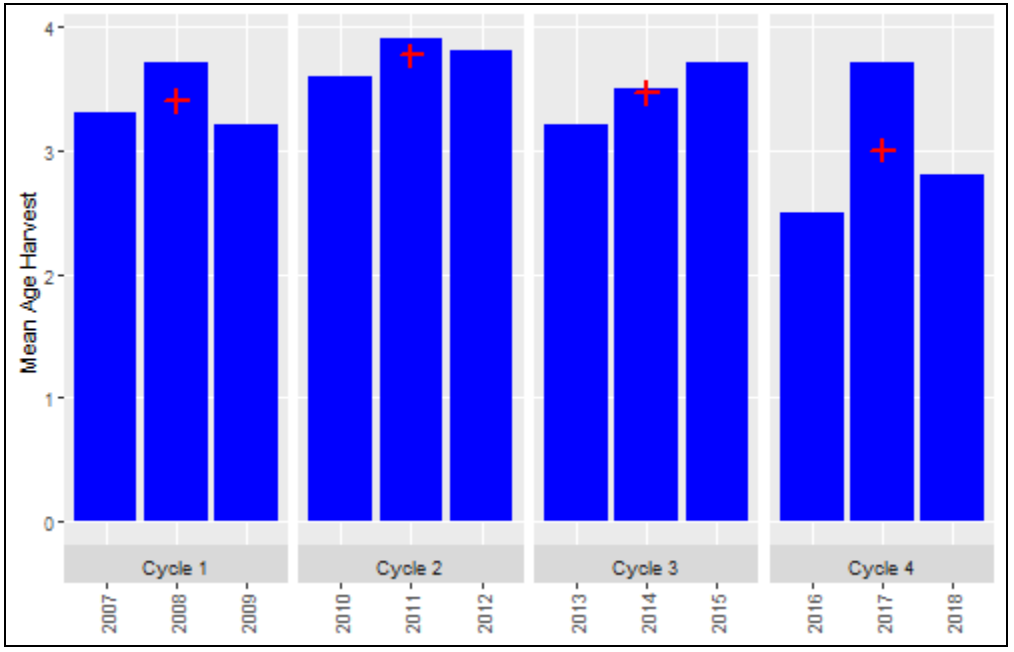

25
20
15
10
5
0
Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

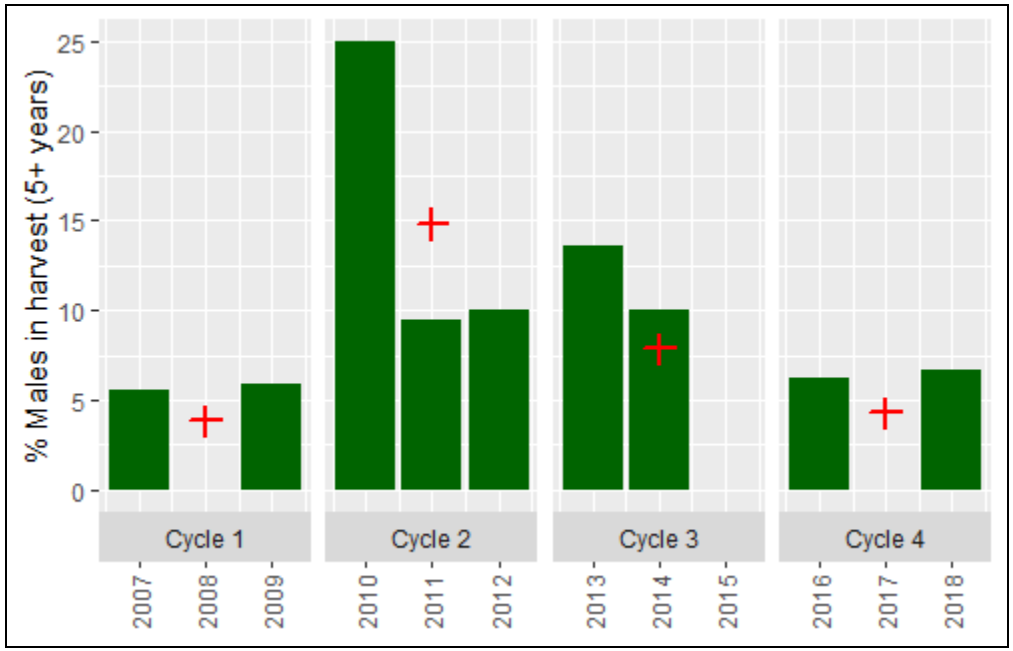

Human-caused mortality/1000km2 habitat
15
10
5
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

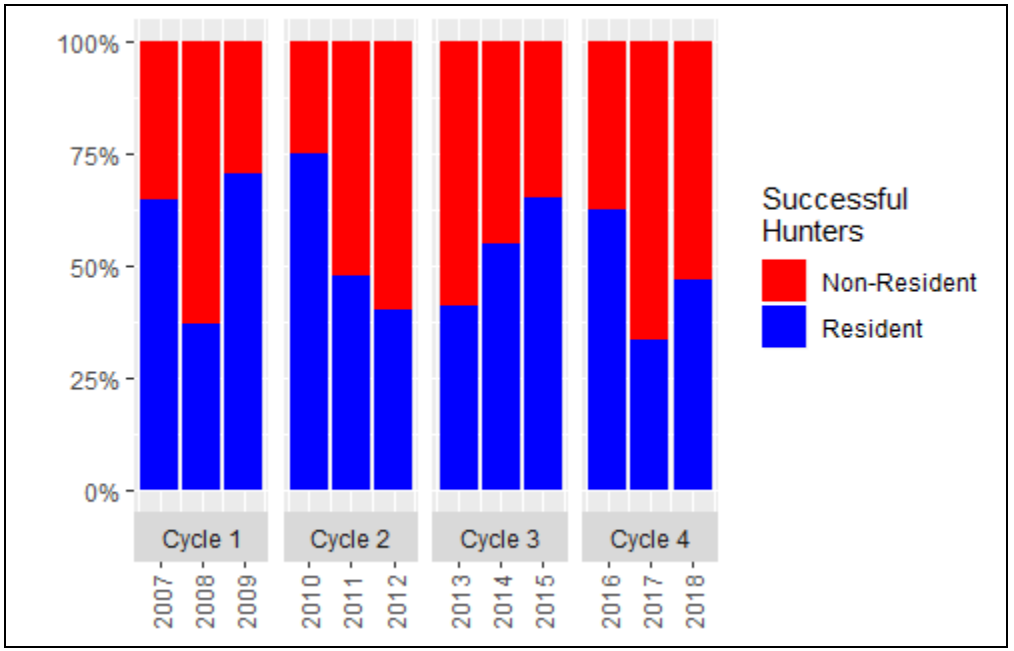

Adult Females Harvested (%)
30%
20%
10%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Average Age of Adult Females
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
25
20
15
10
5
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

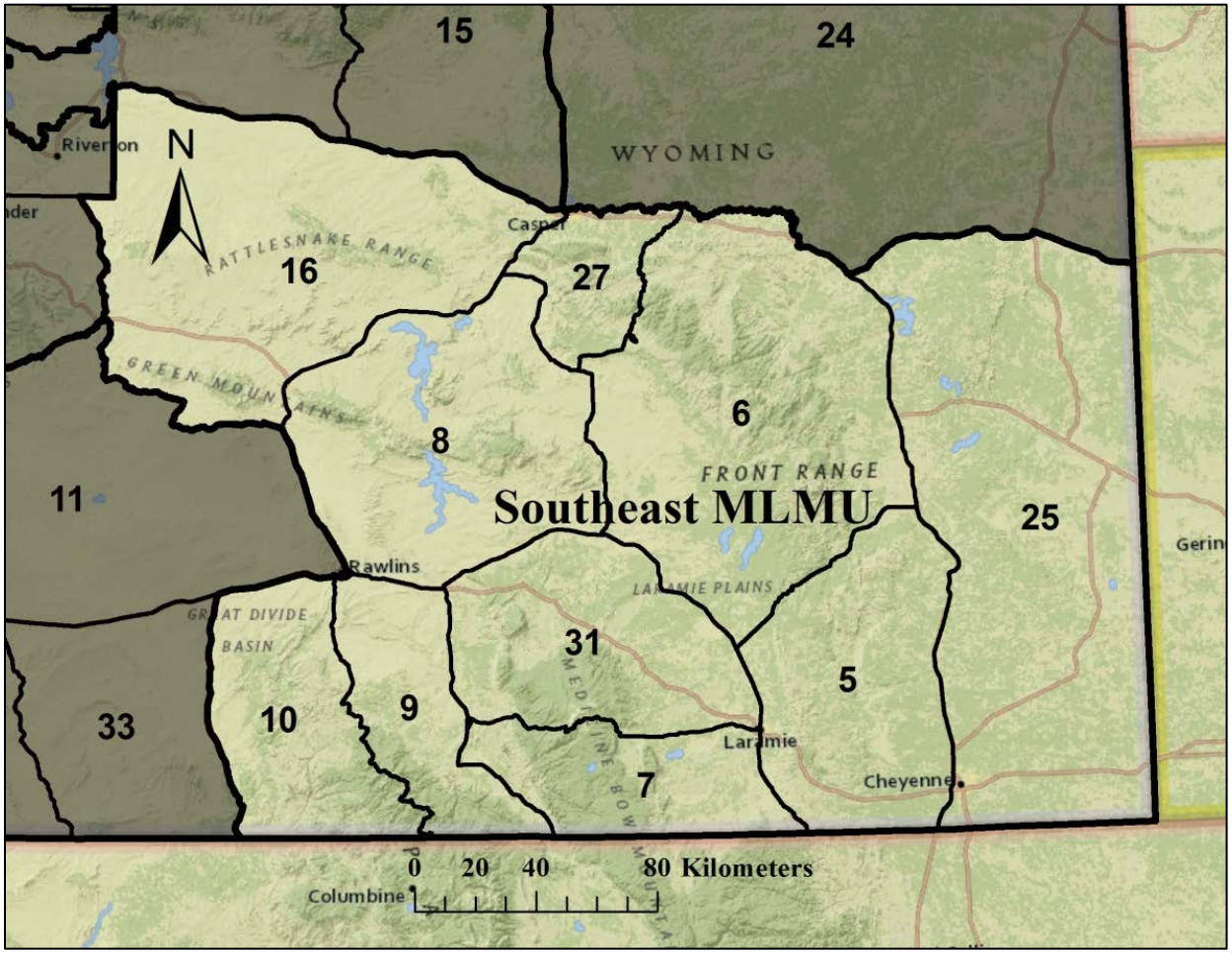
Hunt Area 23. (cont.)

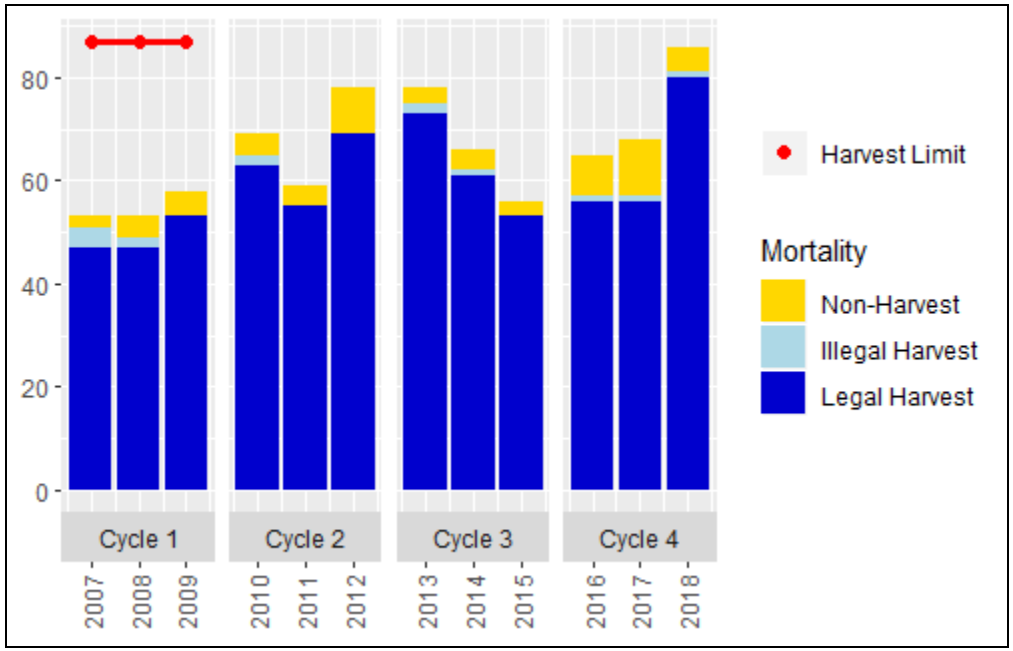
HY2016-HY2018 Regional Objective : Stable management

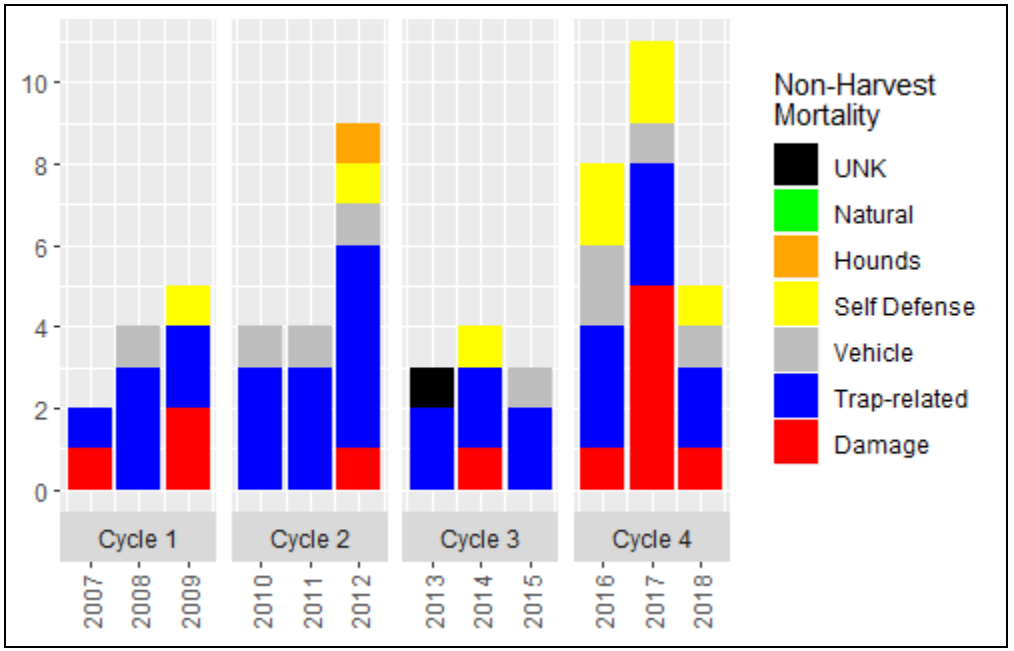
Assessment

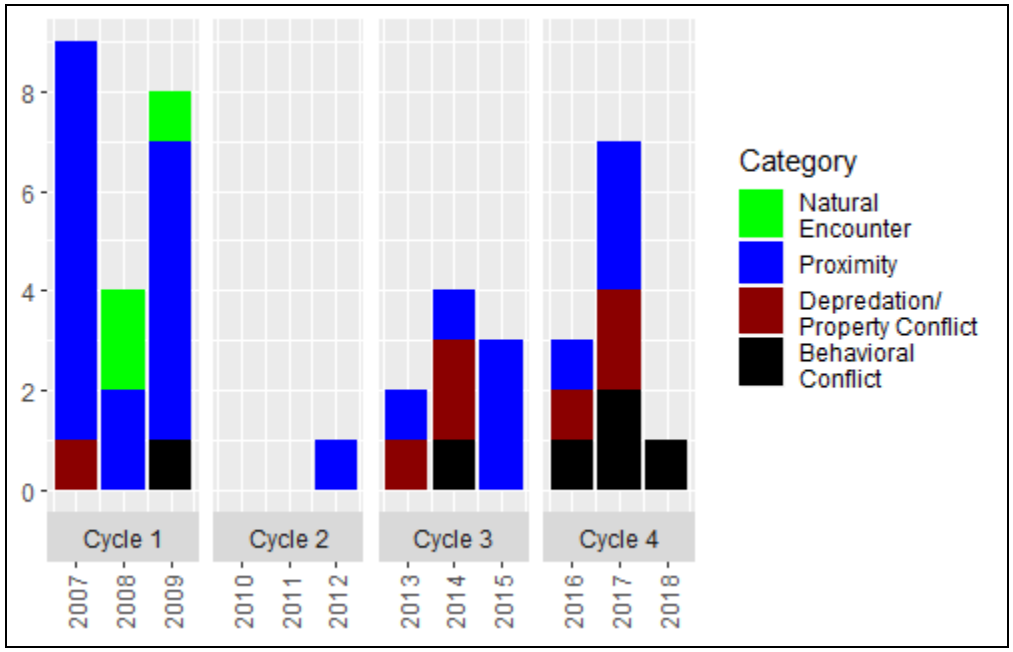
SINK: HA 23 incurred a high mortality density until a trend of decreased harvest after HY 2013. Data indicate that adult males and females are becoming less represented on the landscape, and age/sex structures continue to decrease despite reports of increased hunter selectivity through time. This area did not reach limits during any year of this cycle and has less adult cohorts harvested than any area in the MLMU. Previous assessments reported Stable/Sink function, and the continued trend during this management cycle indicates HA 23 currently functioning as a Sink. Non-resident harvest is consistently high for HA 23, the last two years over 50%.

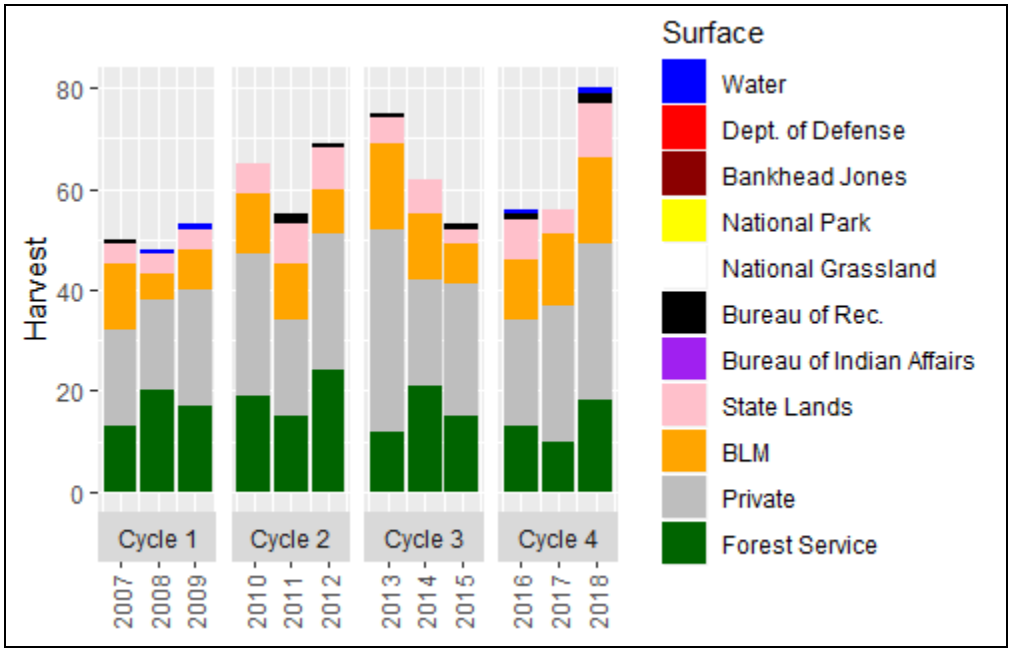
SOUTHEAST MLMU

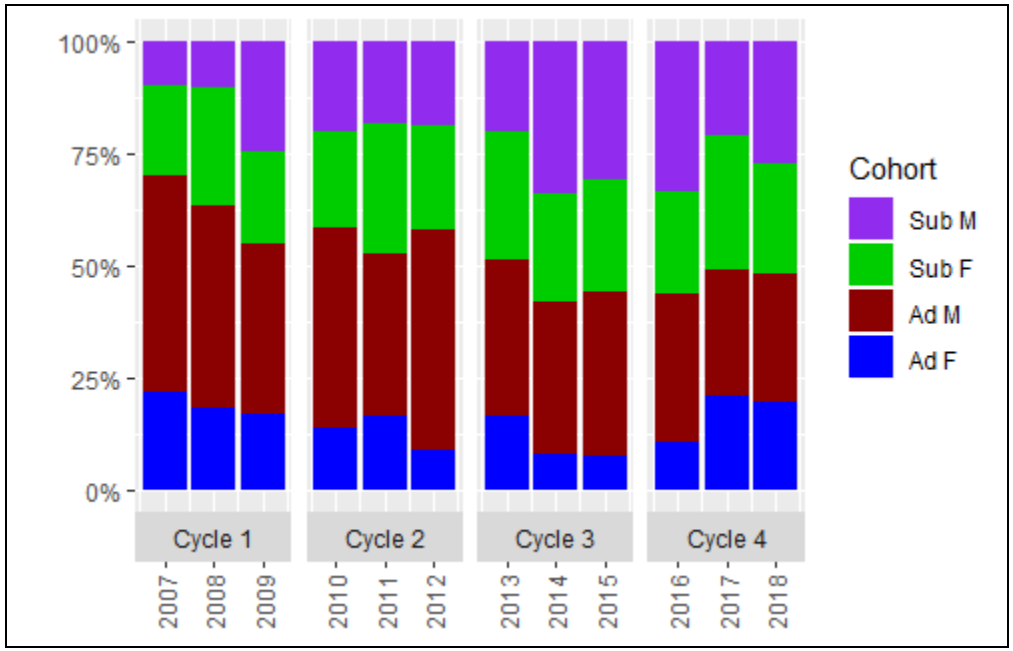


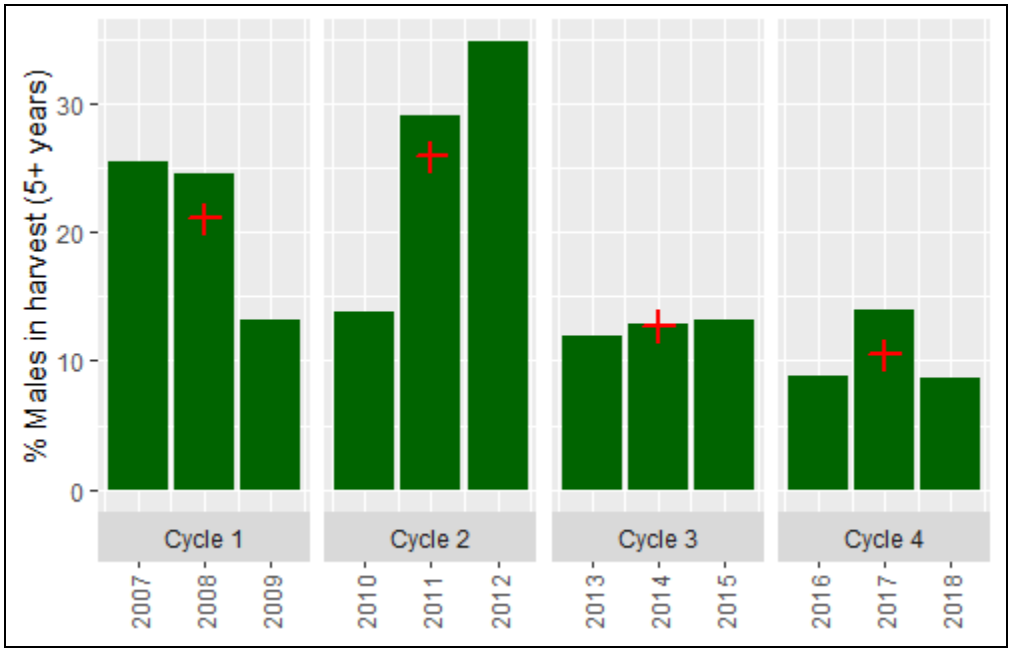

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Non-Harvest Mortality
UNK
Natural
Hounds
Self Defense
Vehicle
Trap-related
Damage
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Category
Natural Encounter
Proximity
Depredation/ Property Conflict
Behavioral Conflict
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Harvest
Surface
Water
Dept. of Defense
Bankhead Jones
National Park
National Grassland
Bureau of Rec.
Bureau of Indian Affairs
State Lands
BLM
Private
Forest Service
Cycle 1
Cycle 2
Cycle 3
Cycle 4

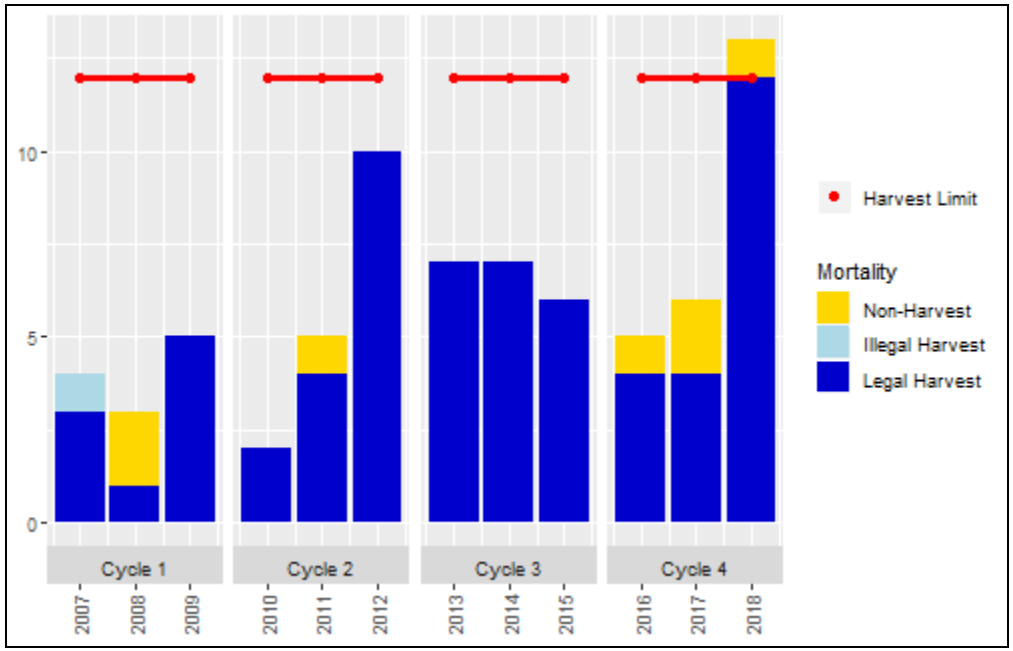


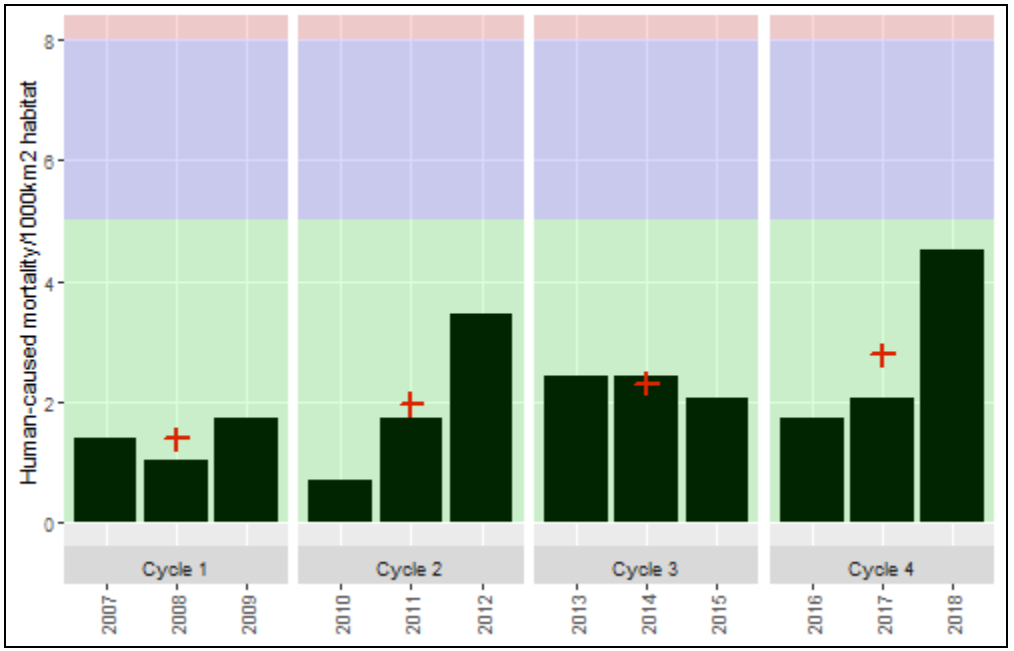


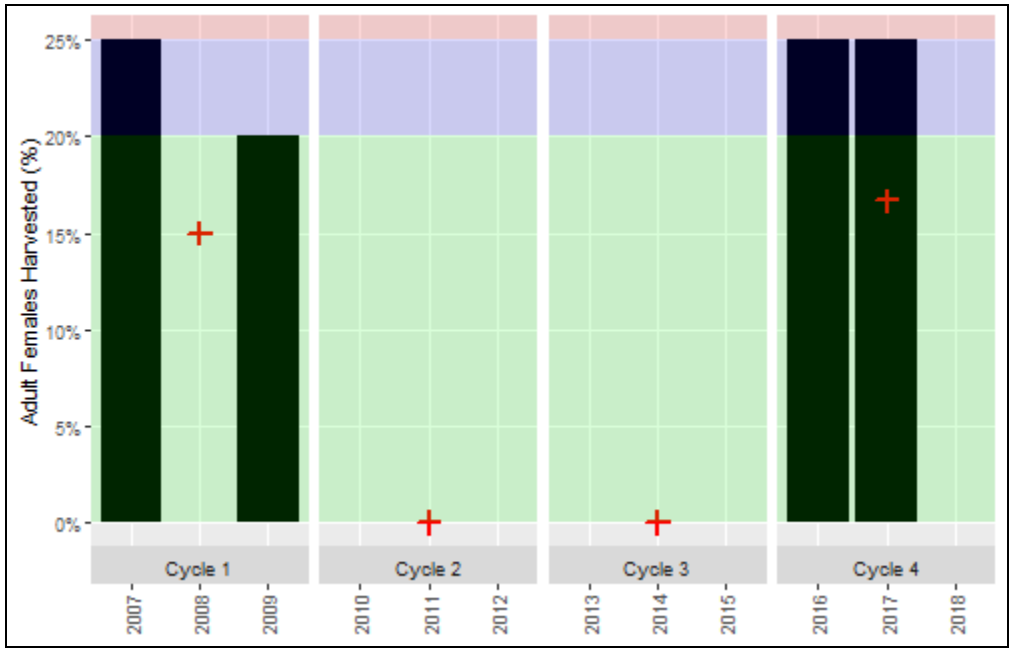
Overview

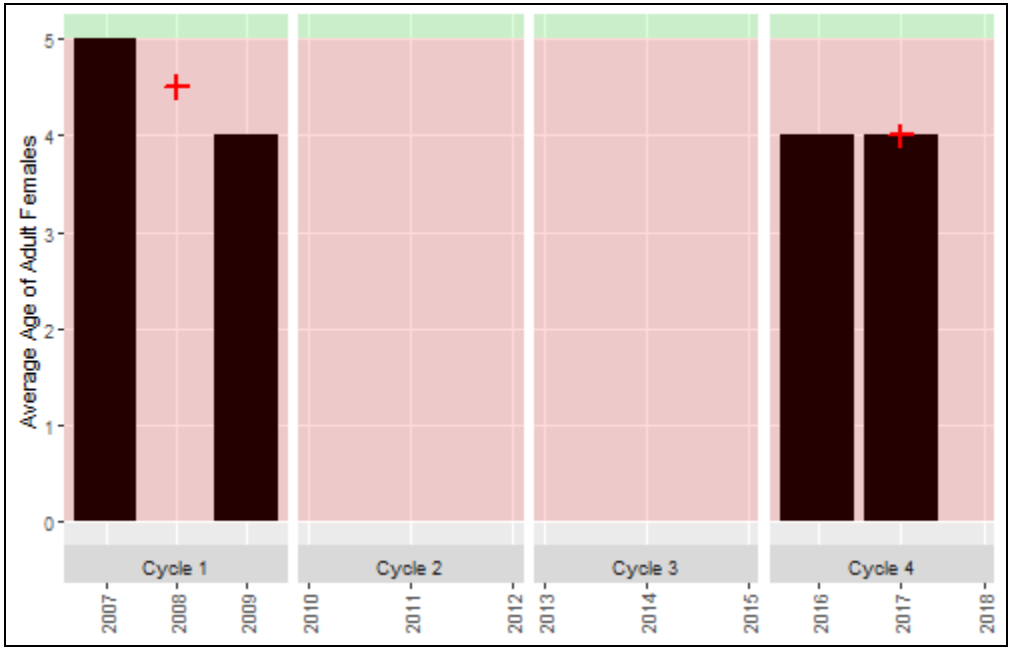
The Southeast MLMU represents a balanced population function, with areas providing a combination of Source, Stable, and Sink status. Management objectives in specified areas to reduce local populations allowed increased harvest through the 2nd cycle which tapered off during the 3rd, resulting in shifts toward younger aged animals but balanced adult/sub-adult proportions throughout the MLMU. Southern hunt areas along the Wyoming/Colorado state line also receive immigration from the south. Hunting conditions in HY 2018 were excellent across this management unit.

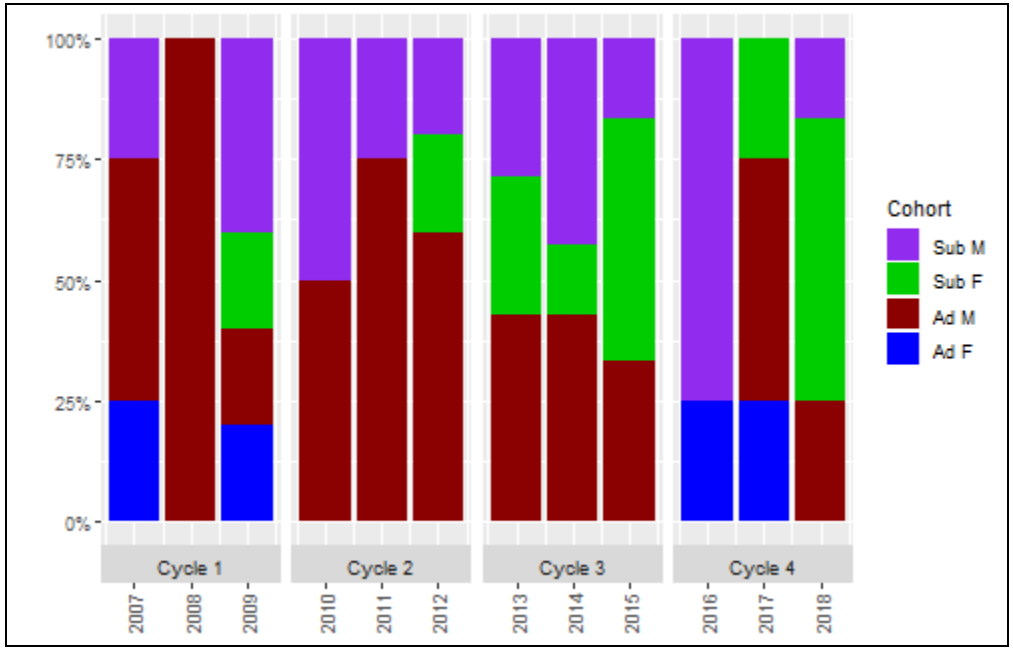
Hunt Area 5.

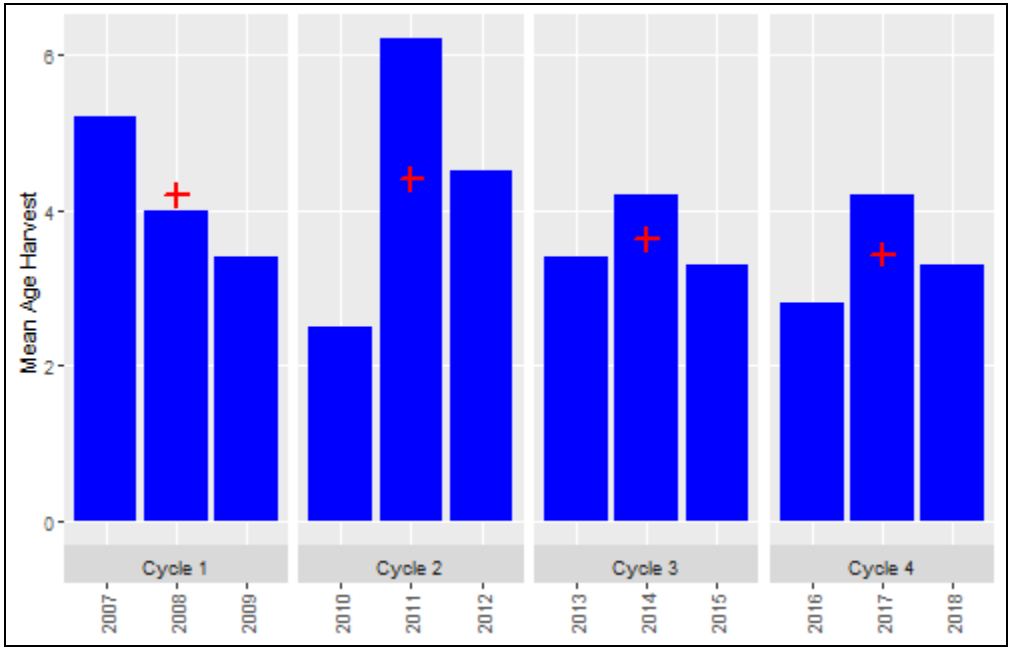

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

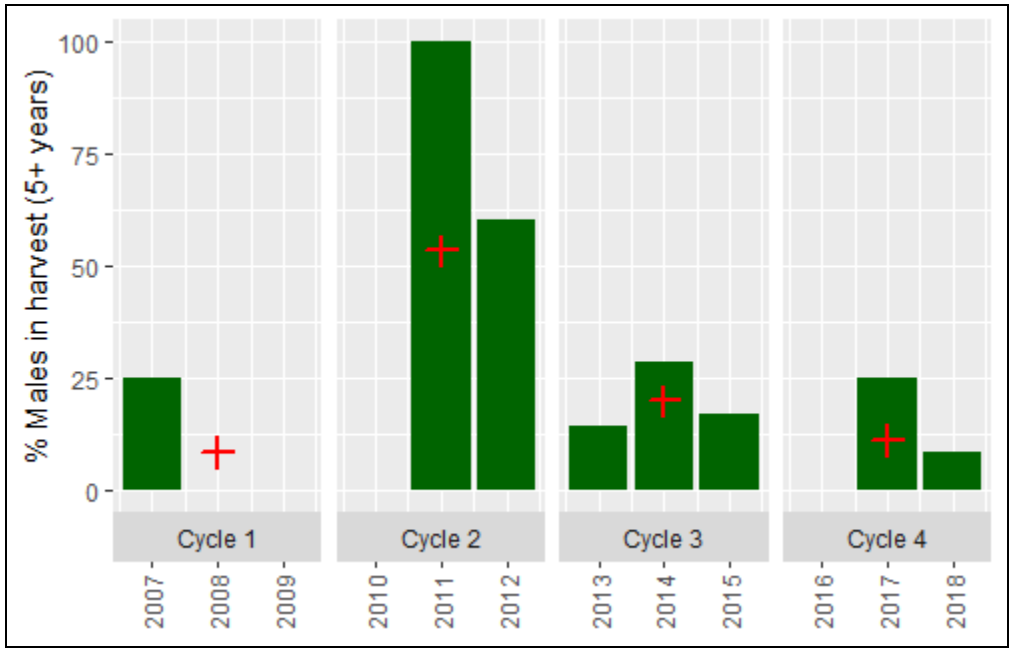

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

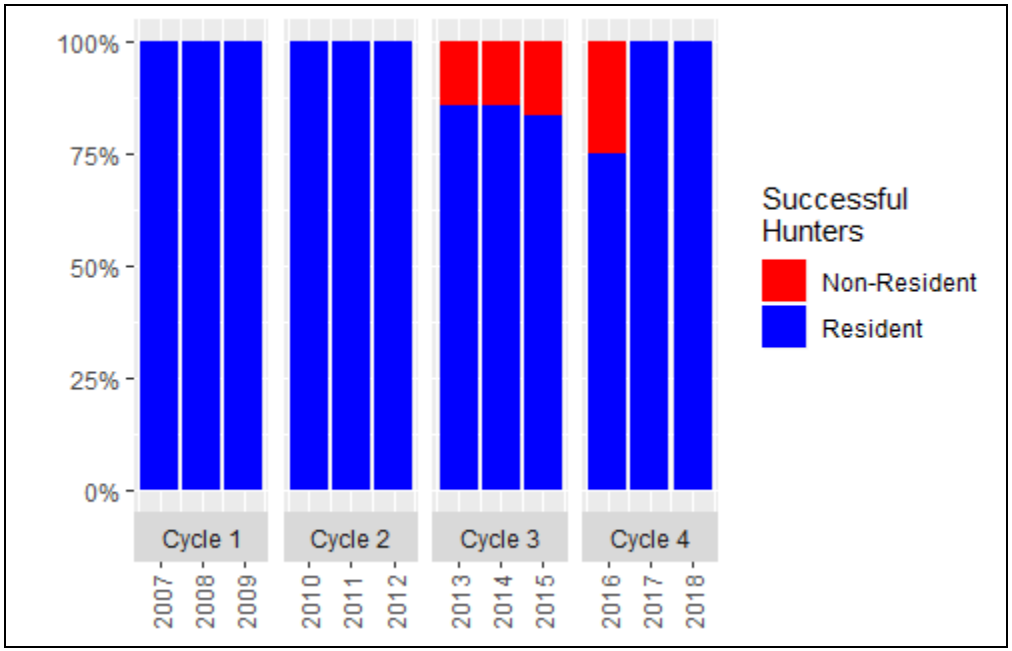

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
100
75
50
25
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

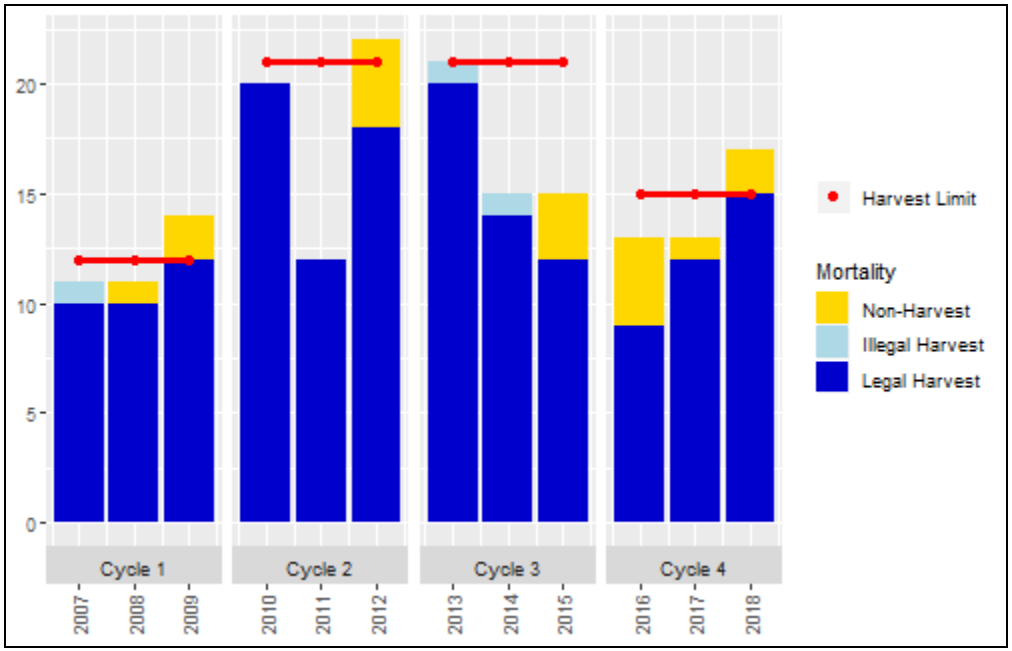
Hunt Area 5. (cont.)

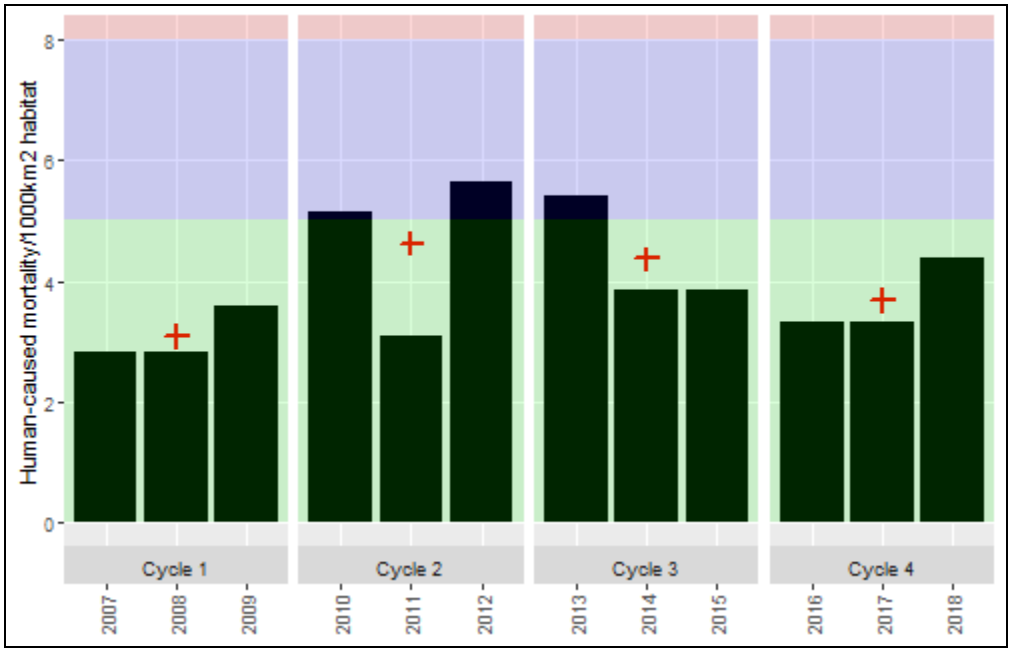
HY2016-HY2018 Regional Objective : Stable/Source management

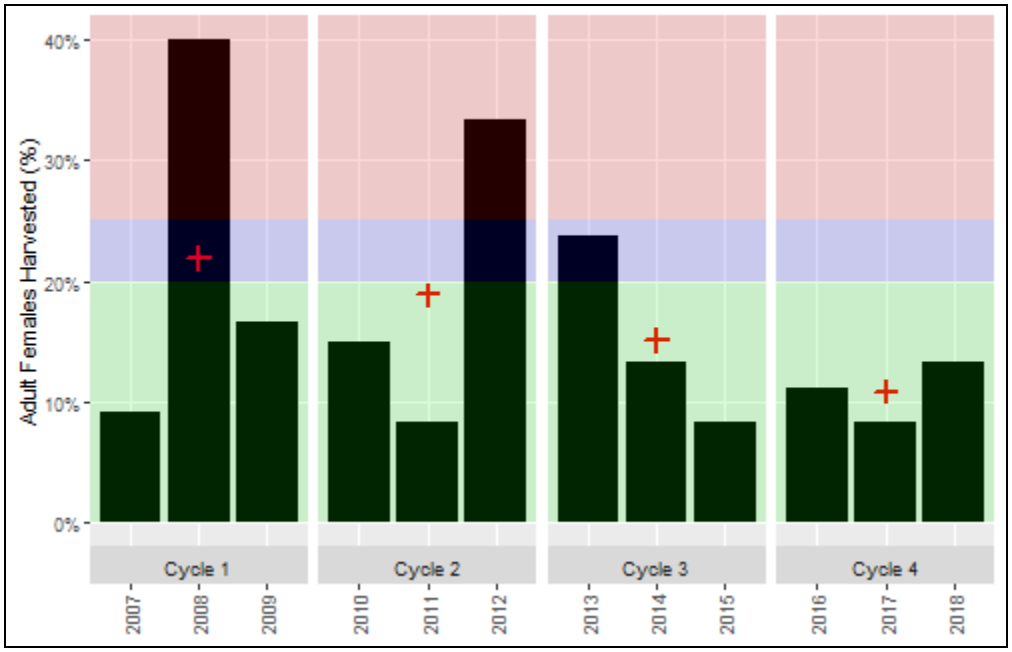
Assessment

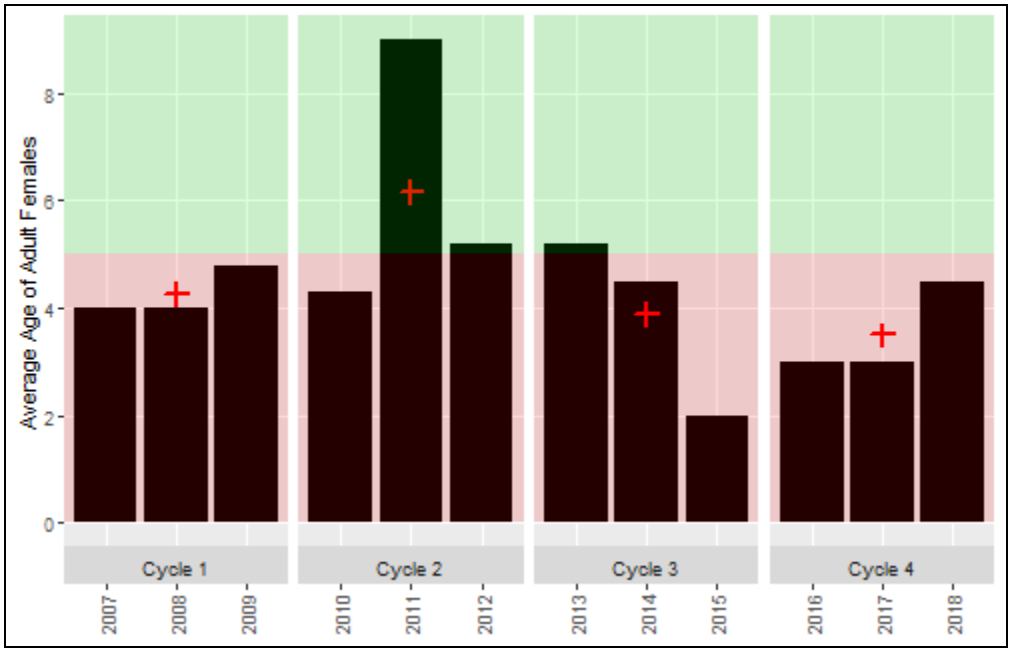
STABLE/SOURCE: HA 5 has a great deal of mountain lion habitat, but incurs relatively low harvest, likely related to private lands and access. Few adult females have been harvested (2 in the last 3 cycles), but the average age and age/sex composition shows a trend toward younger animals. Selectivity of hunters has decreased through time, which may account for the younger aged animals in the harvest. Little harvest data exists with the exception of the mortality limit being met for the first time in HY 2018, likely driven by good tracking conditions. This area is aligning well with current Stable/Source management objectives. Most harvest occurs on private land by resident hunters.

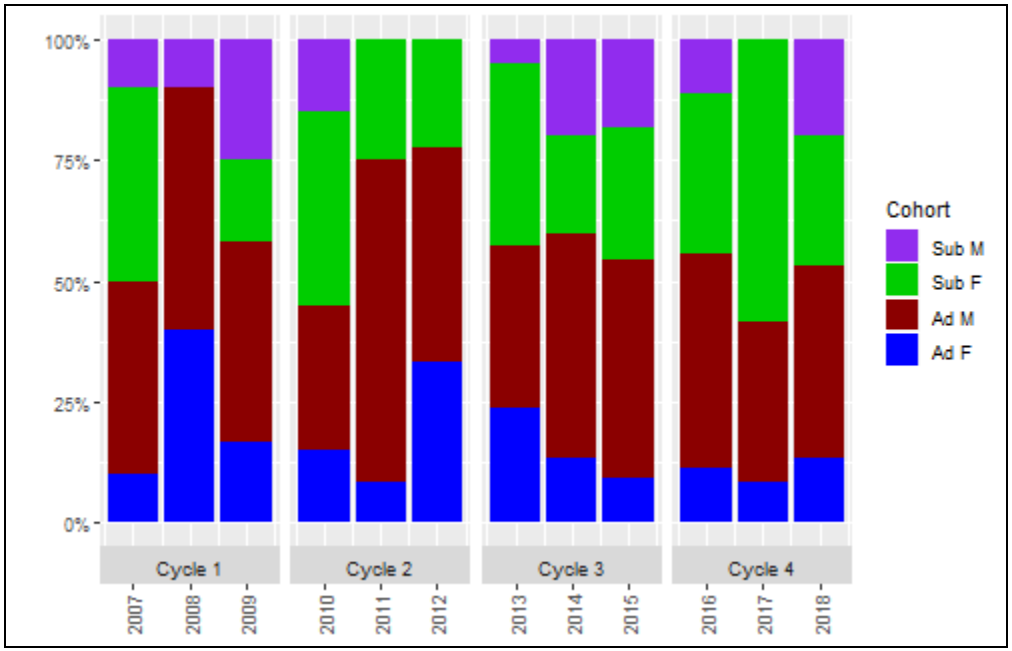
Hunt Area 6.

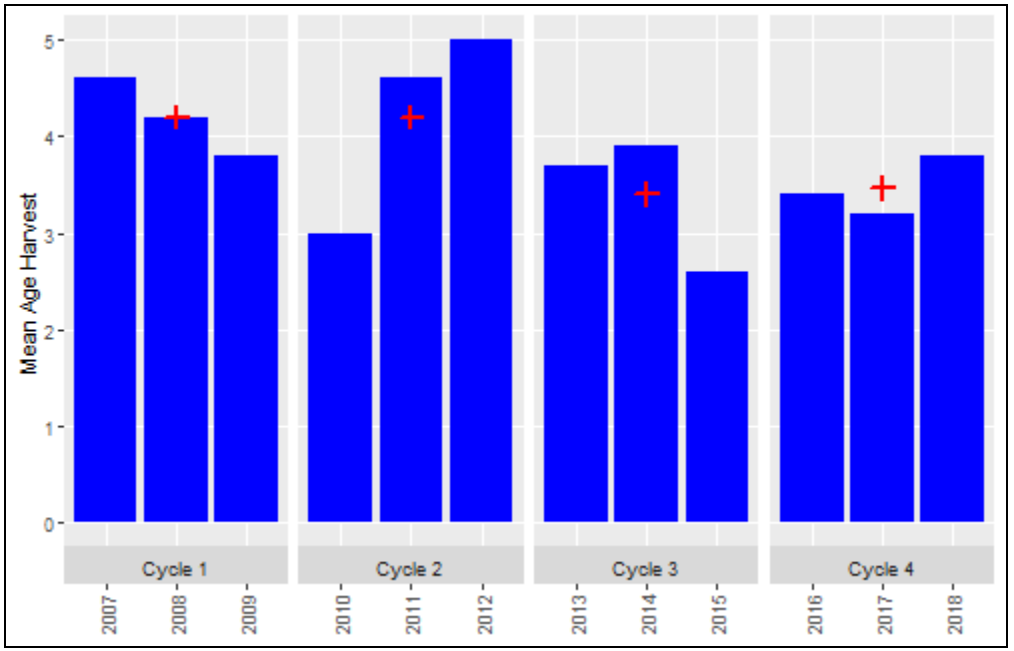

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

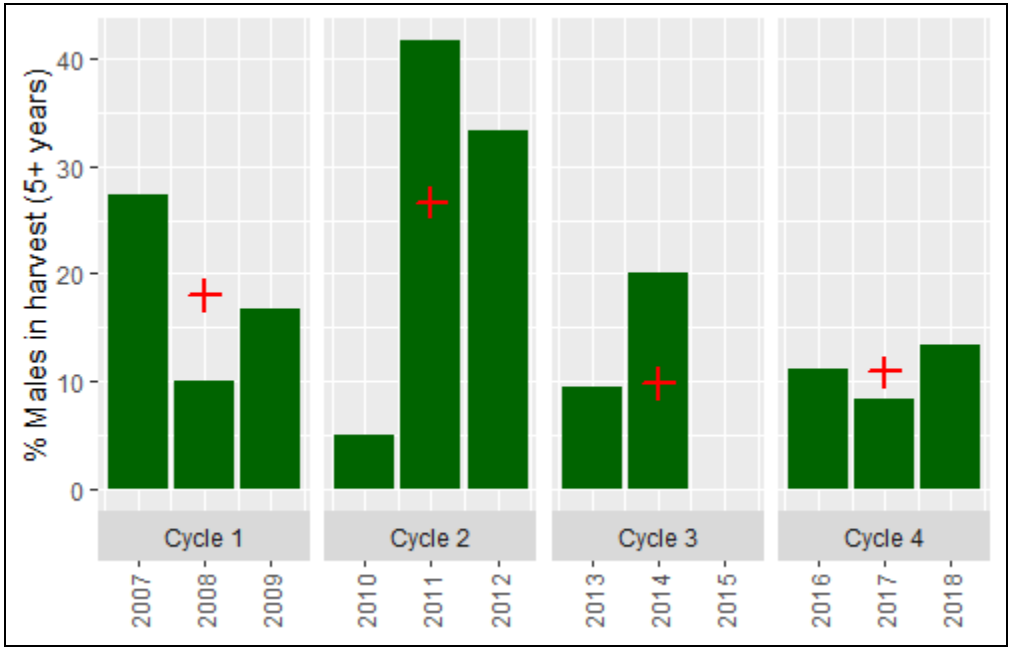

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

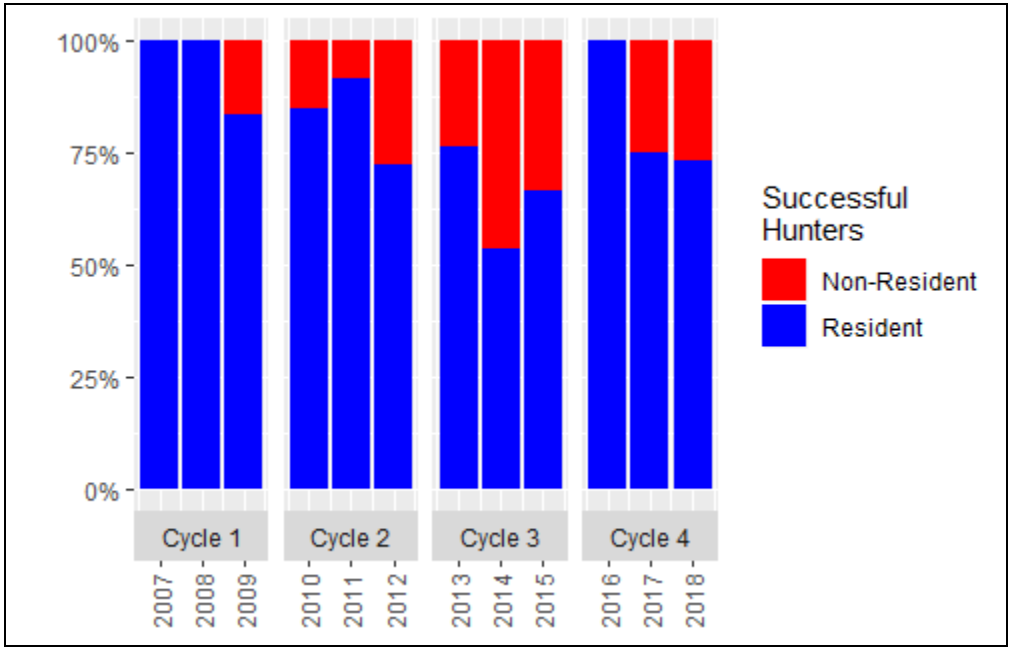

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
5
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
40
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

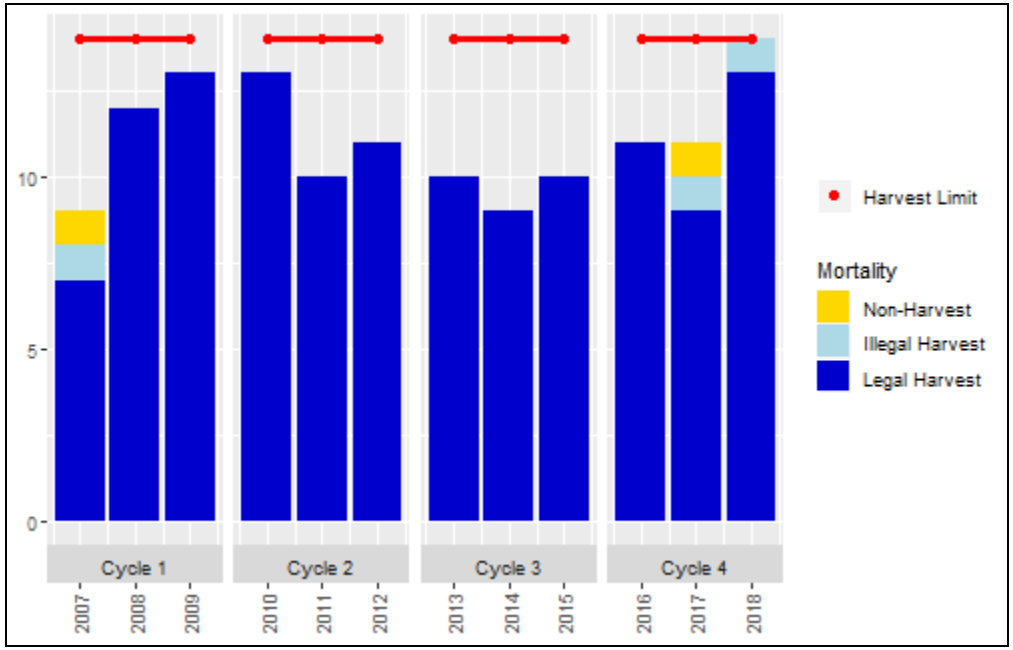
Hunt Area 6. (cont.)

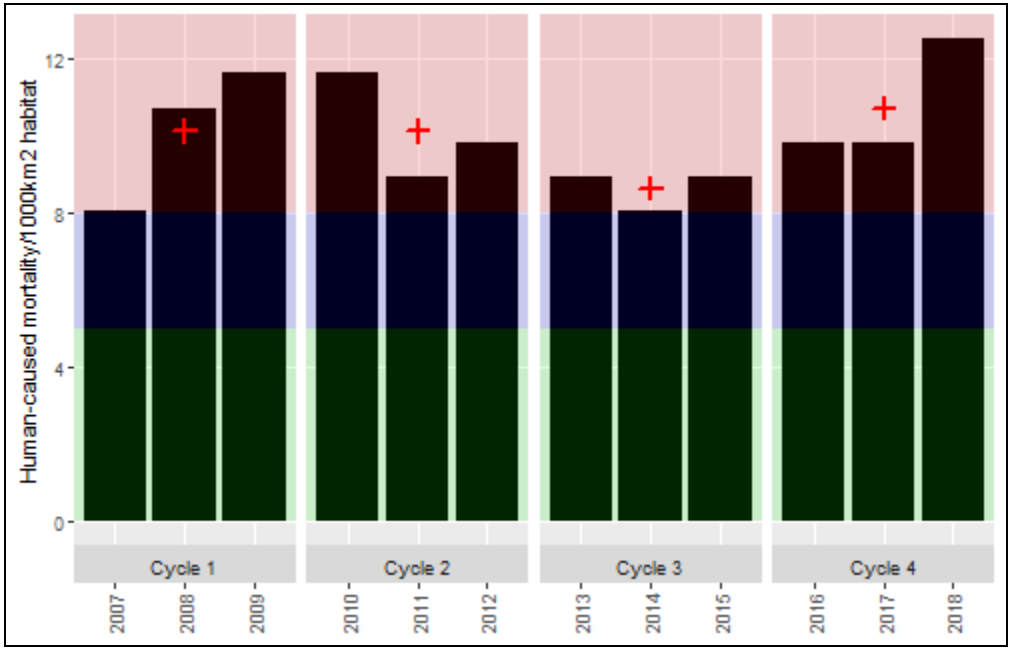
HY2016-HY2018 Regional Objective : Stable/Source management

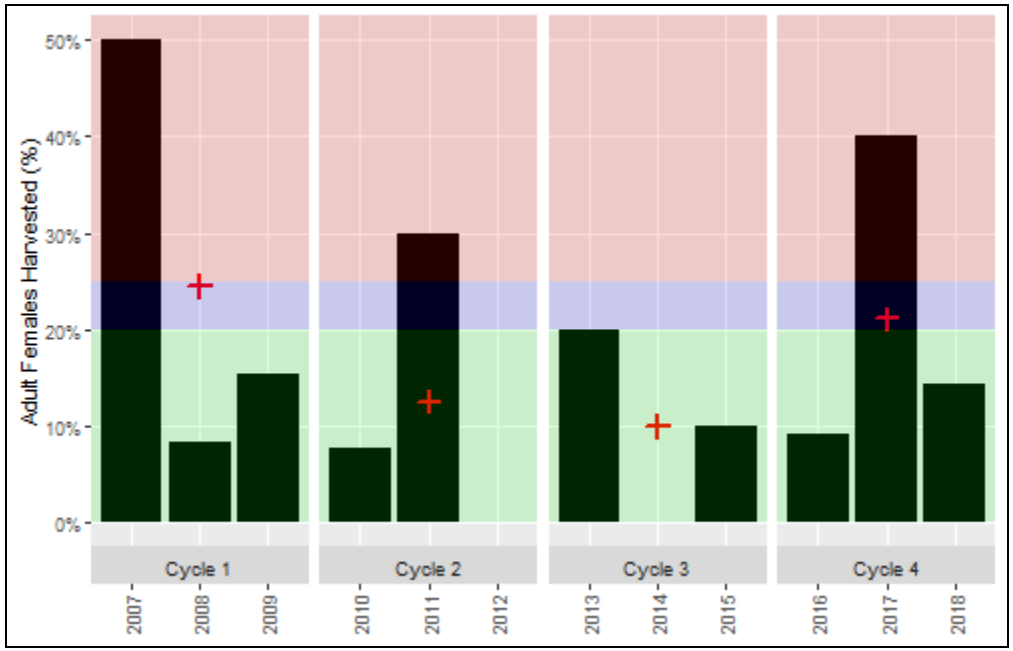
Assessment

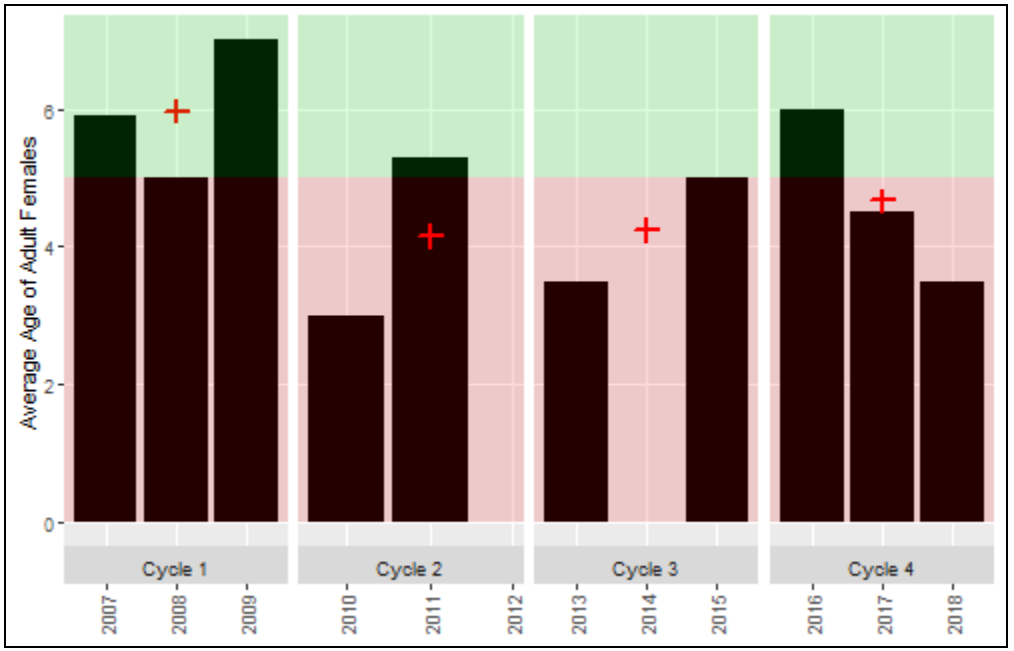
STABLE/SOURCE: The harvest limit for HA 6 was reduced from 21 to 15 in HY 2016 in an attempt to bring back quality of harvest in the hunt area. Recent habitat assessments likely overestimated mountain lion habitat in HA 6, and mortality densities probably better represent a stable population at this time. However, few adult females have been taken since harvest peaked in HY 2013 which coincides with increases in reported hunter selectivity. The average age of adult females taken remains low, and while HA 6 shows a stable age/sex structure with >30% proportion of adult males in the harvest, not as many older age class males are being harvested as in previous years. In response to objectives to rebound hunting quality, if harvest was reduced enough to rebound densities, numerical recovery can occur within 2-3 years, with age structure rebounds in 3-4 years; but returning older age structure consistent with a Source-level population function will benefit from Source management for ~6 years (WGFD 2006). There is an increasing trend in the proportion of guided hunts in HA 6, but surprisingly not a high non-resident harvest.

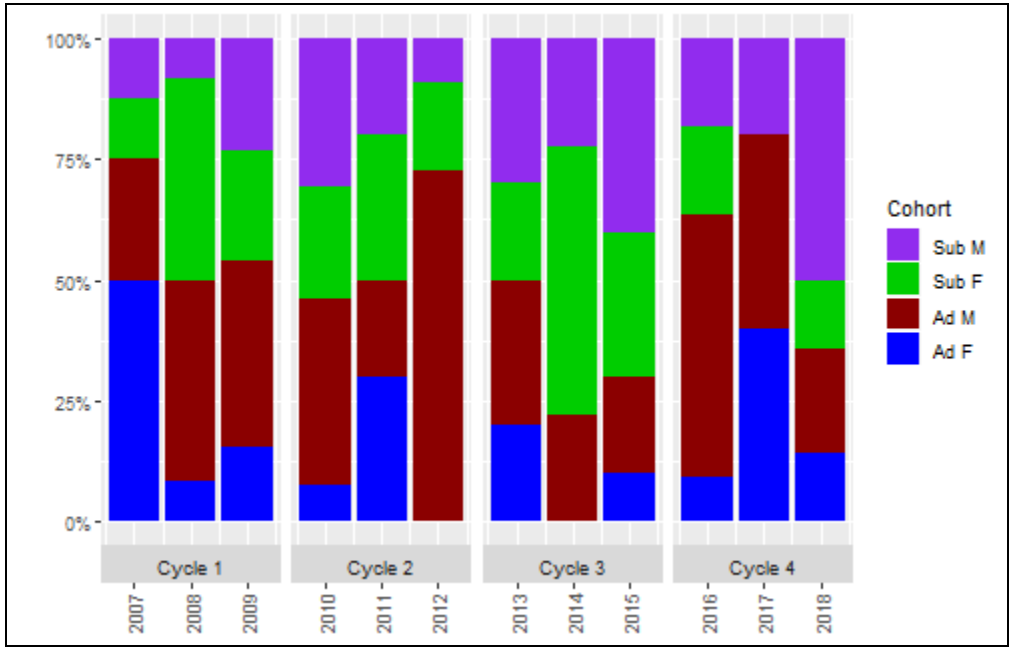
Hunt Area 7.

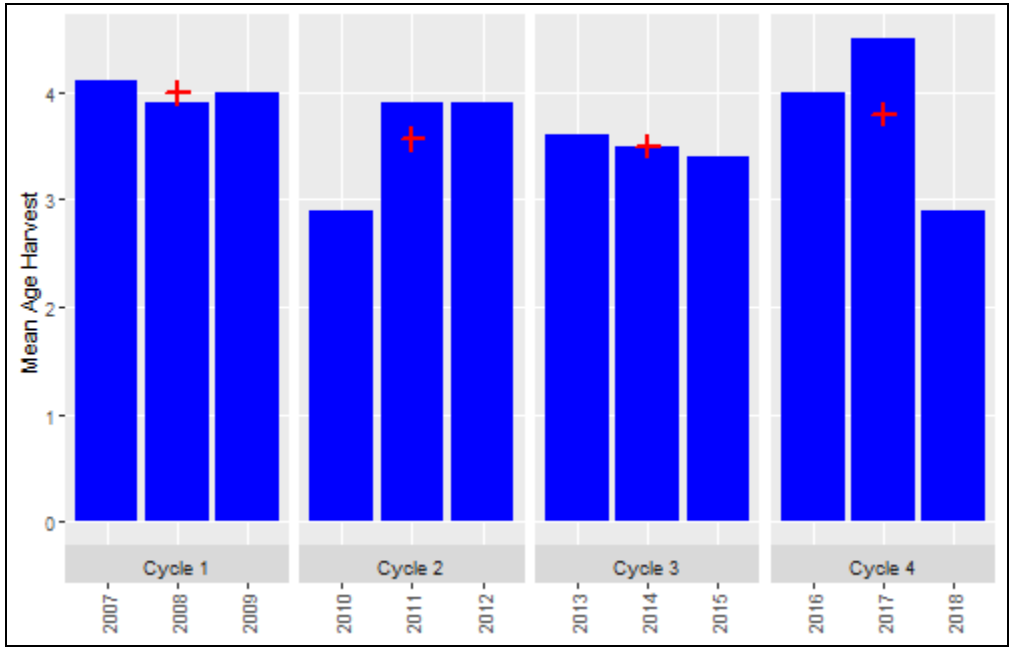

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

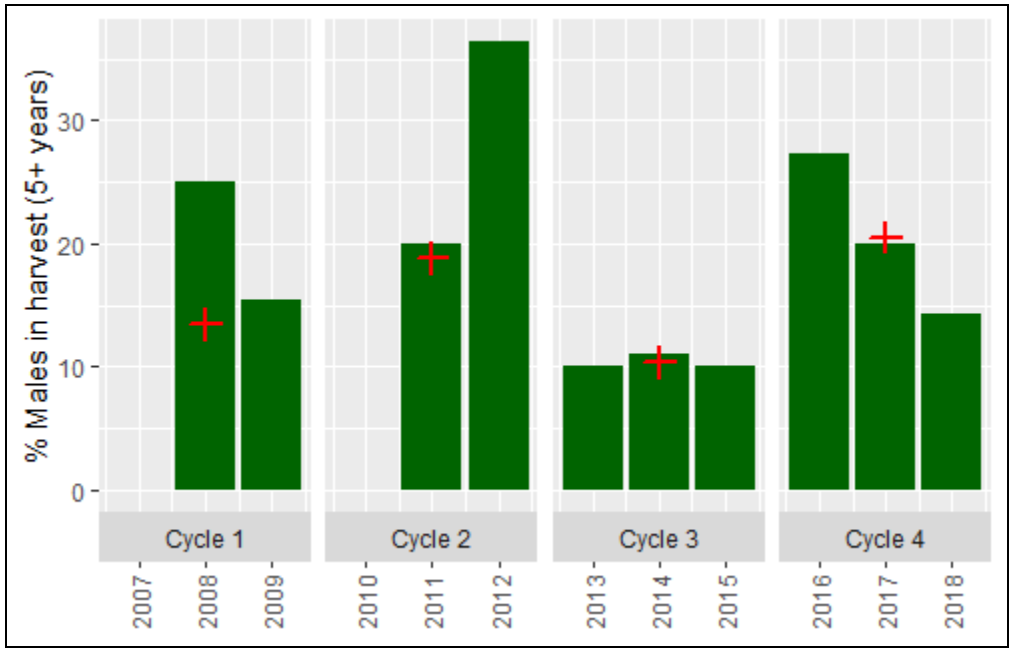

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

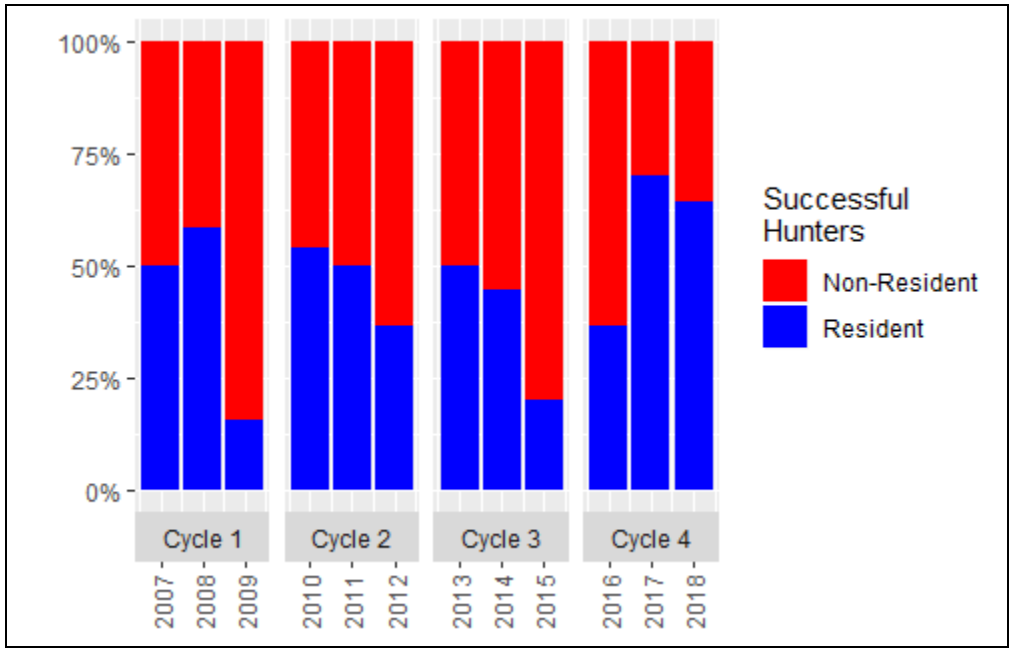

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
0
1
2
3
4
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
0
10
20
30
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

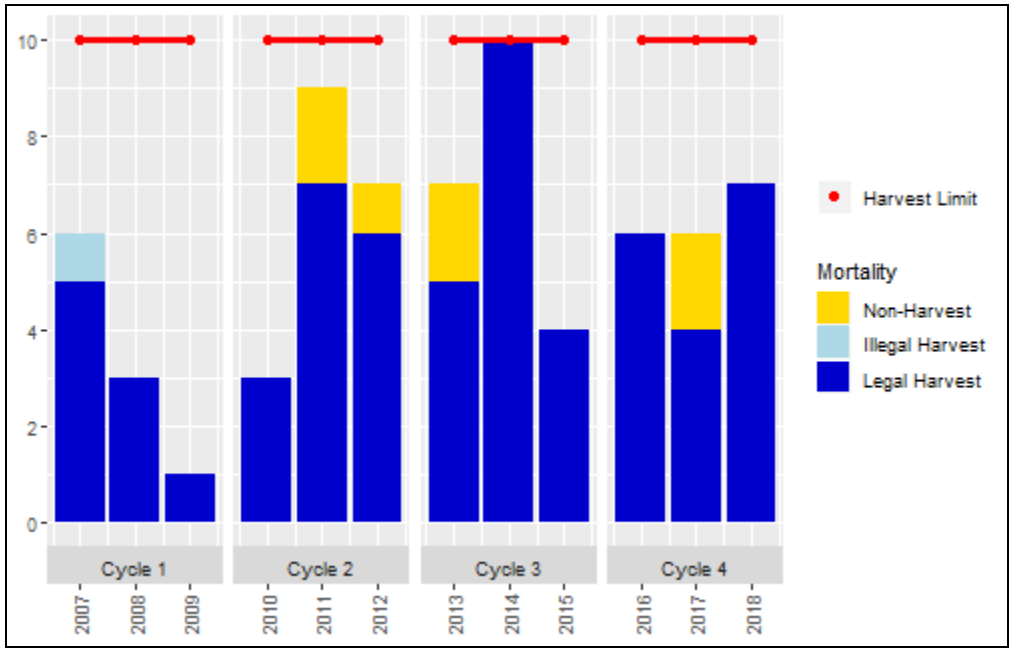
Hunt Area 7. (cont.)

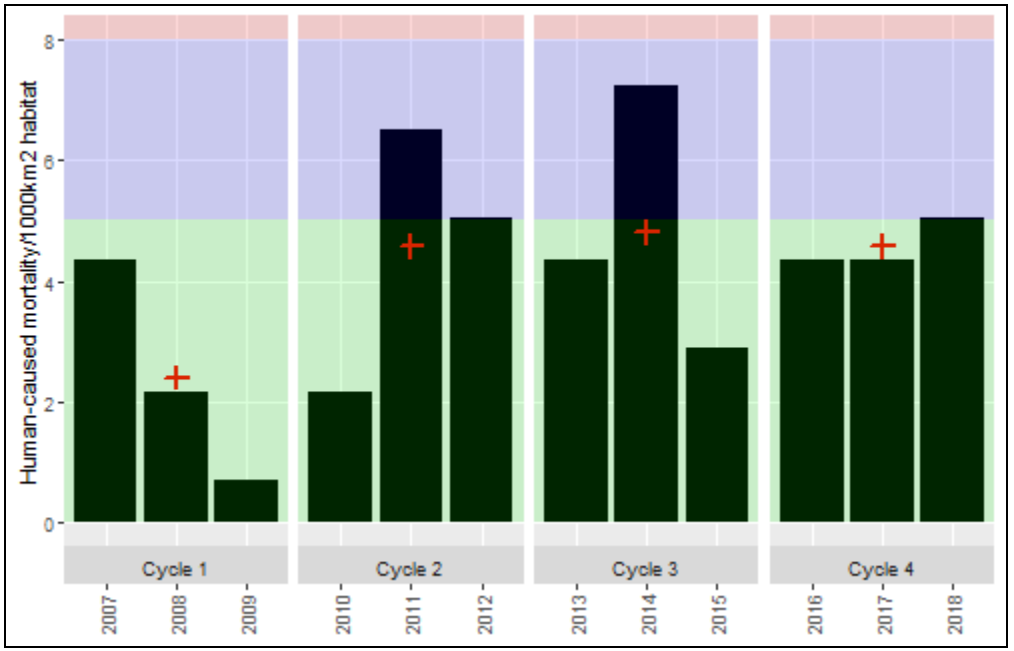
HY2016-HY2018 Regional Objective : Sink management

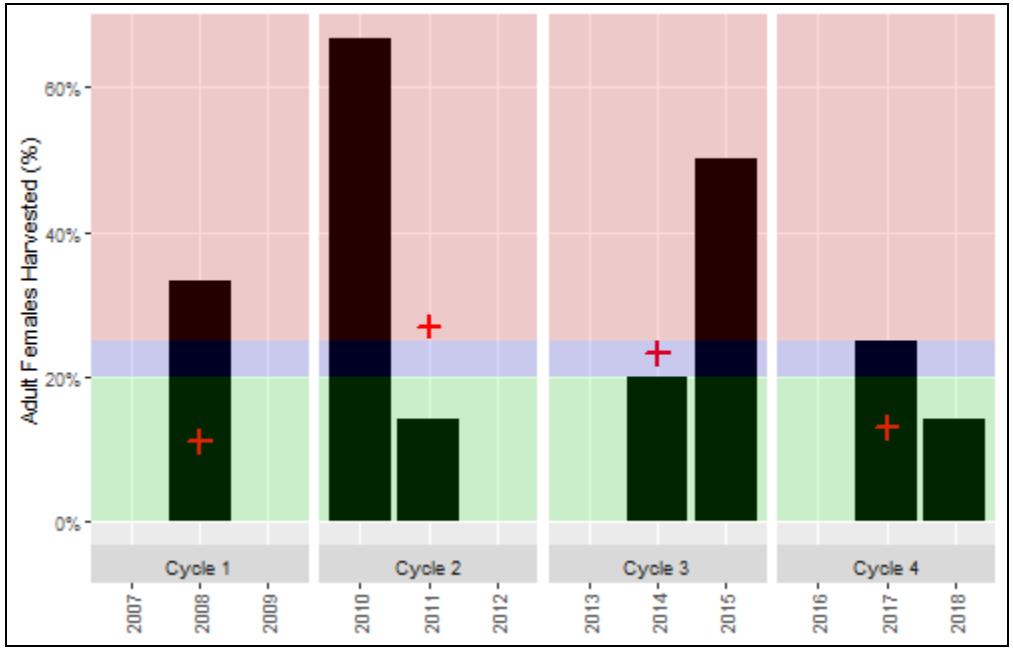
Assessment

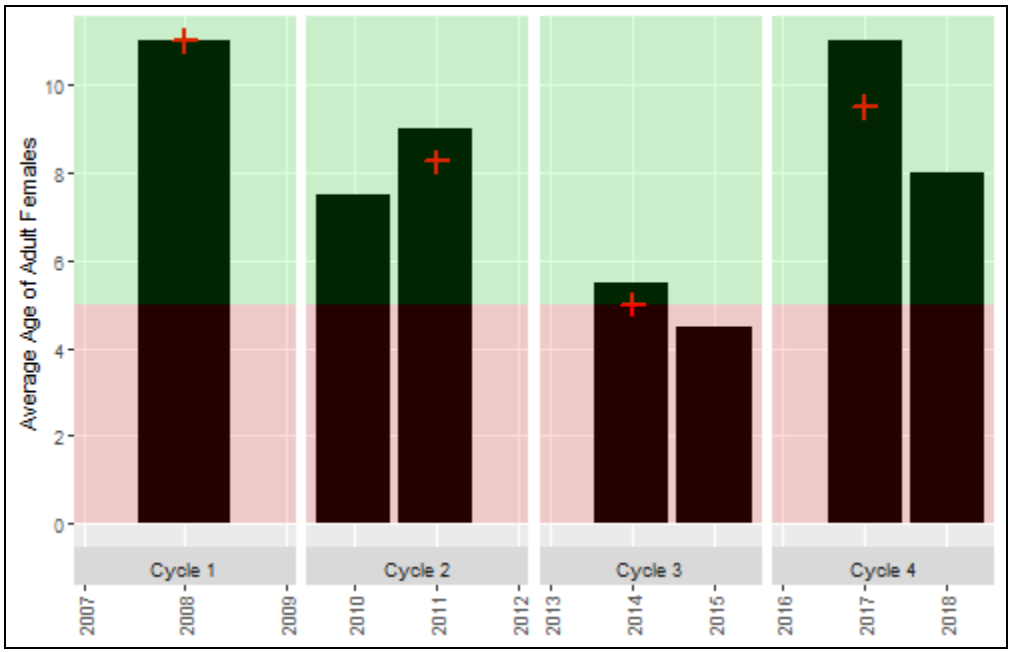
STABLE/SINK: HA 7 is demonstrating Sink-level mortality densities as well as generally younger-aged adult females harvested. On the contrary, only sporadic levels of high adult female harvest occur, and the age/sex structure of harvest rebounded in the current cycle including the proportion of older aged males in the harvest. This is likely due to an increase in reported selectivity among hunters and perhaps a shift away from public land harvest toward private lands where older animals were previously unavailable for harvest.

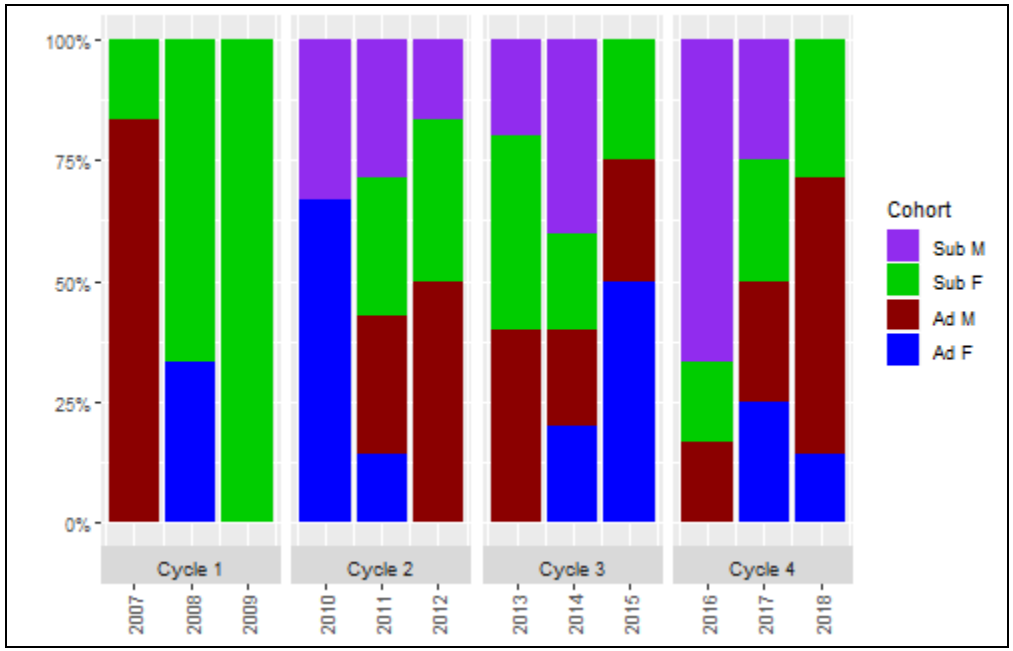
Hunt Area 8.

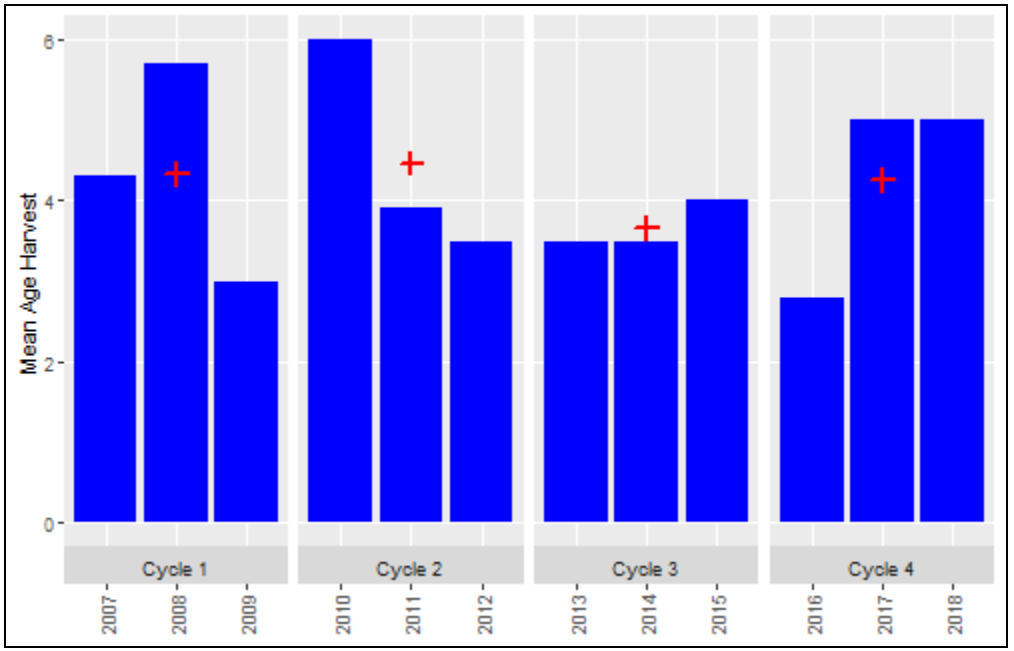

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

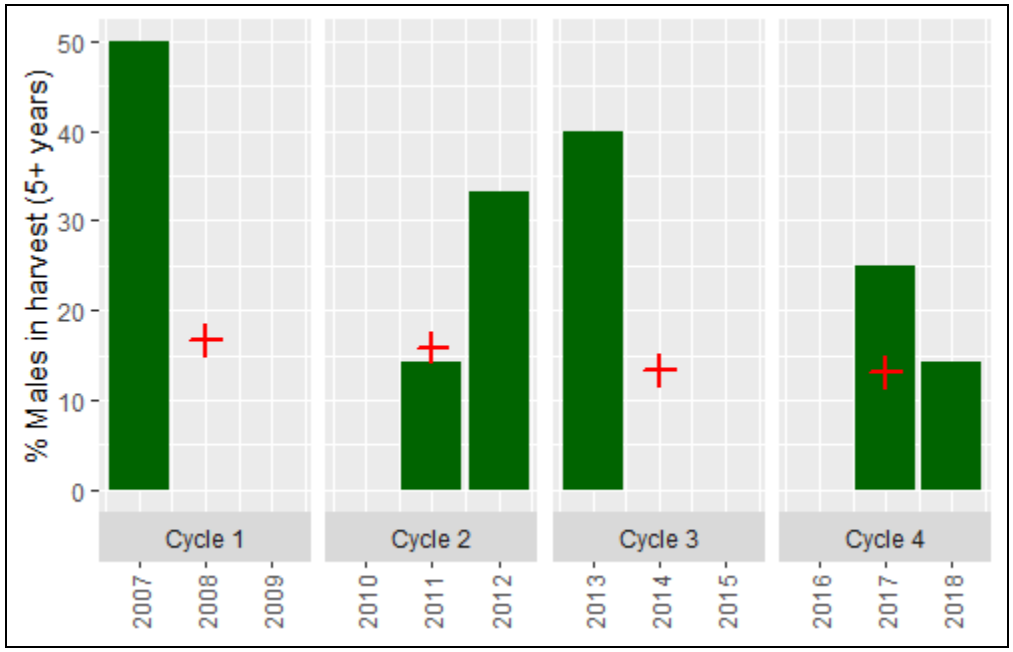

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

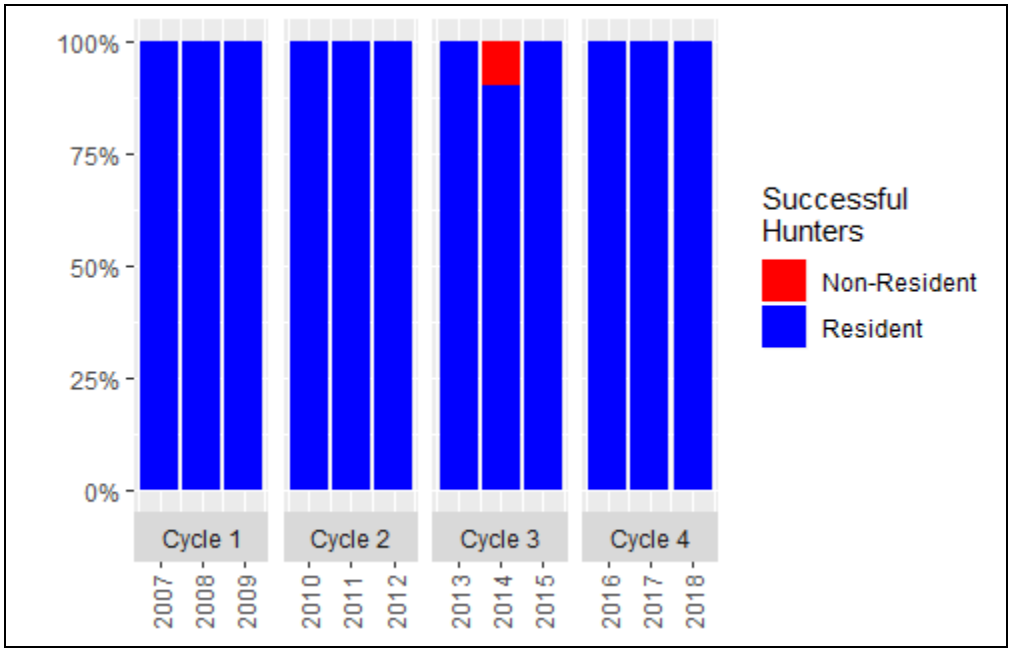

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
50
40
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

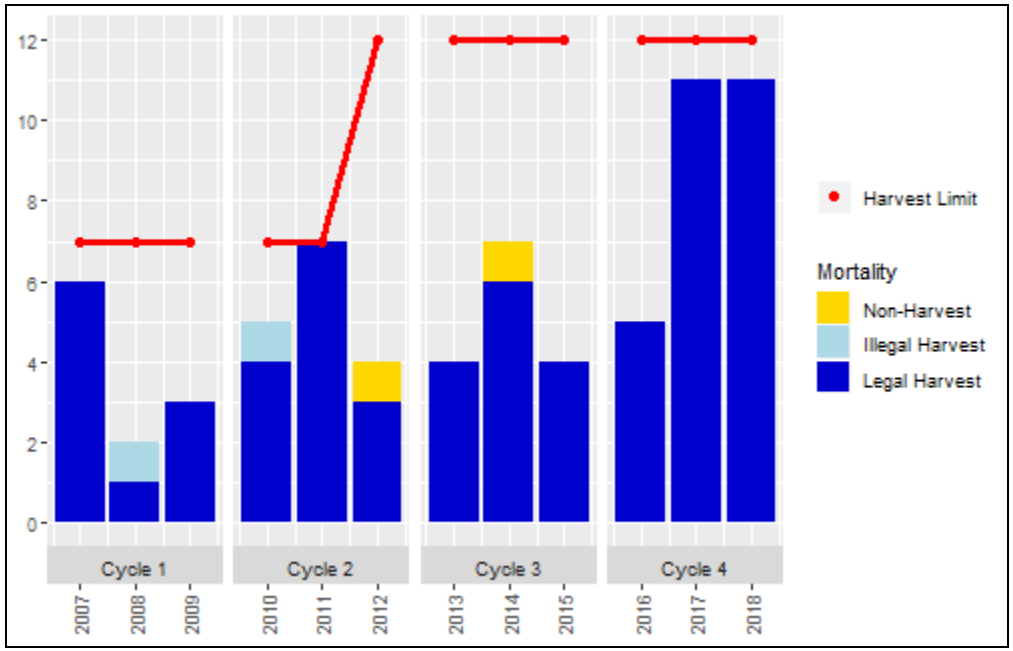
Hunt Area 8. (cont.)

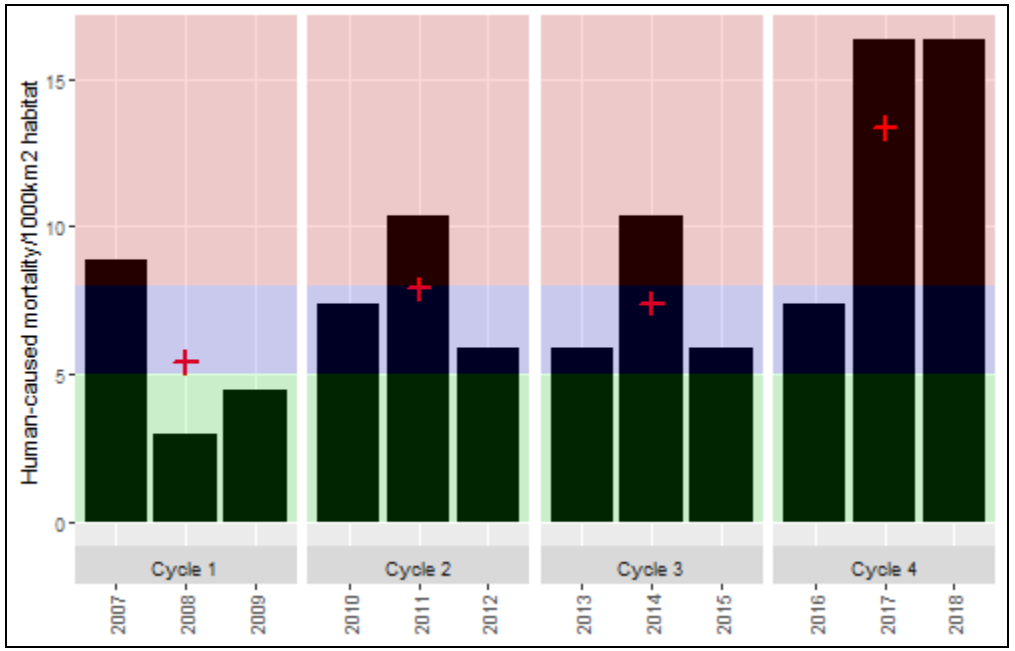
HY2016-HY2018 Regional Objective : Stable management

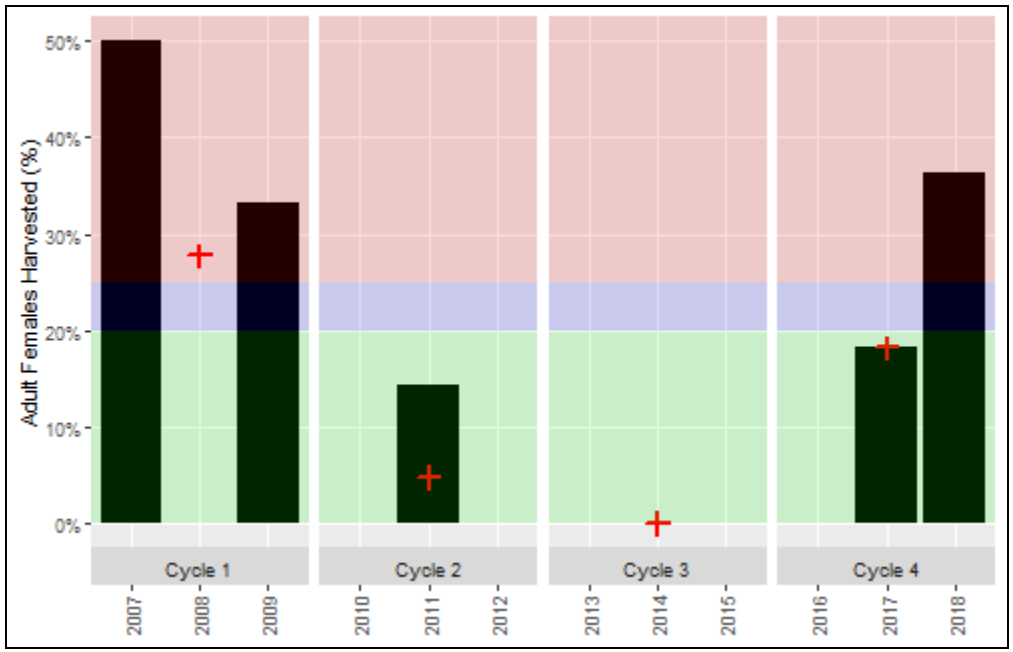
Assessment

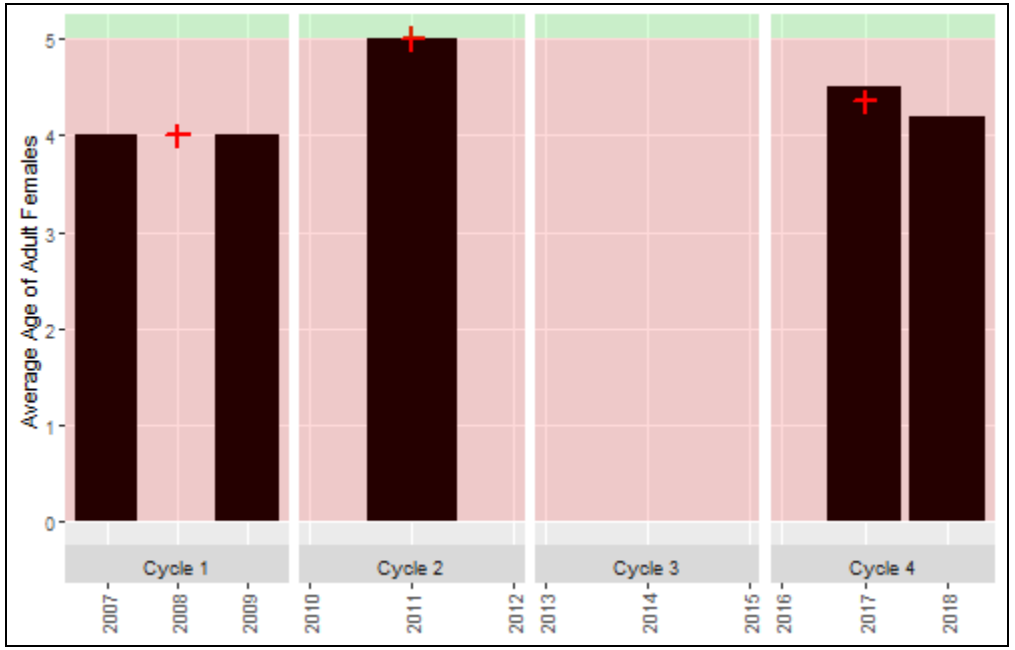
STABLE/SOURCE: HA 8 generally maintained mortality densities in the Stable/Source range. The proportion of adult females harvested is sporadic, and spikes in these proportions usually coincide with low harvest during those seasons. Adult females in the harvest are generally older than 5, and the age/sex composition and overall age of harvested animals remains stable. Current harvest pressure results in HA 8 functioning toward Source dynamics, but to a smaller degree than larger productive areas that contribute more dispersing animals. Most harvest (~75%) occurs on public land in HA 8 and only one non-resident harvest has occurred across all management cycles. Hunters report about 50% selectivity for older age class animals.

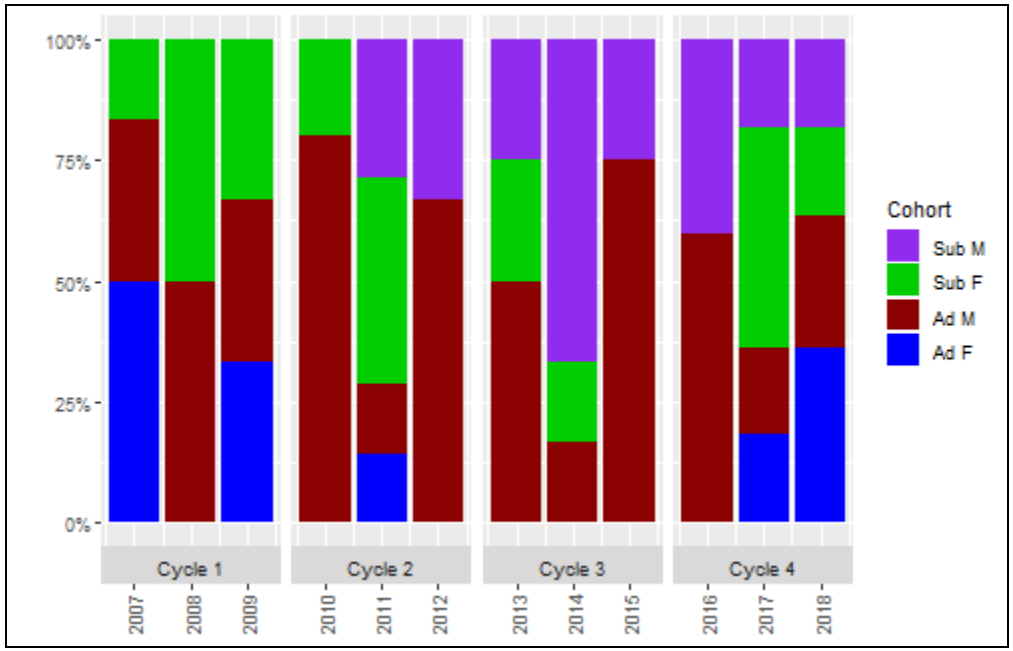
Hunt Area 9.

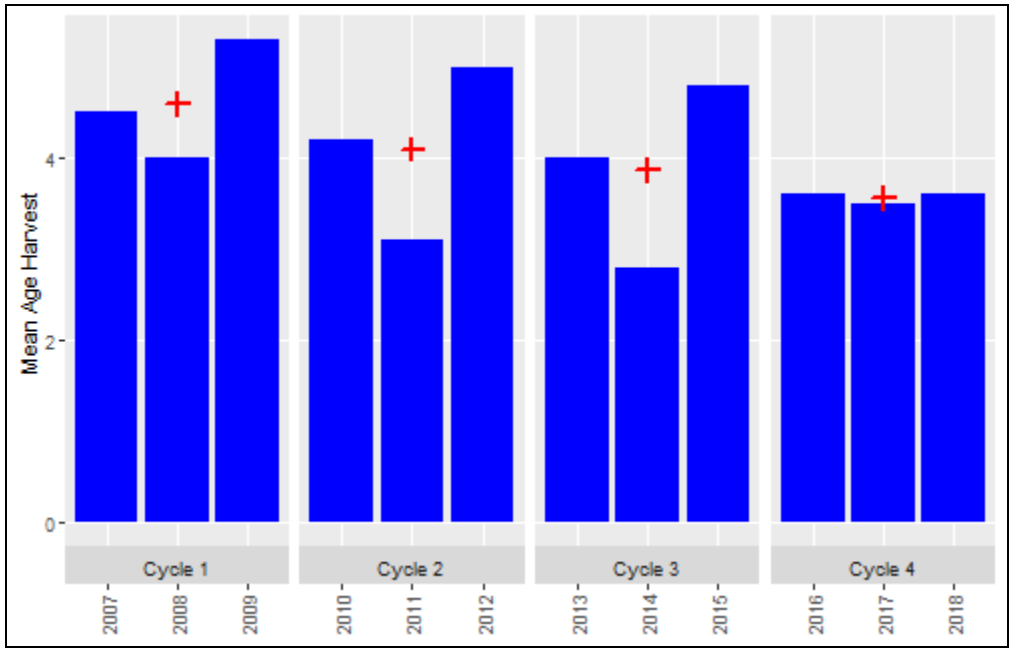

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

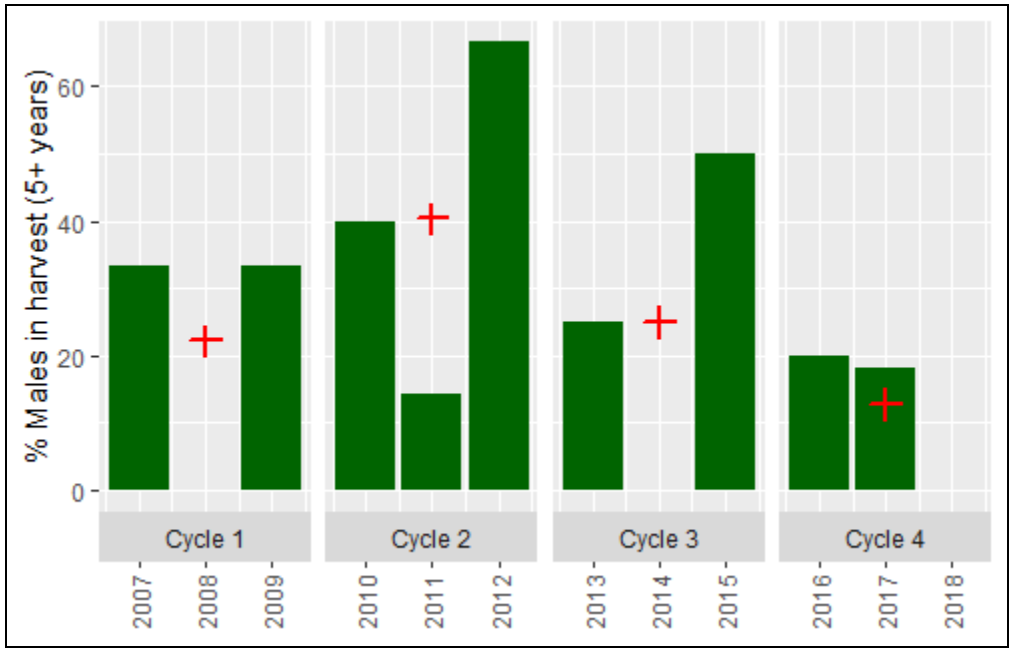

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

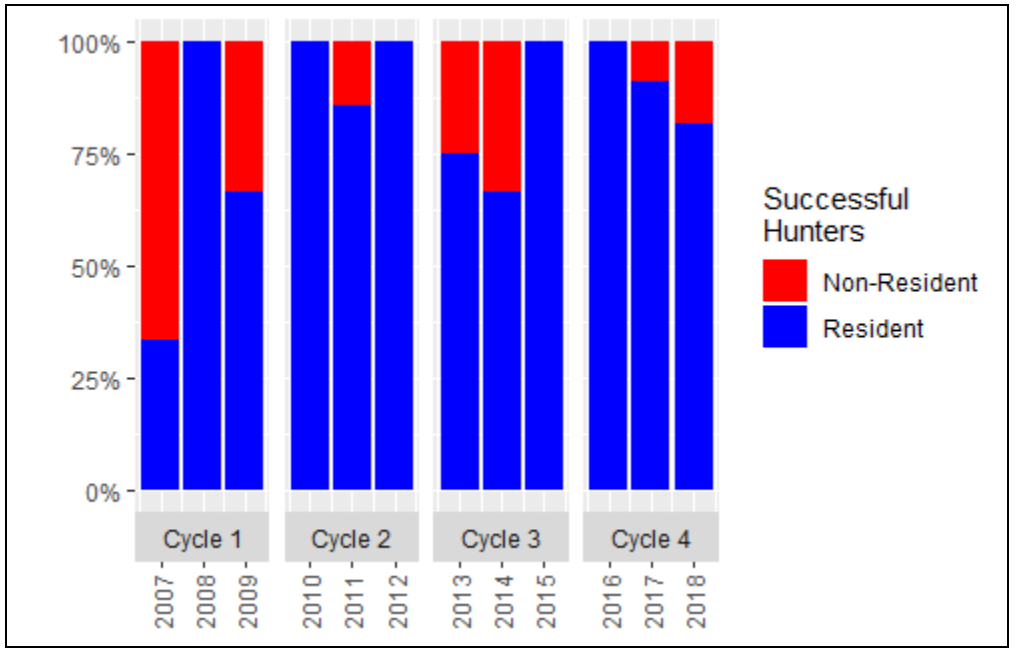

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Cohort
Sub M
Sub F
Ad M
Ad F


Mean Age Harvest
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
60
40
20
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Successful Hunters
Non-Resident
Resident

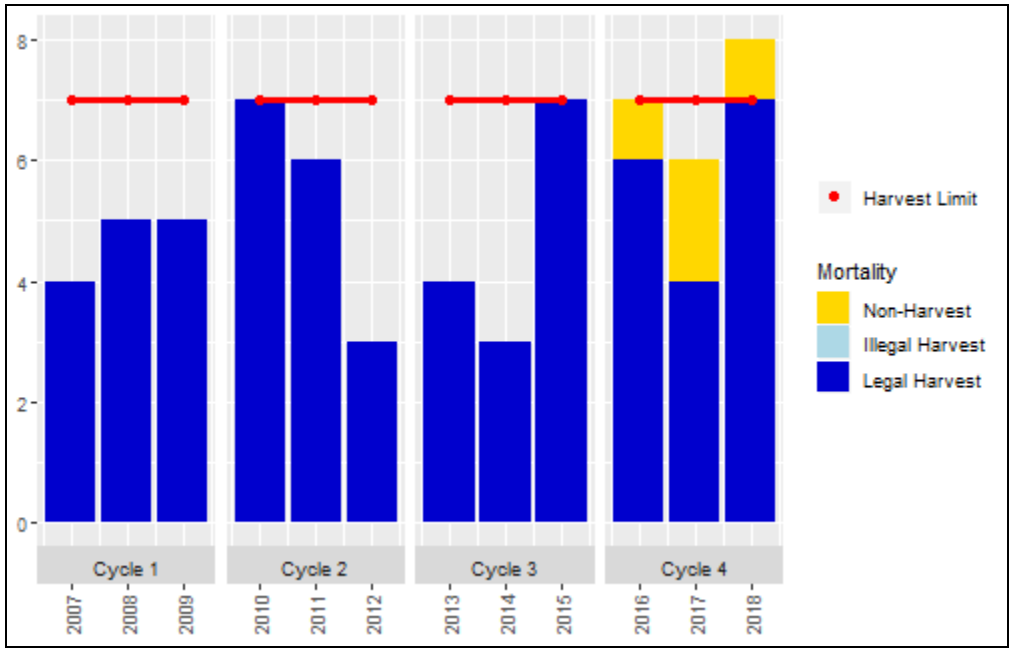
Hunt Area 9. (cont.)

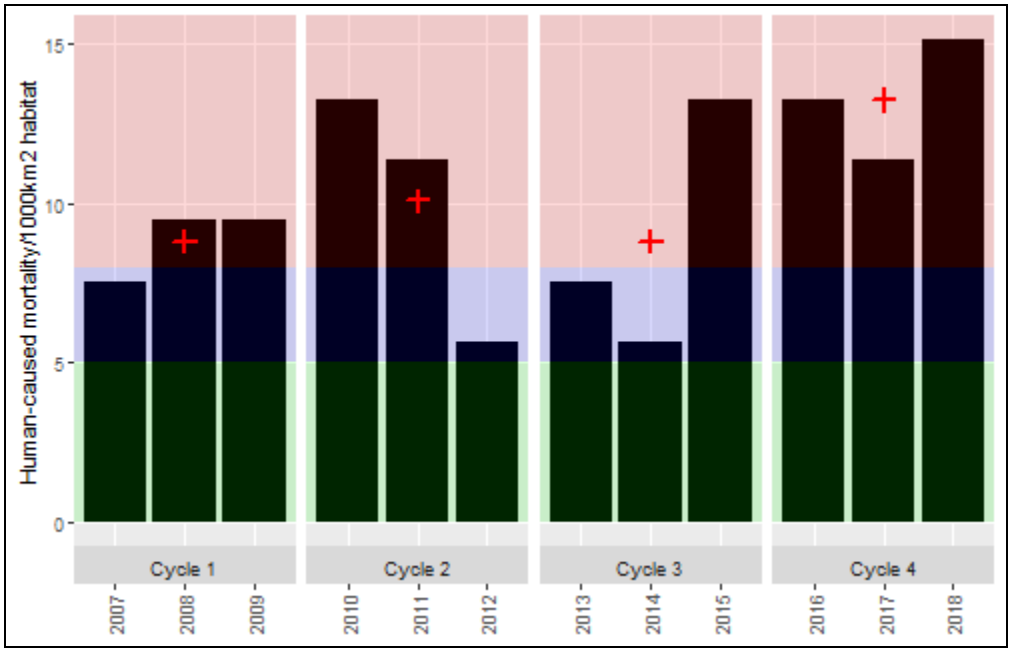
HY2016-HY2018 Regional Objective : Sink management

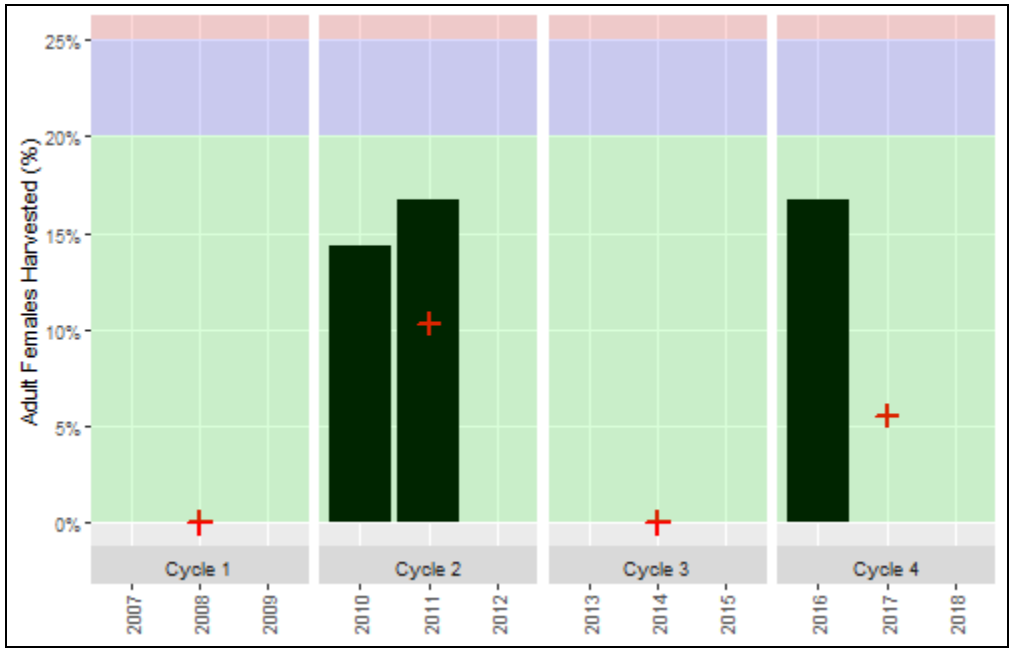
Assessment

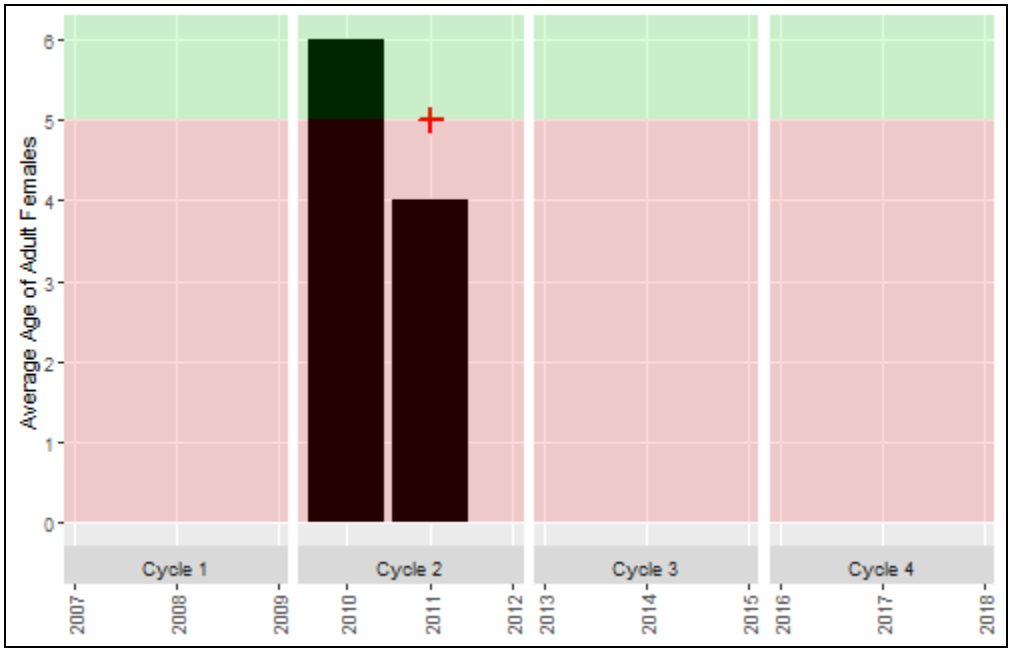
STABLE/SINK: Mortality densities have averaged levels on the upper end of stability, and the last two seasons reached high harvest levels with good hunting conditions reported. Early data indicate that high harvest of adult females may have stifled reproduction in the area. However, population recovery was likely from HY 2012 – HY 2016 with very few adult females taken. The average age of adult females remains young, and the overall age has generally decreased toward what would be expected under moderate hunting pressure. The age/sex structure of harvest remains stable meaning that adults are available, but those adults tend to be slightly younger for both males and females. Guided hunts have decreased as have the proportion of non-resident harvest. Selectivity has increased in the area which may have bolstered the composition of adult animals, and harvests during the 3rd cycle were dominated by male cohorts. This did, however, shift toward more females in the current cycle along with increased harvest. These trend data indicate a relatively stable population, but increased harvest during the current cycle coupled with recent adult female harvest will likely move HA 9 toward the objective for local reduction.

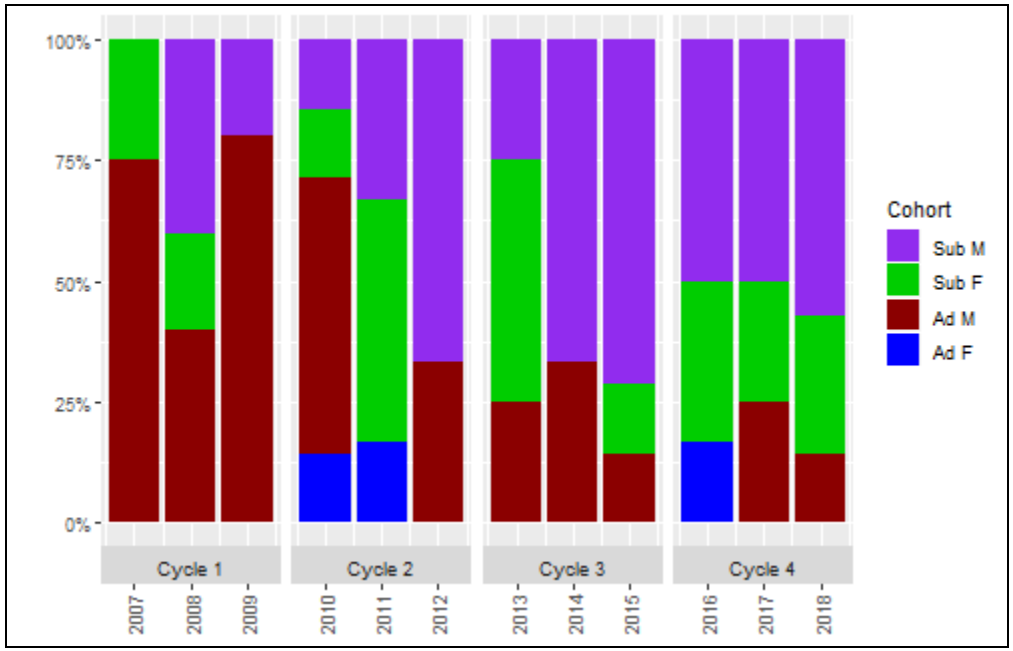
Hunt Area 10.

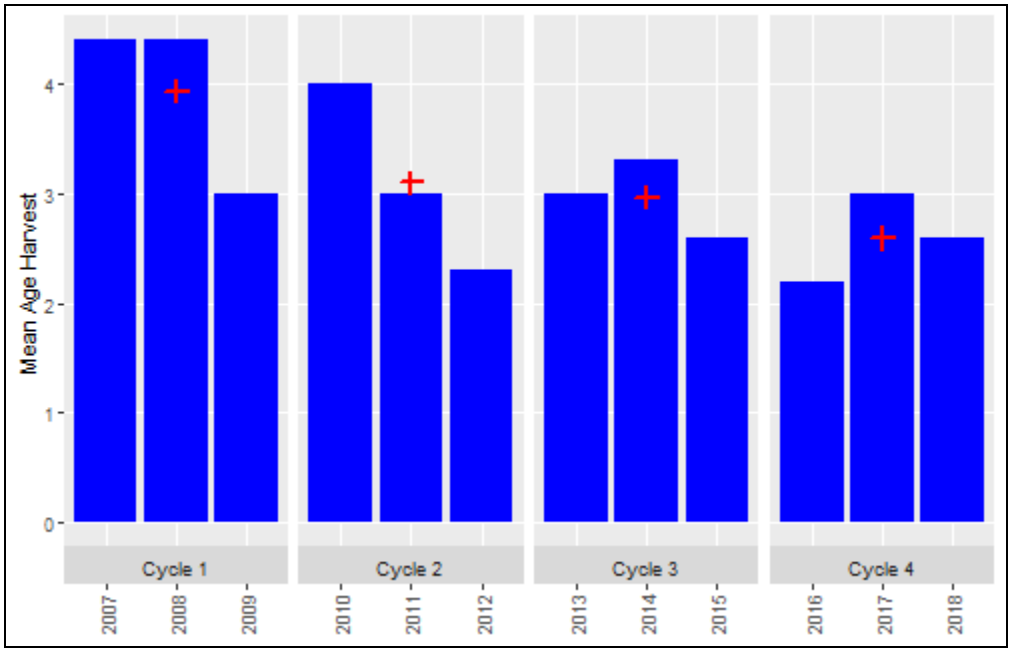

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

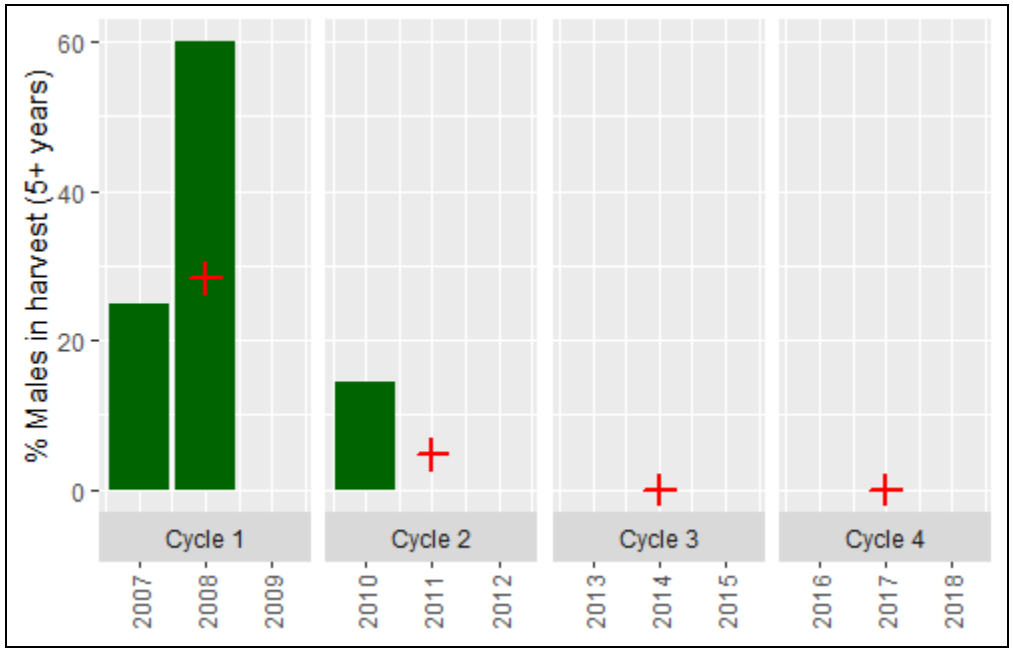

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

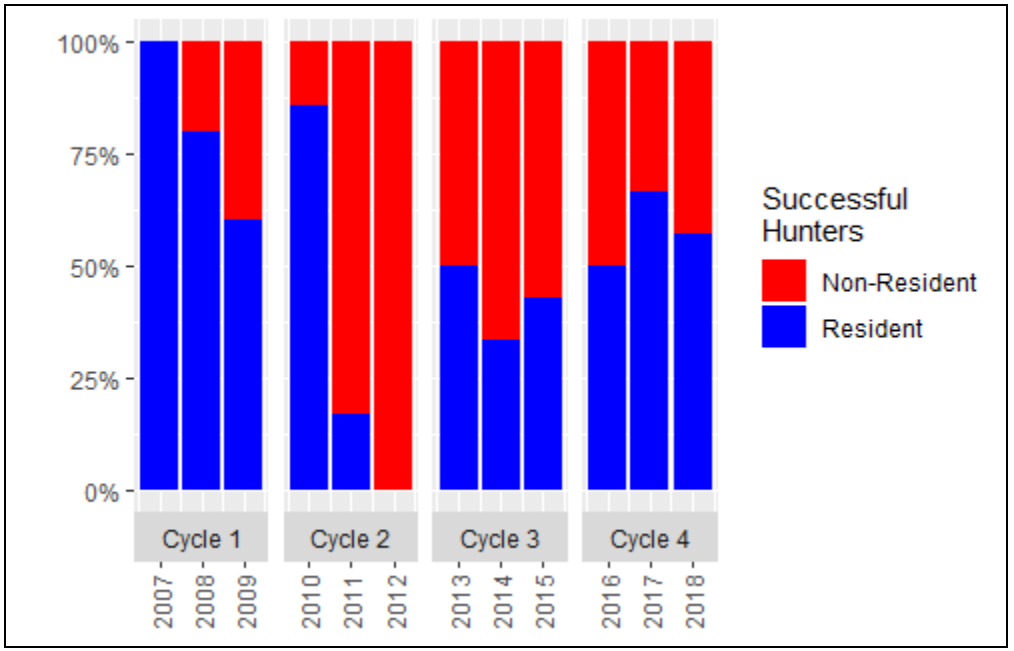

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Cohort
Sub M
Sub F
Ad M
Ad F


Mean Age Harvest
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
60
40
20
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Successful Hunters
Non-Resident
Resident

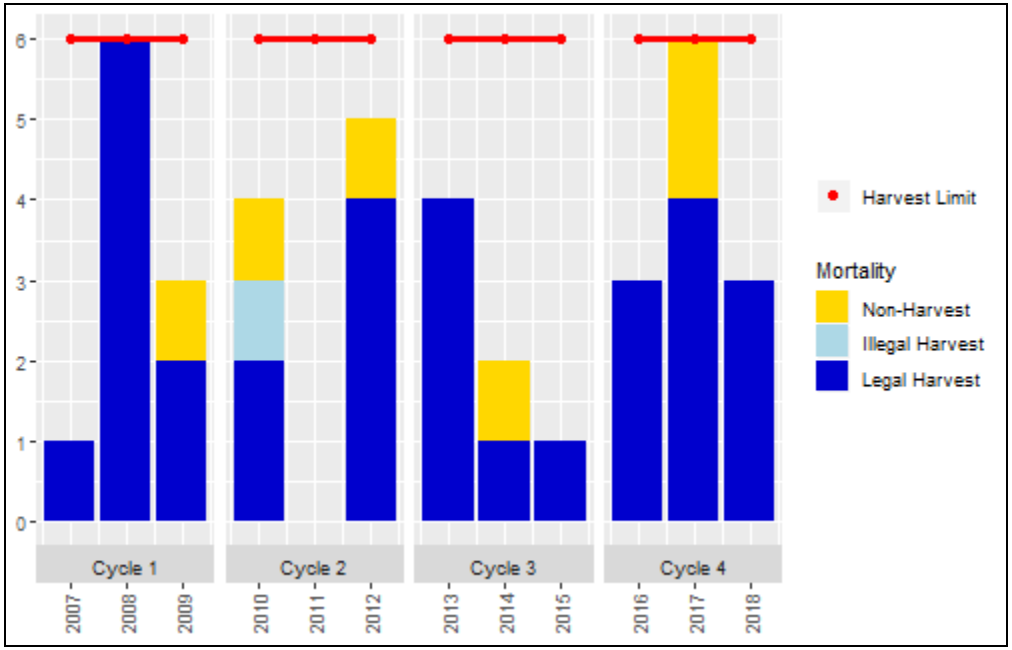
Hunt Area 10. (cont.)

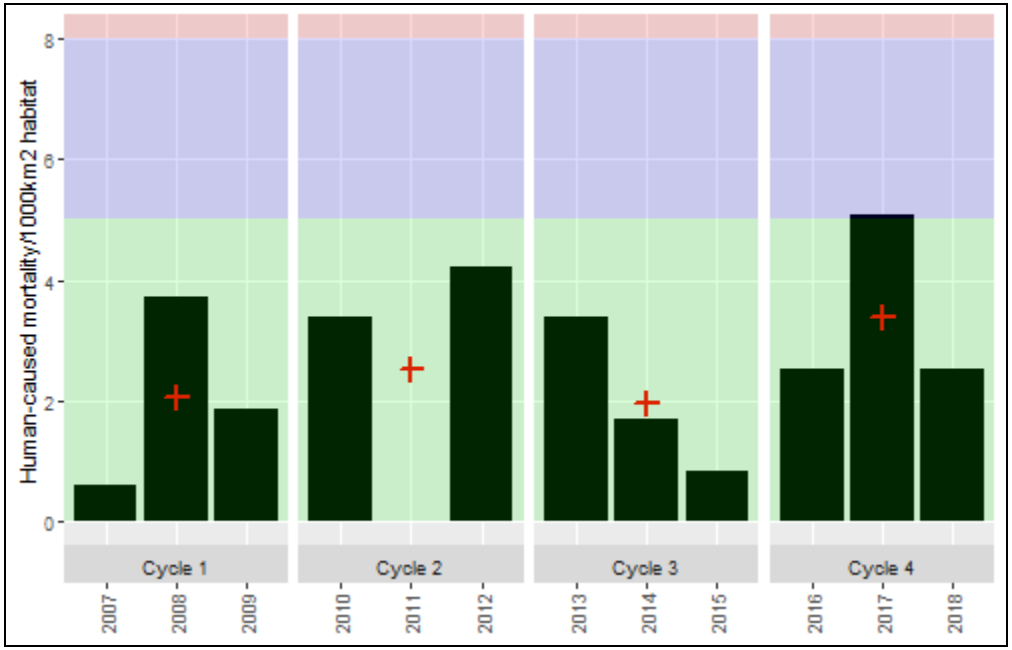
HY2016-HY2018 Regional Objective : Sink management

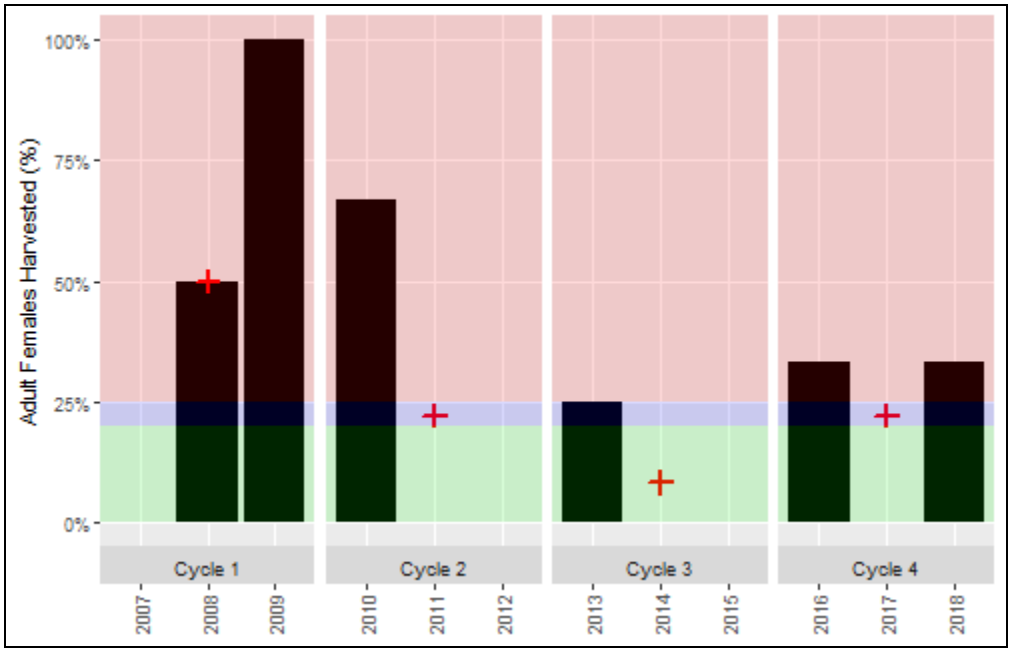
Assessment

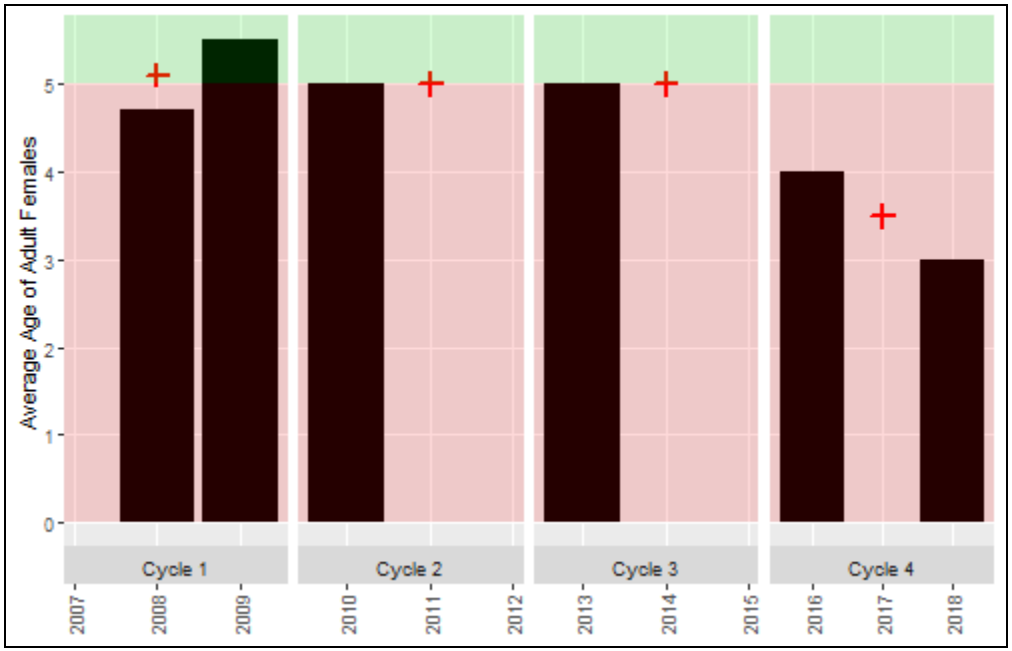
SINK: HA 10 has incurred elevated harvest and overall increased mortality densities since HY 2007. The average age of all harvest has steadily decreased to around 2.5 years for the current cycle which shifted age/sex composition to near 15% mature animals represented. The high proportion of sub-adult animals harvested in this area suggests densities are sustained primarily through immigration. In addition, harvest also appears to be shifting closer toward the state line with Colorado near the Little Snake River. The objective for Sink management is being met. Guided hunts have decreased in this area, with more harvests occurring on public land. Non-resident hunters comprise about half the harvest that occurs in HA 10.

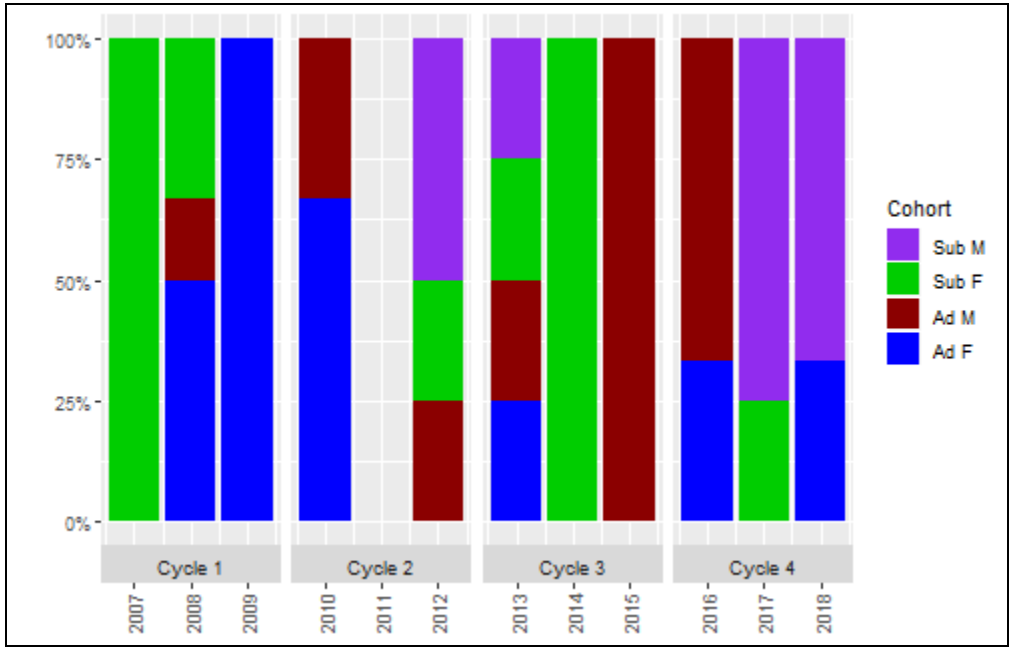
Hunt Area 16.

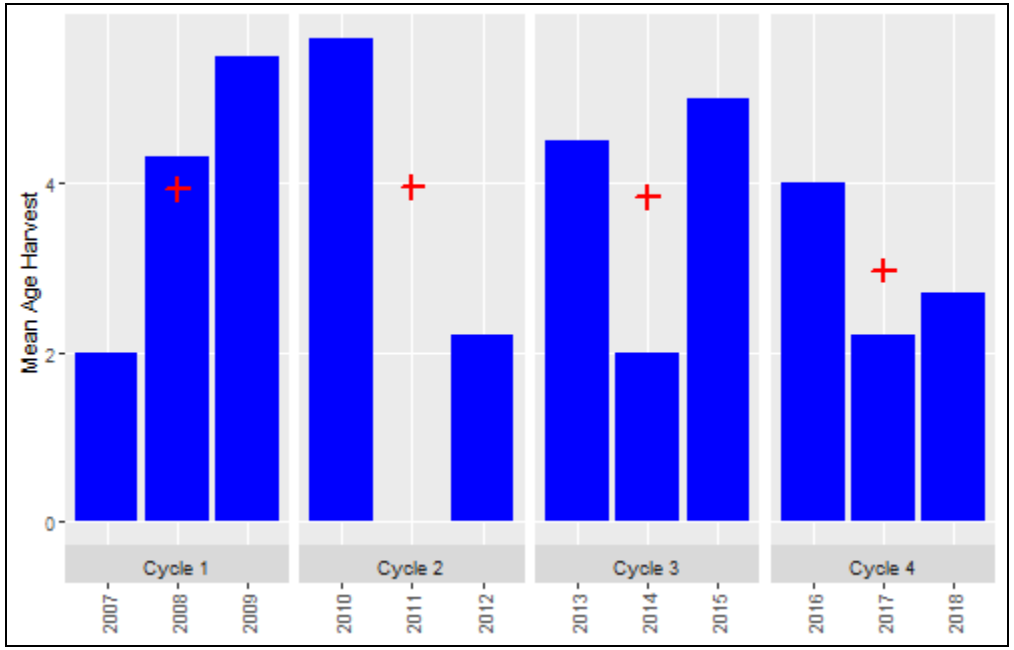

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

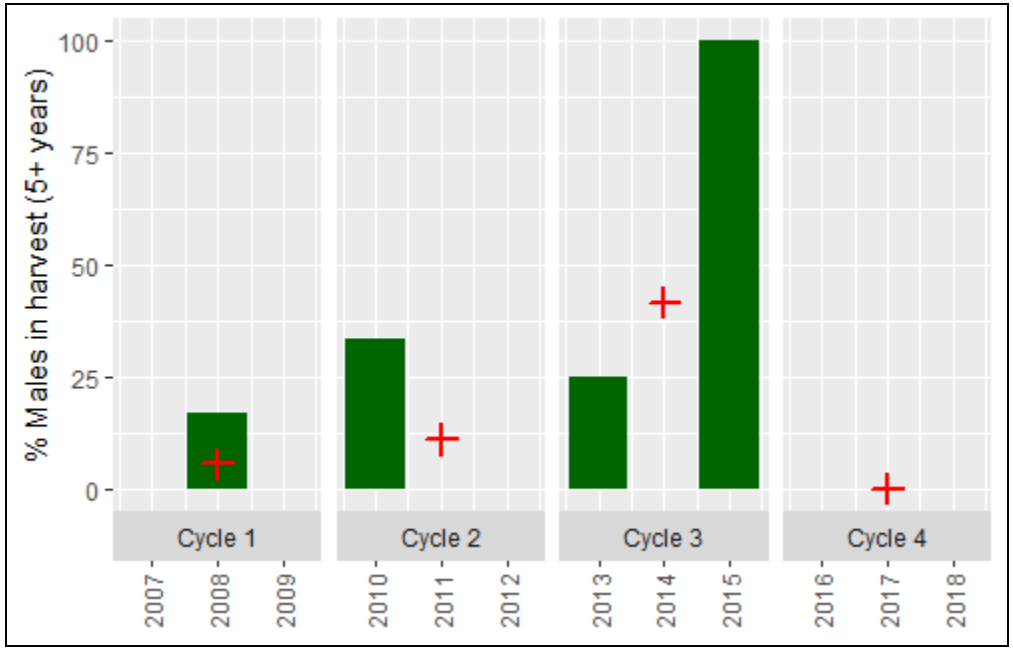

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

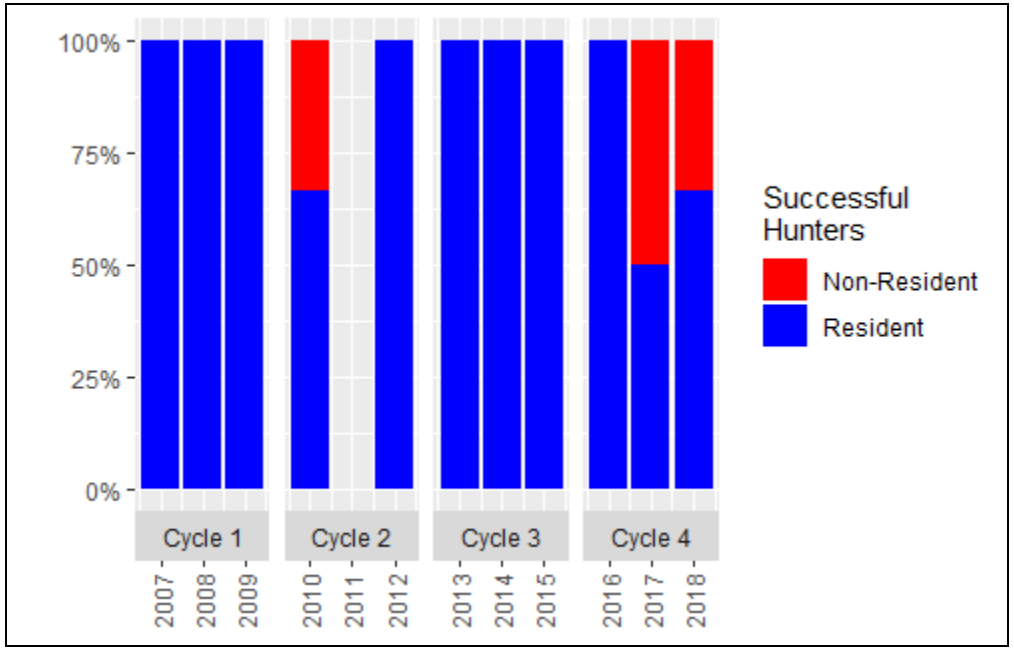

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
100
75
50
25
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

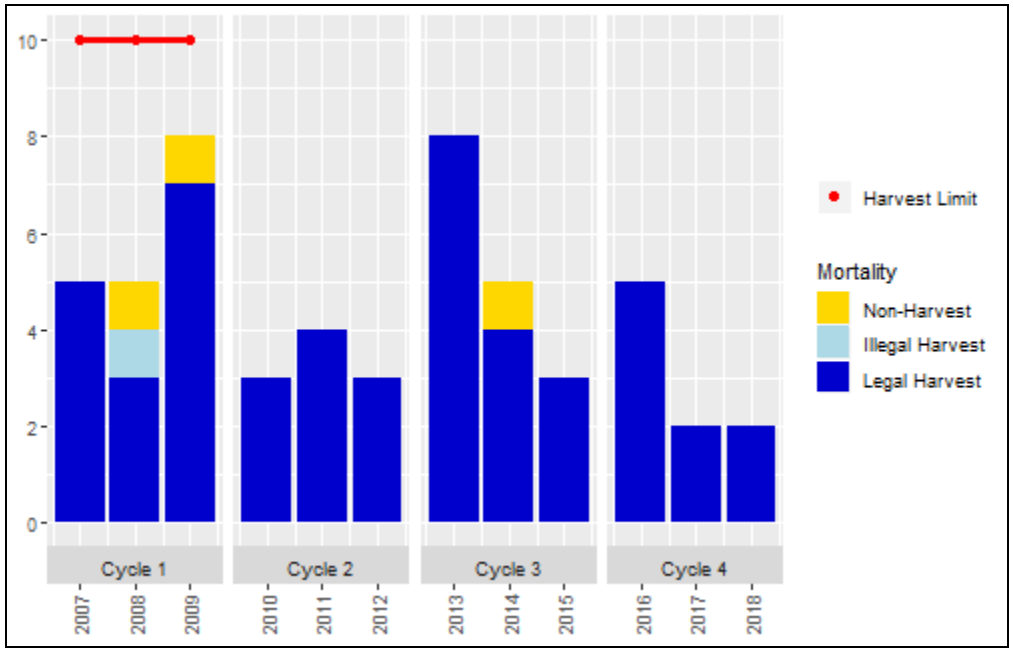
Hunt Area 16. (cont.)

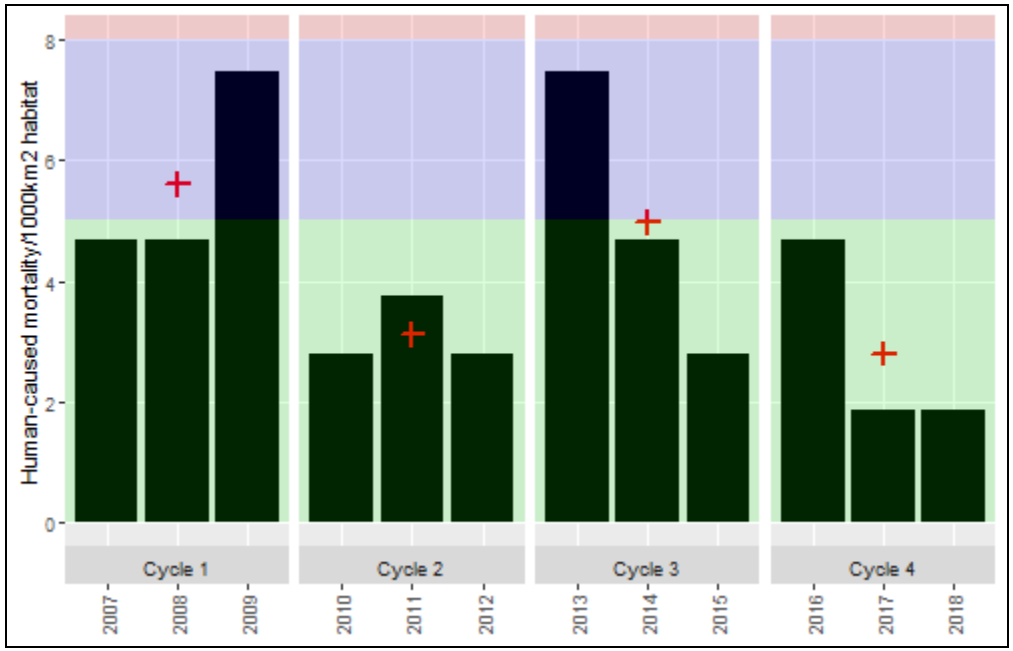
HY2016-HY2018 Regional Objective : Stable management

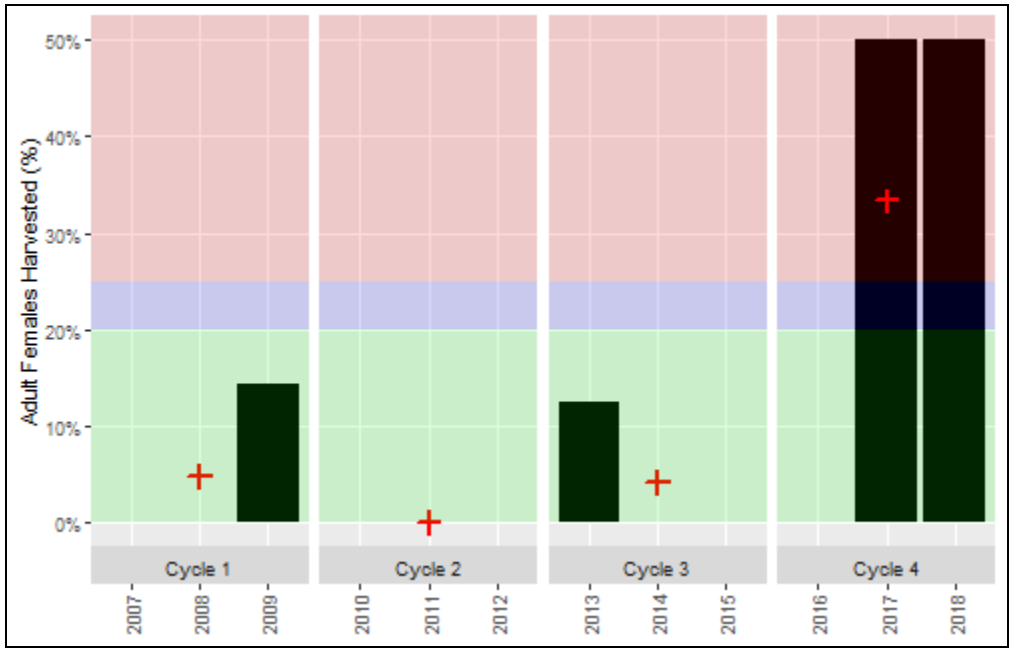
Assessment

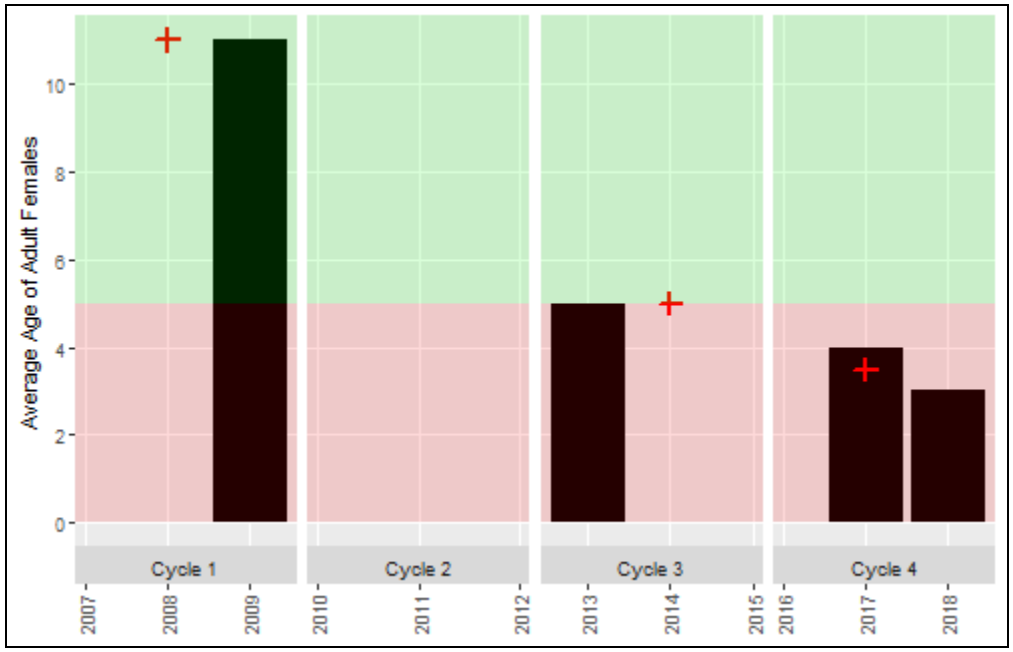
STABLE: Mortality densities in HA 16 fall within the Source range thresholds. The harvest limit has not been met in this hunt area since HY 2008. With generally few or sporadic harvests occurring age/sex structures are probably unreliable, but a few adult females harvested during the current cycle may impact the area. Data generated from harvested animals does not provide adequate context for evaluation of the local mountain lion population, but HA 16 has less contiguous habitat when compared to hunt areas that encompass mountainous terrain or front ranges, and local populations are likely Stable but at low densities. It is probable that the lower density of animals on the landscape results in less hunting interest, compounded by winter conditions that can restrict access.

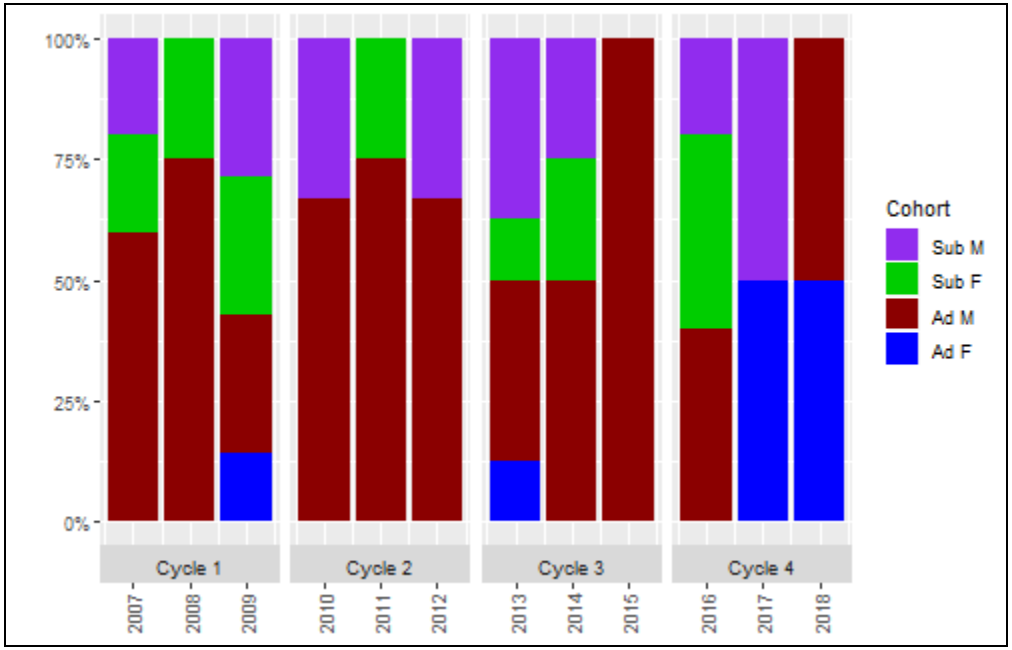
Hunt Area 27.

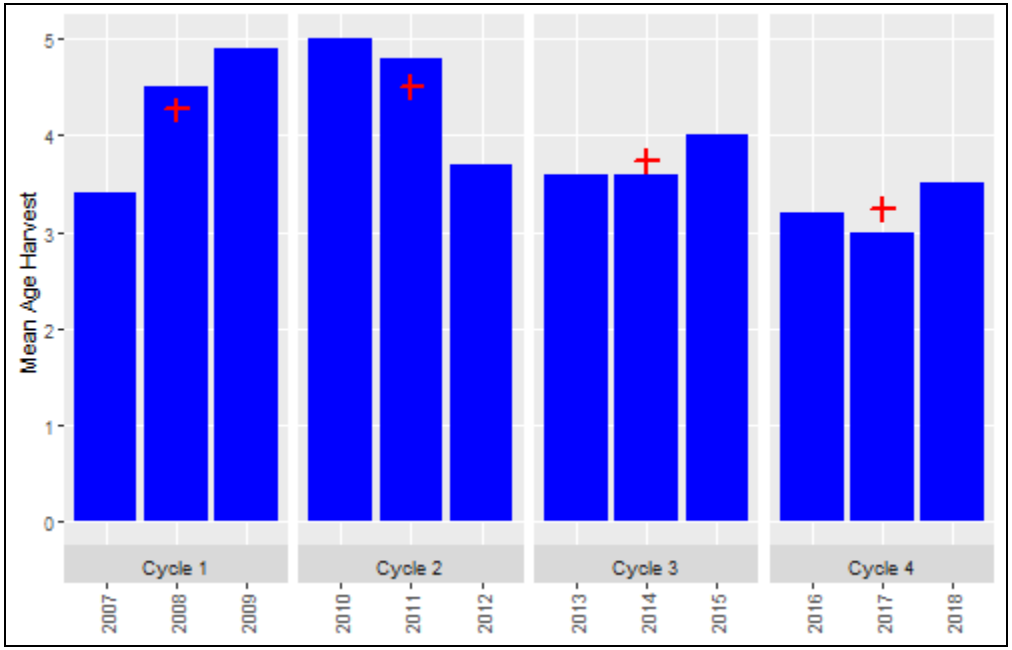

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

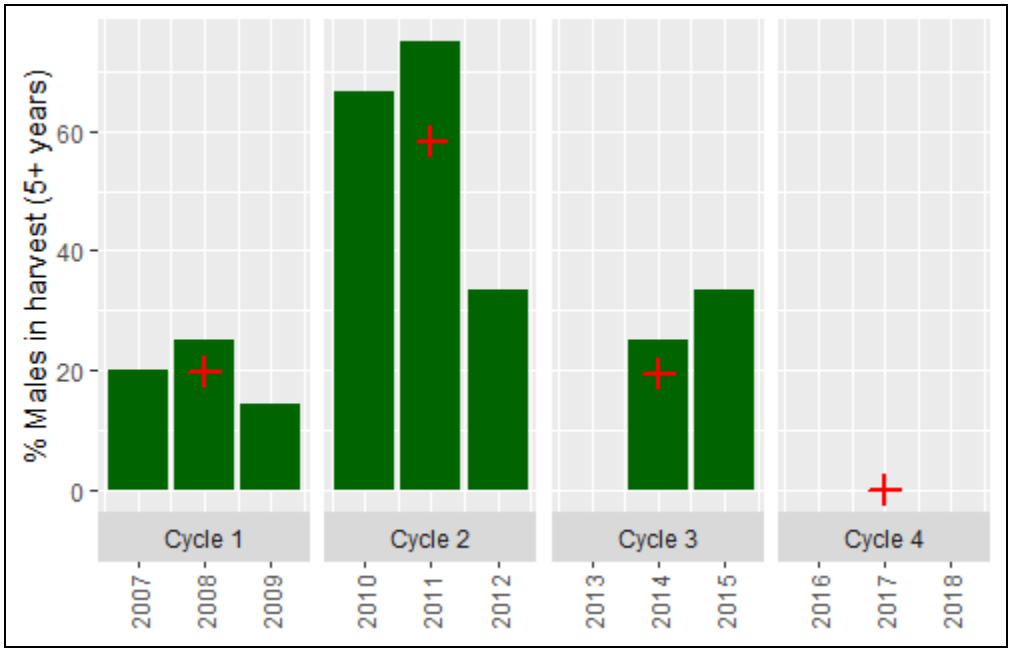

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

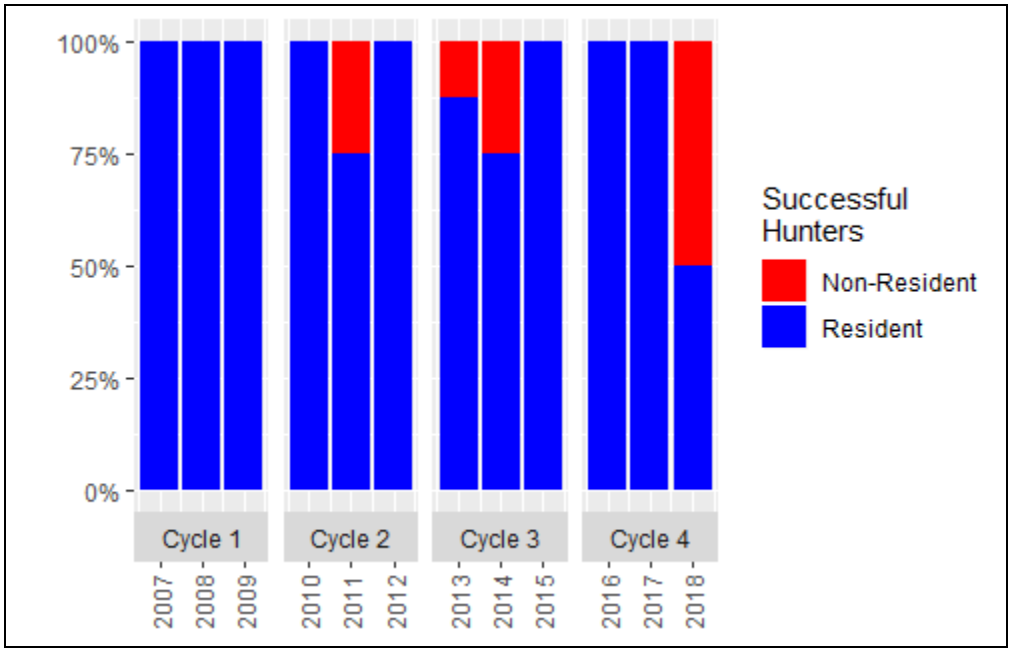

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
5
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
60
40
20
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

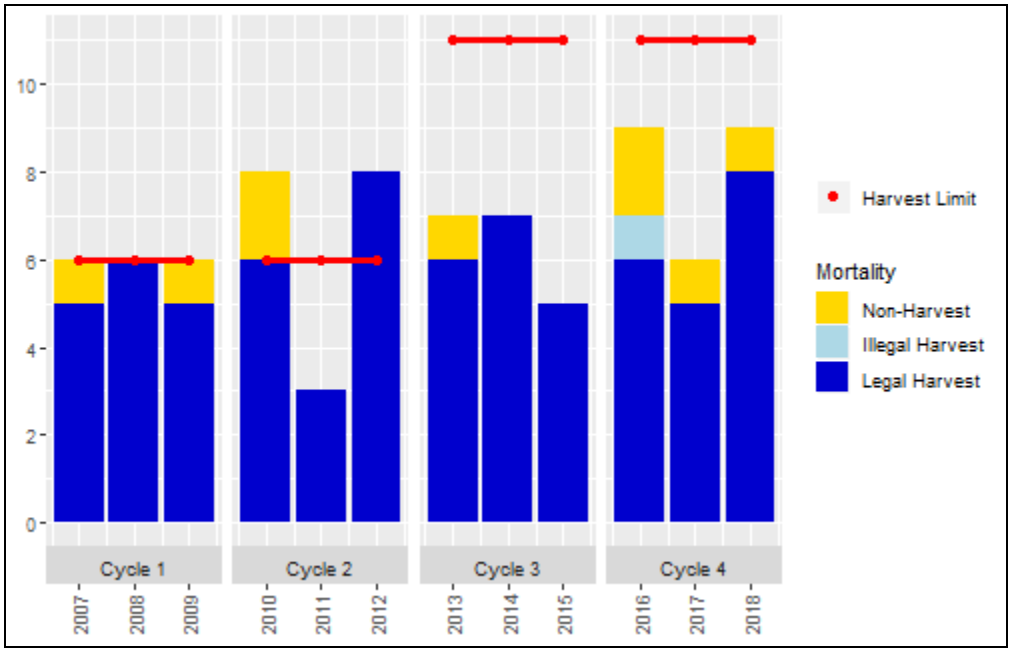
Hunt Area 27. (cont.)

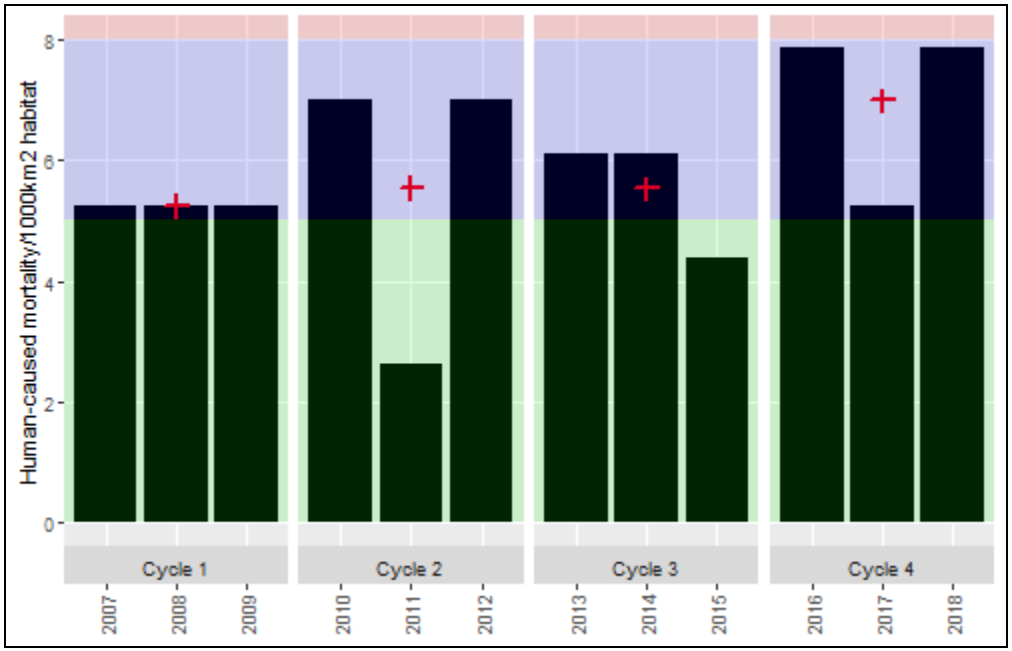
HY2016-HY2018 Regional Objective : Sink management

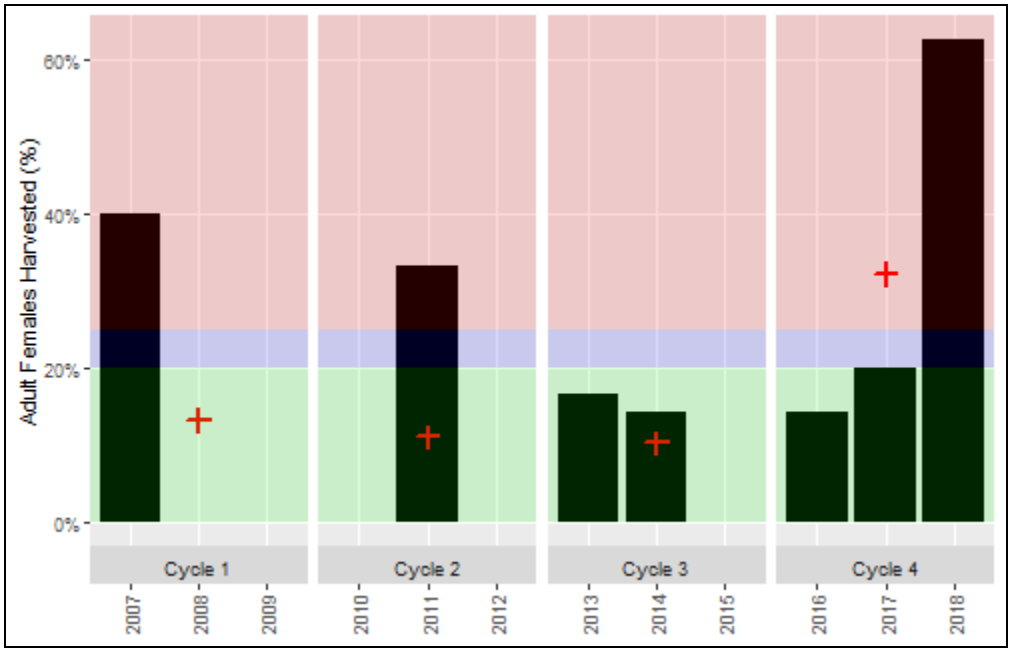
Assessment

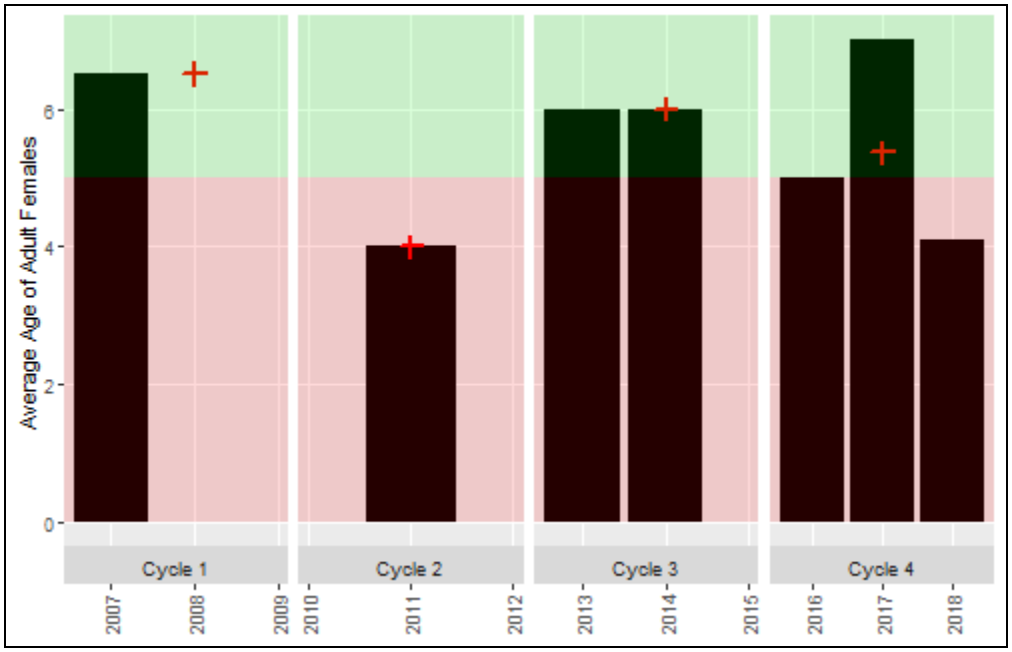
STABLE/SOURCE: Although unlimited harvest limits were initiated in HY 2010, HA 27 reports few mountain lion mortalities. Occasional conflicts are reported, most being from mountain lions sighted in proximity to urban areas near Casper, WY. These reports rarely result in a damage removal, with the last removal occurring in HY 2009. Hunter selectivity may impact HA 27 area given the close proximity to Casper and the lack of incentive for hunters to harvest an animal, as this area also allows year-round hunting. The current cycle reported higher proportions of young adult females harvested, but translated to only two of nine total harvests during the cycle. Few non-resident harvests occur and guided hunts during the 2nd cycle have changed to none reported in the 4th cycle.

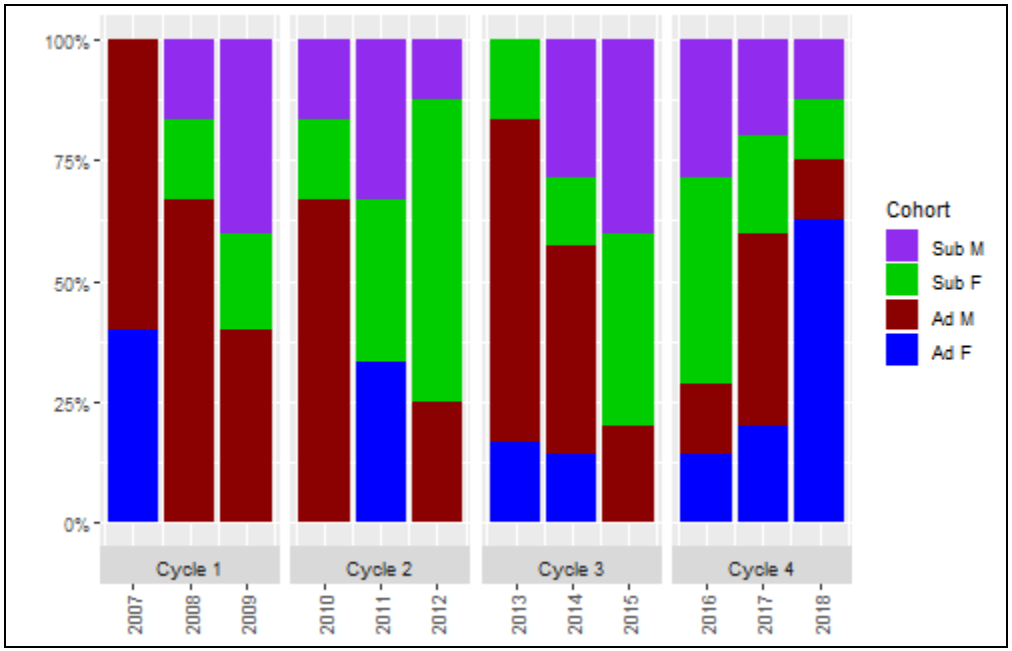
Hunt Area 31.

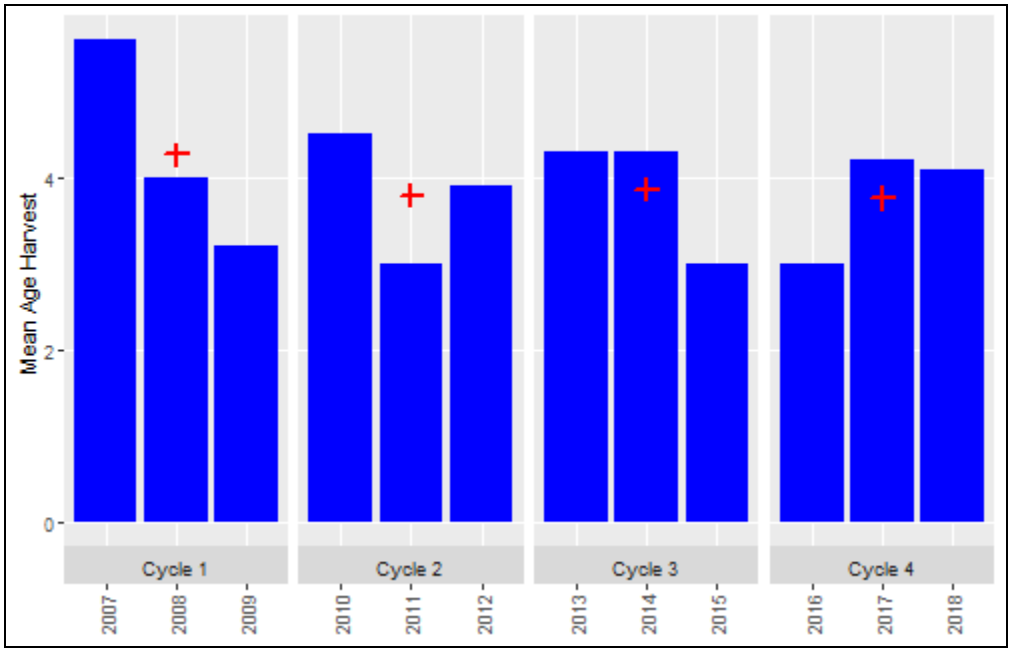

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

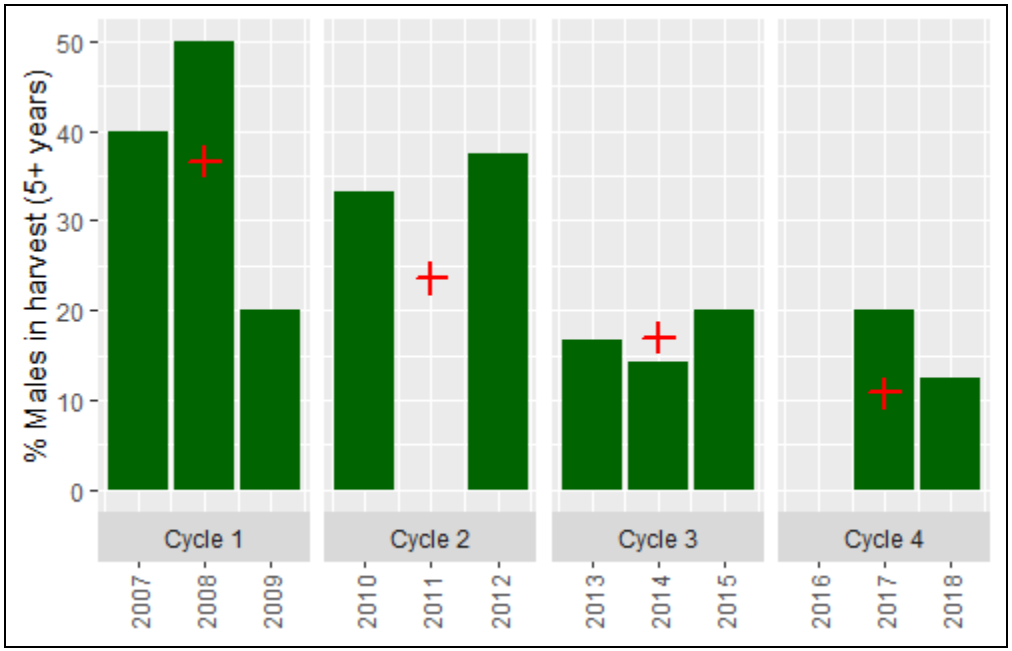

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

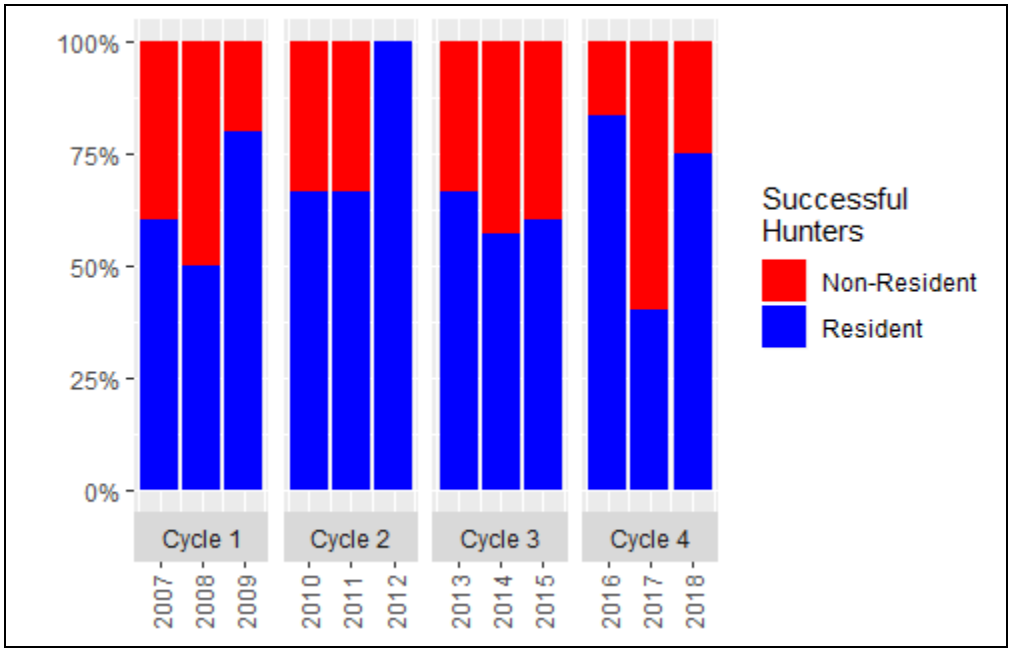

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
50
40
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

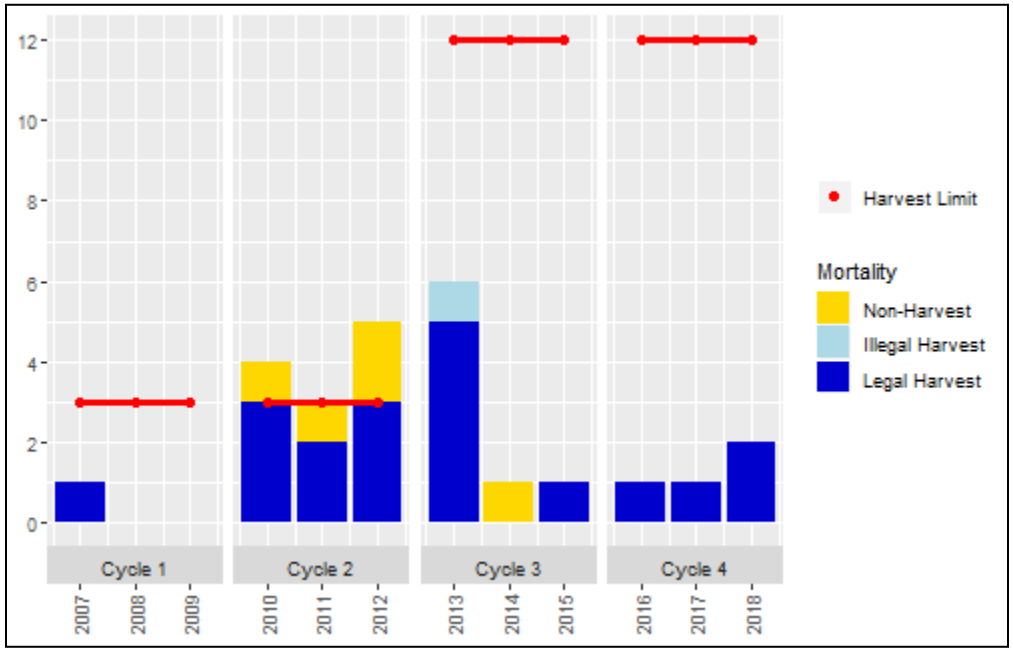
Hunt Area 31. (cont.)

HY2016-HY2018 Regional Objective : Sink management

Assessment

STABLE: A general trend showing a slight increase in mortality has occurred in HA 31, although mortality densities remain within Stable range. Ages of adult females and overall age of harvested animals remain stable, although the proportion of adult males is decreasing along with the proportion of older aged males harvested. The current cycle did show an increase in adult female harvest, with adult females taken each year and comprising 60% in HY 2018, impacting reproduction. Guided hunts have increased in HA 31 and selectivity has stayed 40-60% for the past 2 cycles. About half of harvest occurs on private lands. Of note, hunting opportunity in HA 31 is somewhat limited by winter access closures on big game winter ranges which likely serves as a refuge for some mountain lions in the area.

Hunt Area 25.

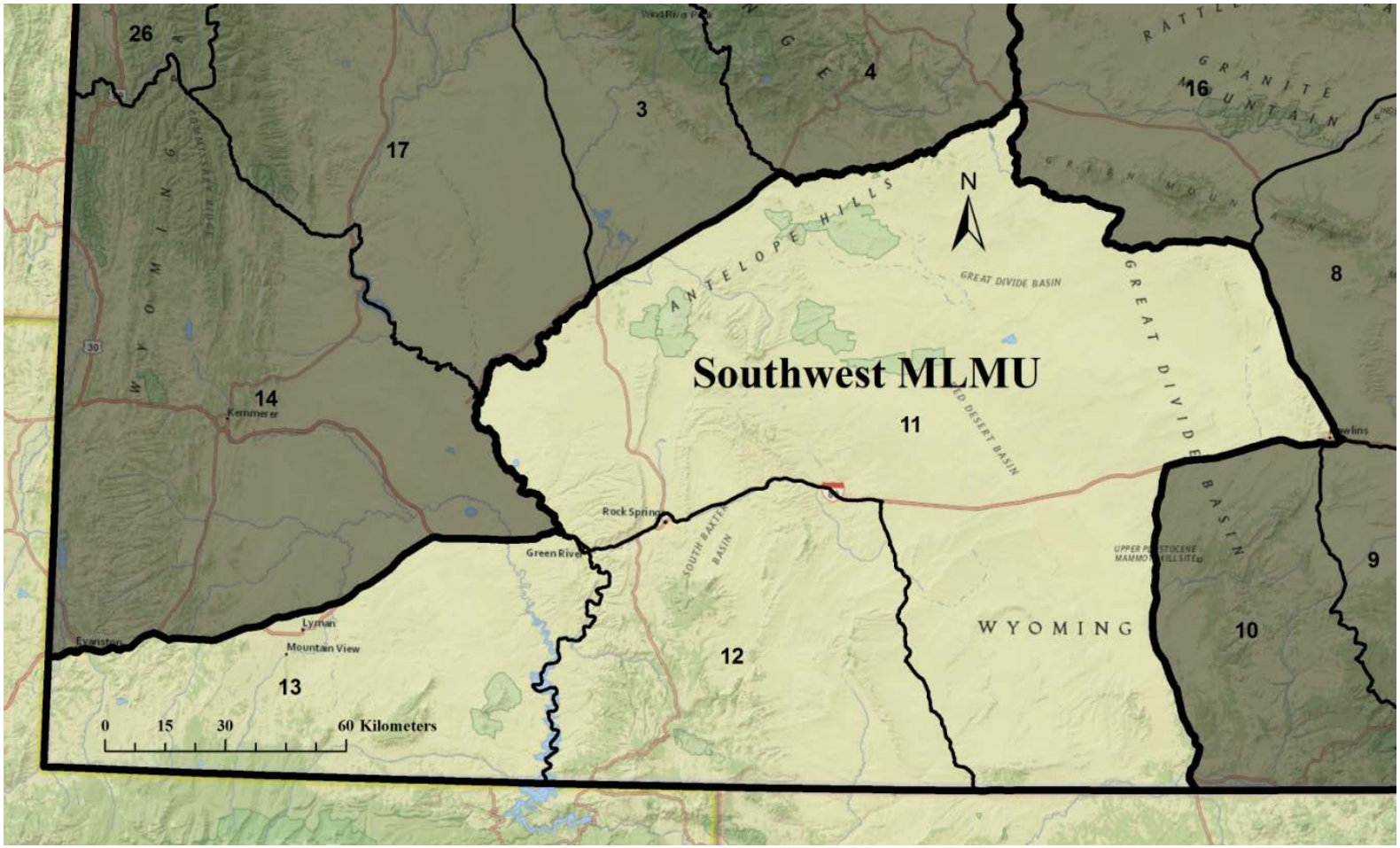


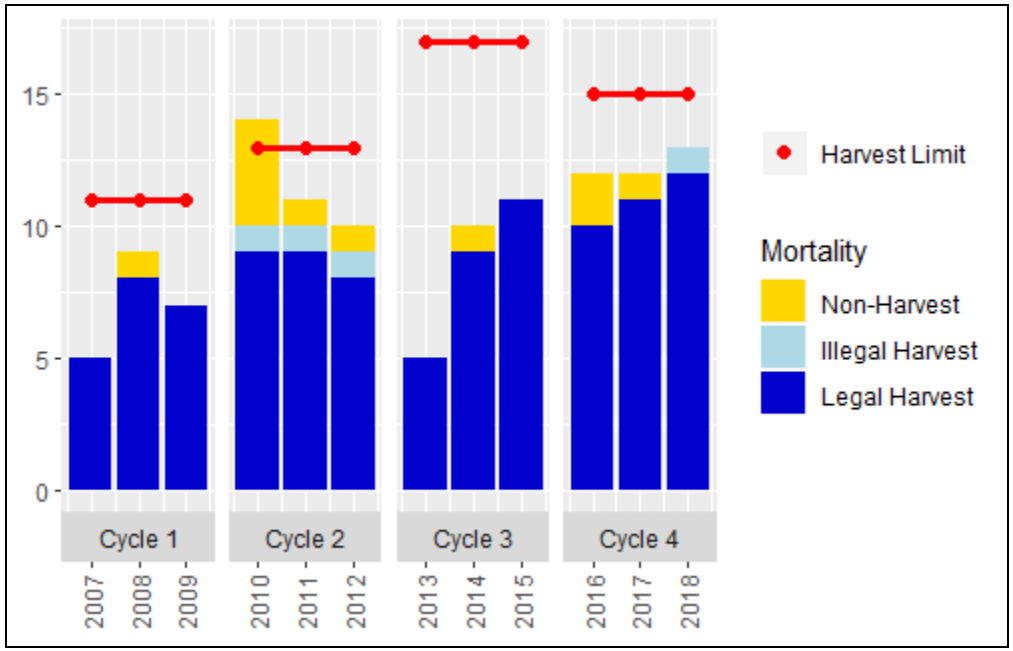
HY2016-HY2018 Regional Objective : N/A

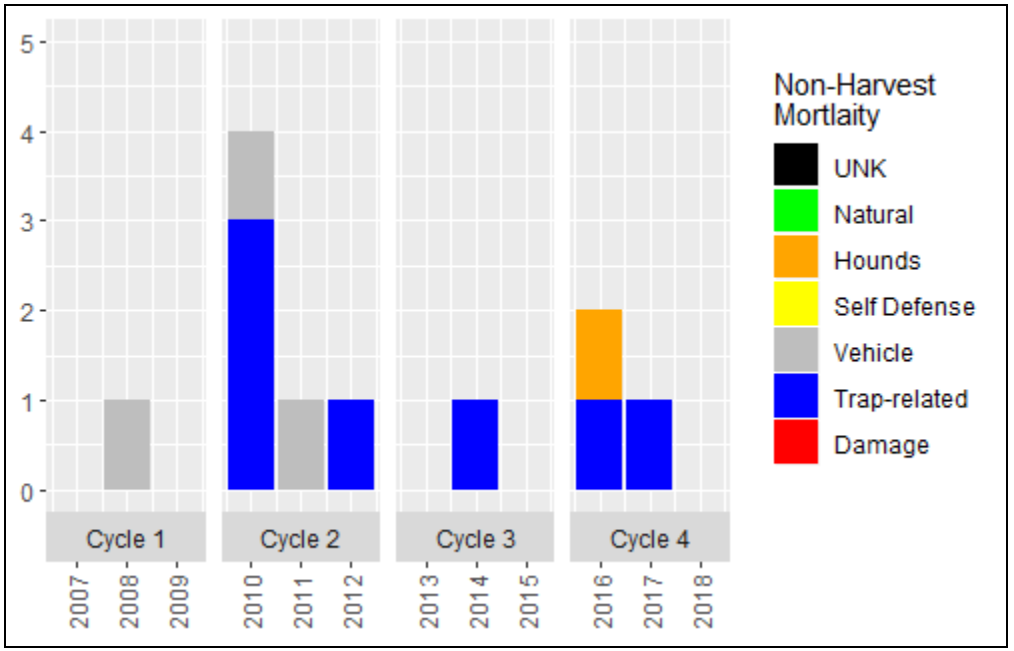
Assessment

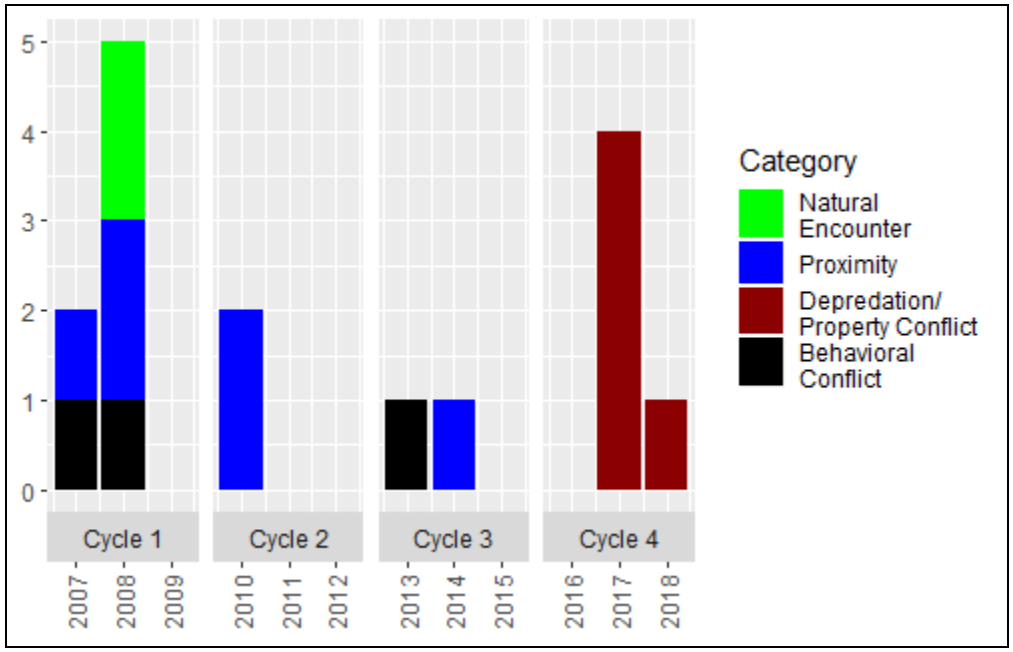
N/A: HA 25 has low levels of dispersed habitat throughout the area and reports few harvests, but is not currently managed for population viability.

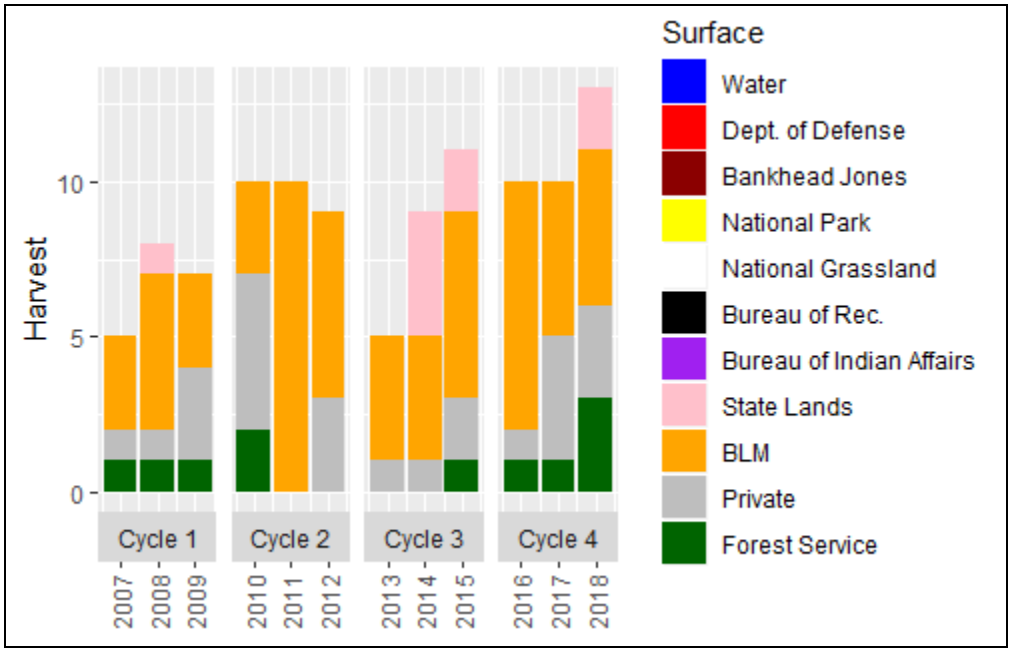
SOUTHWEST MLMU

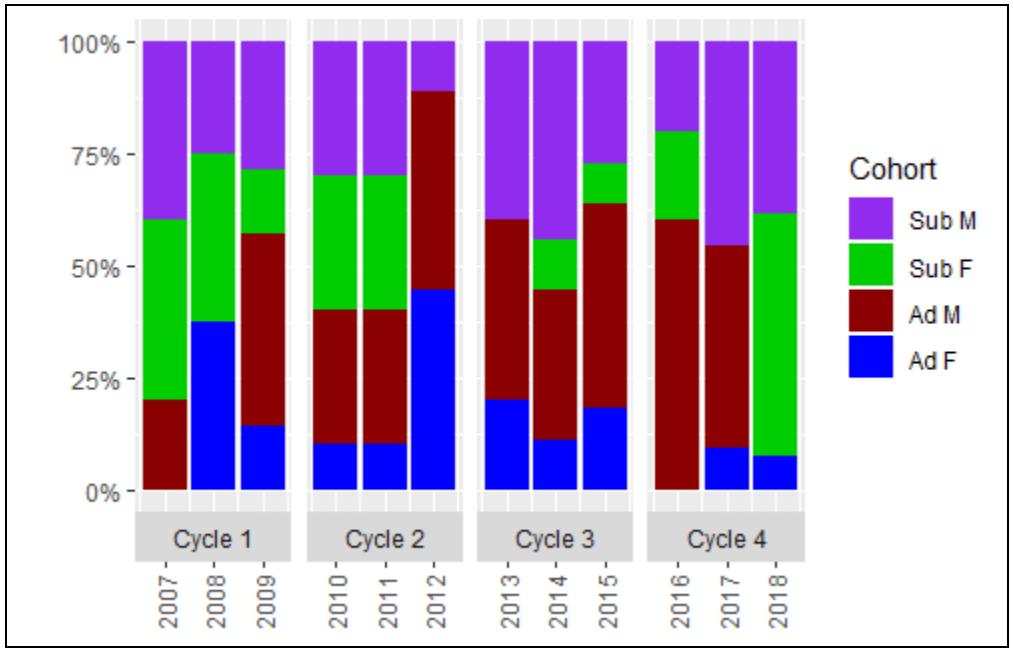


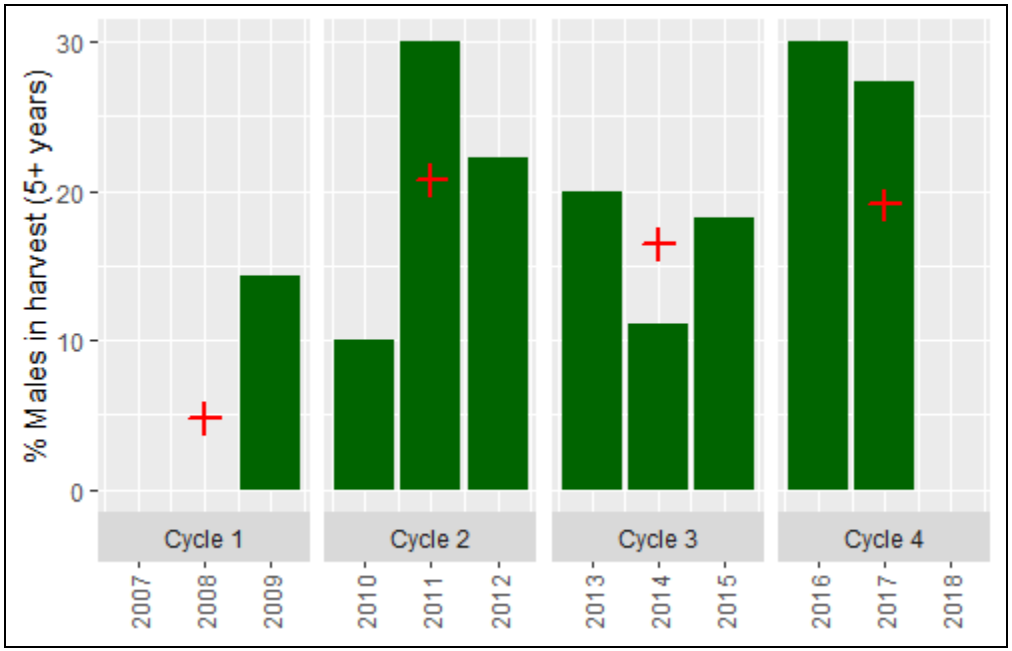

15
10
5
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest


5
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Non-Harvest Mortlaity
UNK
Natural
Hounds
Self Defense
Vehicle
Trap-related
Damage


5
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Category
Natural Encounter
Proximity
Depredation/ Property Conflict
Behavioral Conflict


Harvest
10
5
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Surface
Water
Dept. of Defense
Bankhead Jones
National Park
National Grassland
Bureau of Rec.
Bureau of Indian Affairs
State Lands
BLM
Private
Forest Service

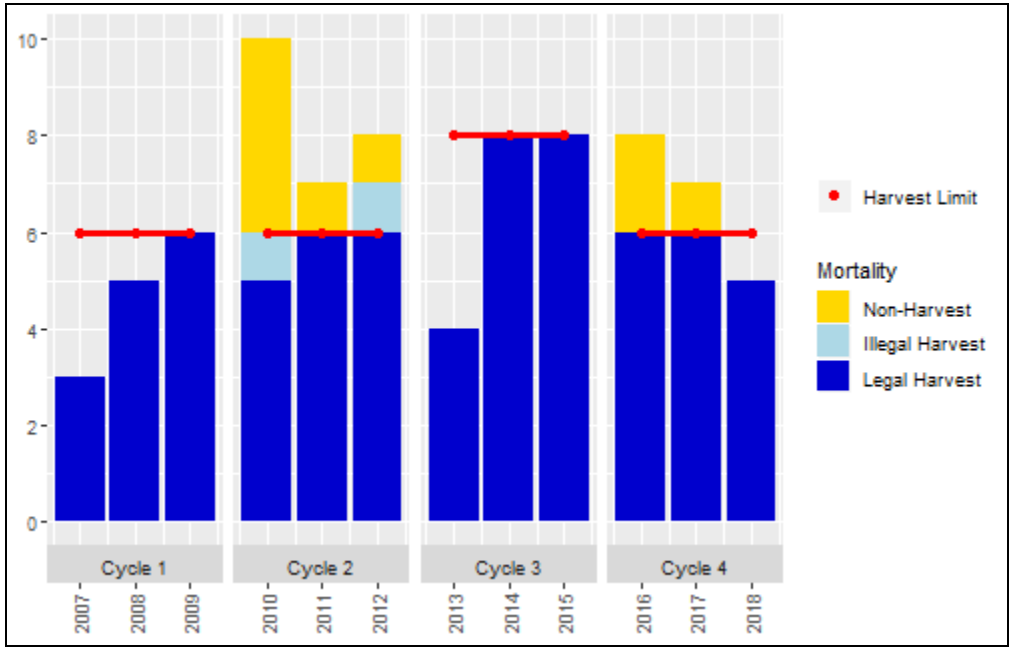


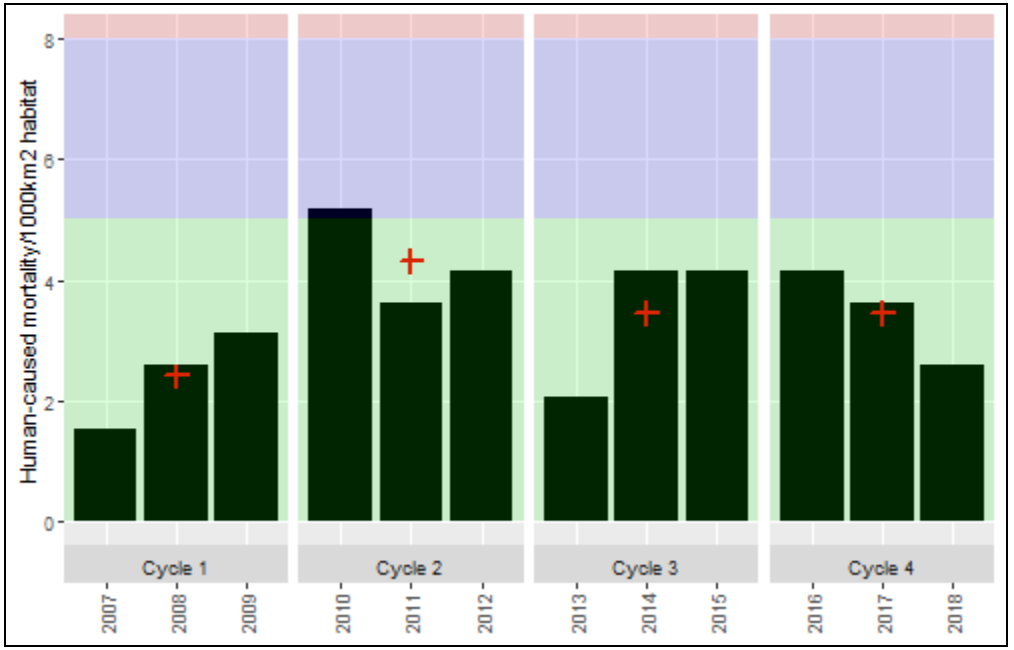


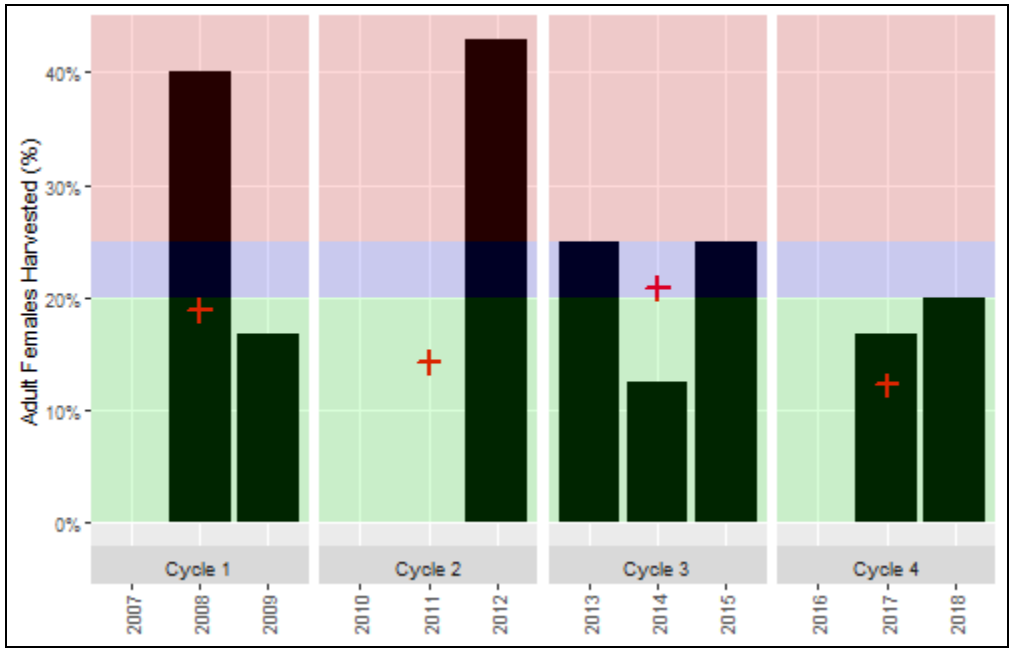
Overview

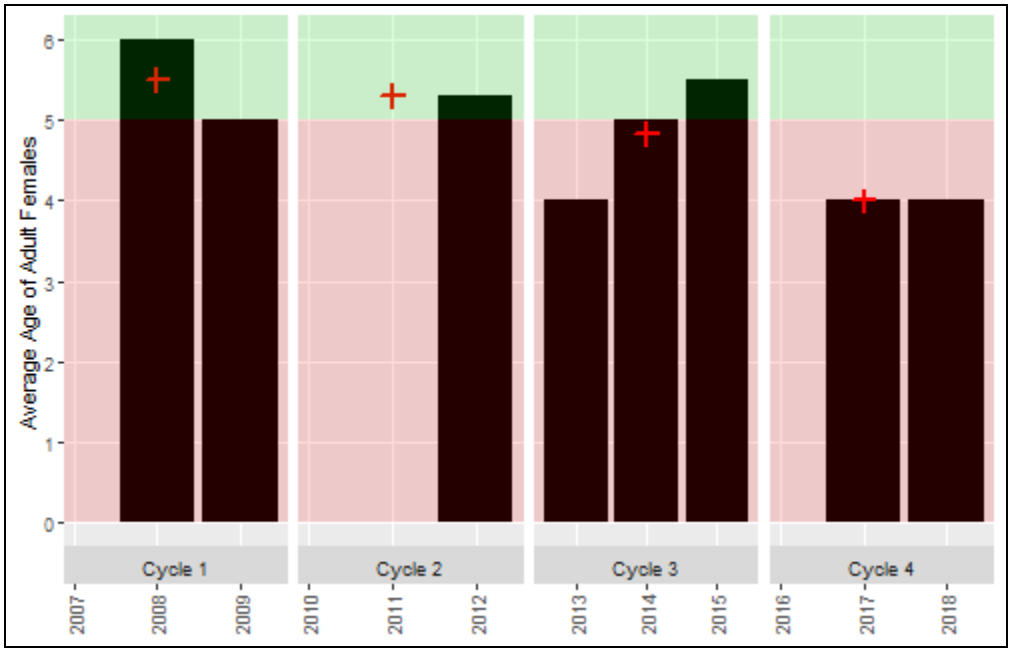
The Southwest MLMU comprises only 2 hunt areas (HA 12 and 13) with suitable mountain lion habitat and managed for sustainable mountain lion populations. A slight adjustment in HA 12 mortality limit was reached during two seasons of the current cycle, and updated habitat information and field monitoring indicates that HA 12 is maintaining stable age/sex ratios and experienced a recent decrease in the harvest of adult females. HA 13 harvest is focused near the Wyoming/Utah state line within modeled suitable habitat, and HA 13 reported an increase in harvest during the last two seasons. Hunt area 11 now includes what was previously HA 33. This area holds little suitable mountain lion habitat and is not managed for long-term population viability. The MLMU is meeting objectives and providing stable populations that also offer good hunting opportunity.

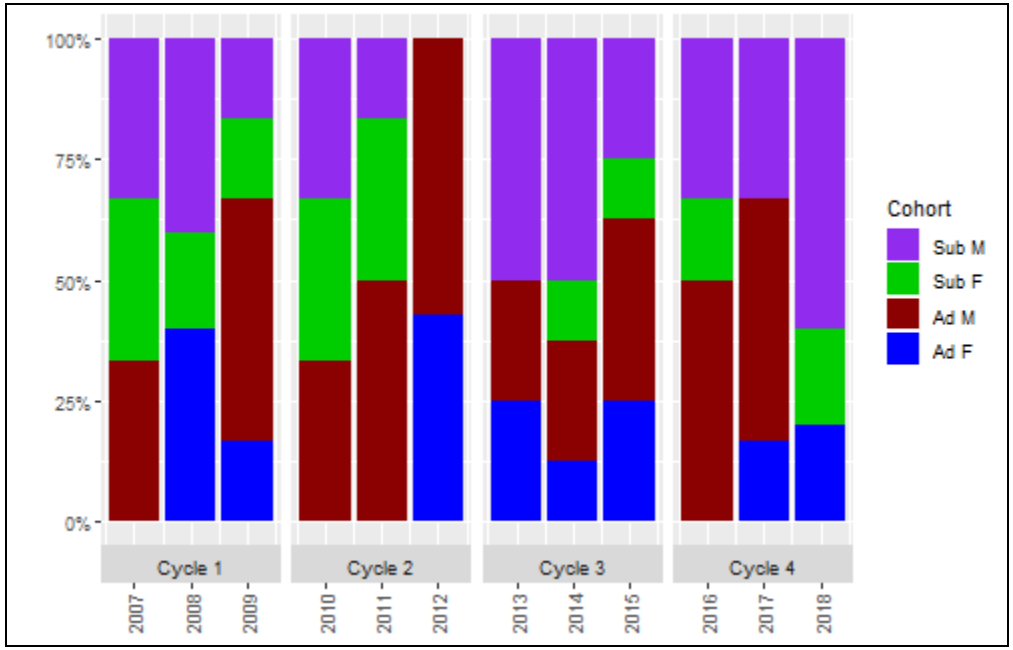
Hunt Area 12.

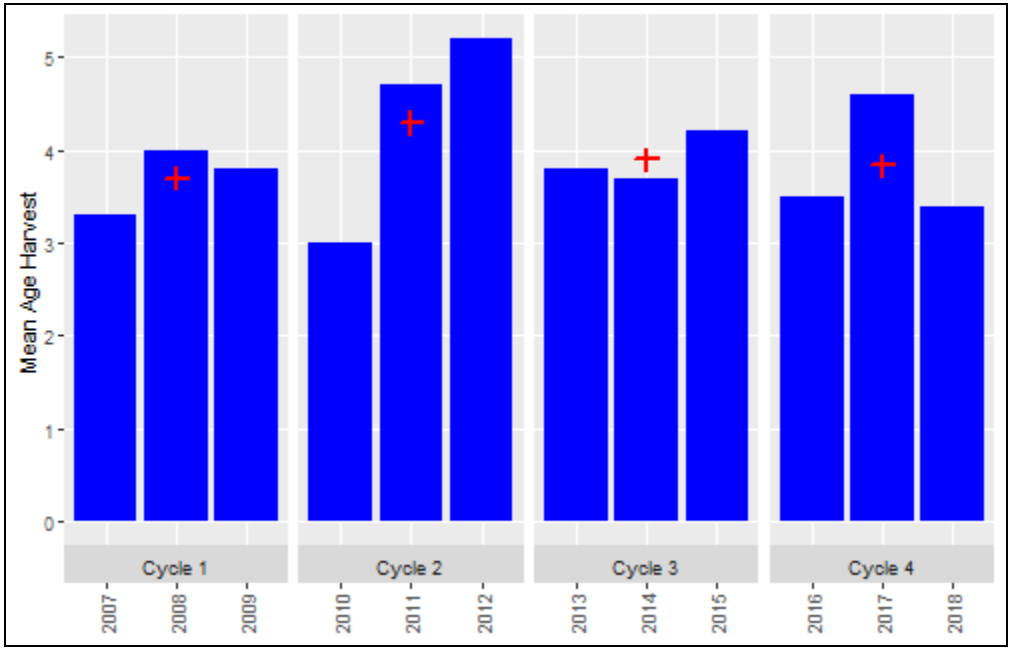

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

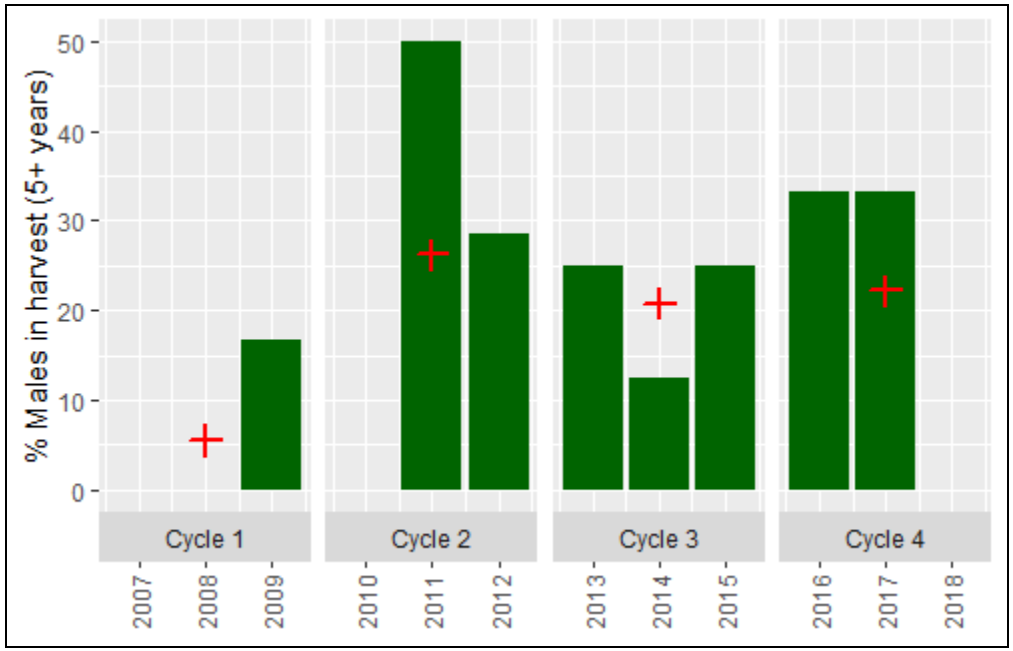

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

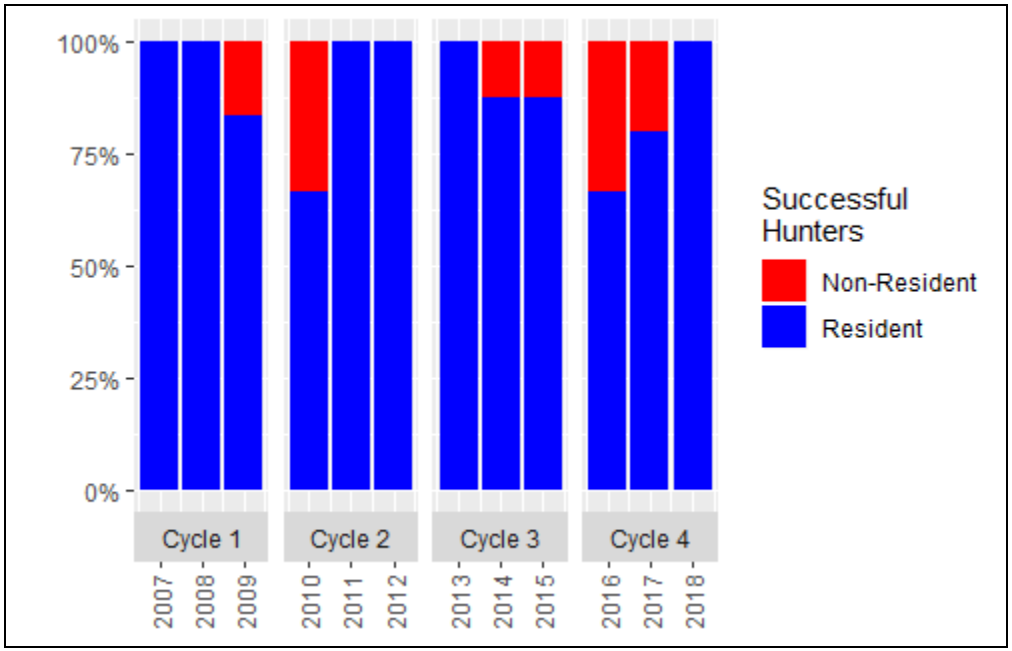

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
5
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
50
40
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

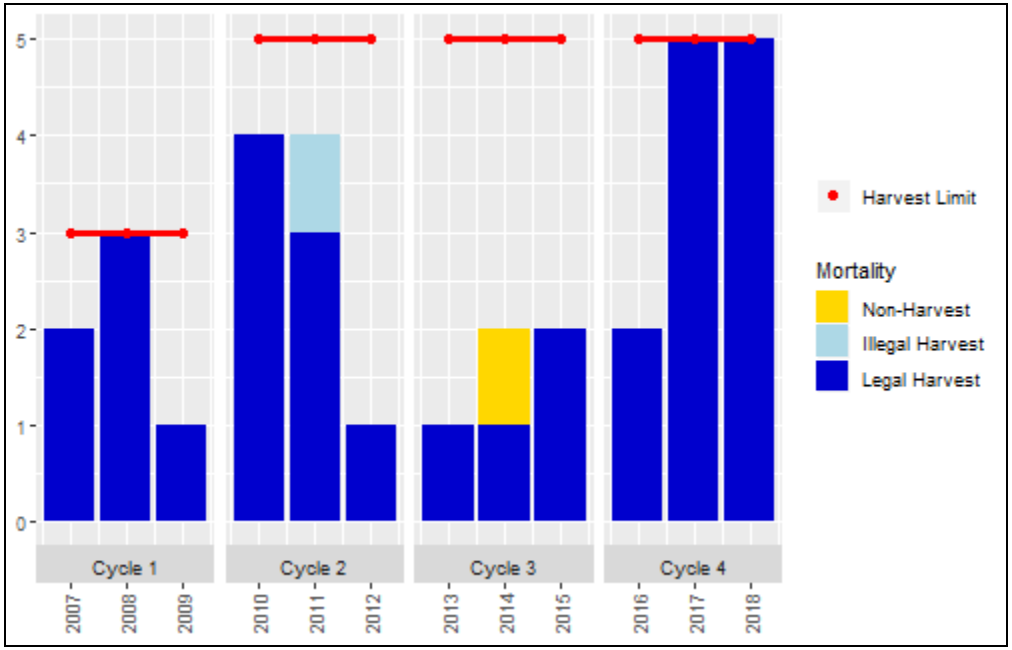
Hunt Area 12. (cont.)

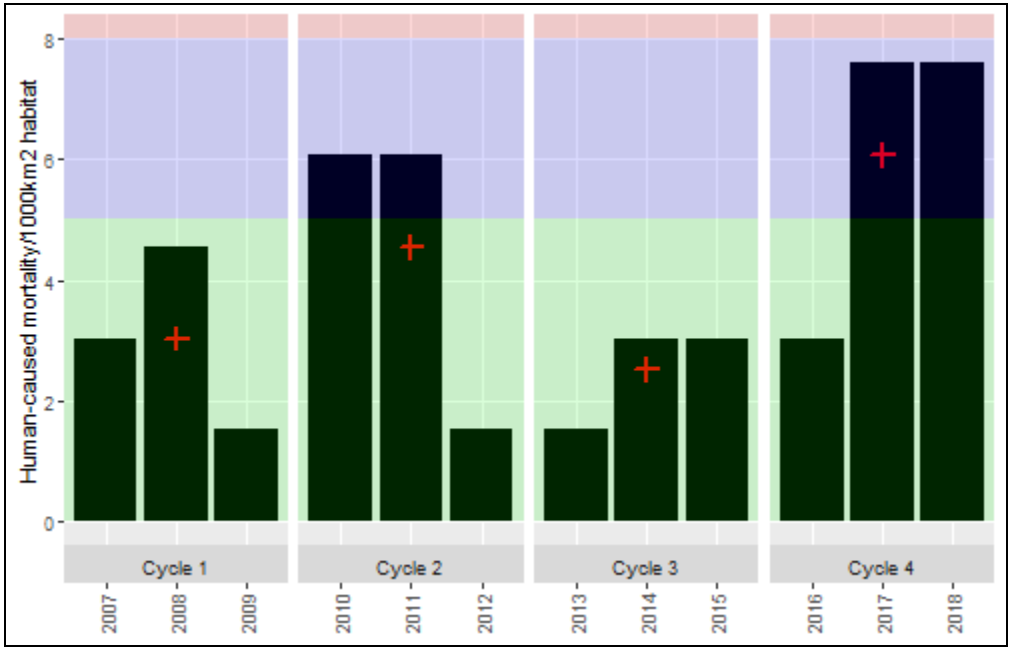
HY2016-HY2018 Regional Objective : Stable management

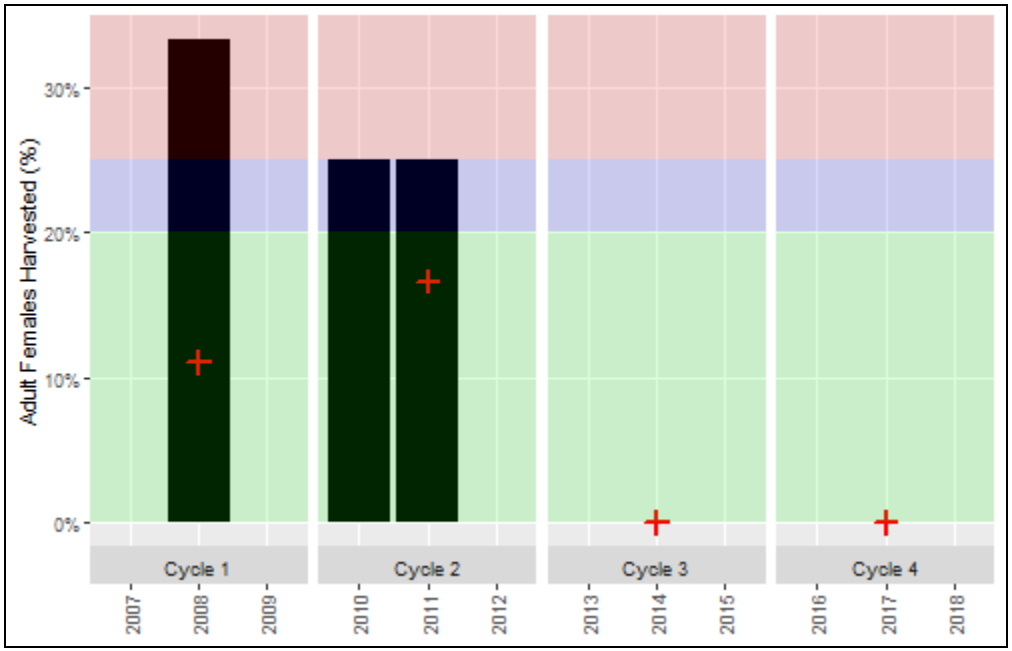
Assessment

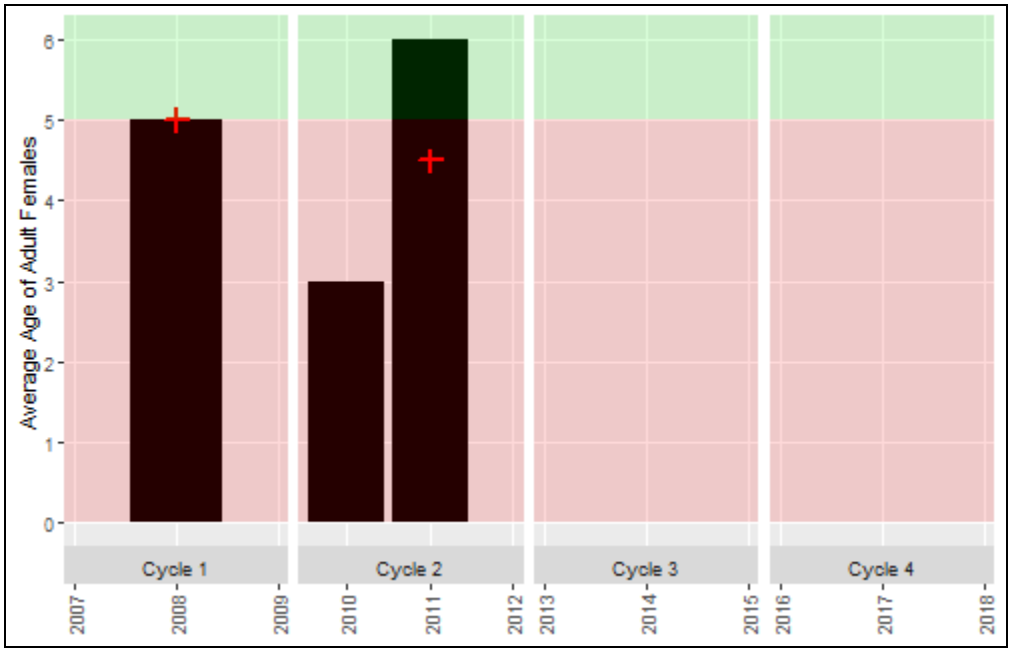
STABLE: Previous analysis of HA 12 suggested population suppression given elevated estimated mortality densities near established Sink thresholds, elevated adult female harvest (3 of 4 previous years at or above Sink status), and a reduced average age of adult females harvested. New habitat evaluations increased suitable habitat considerably in HA 12, resulting in a change from the higher end of stability to Source-level mortality densities. However, the density of lions on the landscape is likely not as high as what was used to estimate density thresholds (WGFD 2006). The proportion of adult females in the harvest has decreased. The average age of adult females harvested is still trending younger, but sample size restrains interpretation. Current monitoring data documented reproduction contributing to the local population, likely in addition to immigration from habitats to the south. As in previous cycles the overall age and age/sex structure is stable, and older aged adult males are well represented in the harvest likely via hunter selectivity which rebounded during the current cycle. Overall HA 12 demonstrates stability in line with MLMU objectives as well as quality mountain lion hunting for selective hunters.

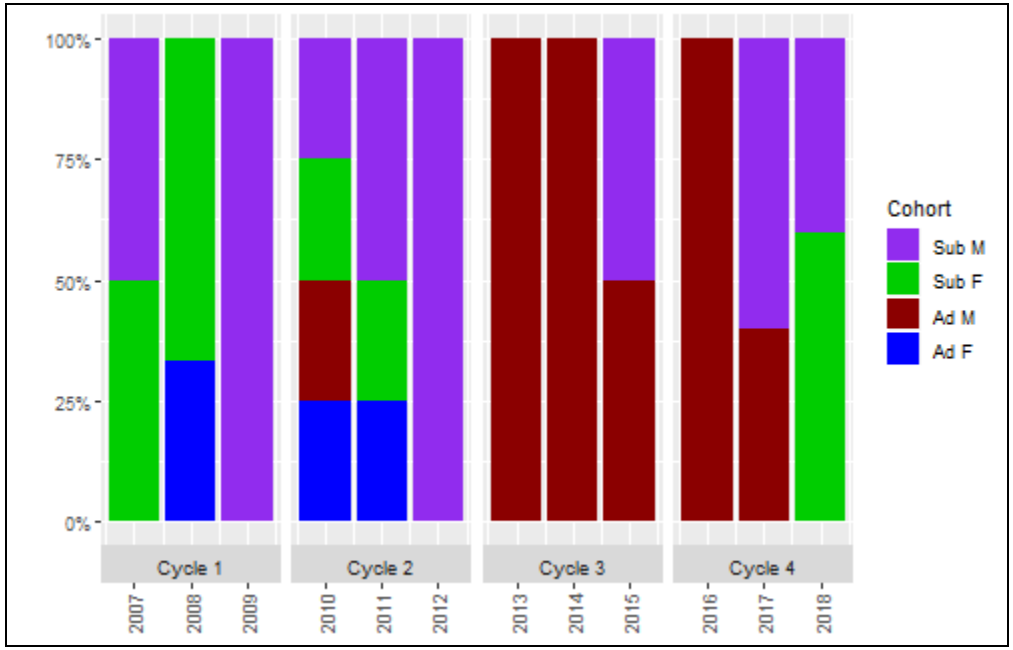
Hunt Area 13.

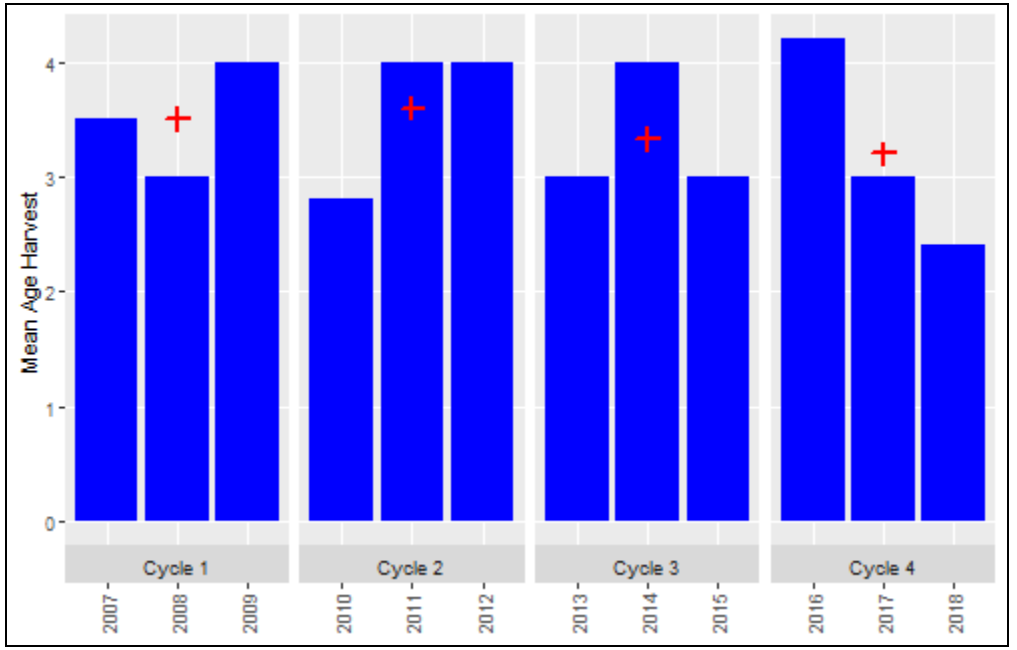

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

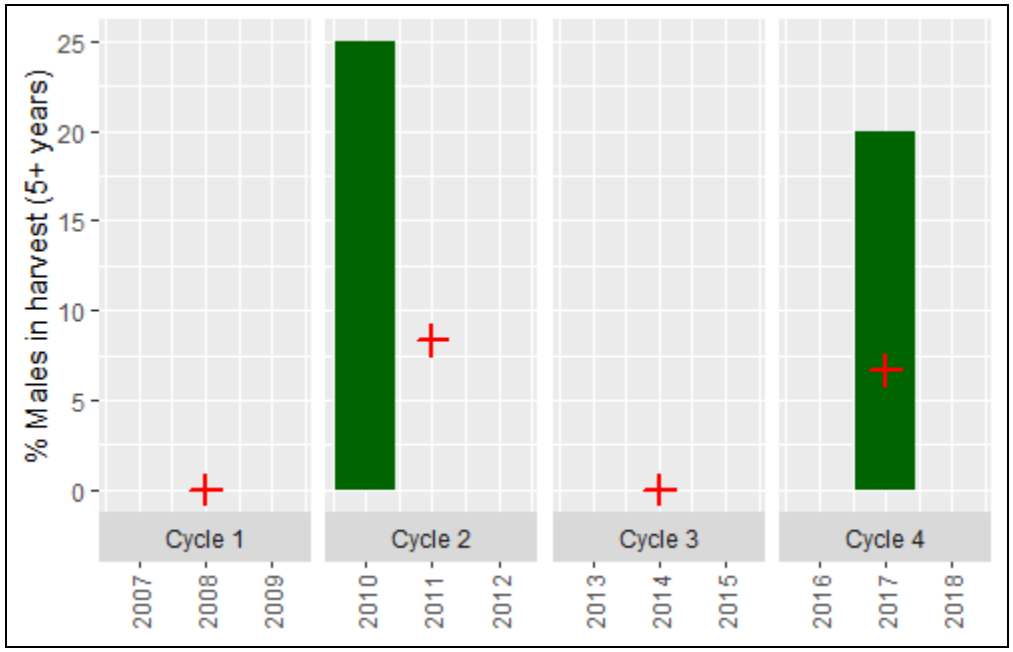

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

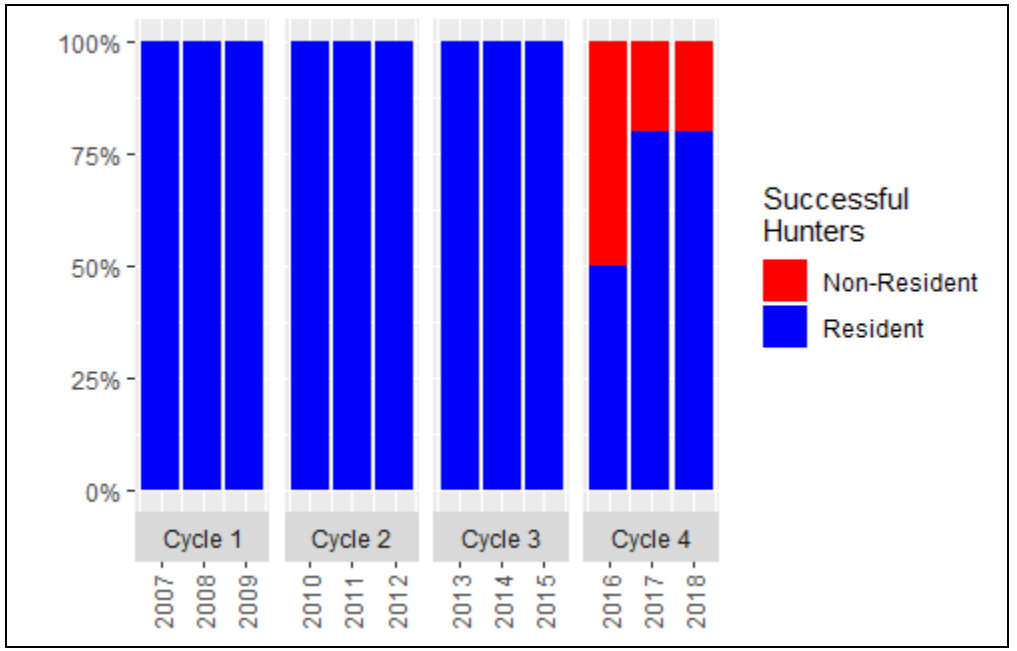

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
25
20
15
10
5
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

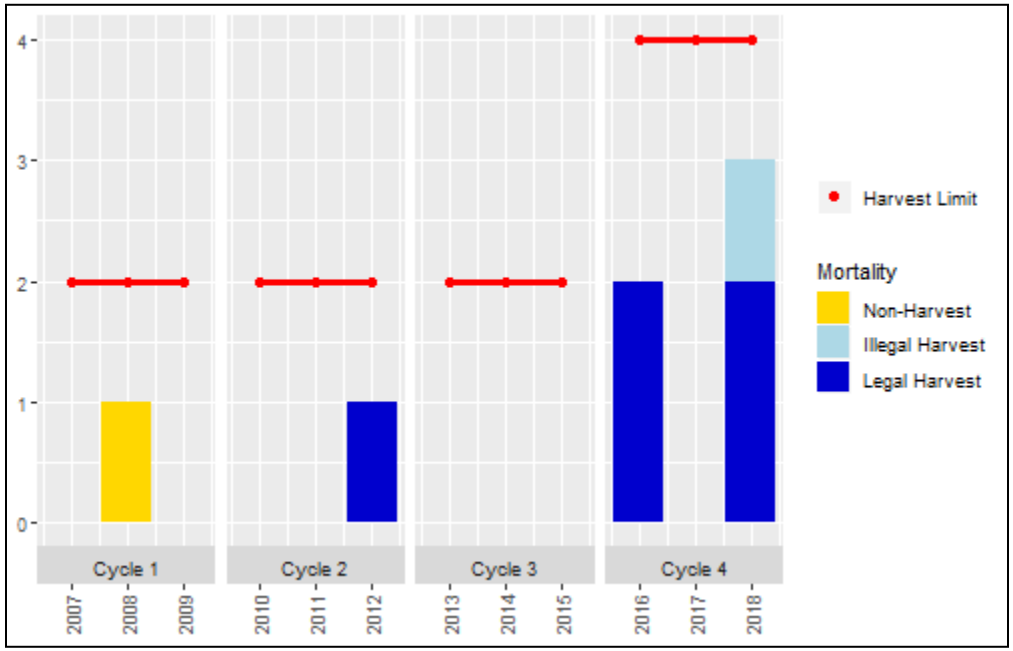
Hunt Area 13. (cont.)

HY2016-HY2018 Regional Objective : Stable management

Assessment

STABLE: HA 13 has recently garnered increased attention from hunters, a change from only four harvests during the previous cycle to reaching the mortality limit of five during each of the past two seasons resulting in 12 total harvests during the cycle. No adult females have been harvested in the past two cycles. Non-resident hunters began hunting in HA 13 for the first time during the current cycle comprising 25% of the harvest, but no guided services were reported. During the 3rd cycle almost all harvest was comprised of adult males, although no males over age 5 were reported. The current cycle resulted in more sub-adults harvested overall. Little data is available for HA 13, but the average age of harvested animals is stable, and most harvest occurs on the northern foothills of the Uinta Range in Utah which probably supports dispersal and hunting opportunity in HA 13.

Hunt Area 11.

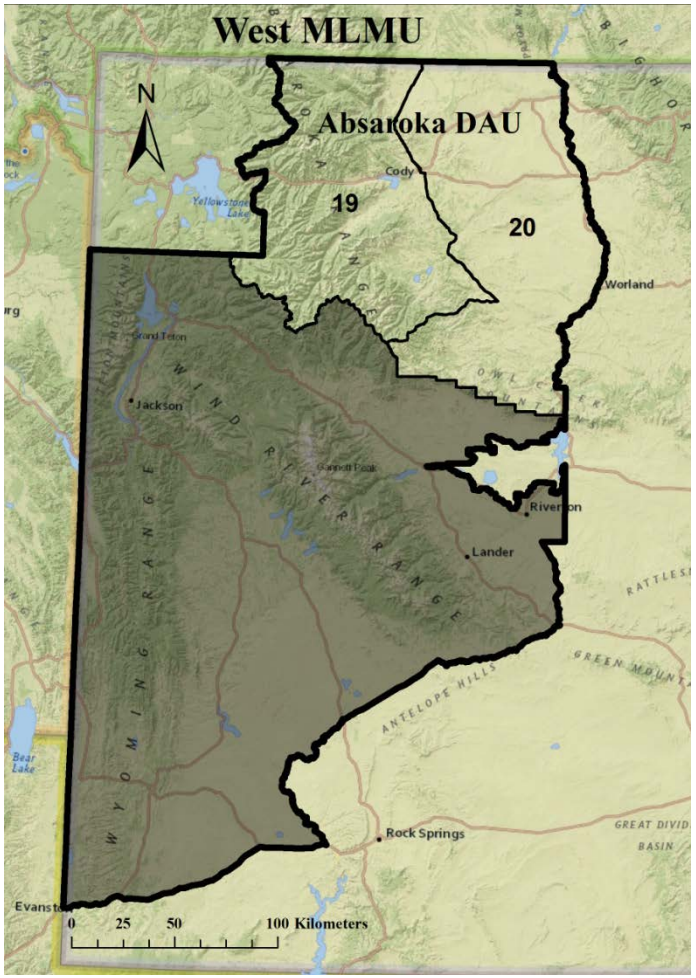


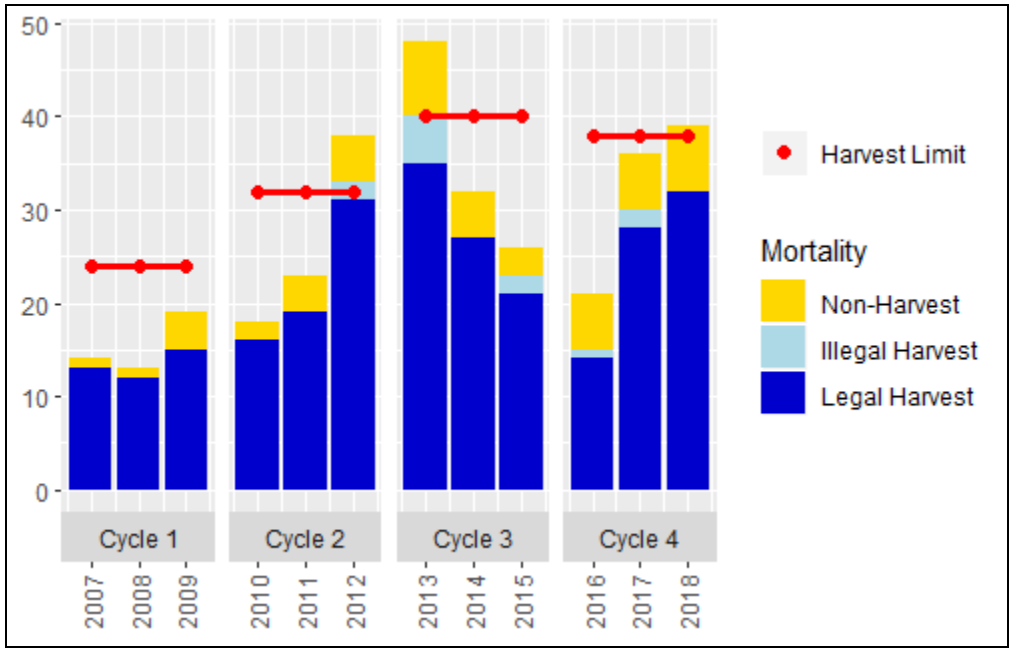
HY2016-HY2018 Regional Objective : N/A

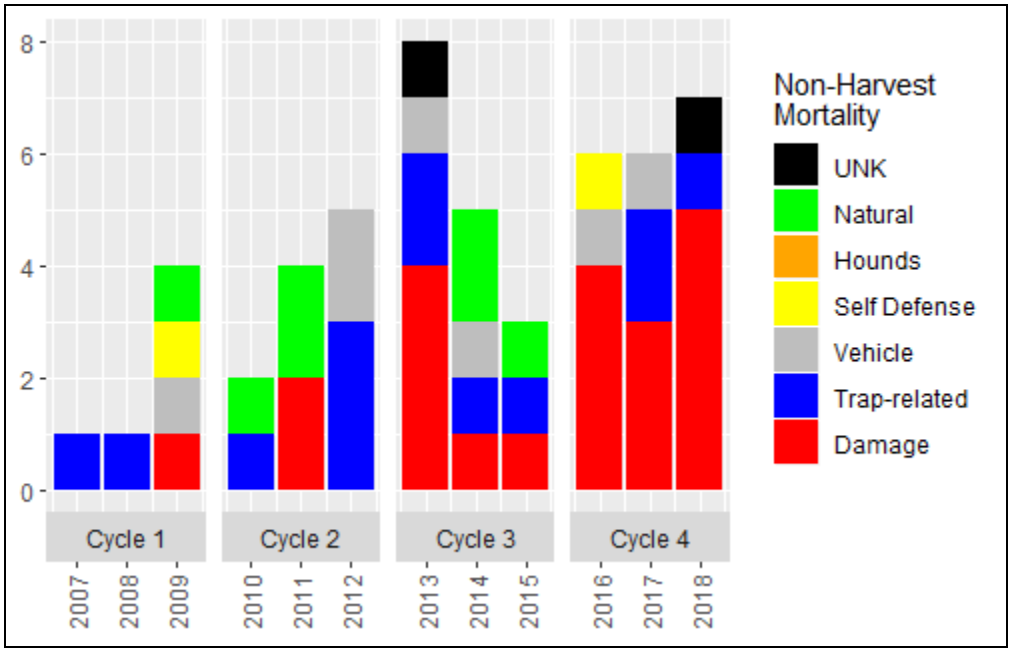
Assessment

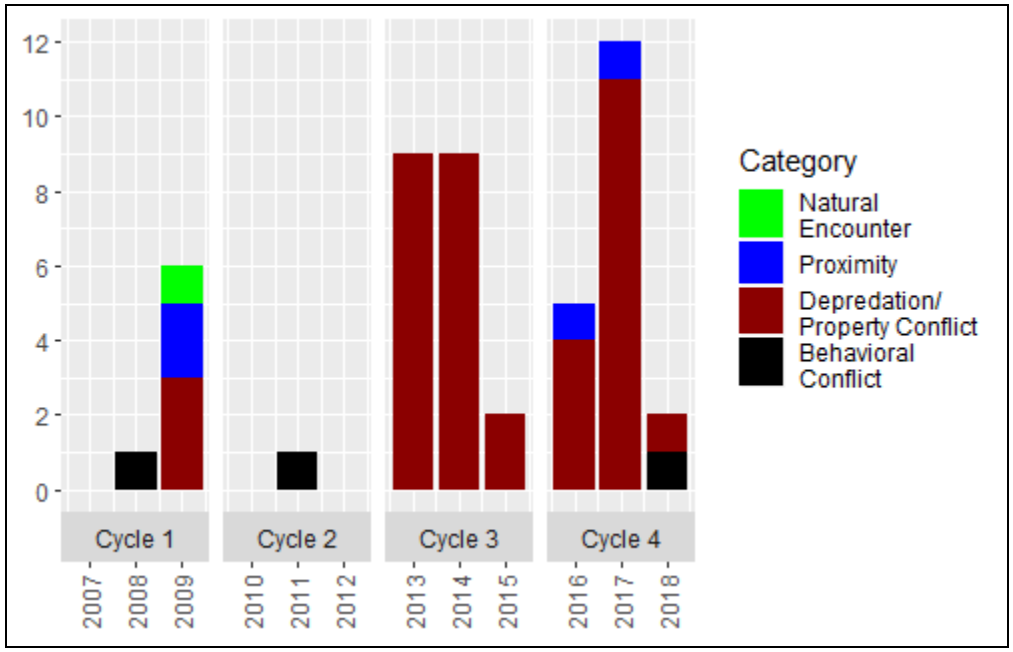
N/A: HA 11 has low levels of dispersed habitat throughout the area and reports few harvests, but is not currently managed for population viability.

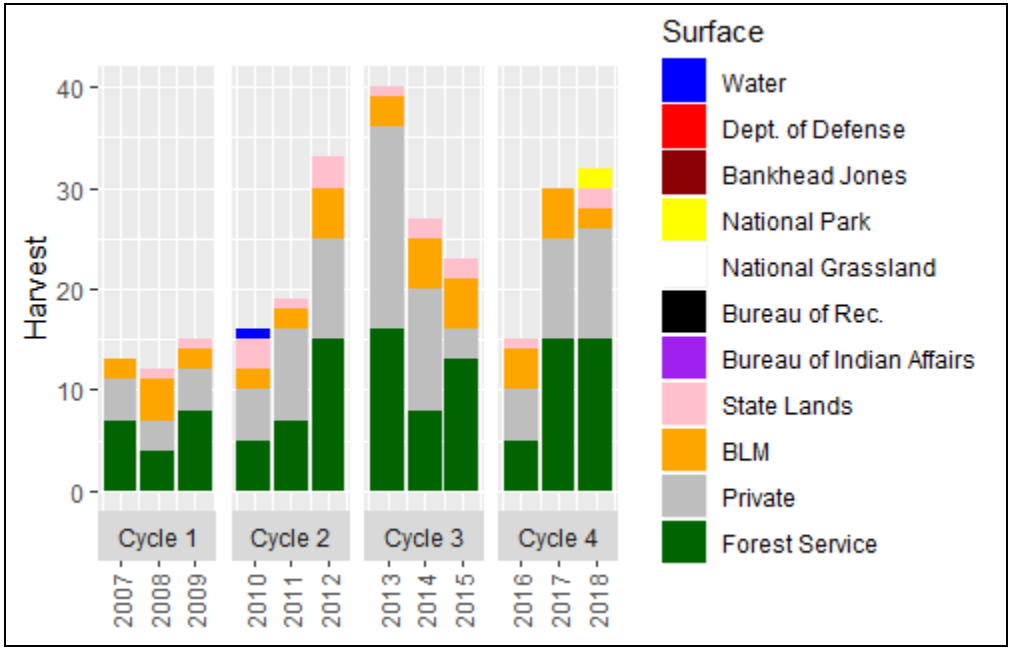
ABSAROKA DAU

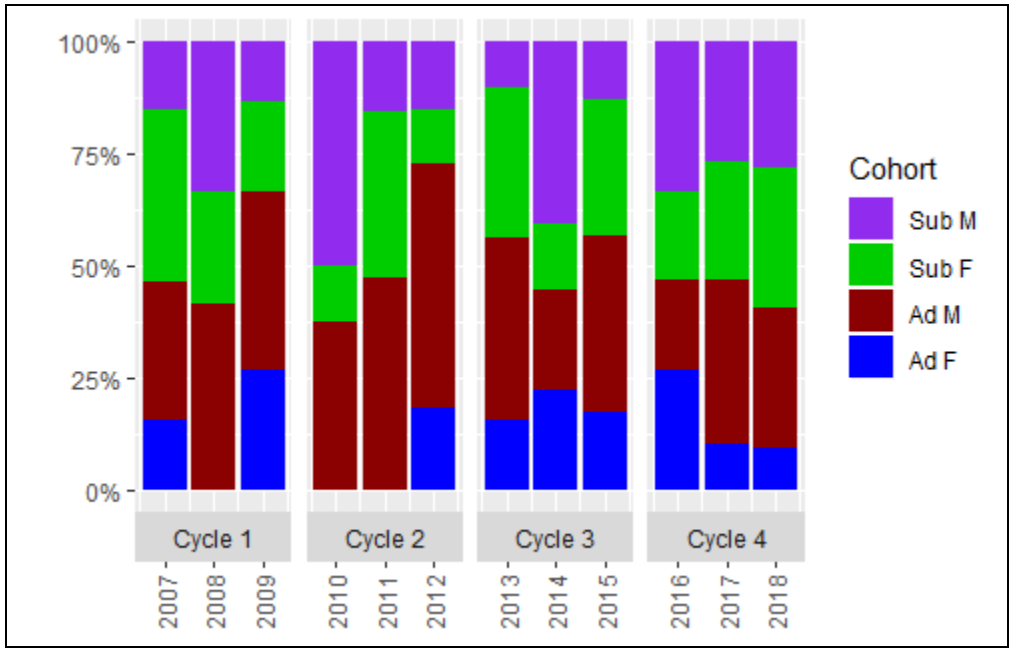


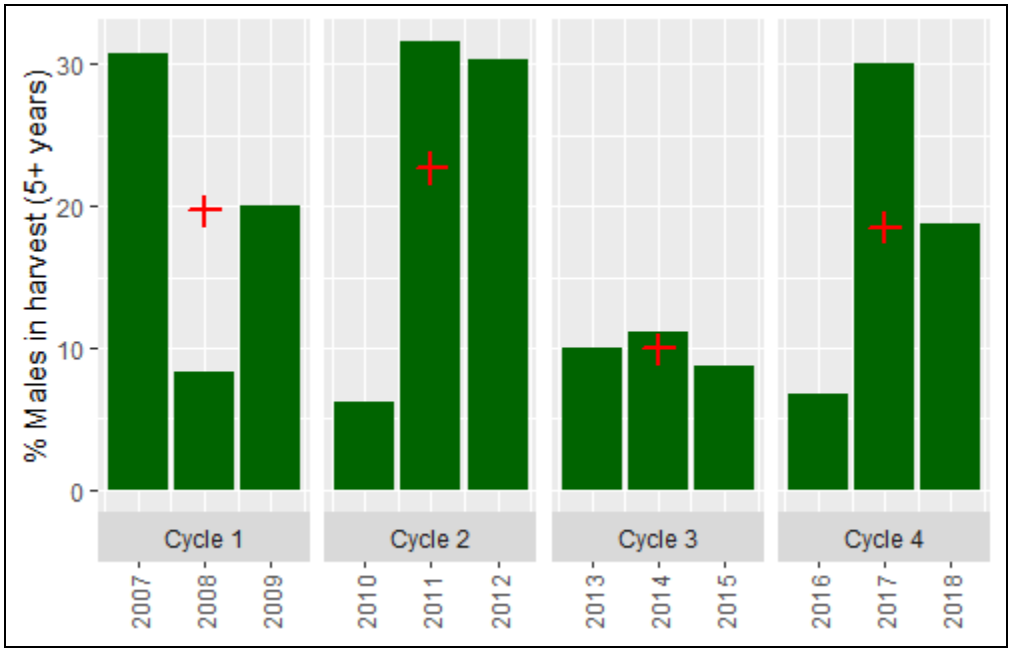

50
40
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest


8
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Non-Harvest Mortality
UNK
Natural
Hounds
Self Defense
Vehicle
Trap-related
Damage


12
10
8
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Category
Natural Encounter
Proximity
Depredation/ Property Conflict
Behavioral Conflict


Harvest
40
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Surface
Water
Dept. of Defense
Bankhead Jones
National Park
National Grassland
Bureau of Rec.
Bureau of Indian Affairs
State Lands
BLM
Private
Forest Service

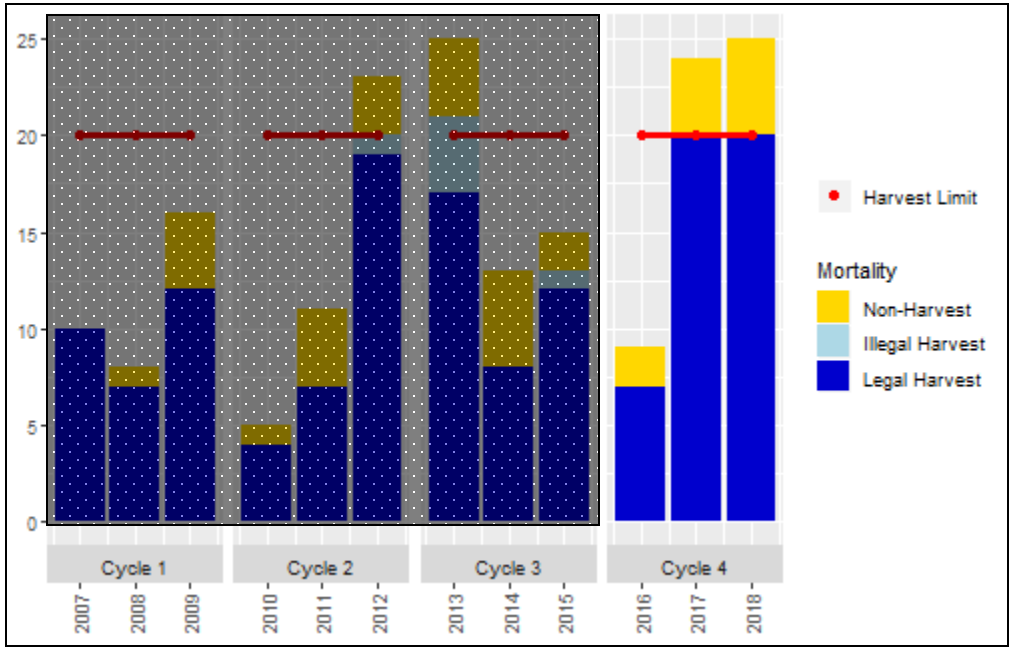


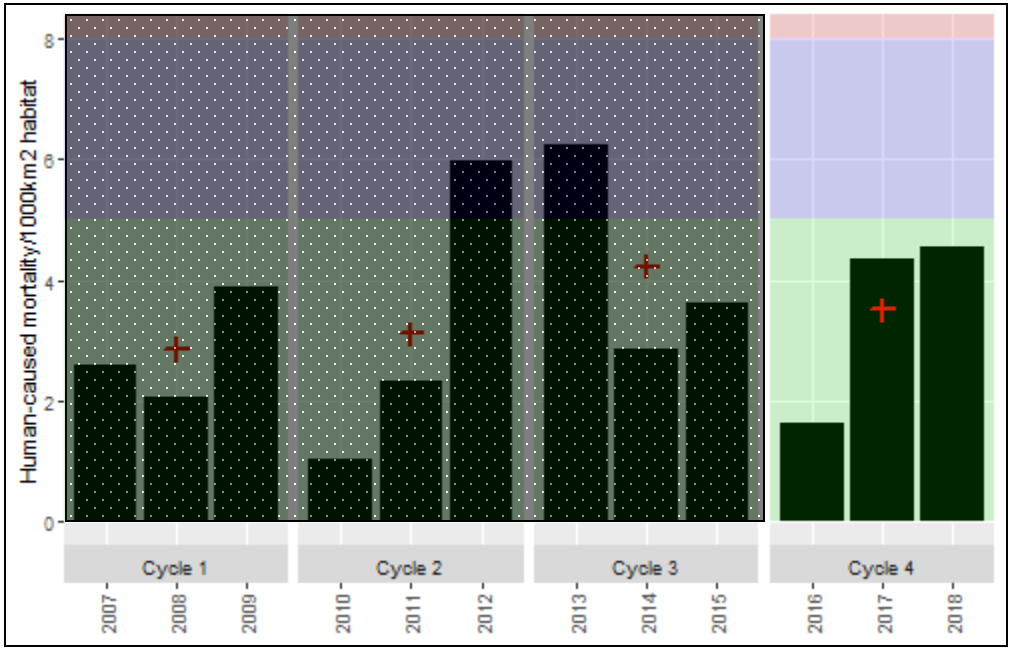


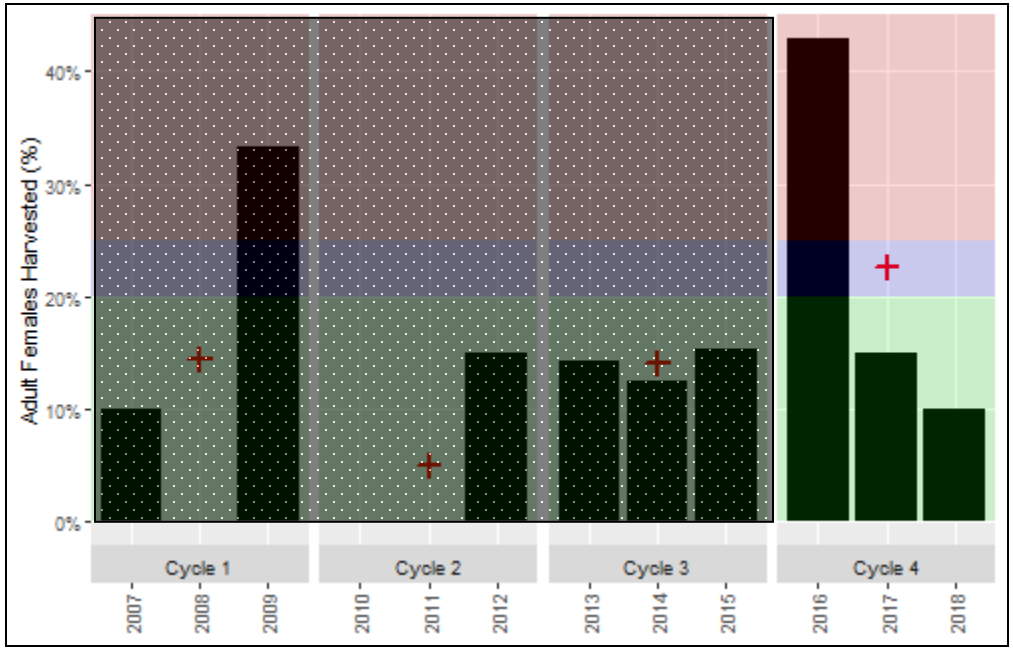
Overview

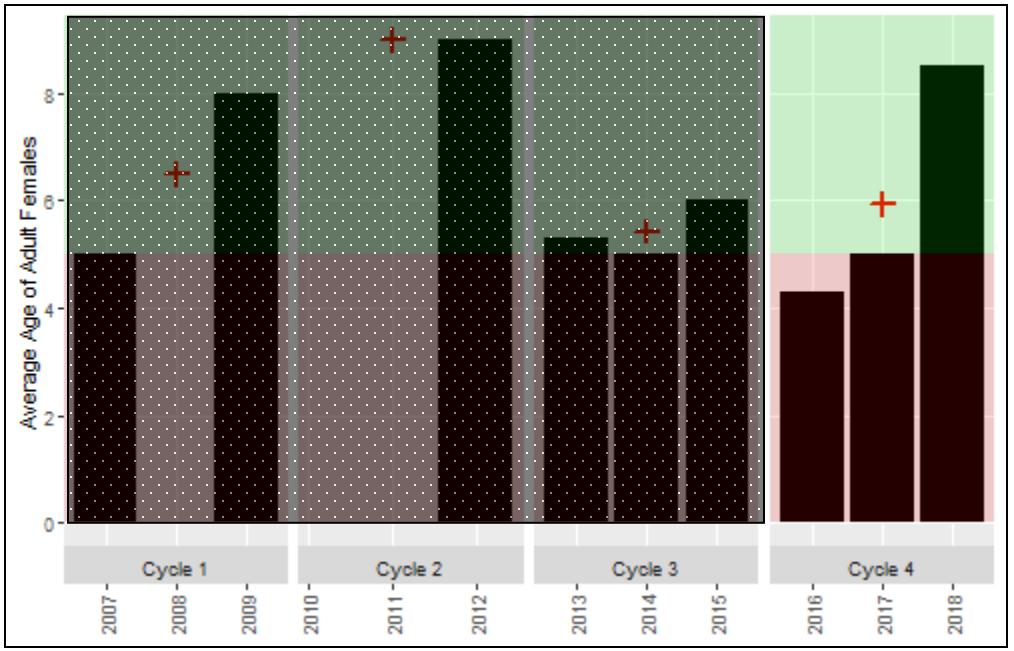
The Absaroka DAU was reconfigured prior to HY 2016, with HA 19 and HA 20 boundaries redrawn within the DAU at the same time habitat estimates were updated. Therefore, habitat changes do not apply to hunt areas within this DAU. Trend data is relevant at the DAU level, but hunt area trends are only applicable for the current management cycle (reflected in shaded areas within panel figures). The Absaroka DAU is functioning near objectives. Due to the size of HA 19, it provides both good hunting opportunity as well as quality animals for selective hunters, and harvest was well distributed across the area. HA 20 functions mainly as a Sink population with removal of young dispersing animals throughout the Bighorn Basin with the exception of the southwest portion that holds more habitat but also reports occasional conflict. Overall, these two strategies complement each other resulting in well-balanced management of the Absaroka DAU.

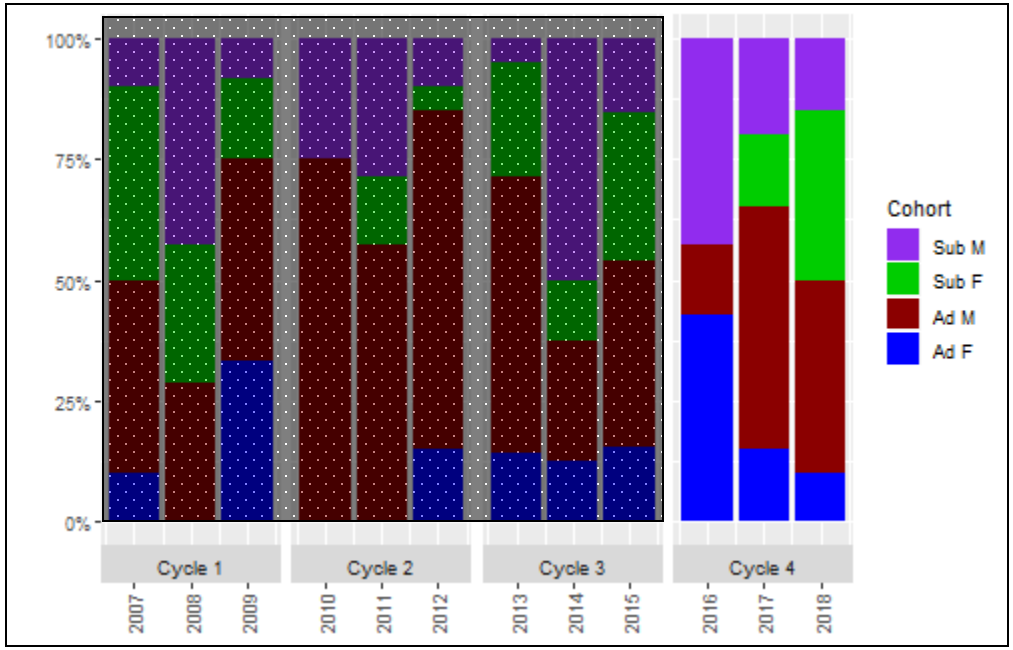
Hunt Area 19.

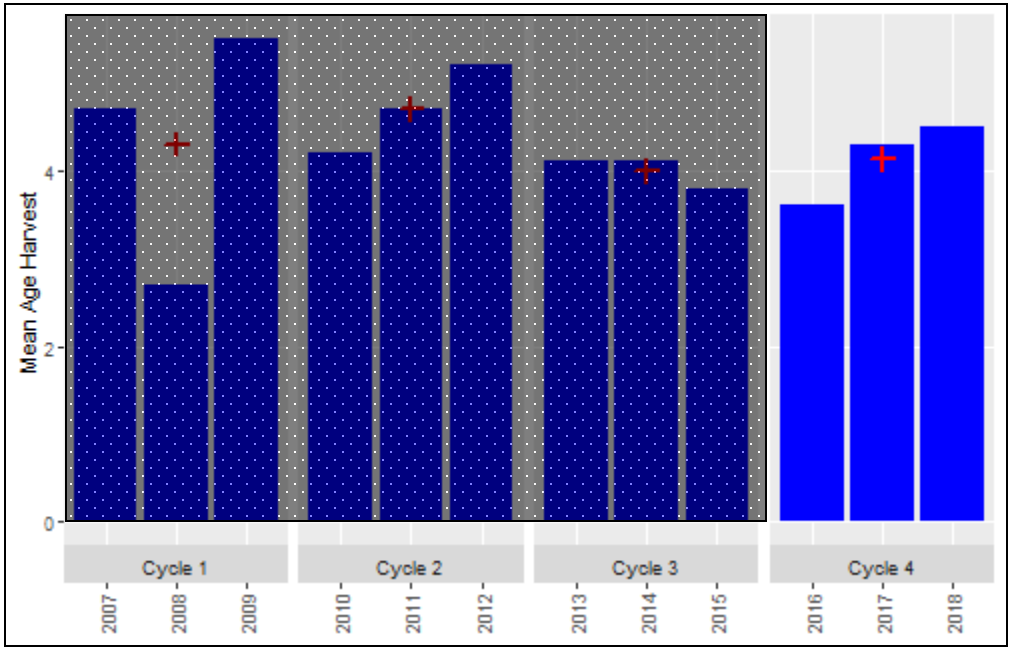

25
20
15
10
5
0
Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

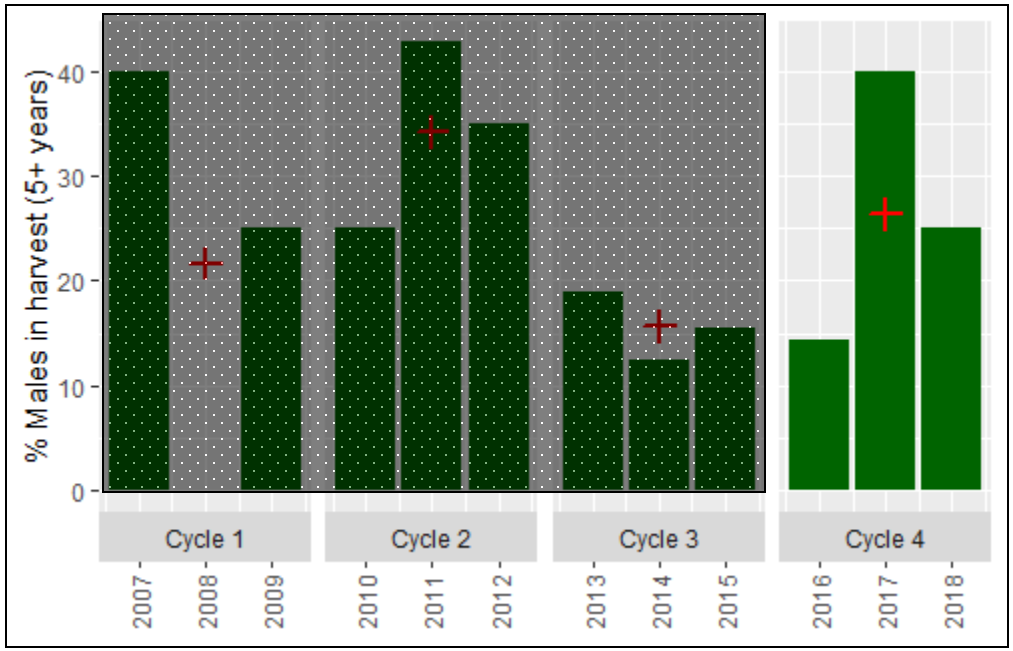

Human-caused mortality/1000km2 habitat
8
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

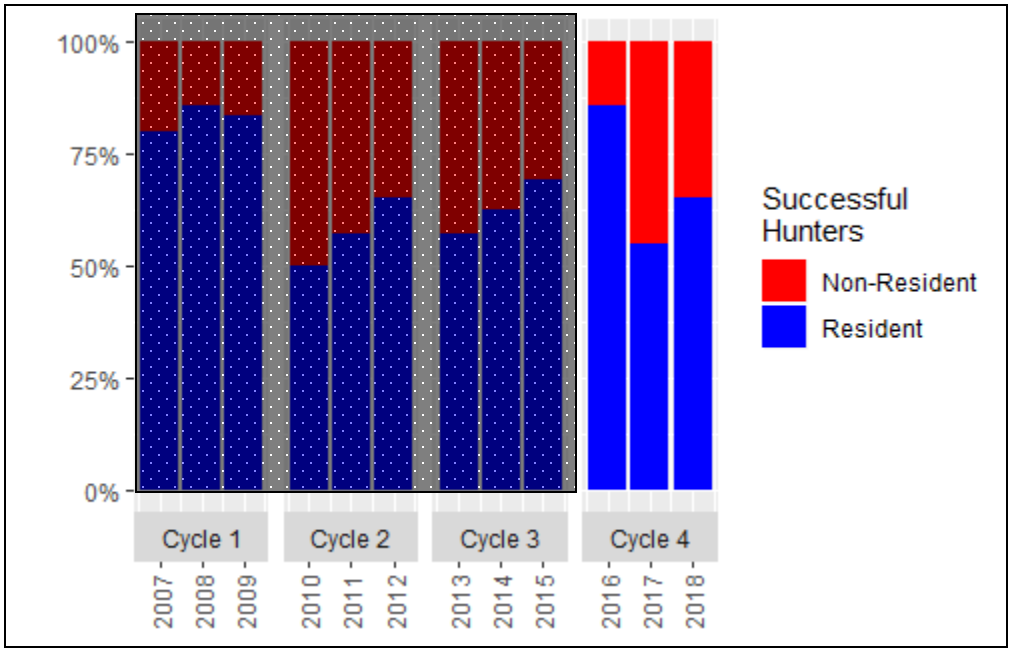

Adult Females Harvested (%)
40%
30%
20%
10%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Average Age of Adult Females
8
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Cohort
Sub M
Sub F
Ad M
Ad F


Mean Age Harvest
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
40
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Successful Hunters
Non-Resident
Resident

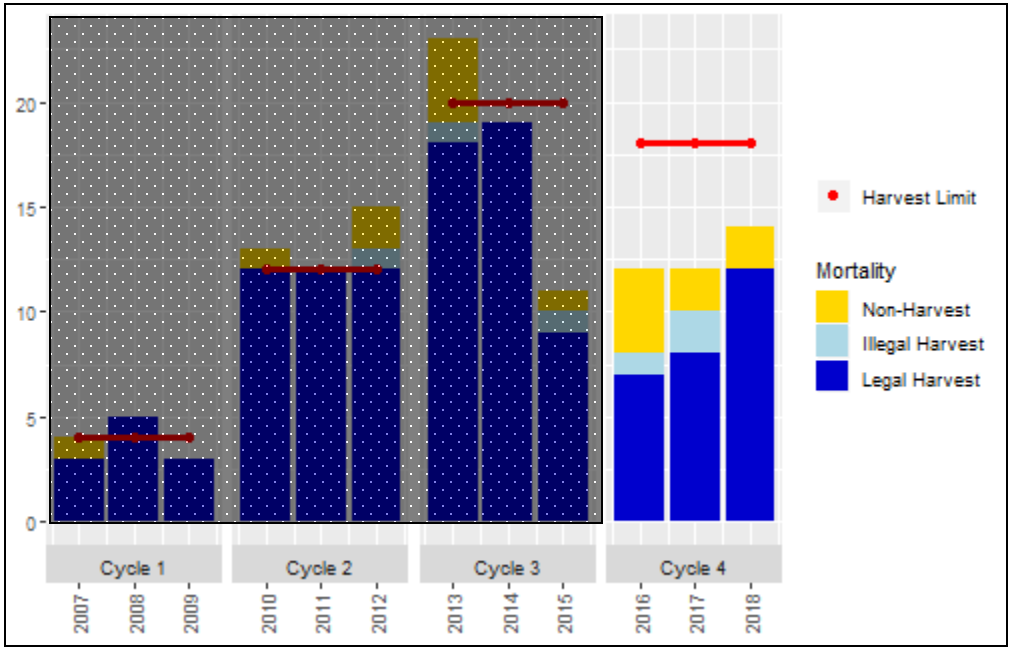
Hunt Area 19. (cont.)

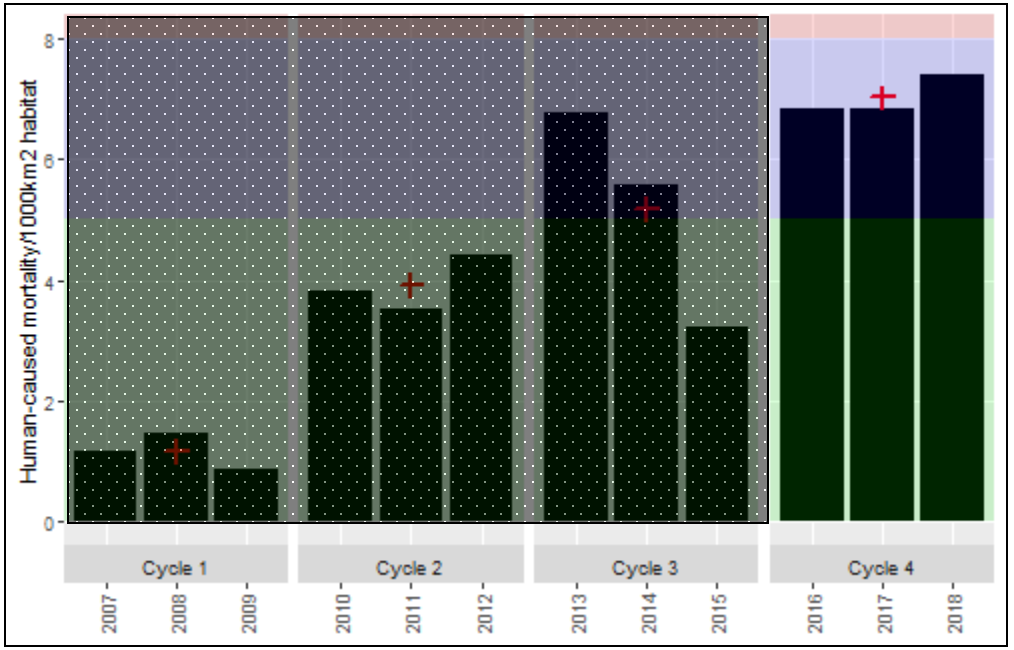
HY2016-HY2018 Regional Objective : Stable/Source management

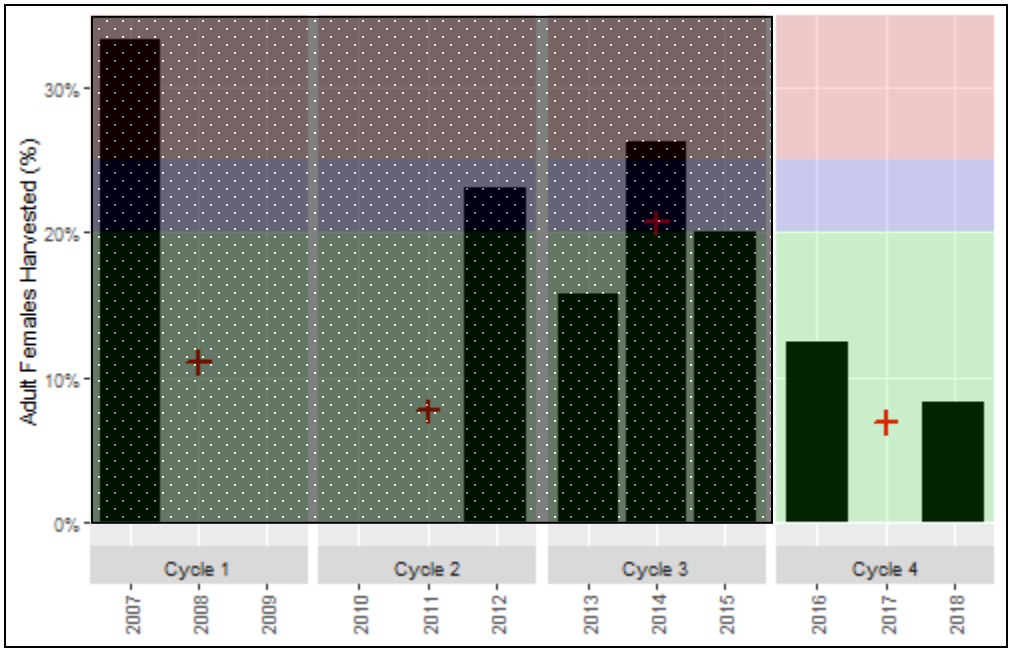
Assessment

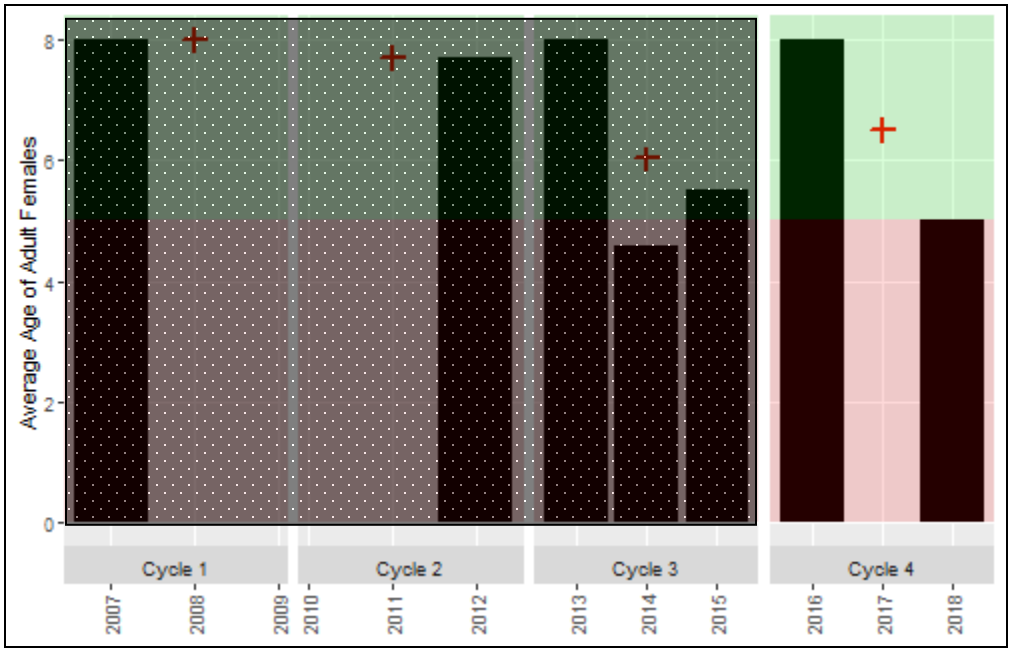
SOURCE: HA 19 now holds the largest amount of suitable habitat of all hunt areas in the state, and is currently managed at a Stable/Source level to provide quality hunting opportunity. Limited trend data for HA 19 show Source-level mortality density with harvest limits reached the last two seasons. Proportion of adult females harvested has declined. The average age of adult females for this cycle reflects older females in the harvest. The age/sex structure is stable, the average age of harvests is over four years old, and a strong proportion of older adult males (>5 years) indicate quality hunting opportunity. Almost all harvest occurs on public land. Around 40% of harvest was by non-resident hunters, although less than 20% reported using guide services. Selectivity was high in the current cycle with ~75% of hunters reporting selective hunting strategies. Harvest during this cycle was also well distributed across the hunt area.

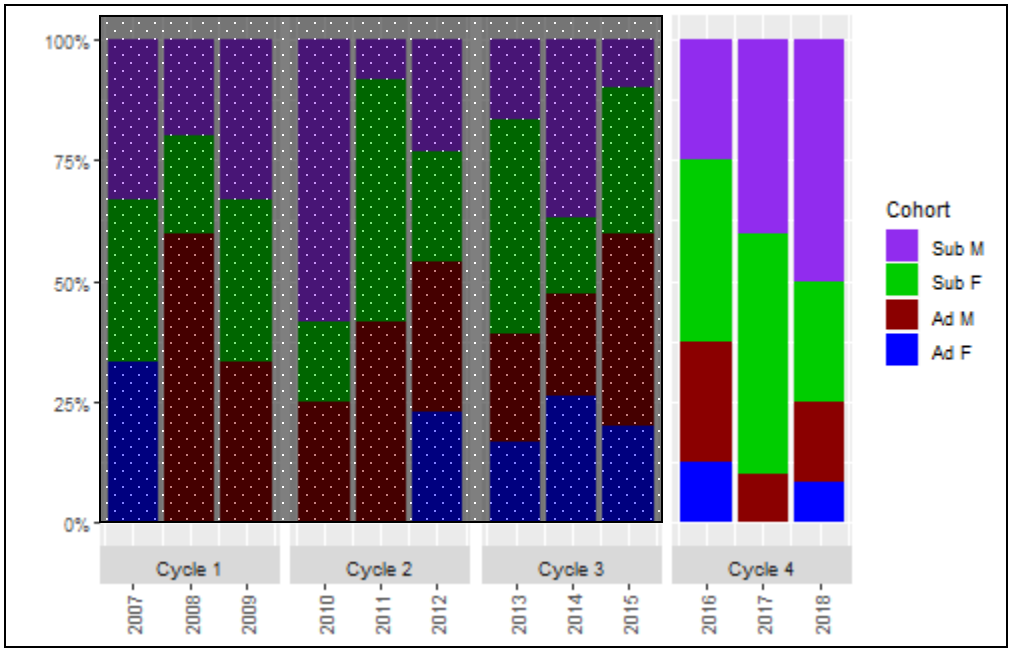
Hunt Area 20.

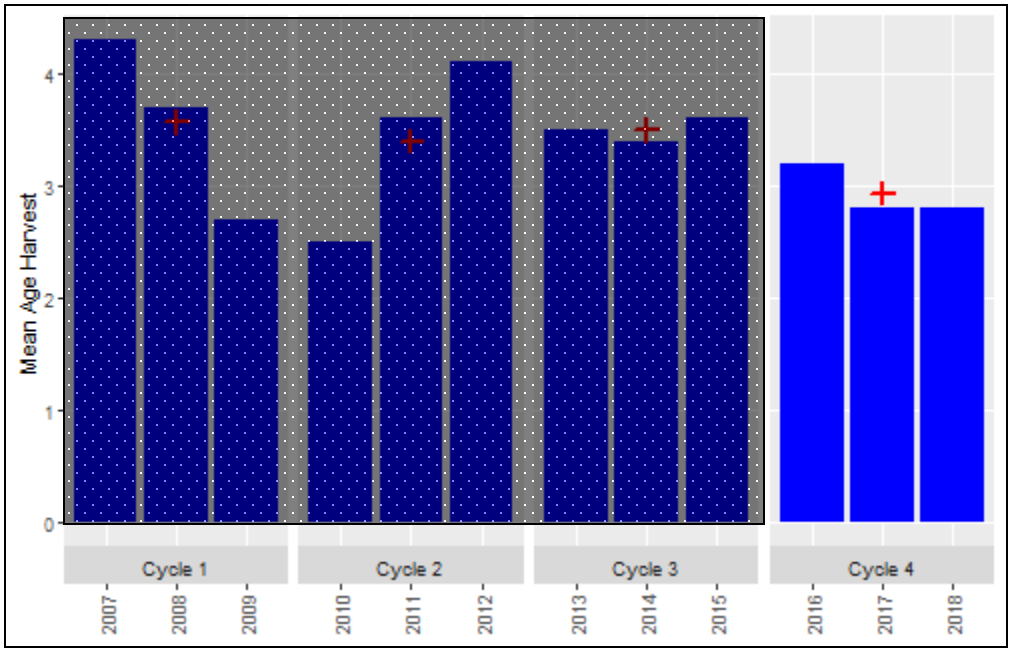

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

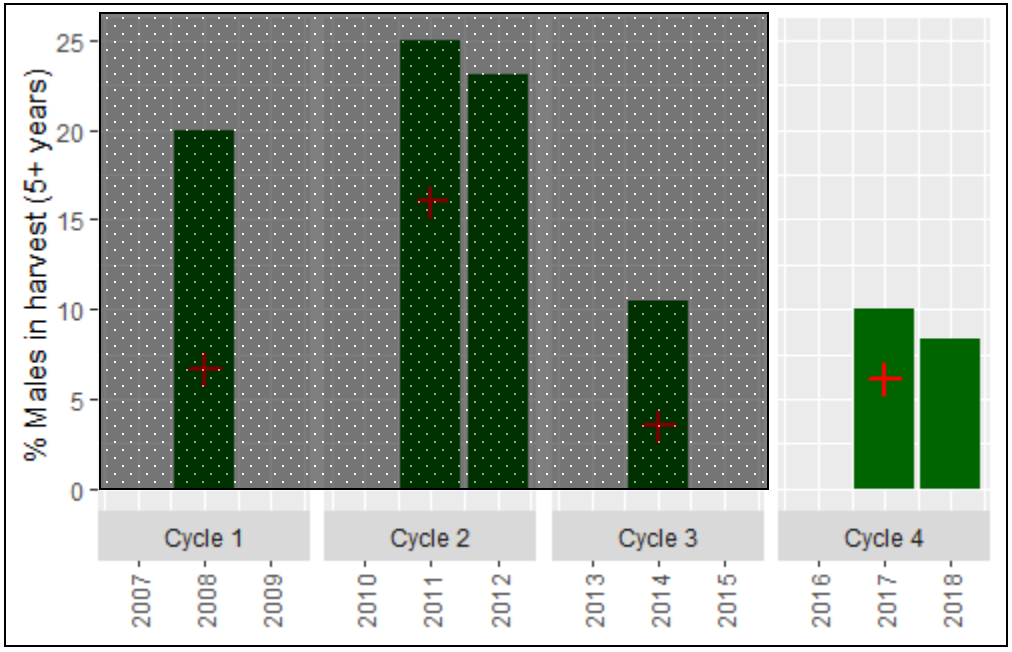

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

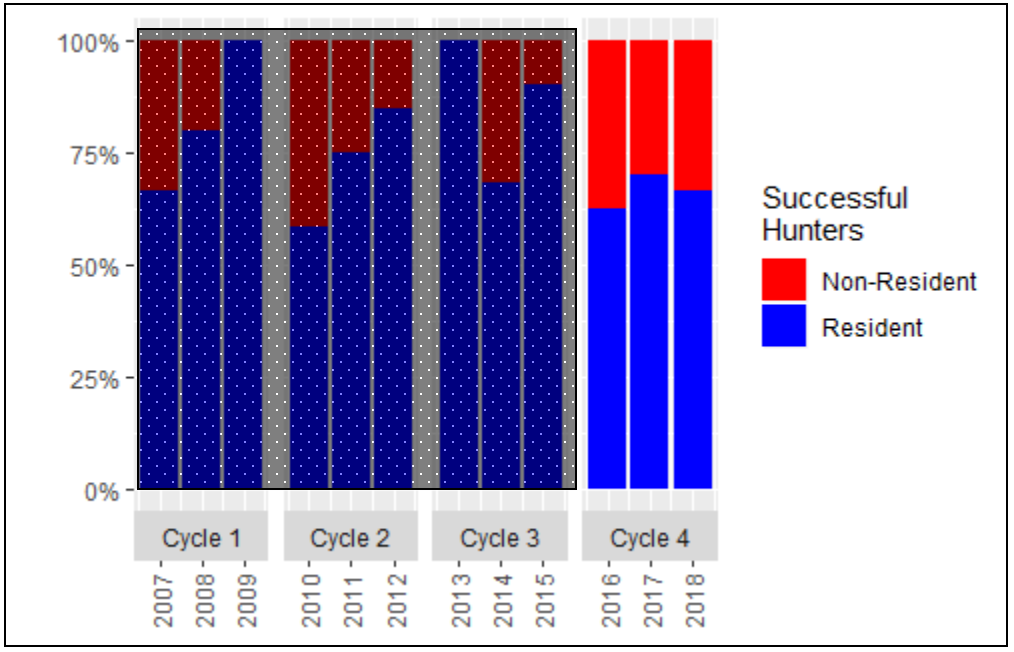

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
0
1
2
3
4
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
0
5
10
15
20
25
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

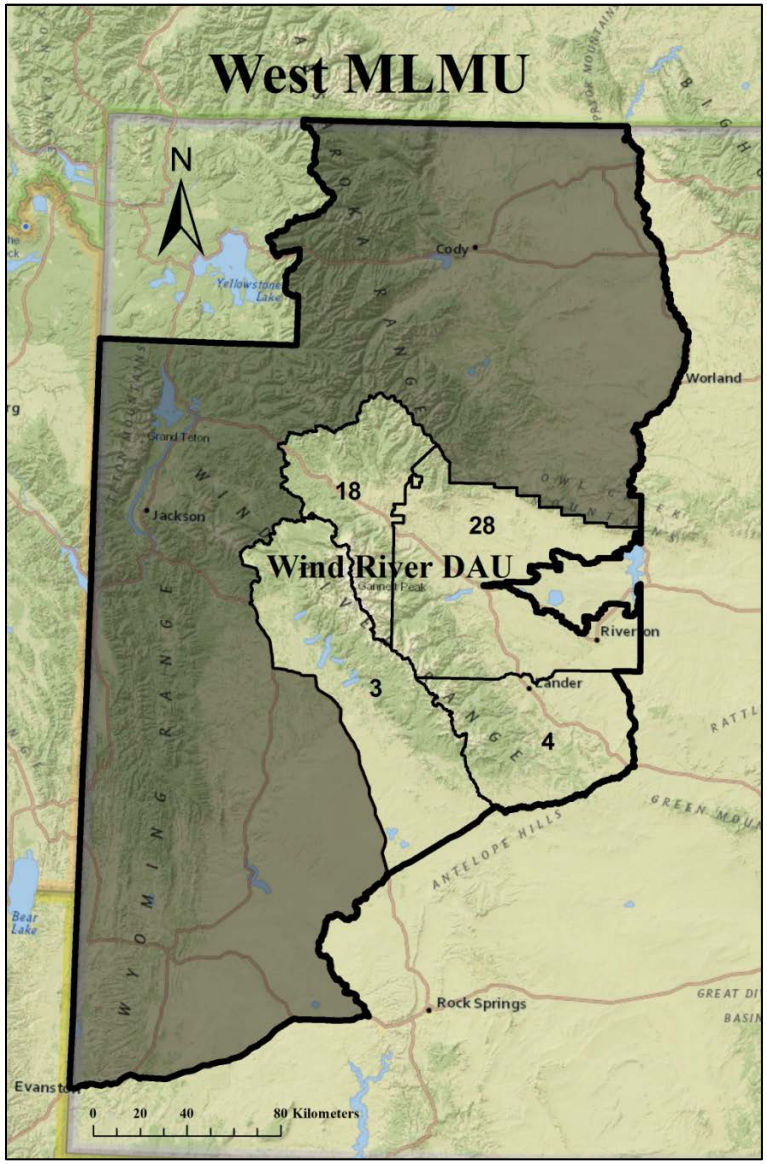
Hunt Area 20. (cont.)

HY2016-HY2018 Regional Objective : Stable/Sink management

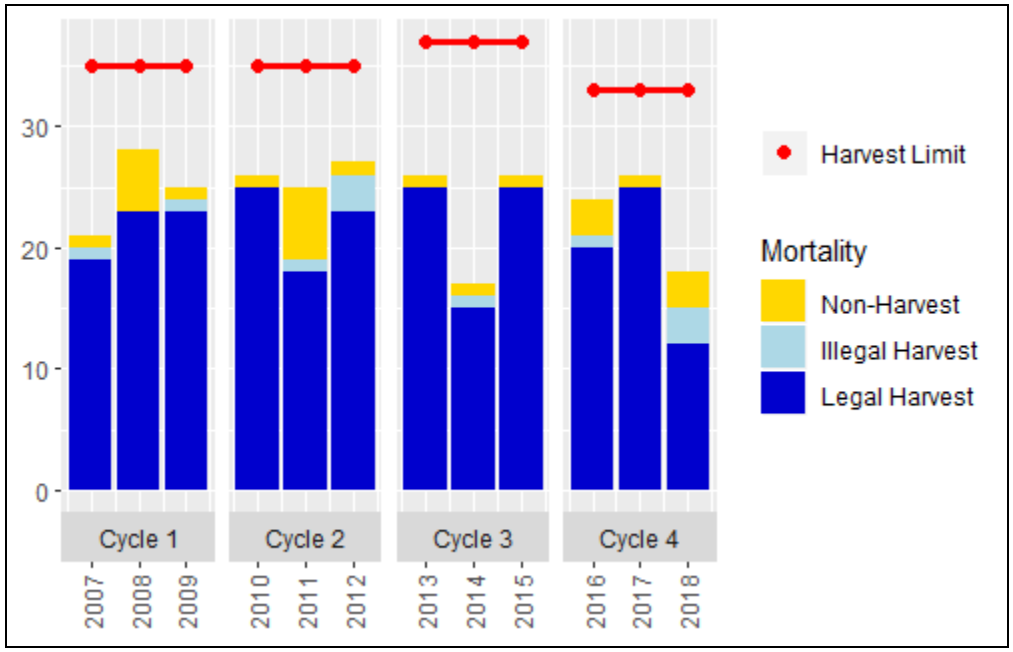
Assessment

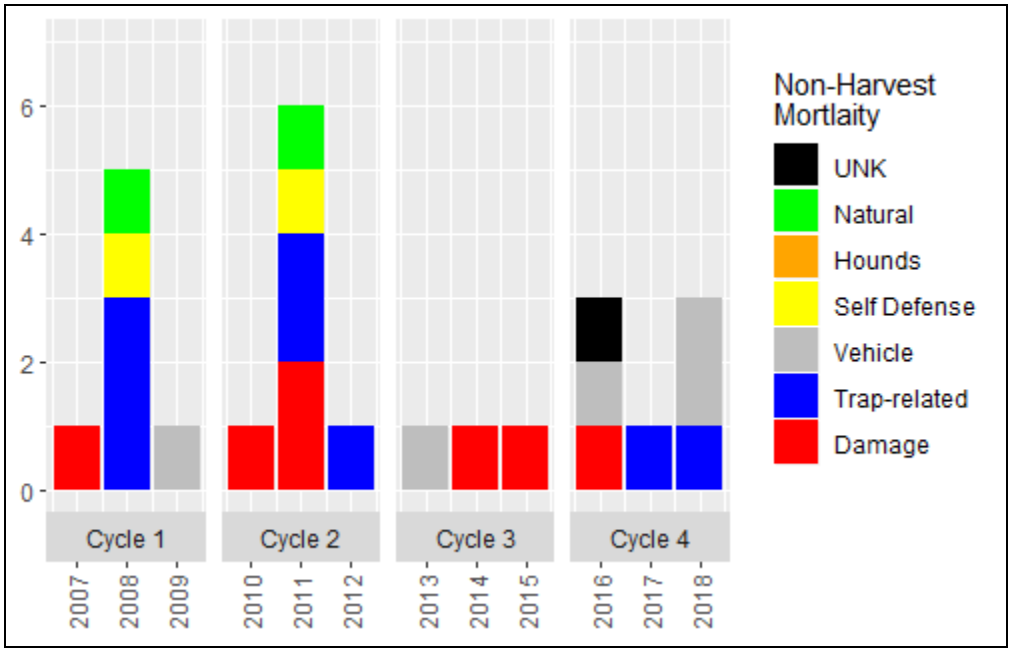
STABLE/SINK: HA 20 now encompasses areas to the east of HA 19 with an objective for Stable/Sink management. The new mortality limit of 18 was not reached but averaged around 10 during the current cycle (within Stable range). Few adult females were harvested, but the age/sex structure for this cycle comprised ~75% sub-adults, indicative of dispersing younger animals across lower-quality habitat and via river corridors throughout the Bighorn Basin. Spatial distribution of the harvest supports this, with most of the harvest throughout the basin consisting of younger animals, and the average age of harvest is lower than in HA 19 at ~3 years. Therefore, HA 20 functions mostly as a Sink with the exception of the southwestern portion that holds the most suitable habitat. This portion of the area has limited access but provides opportunity for guided hunts with direct connectivity to Source-level populations in HA 19 to the west and HA 28 to the south.

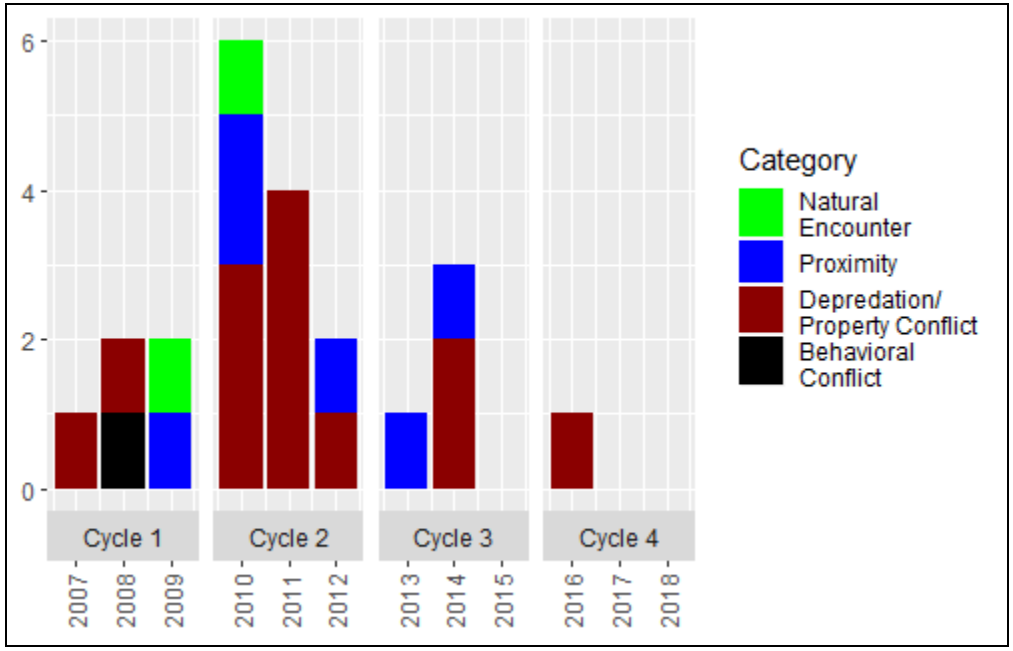
WIND RIVER DAU

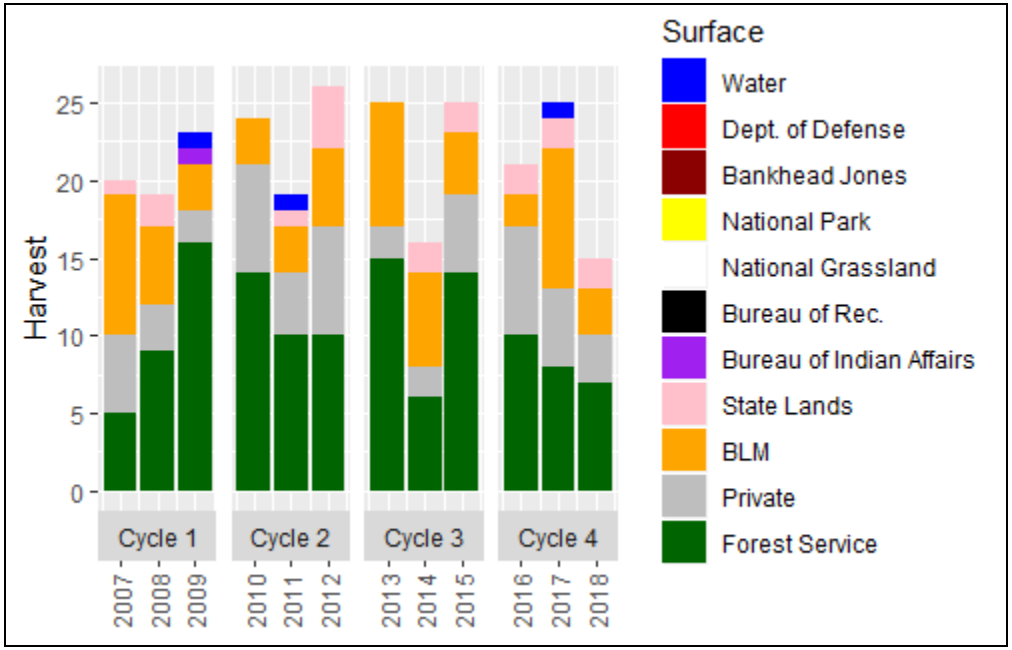


Wind River DAU

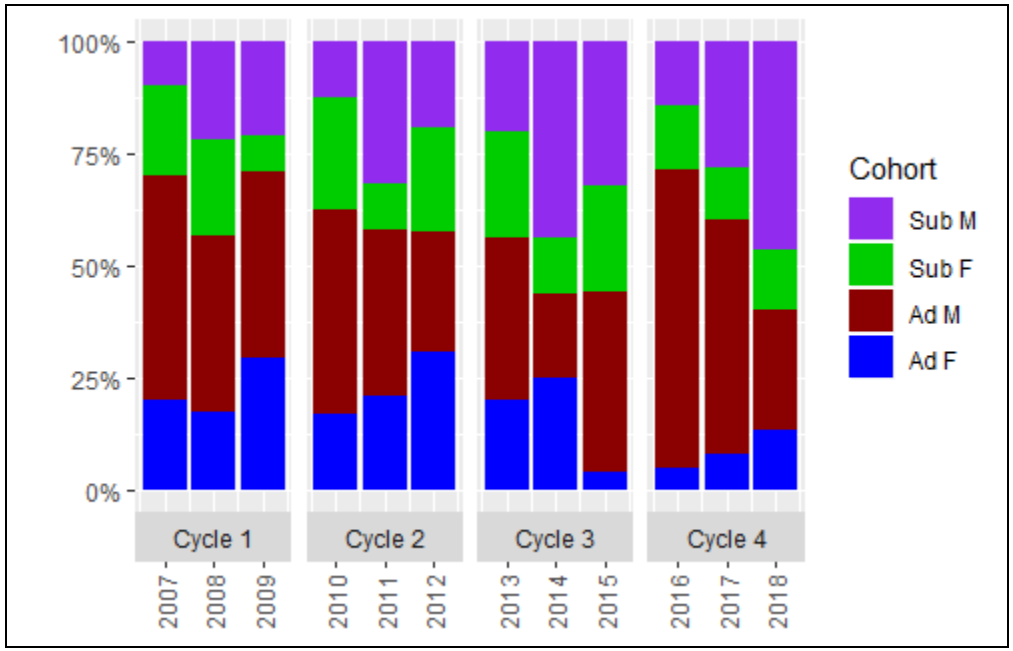


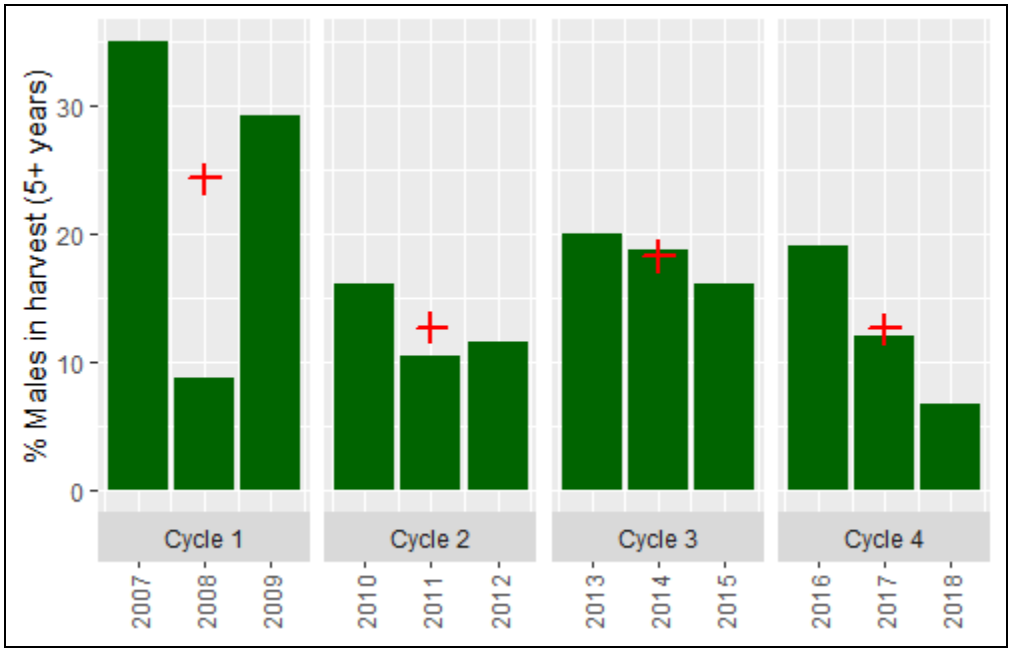






Wind River DAU (cont.)

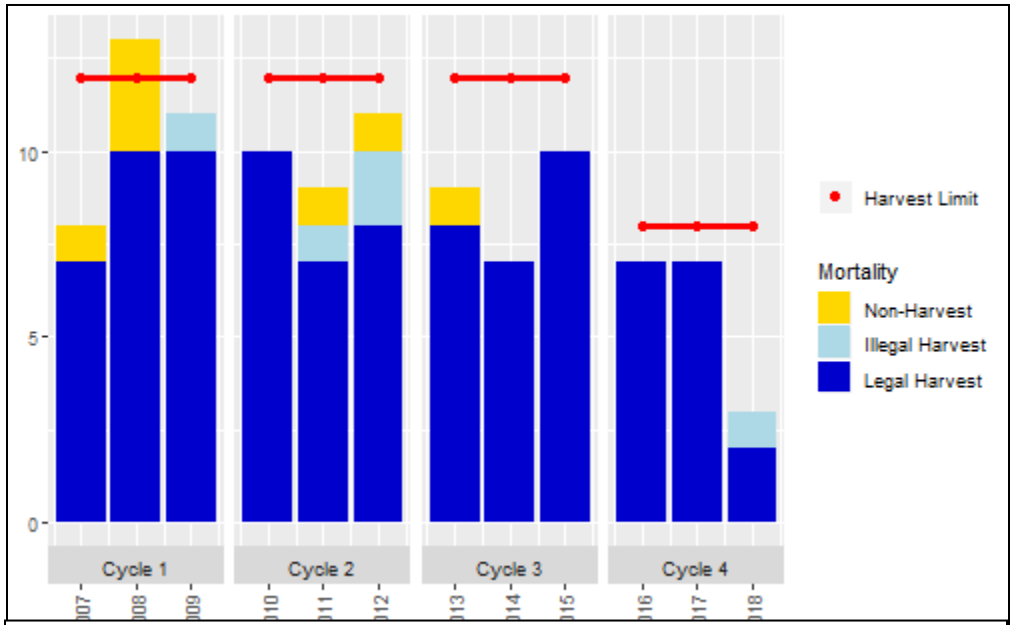


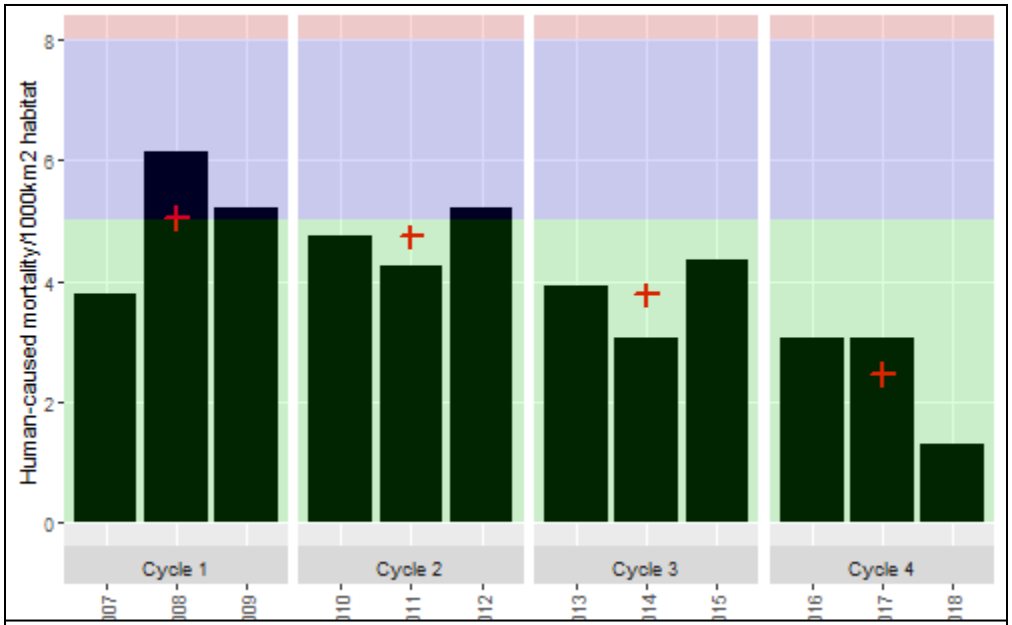


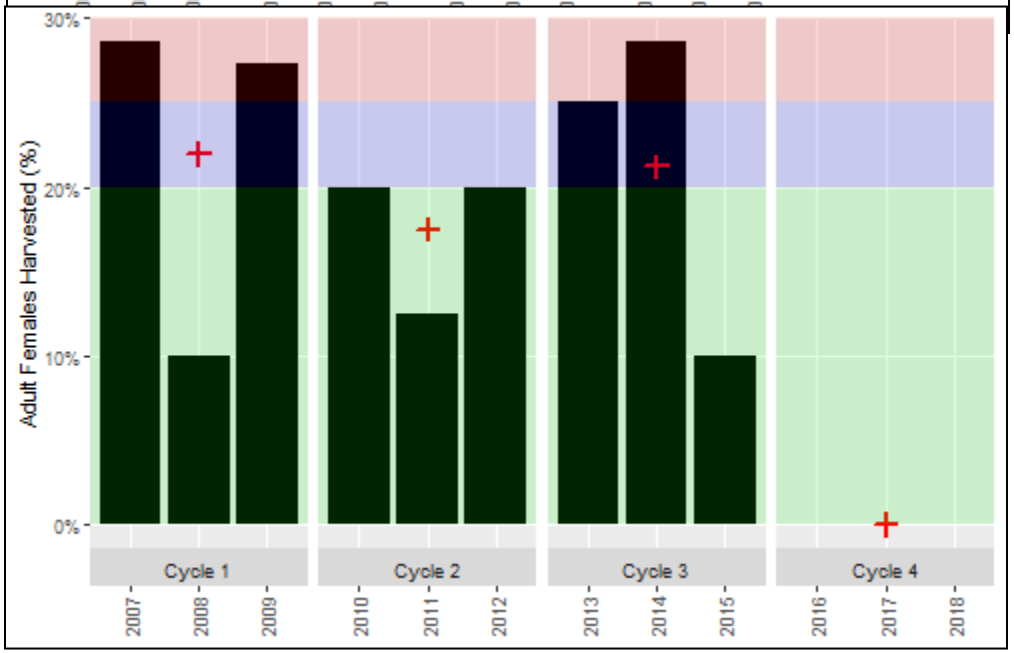
Overview

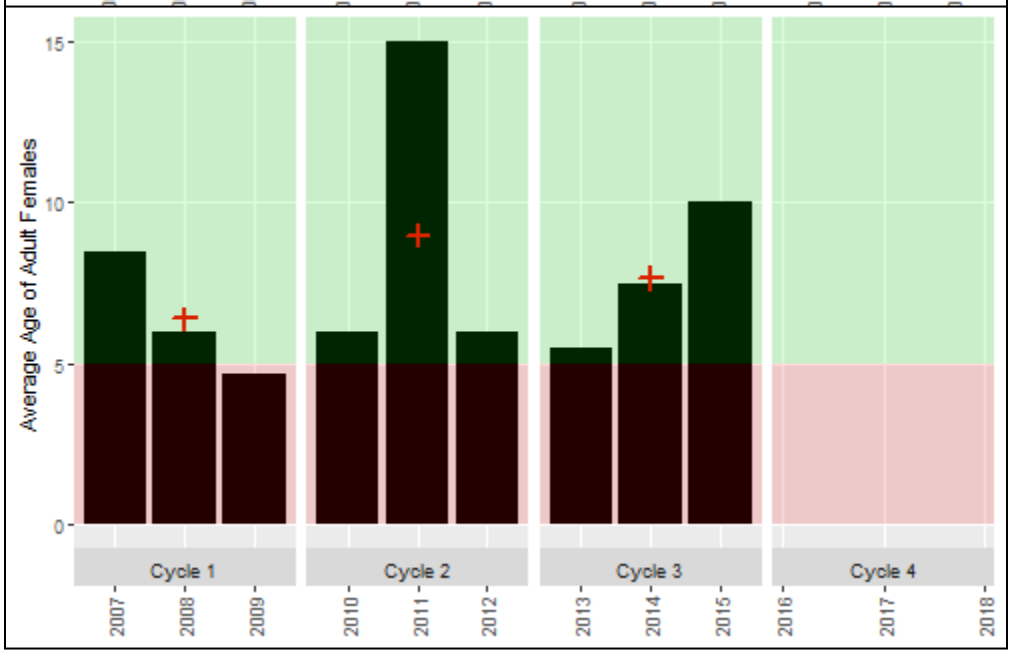
The Wind River DAU includes four hunt areas encompassing the Wind River Range of the West MLMU. Hunt area 28 is comprised almost entirely of reservation land, reports few harvests, and is considered a Source population. HAs 4 and 18 both show stable harvest rates, high selectivity, and quality hunting opportunity. HA 3 has indications of being less productive, but is in line with management objectives for that area. Overall, the Wind River DAU demonstrates robust mountain lion populations and is well maintained.

Hunt Area 3.

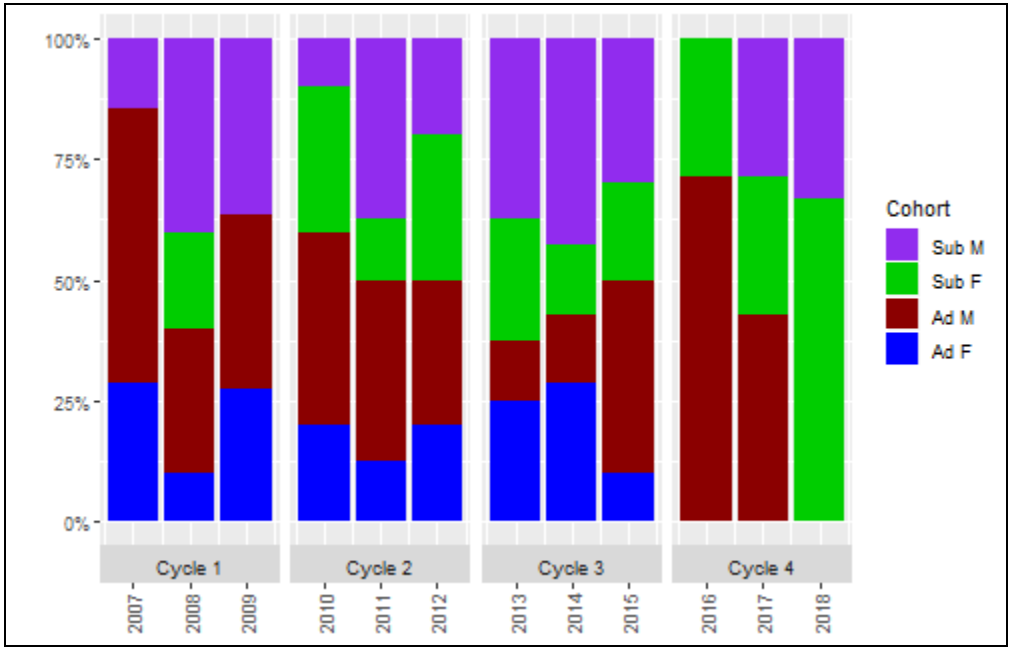

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

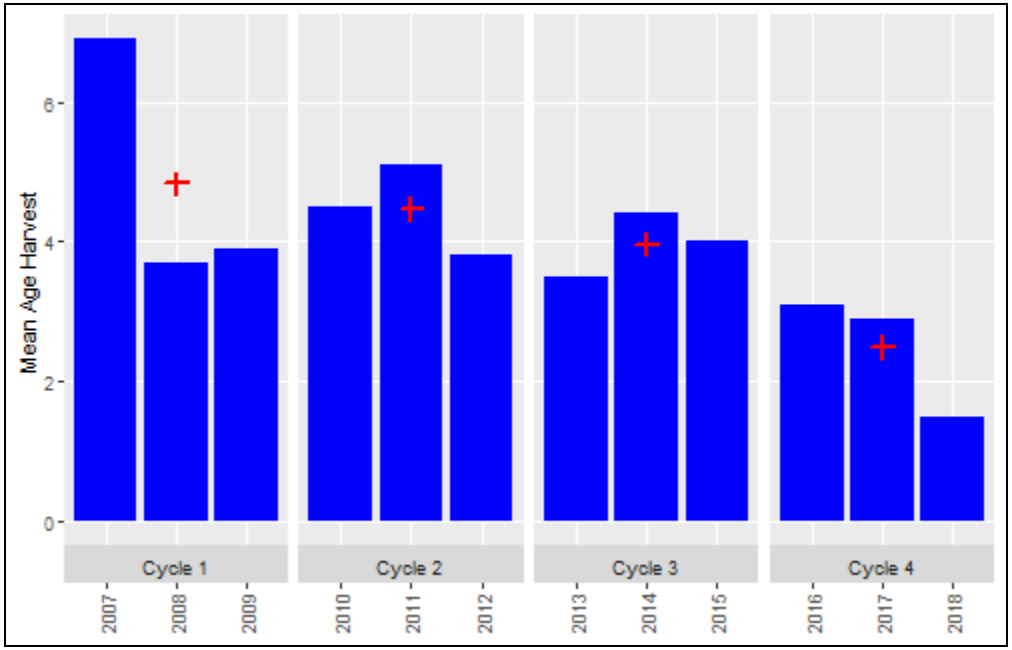

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

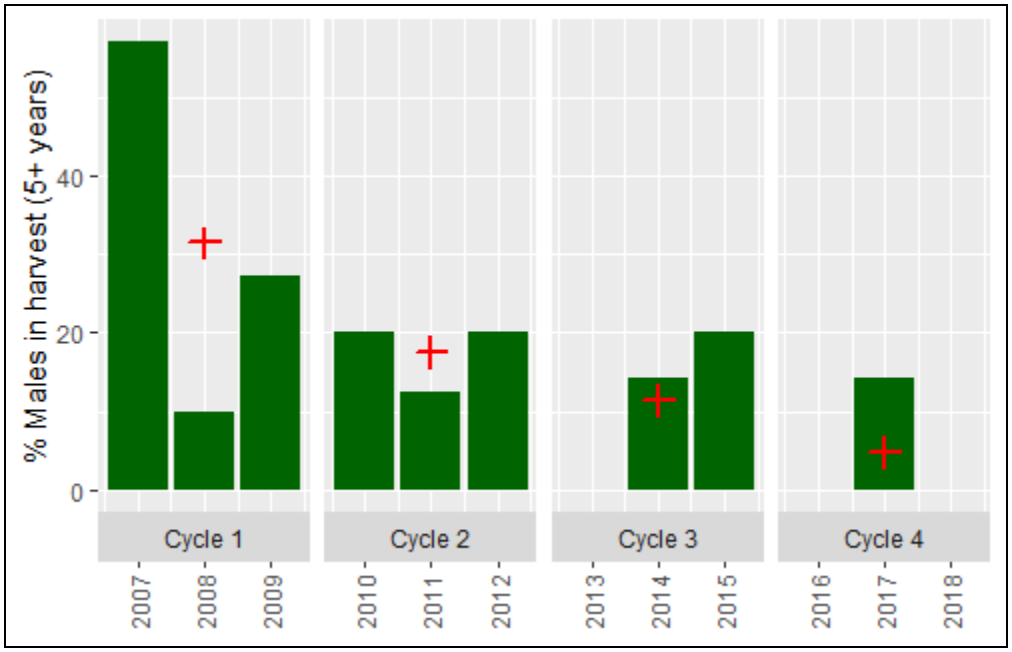

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4

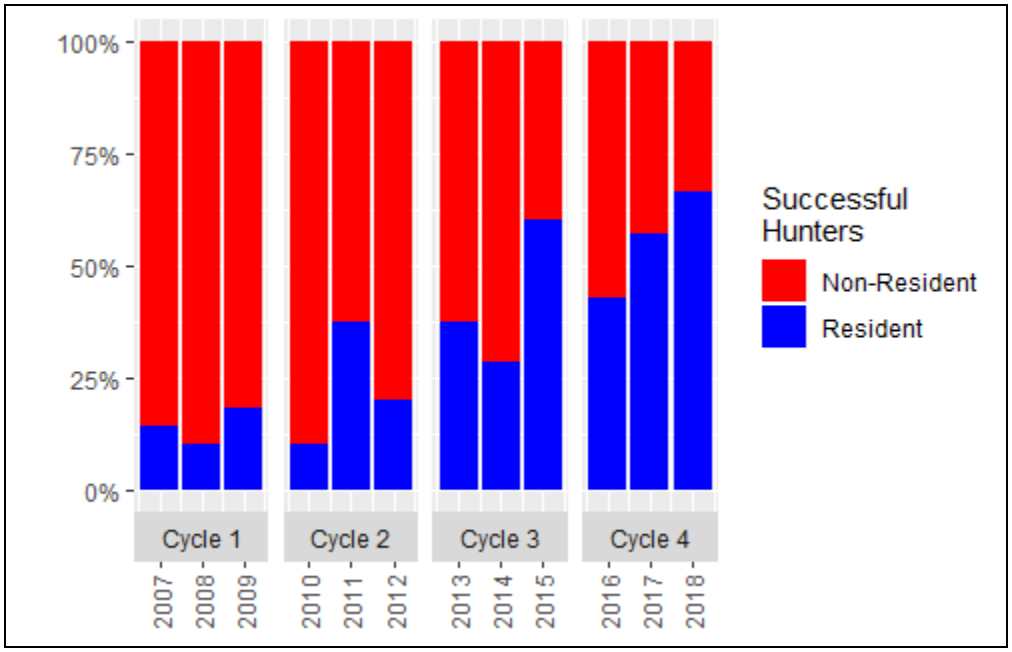

Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4

Hunt Area 3. (cont.)









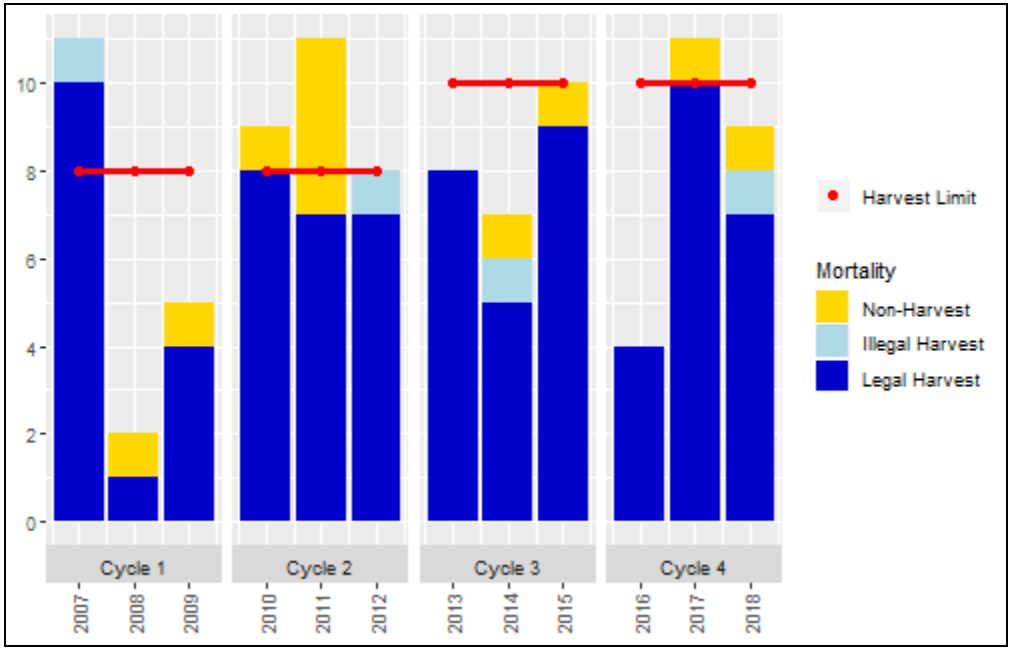
Hunt Area 3. (cont.)

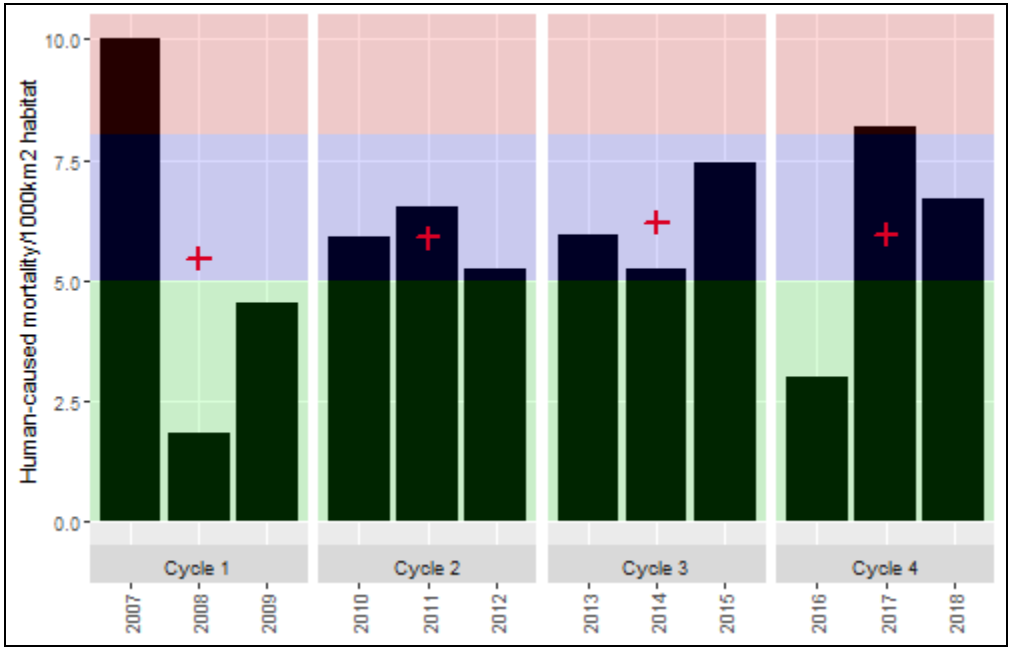
HY2016-HY2018 Regional Objective : Stable/Sink management

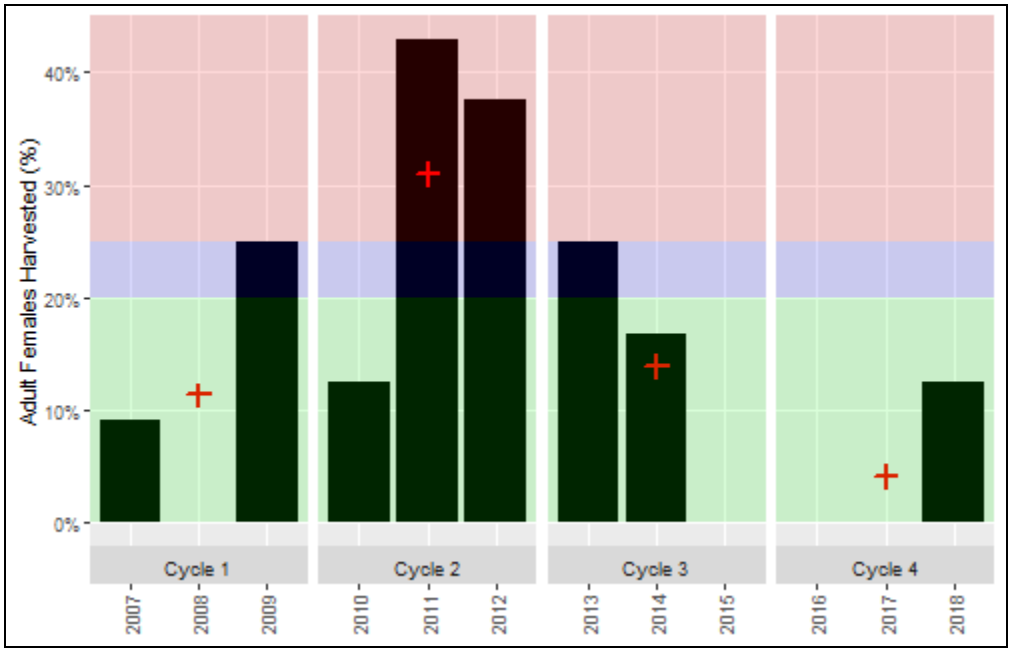
Assessment

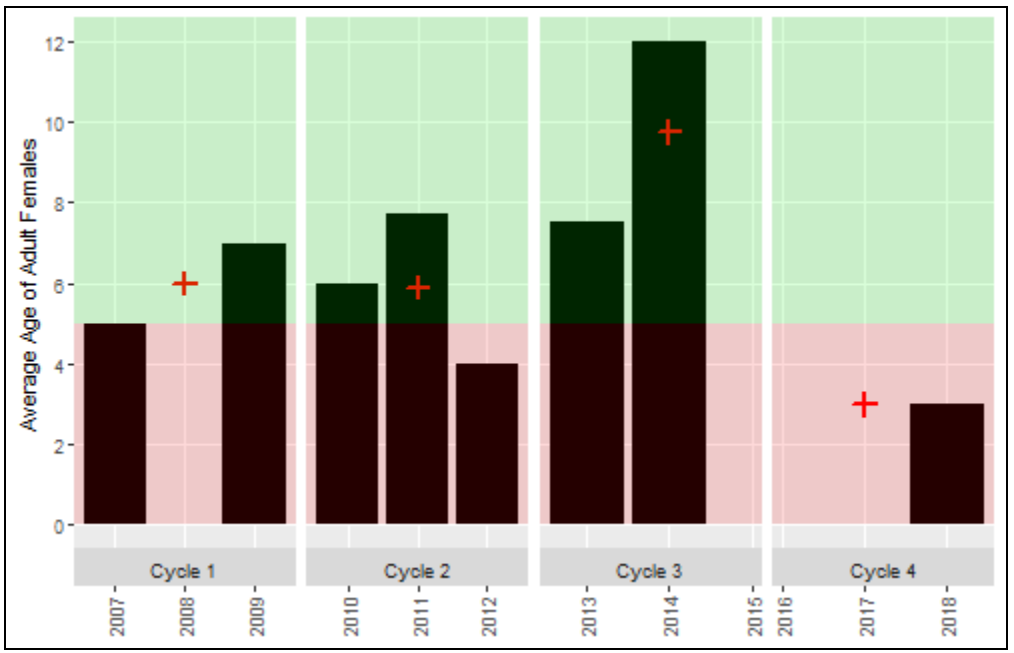
STABLE/SINK: This hunt area previously exhibited signs of population suppression (elevated adult female harvest) under Stable/Source level mortality densities, and HA 3 may naturally sustain lower mountain lion densities than used in population trend models. Harvest continued to decline in HA 3 although opportunity was not limited by a harvest limit reduction in HY 2016. Recently, low mortality and no adult female harvest suggest a rebound in HA 3 densities, and the adult portion of the age/sex composition has generally remained stable. However, despite increased reports of hunter selectivity the overall age of harvest has consistently declined from greater than six years in HY 2007 to less than two years in HY 2018, and older adult males also follow this trend. Guided hunts have dropped significantly in HA 3 corresponding to a decrease in non-resident hunters. Nearly all harvest occurs on public land (>90% during past 2 cycles).

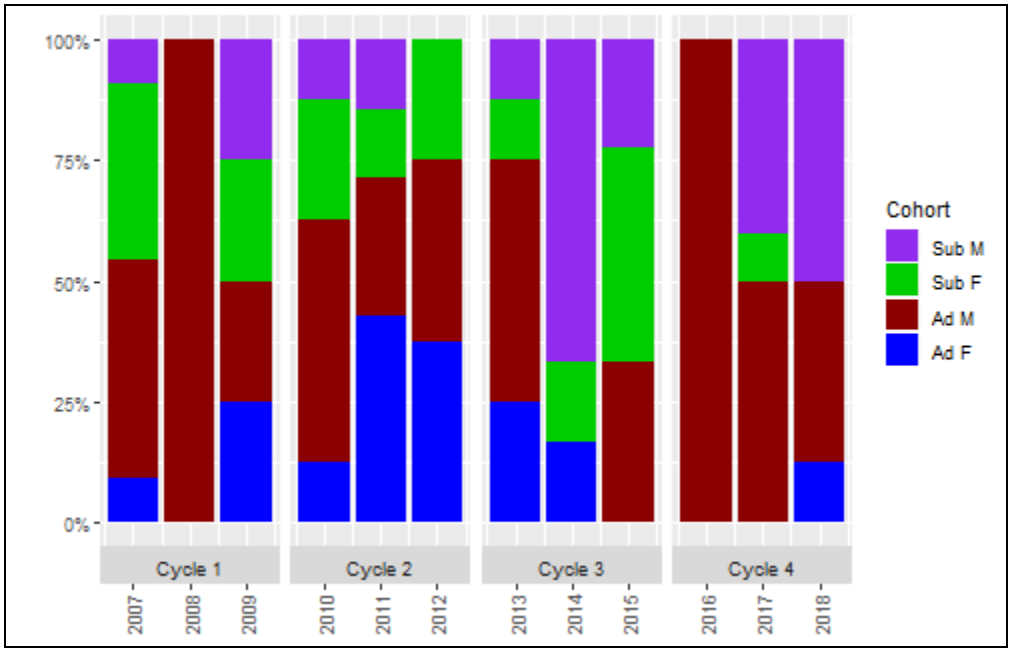
Hunt Area 4.

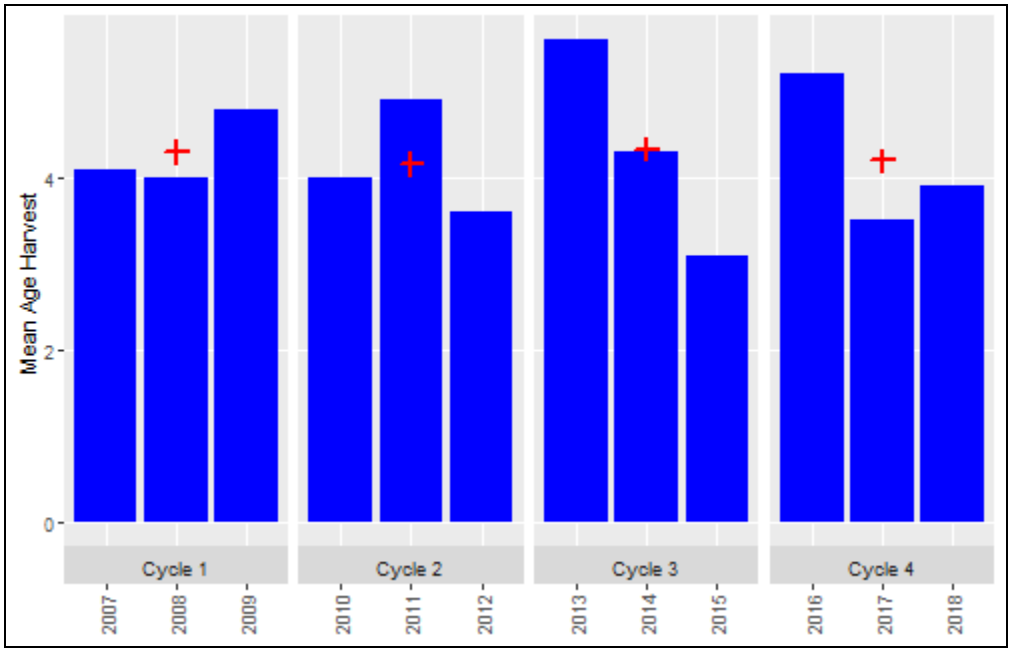

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

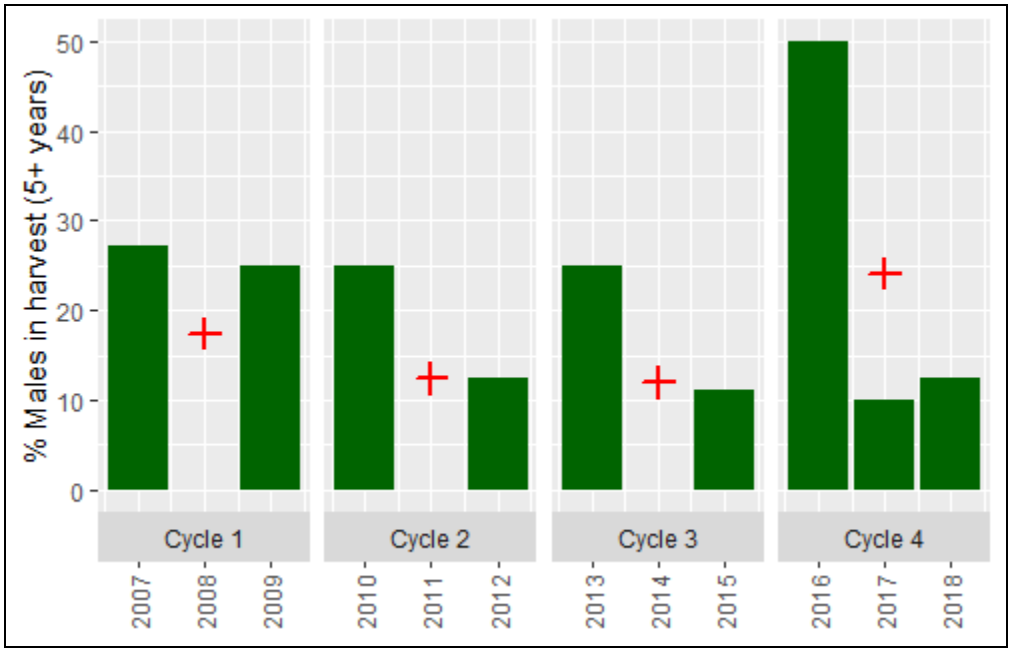

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

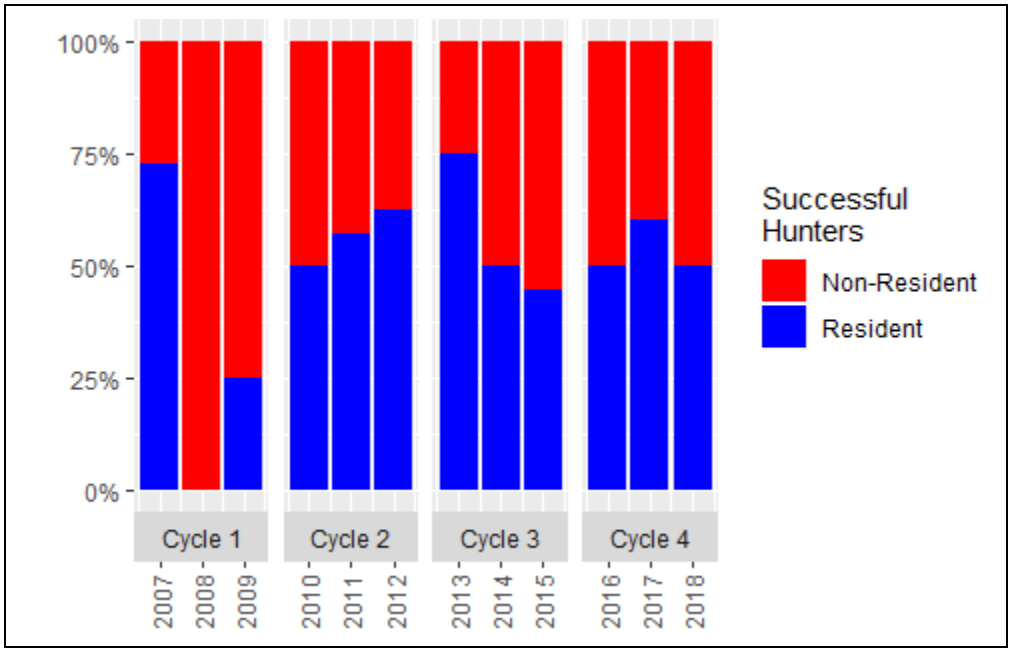

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Cohort
Sub M
Sub F
Ad M
Ad F


Mean Age Harvest
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
50
40
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Successful Hunters
Non-Resident
Resident

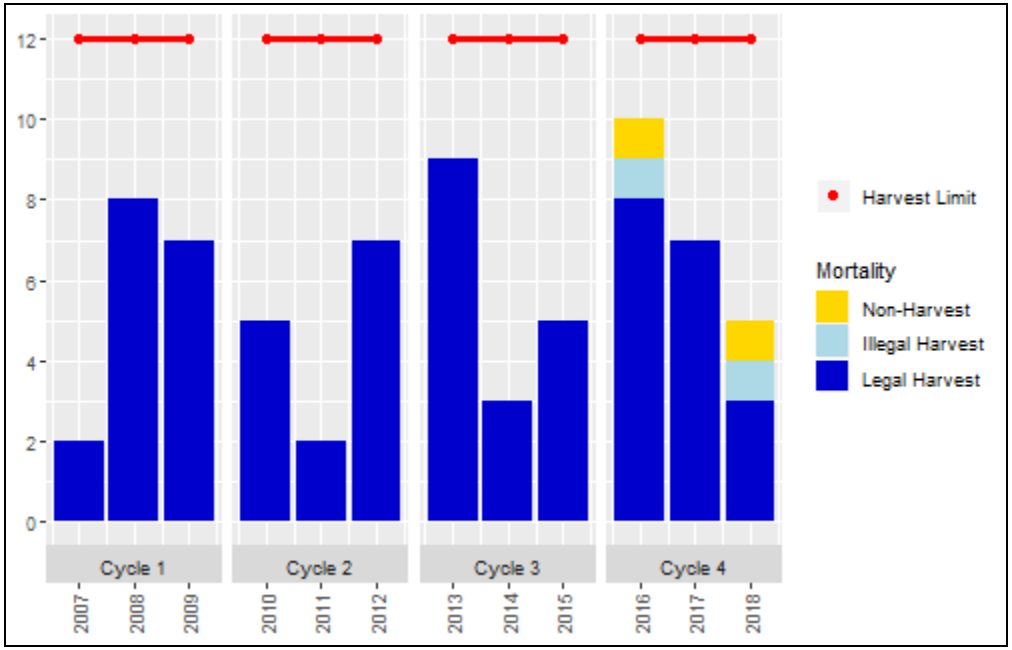
Hunt Area 4. (cont.)

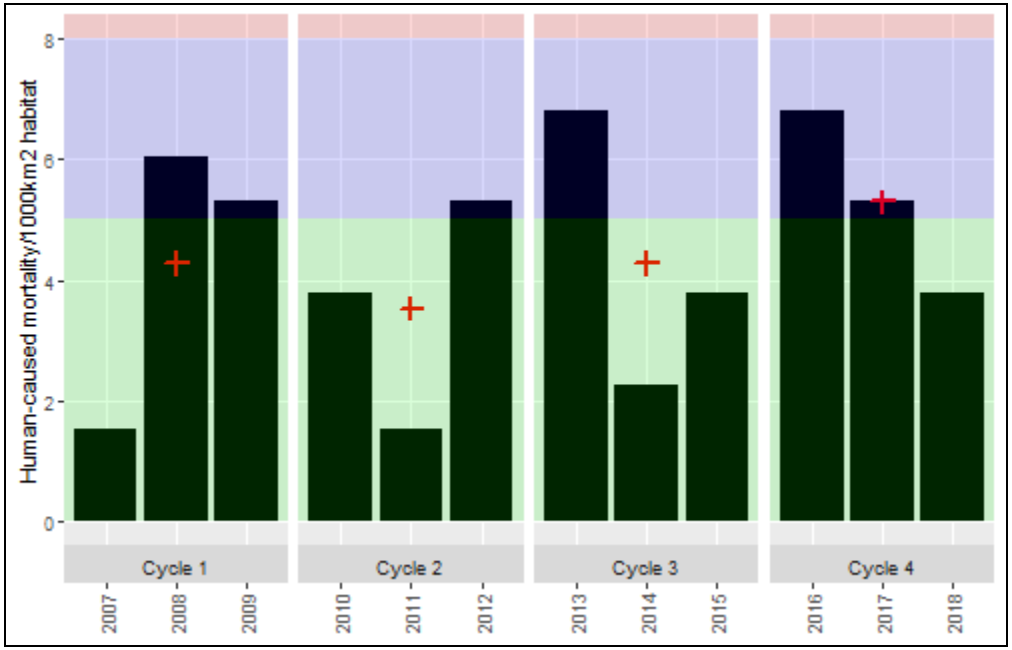
HY2016-HY2018 Regional Objective : Stable management

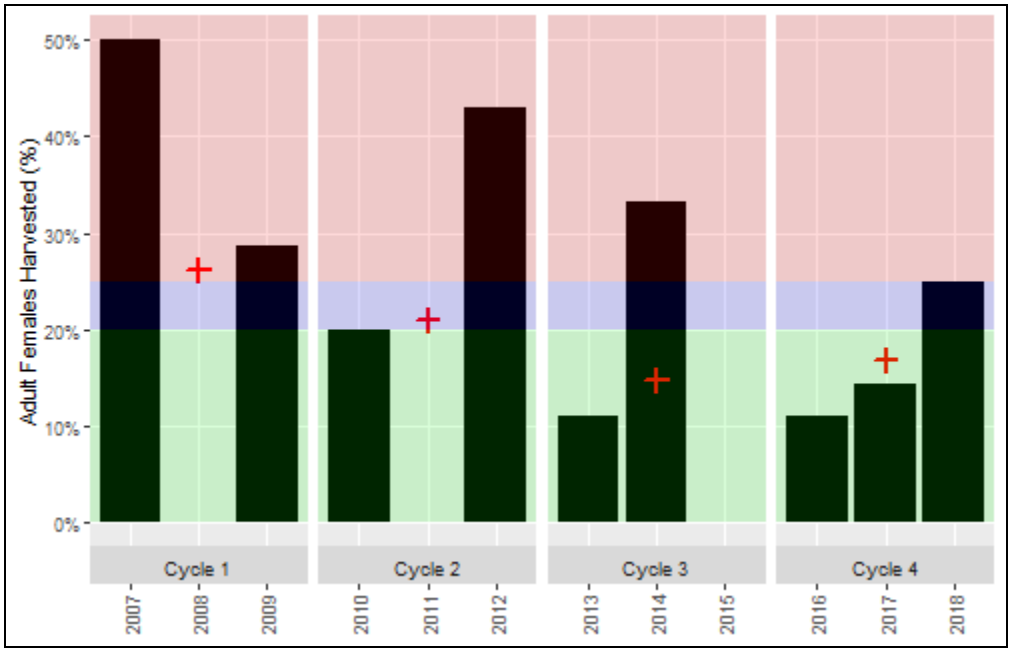
Assessment

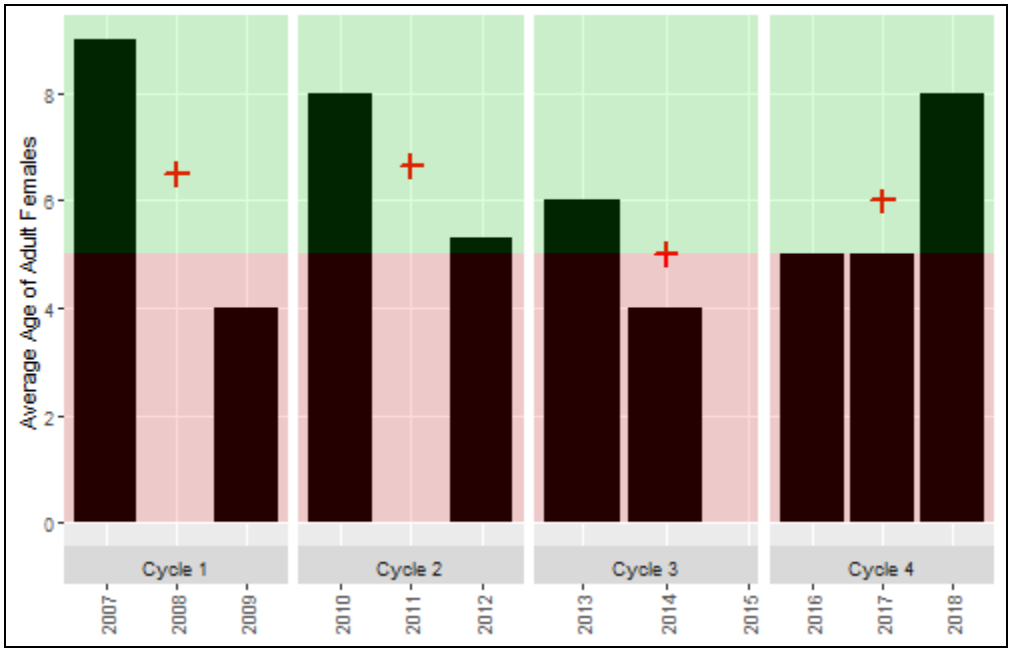
STABLE/SOURCE: HA 4 currently maintains mortality densities near Stable ranges. Higher adult female harvest occurred in HY 2011, HY 2012, and HY 2013, but only two adult females have been harvested in the past five seasons. High hunter selectivity has resulted in only two females taken during this cycle, and this selectivity maintains consistently high overall age and proportions of older adult males harvested. Besides the resulting reproduction within HA 4, dispersal from the adjacent Source population in HA 28 to the north also compensates for harvest in the area. Approximately 50% of hunts are guided in the area to non-resident hunters. Consistency in hunting pressure and high selectivity may result in adult males taken from the area as they become available. The result is excellent hunting opportunity and a high probability that seasons will remain open longer if younger aged animals and females are avoided by hunters.

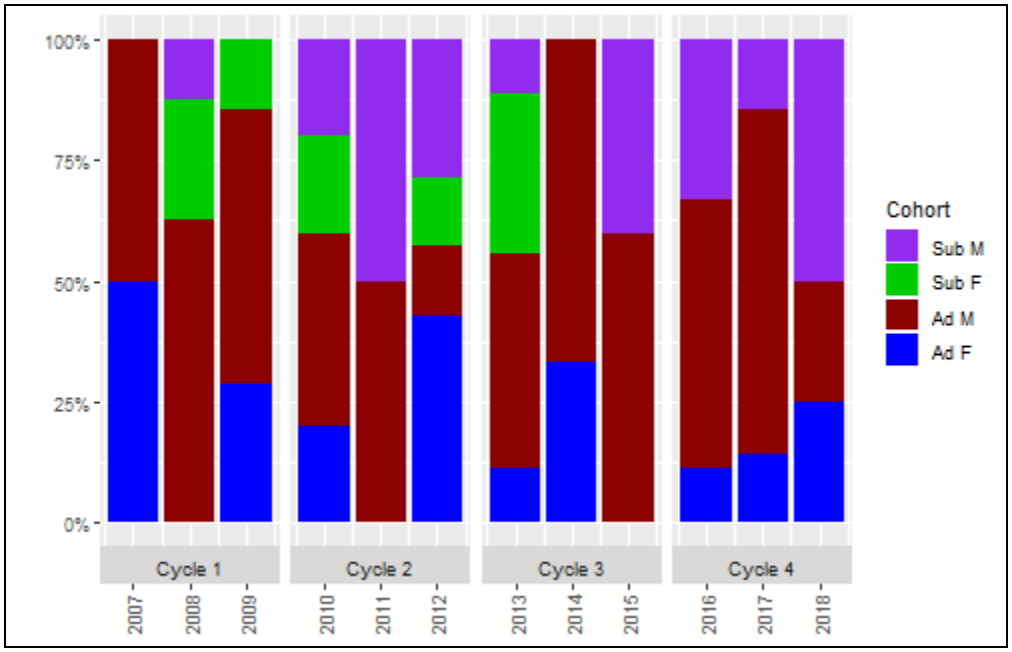
Hunt Area 18.

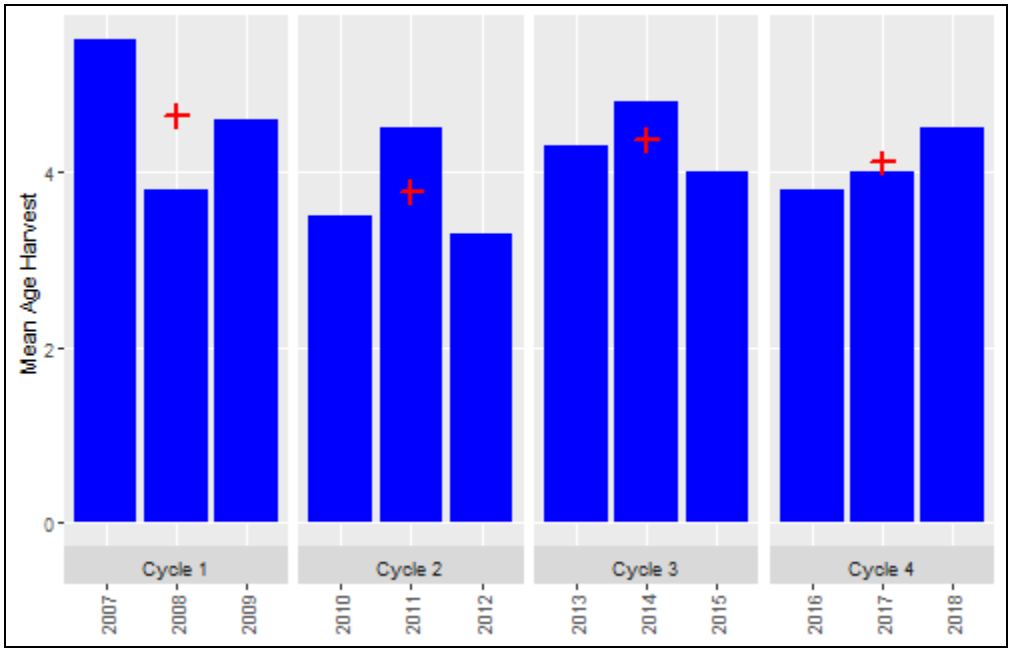

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

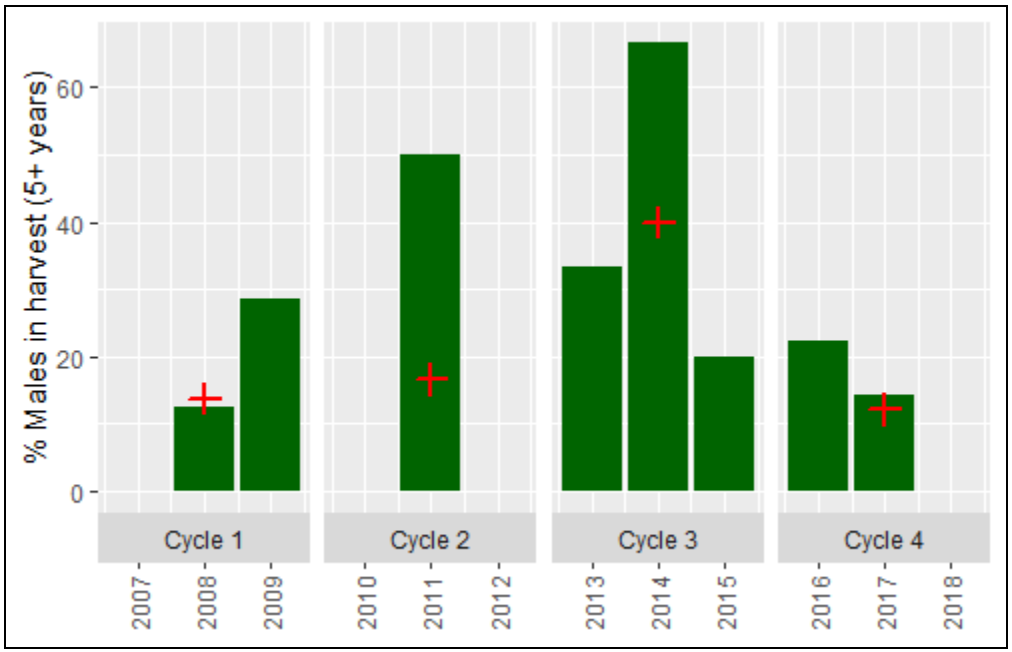

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

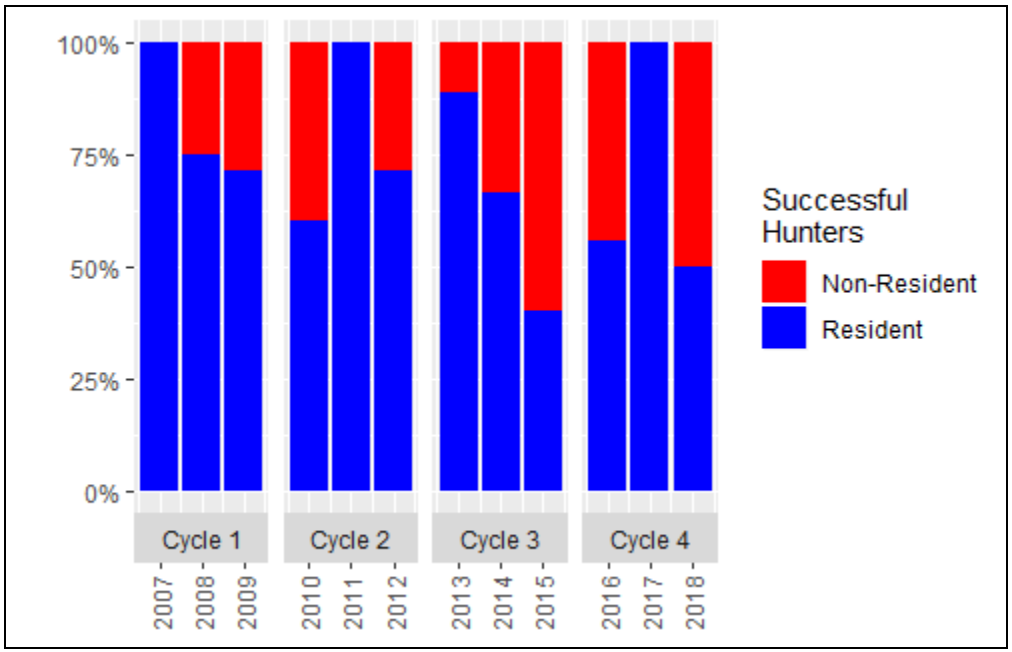

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
60
40
20
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

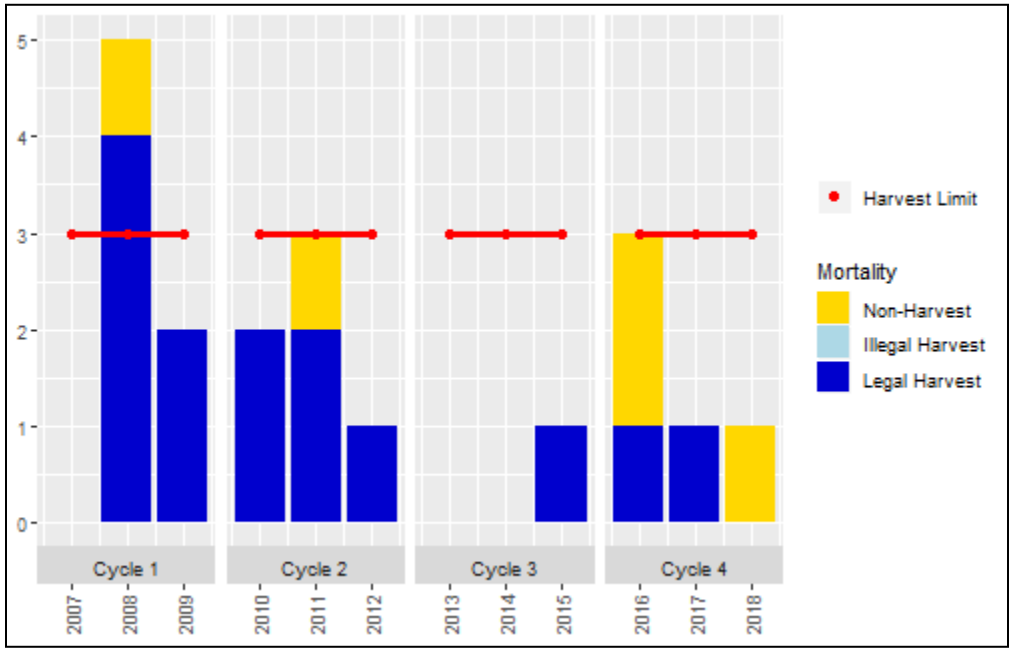
Hunt Area 18. (cont.)

HY2016-HY2018 Regional Objective : Stable management

Assessment

SOURCE: During the current cycle, HA 18 averaged ~7 harvests annually resulting in stable mortality densities. A reduction in the proportion of adult females in the harvest occurred during this cycle (also older in age), and a strong portion of adults in the age/sex structure maintains this area at Source function. Overall age of harvest maintains ~4 years old, and older adult males remain available for harvest. Located at the head of the Wind River Basin, HA 18 is surrounded by many Source and Stable/Source functioning areas, and big game winter range access closures also lend to the current status of the area. Guided hunts have decreased through time, and reported selectivity has increased. More non-resident hunters appear to be using this area than in previous cycles.

Hunt Area 28.

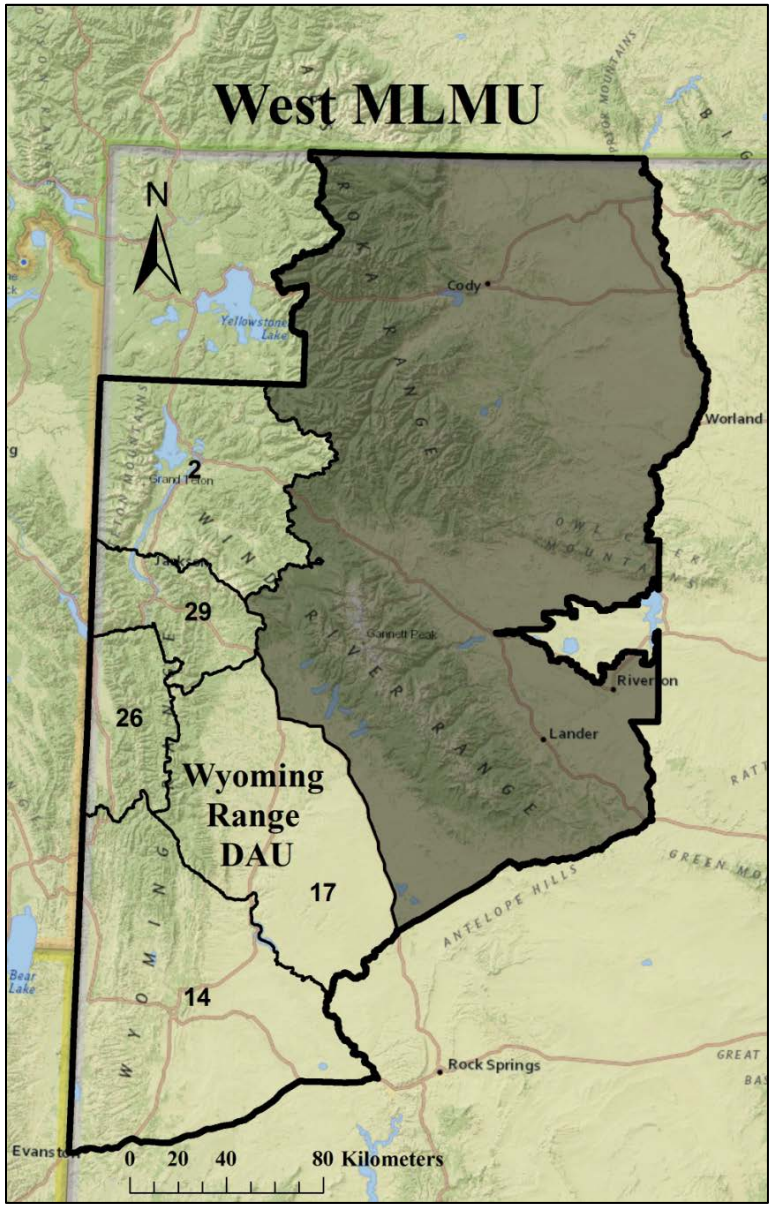


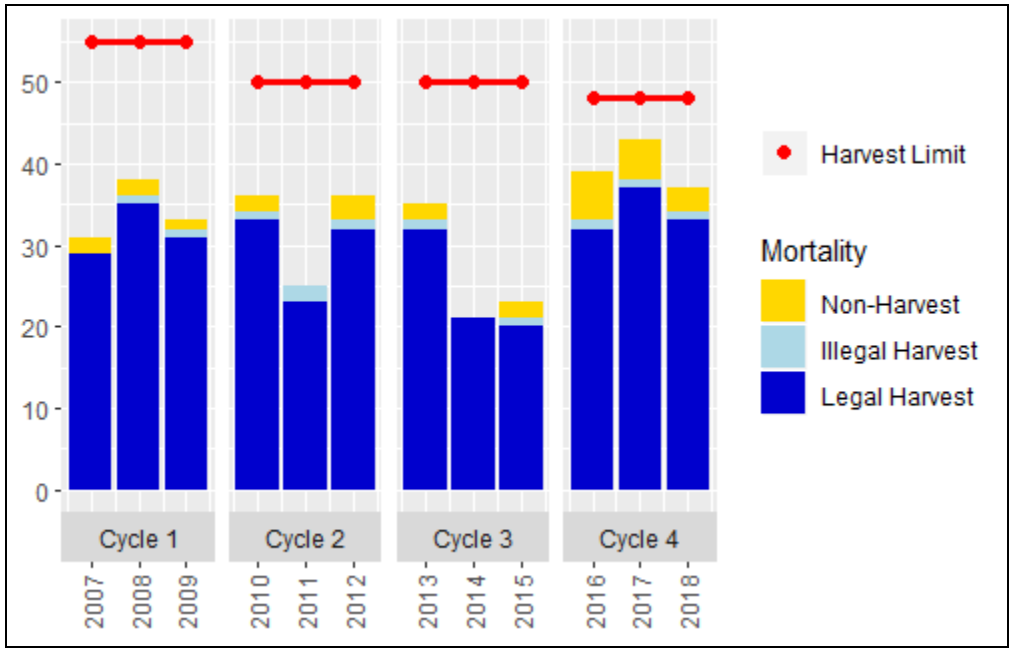
HY2016-HY2018 Regional Objective : Source management

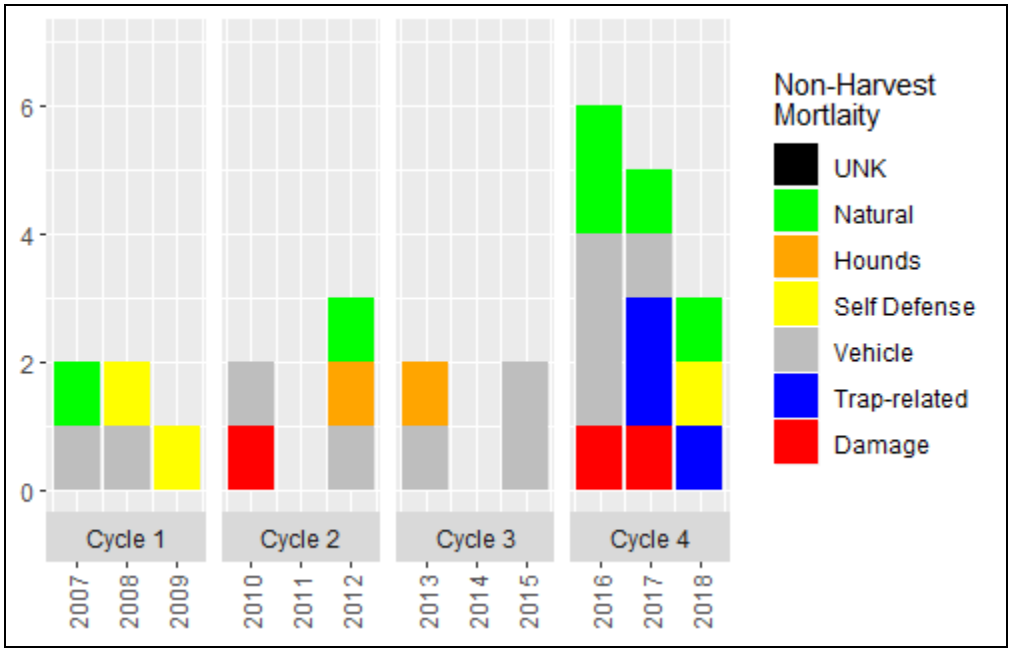
Assessment

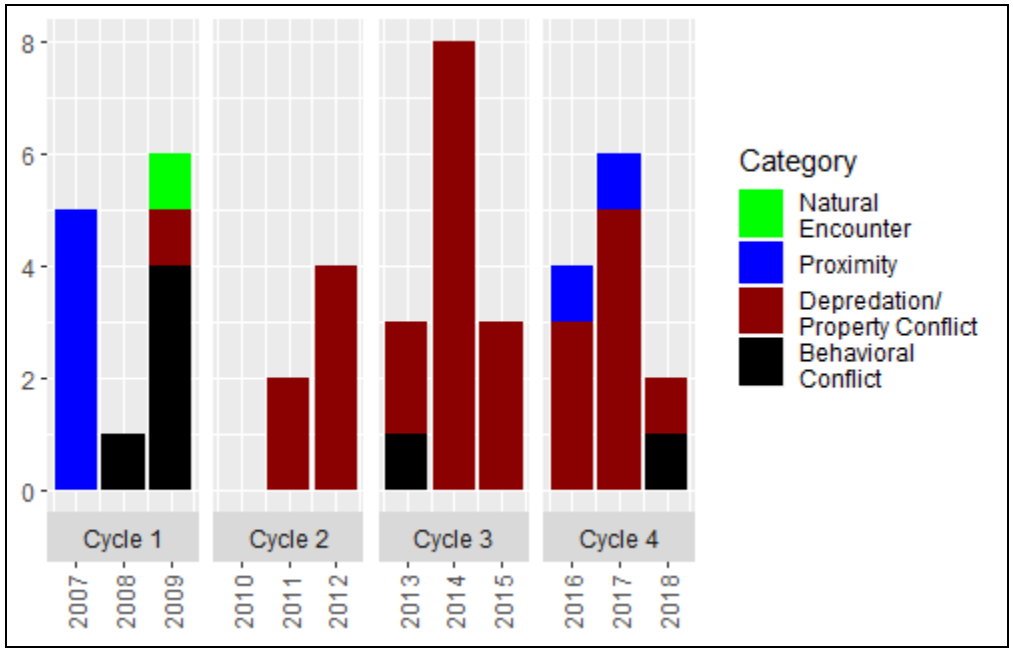
SOURCE: HA 28 consists primarily of Wind River Indian Reservation land as well as a small amount of private in-holdings (where Department regulations apply). Mortalities include shared reporting from the Shoshone and Arapahoe Tribal Fish and Game. Little mortality occurs in HA 28, and it functions as a Source population.

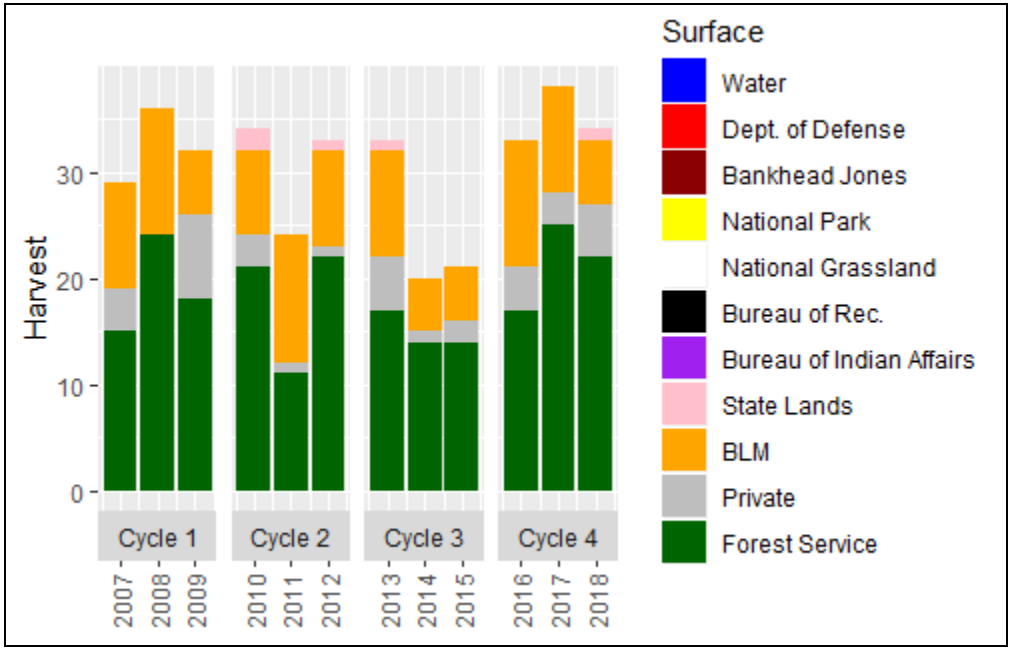
WYOMING RANGE DAU

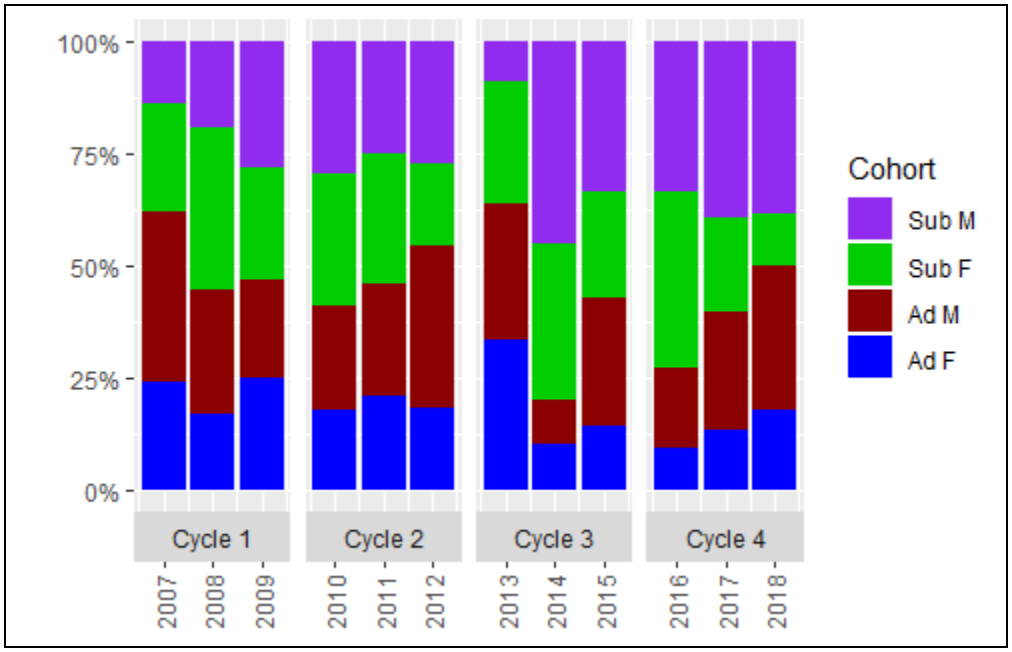


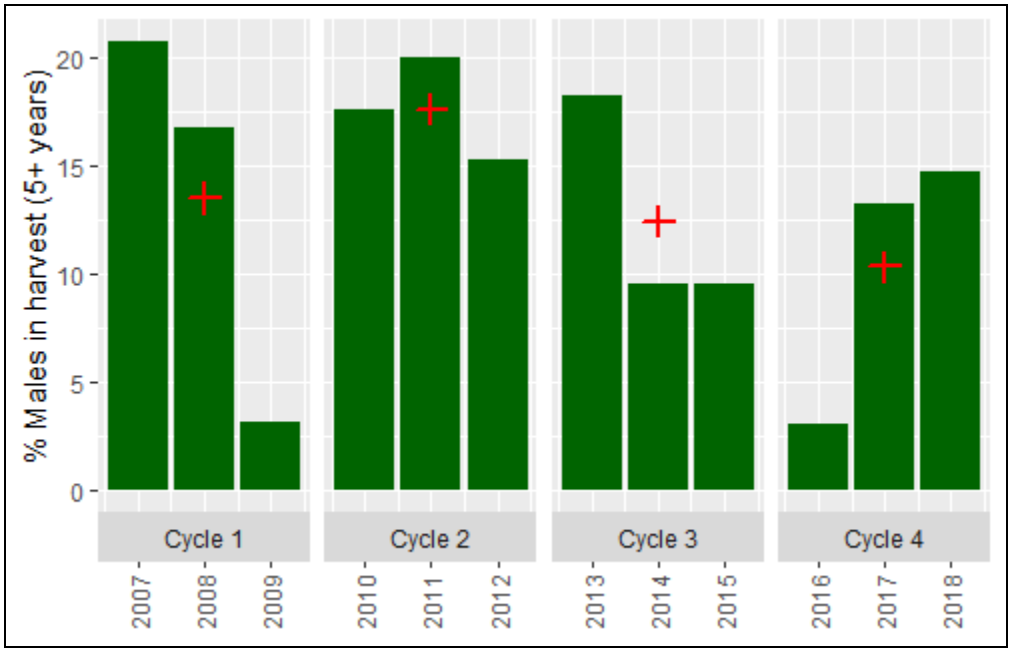

50
40
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest


6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Non-Harvest Mortlaity
UNK
Natural
Hounds
Self Defense
Vehicle
Trap-related
Damage


8
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Category
Natural Encounter
Proximity
Depredation/ Property Conflict
Behavioral Conflict


Harvest
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Surface
Water
Dept. of Defense
Bankhead Jones
National Park
National Grassland
Bureau of Rec.
Bureau of Indian Affairs
State Lands
BLM
Private
Forest Service

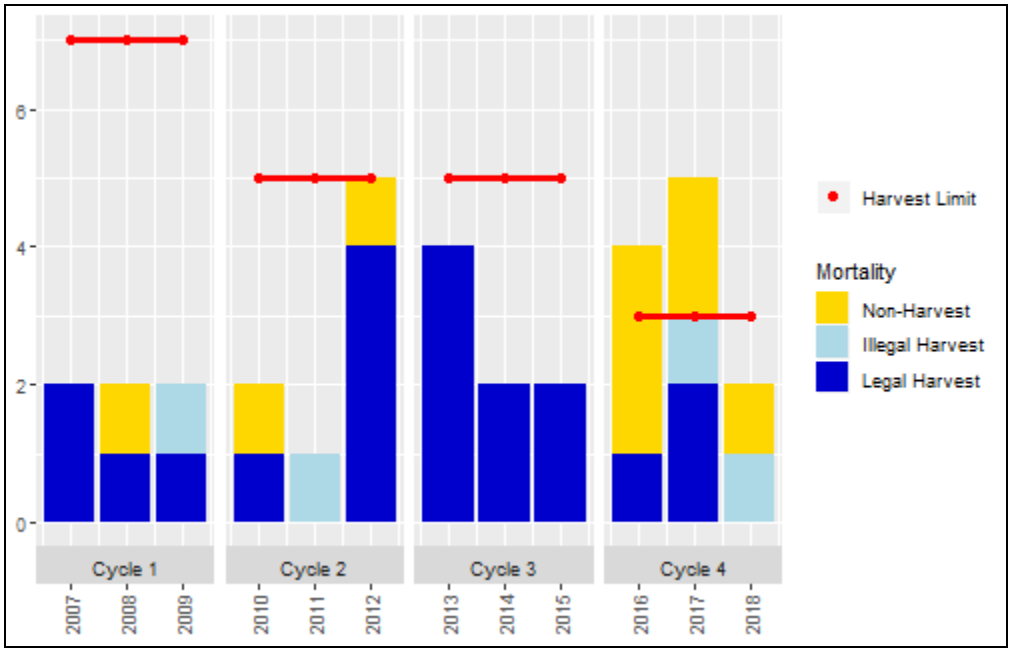


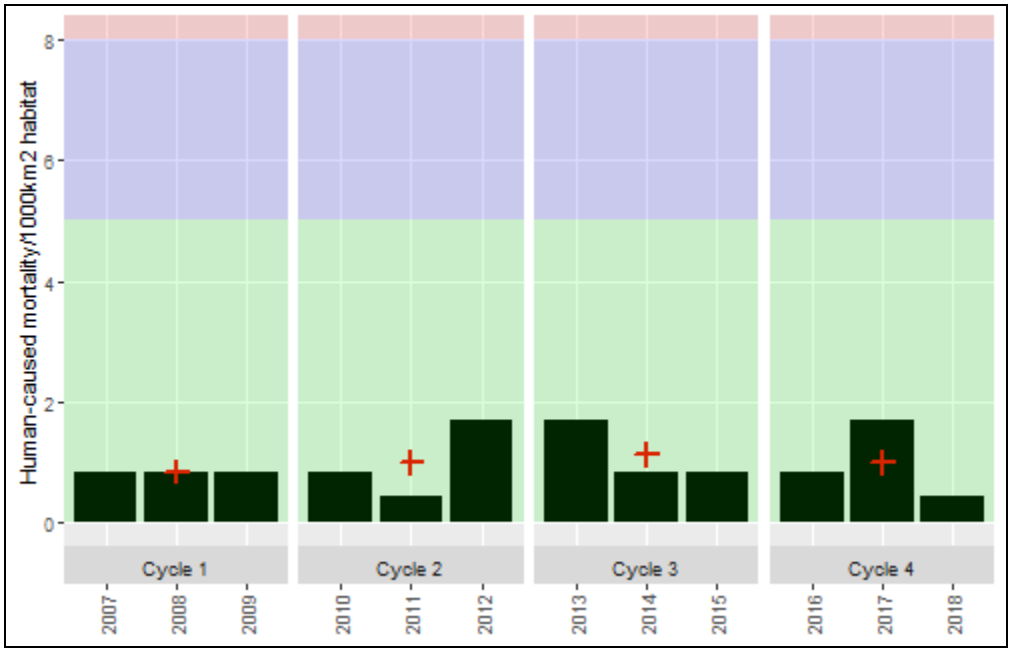


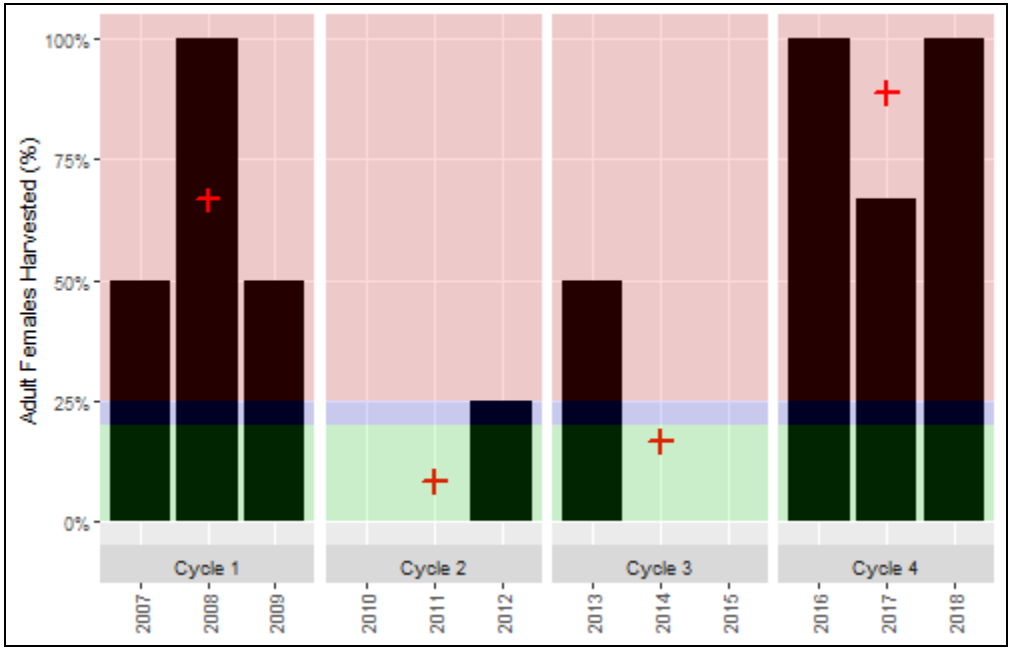
Overview

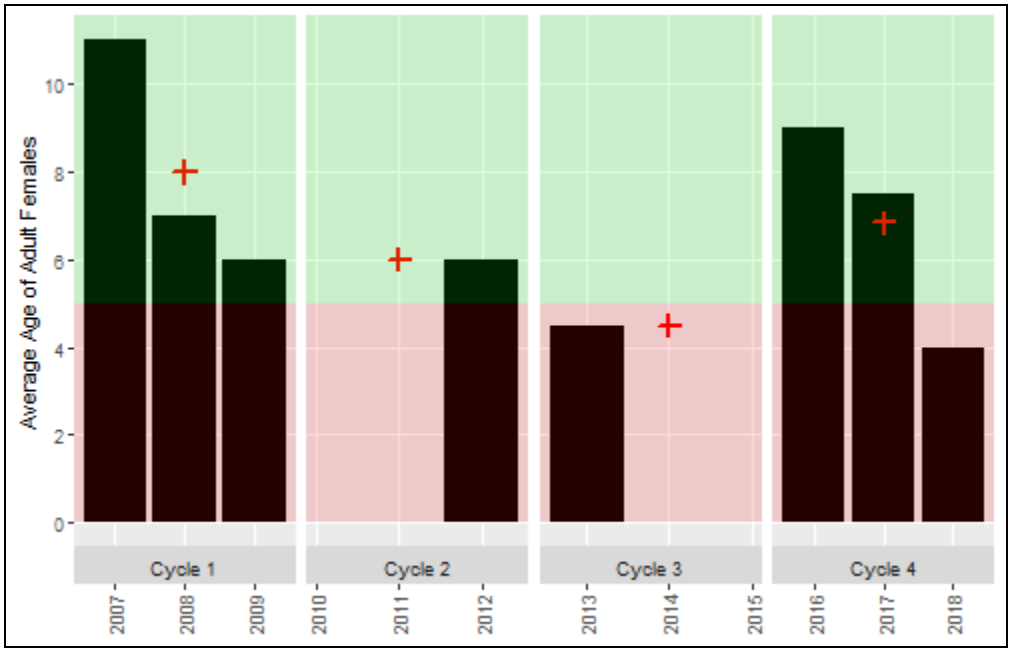
Harvest rates in The Wyoming Range DAU rebounded during the current cycle, mostly due to increased harvest in HAs 14 and 26. Low harvest rates continue to persist in HAs 2, 29, and 17 - areas with lower densities but generally Stable population function. HAs 14 and 26 in the Wyoming Range report similar outcomes, where high adult female harvest in previous years likely impacted these areas. Increased selectivity and reduced harvest likely increased both areas' mountain lion densities, albeit with younger age classes. During this cycle HAs 14 and 26 increased harvest at or near limits for the past three years, pushing mortality densities toward Sink status, but not removing many adult females. The result was high harvest of younger aged animals. As with much of the state, tracking conditions have been favorable which also increases hunting success.

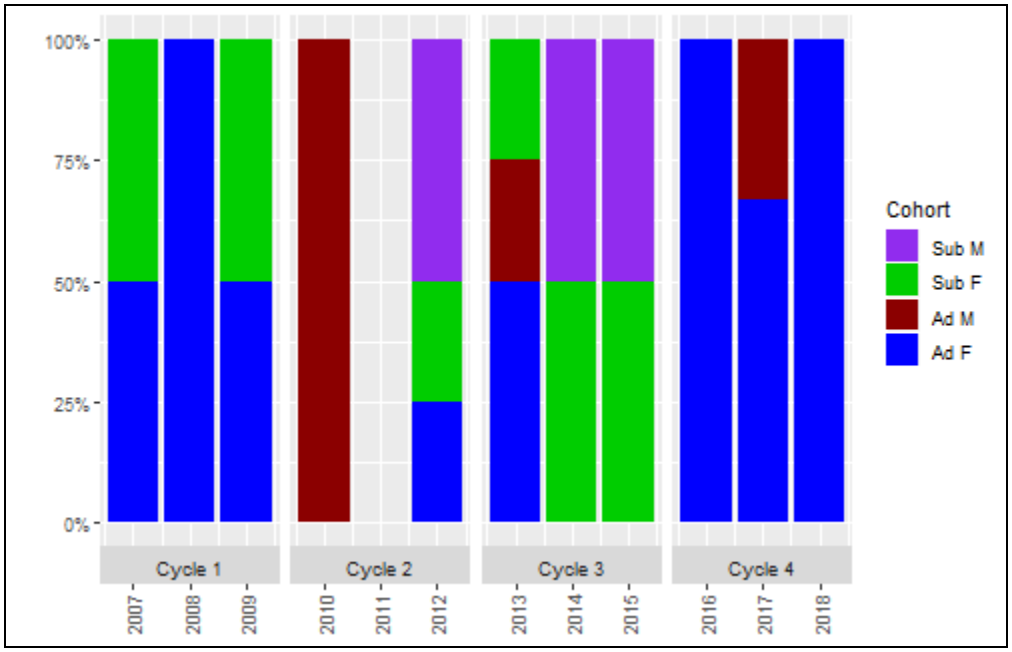
Hunt Area 2.

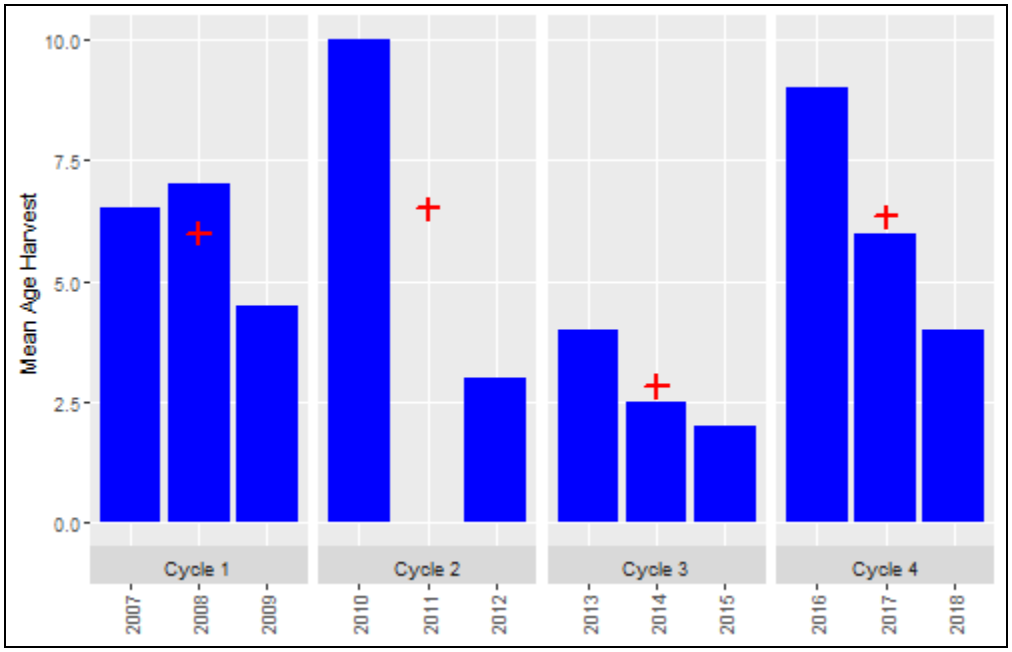

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

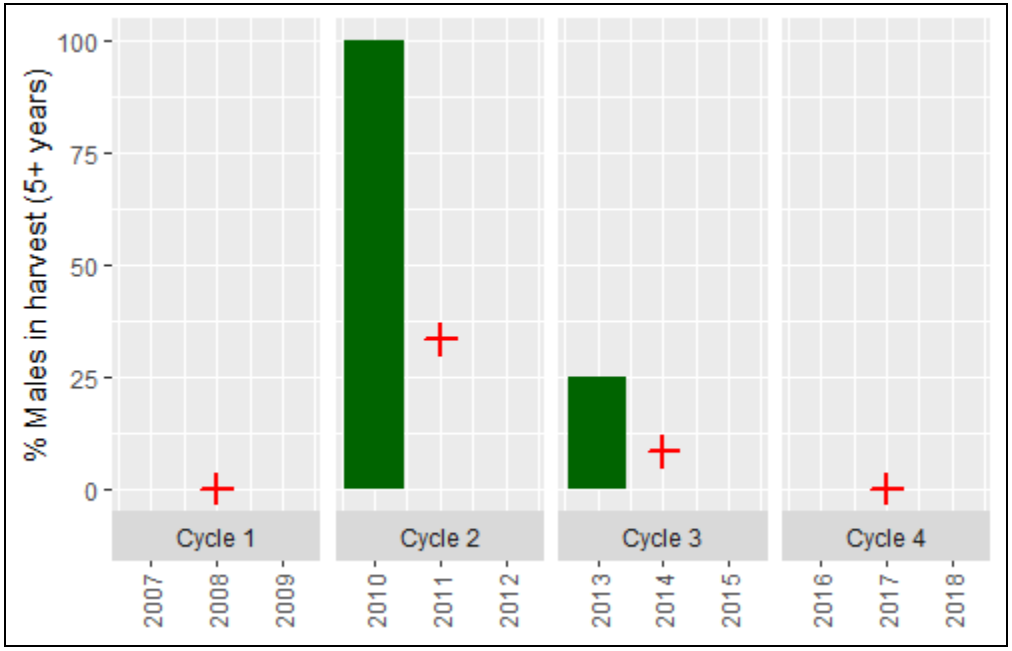

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

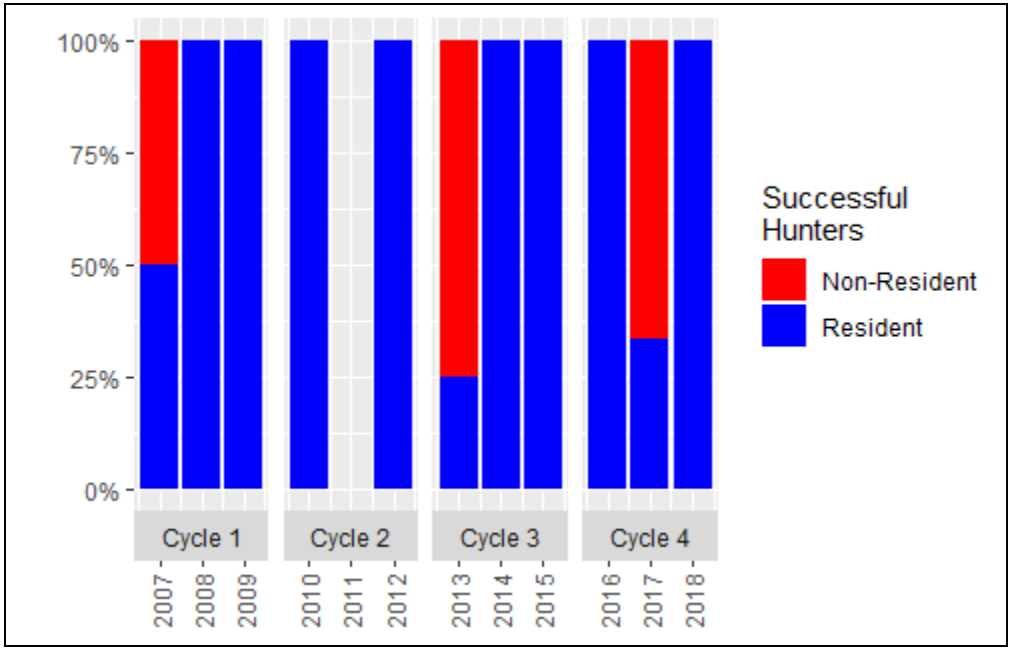

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Cohort
Sub M
Sub F
Ad M
Ad F


Mean Age Harvest
10.0
7.5
5.0
2.5
0.0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
100
75
50
25
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Successful Hunters
Non-Resident
Resident

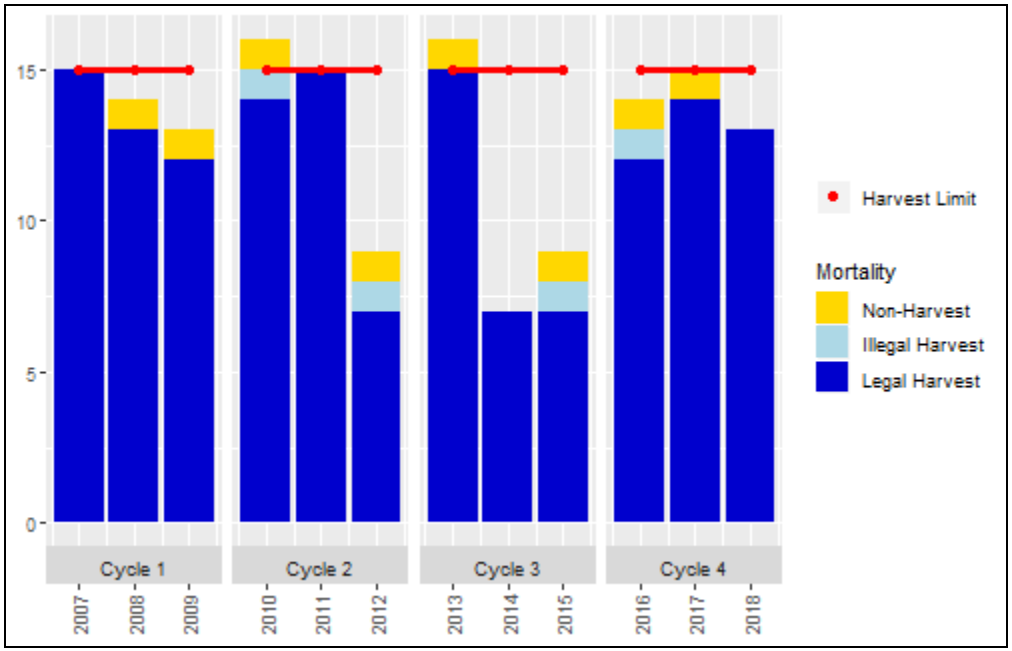
Hunt Area 2. (cont.)

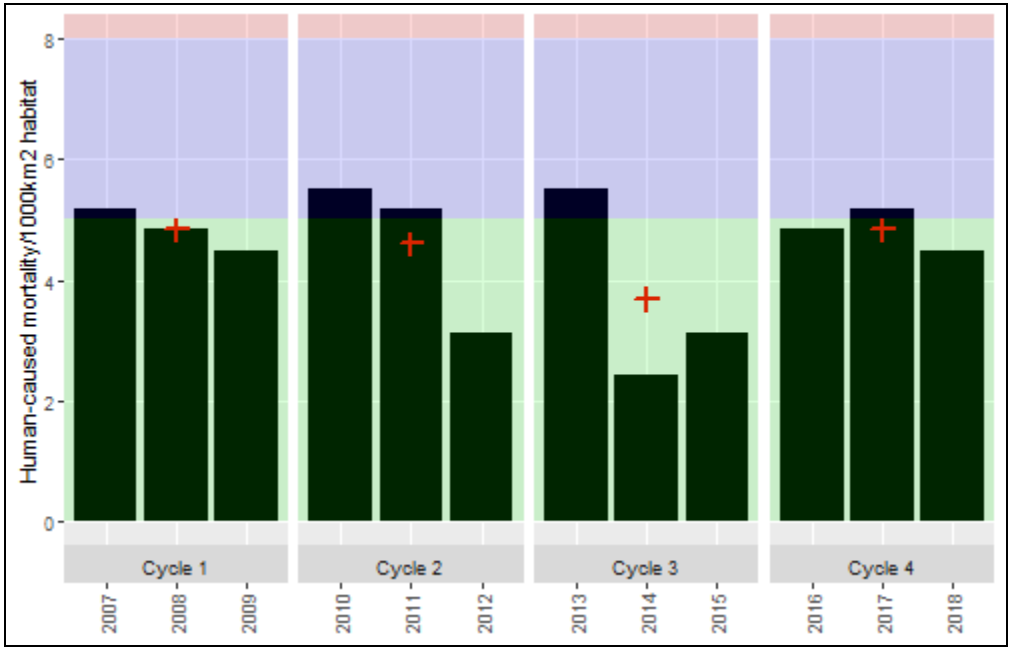
HY2016-HY2018 Regional Objective : Source management

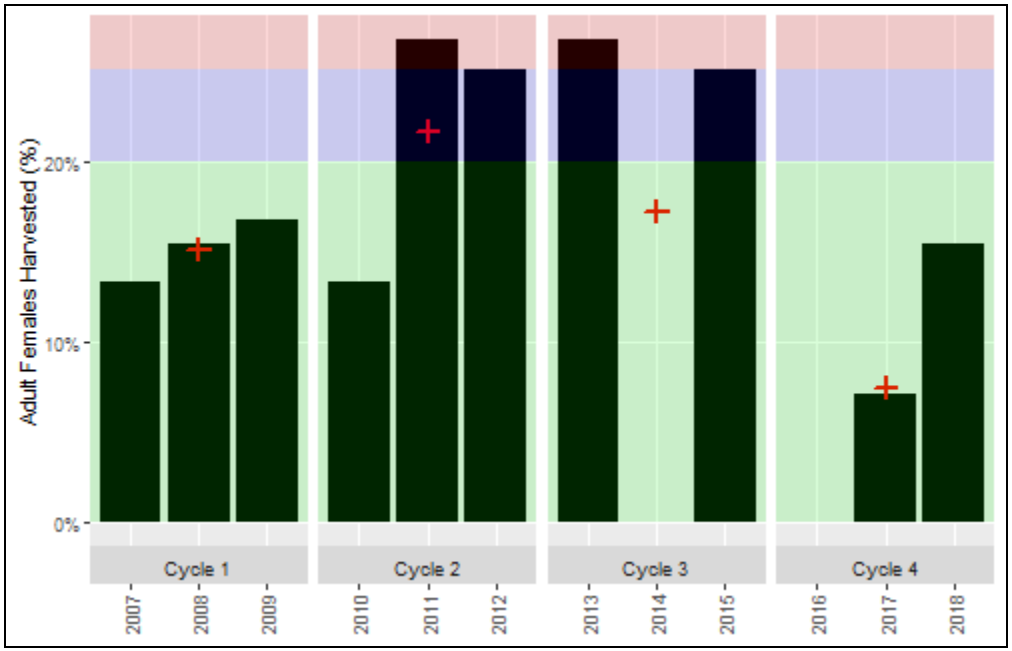
Assessment

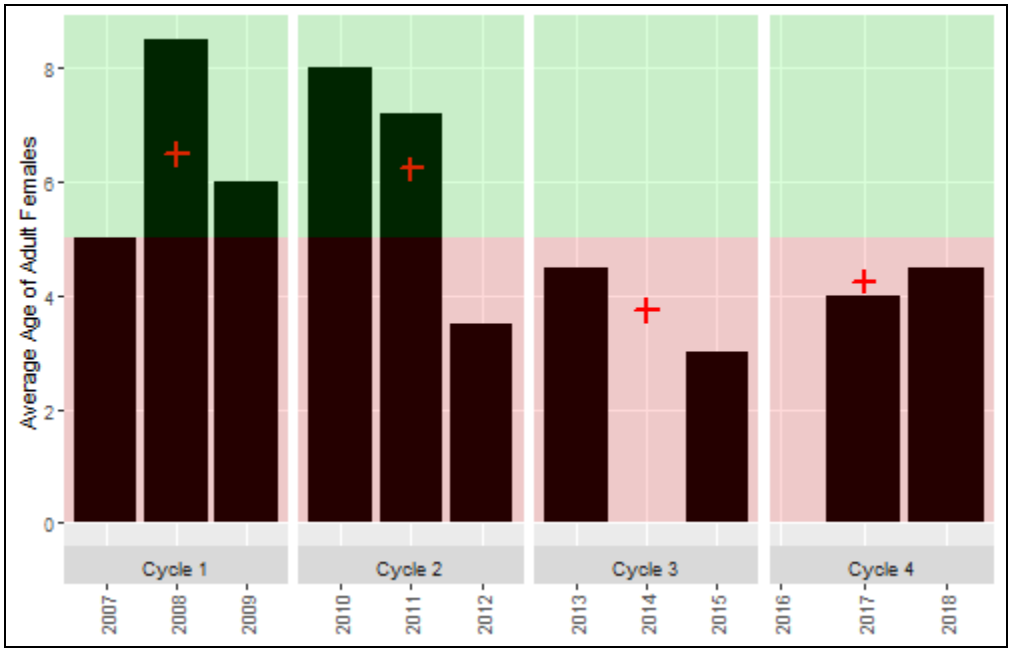
STABLE: HA 2 continues to demonstrate some of the lowest levels of human-caused mortality of mountain lions in the state. Although harvest is low, mountain lion densities in the area are likely also lower than in other Wyoming mountain lion populations, further supported by research that has occurred in conjunction with the Department (Alexander 2016, Elbroch et al., 2015). There have been a few depredation conflicts in the area reporting pet and poultry losses, but no damage removals have occurred since HY 2010. Most harvest during this cycle was opportunistic harvest of adult females. Hunters using hounds to pursue mountain lions all reported being selective, and included the adult male harvested. Interestingly, non-harvest mortality exceeded harvest during the cycle and included drowning, wolf predation, one vehicle collision, and one incidental snare mortality. Harvest is likely not a current limiting factor in this area.

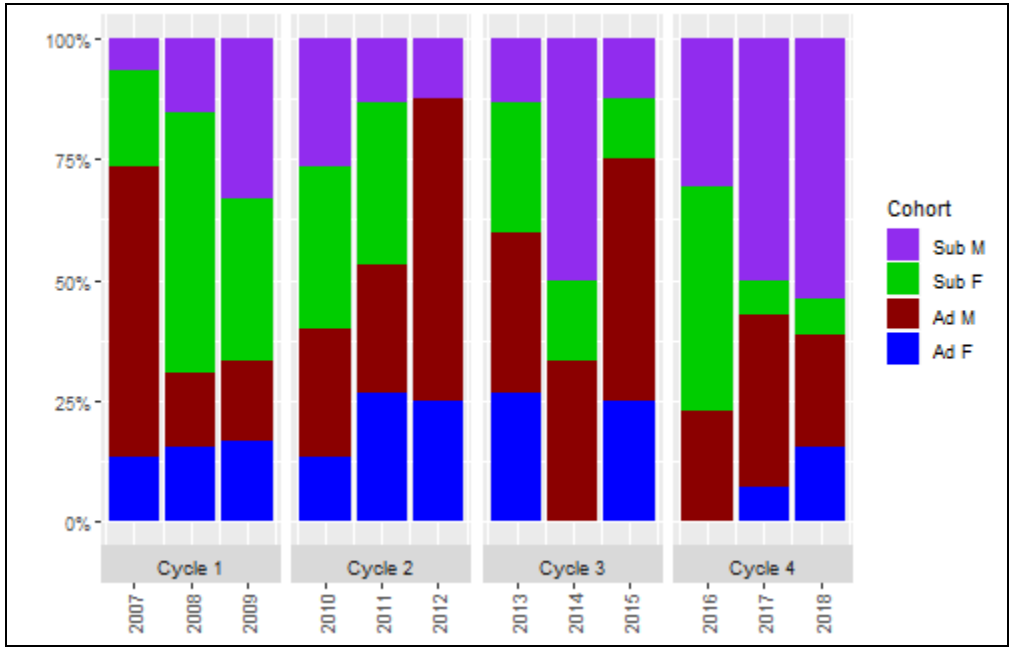
Hunt Area 14.

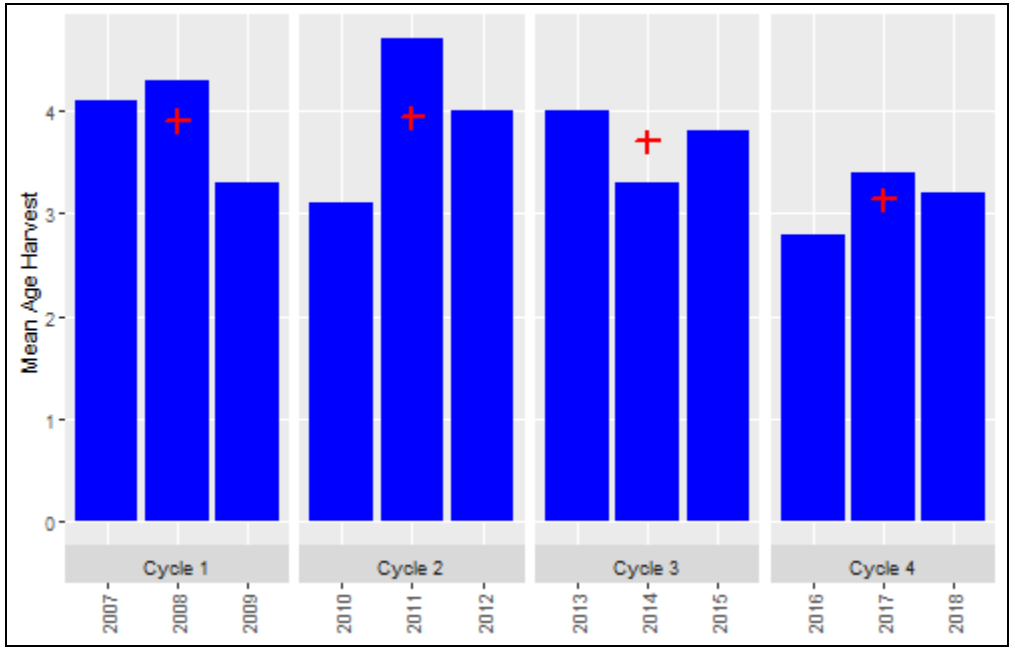

15
10
5
0
Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

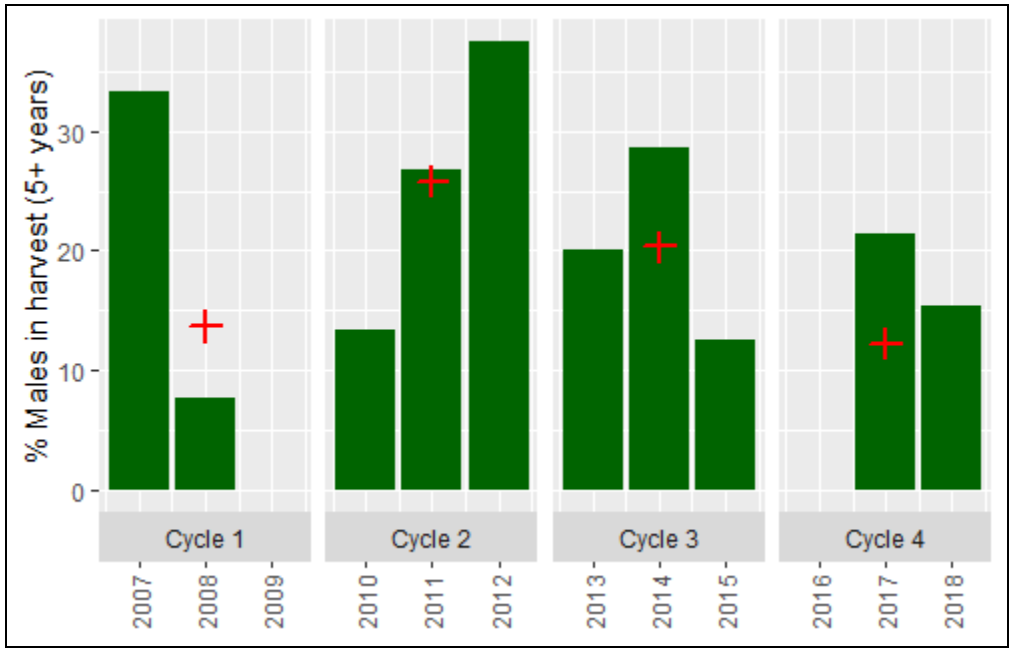

Human-caused mortality/1000km2 habitat
8
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

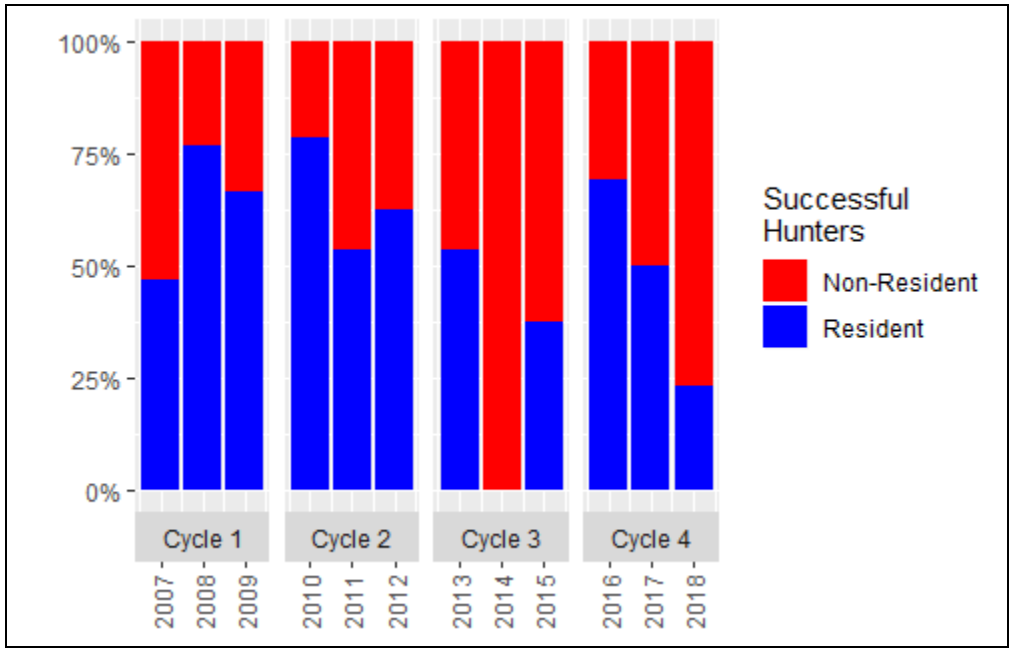

Adult Females Harvested (%)
20%
10%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Average Age of Adult Females
8
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cohort
Sub M
Sub F
Ad M
Ad F
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Mean Age Harvest
0
1
2
3
4
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
0
10
20
30
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Successful Hunters
Non-Resident
Resident
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

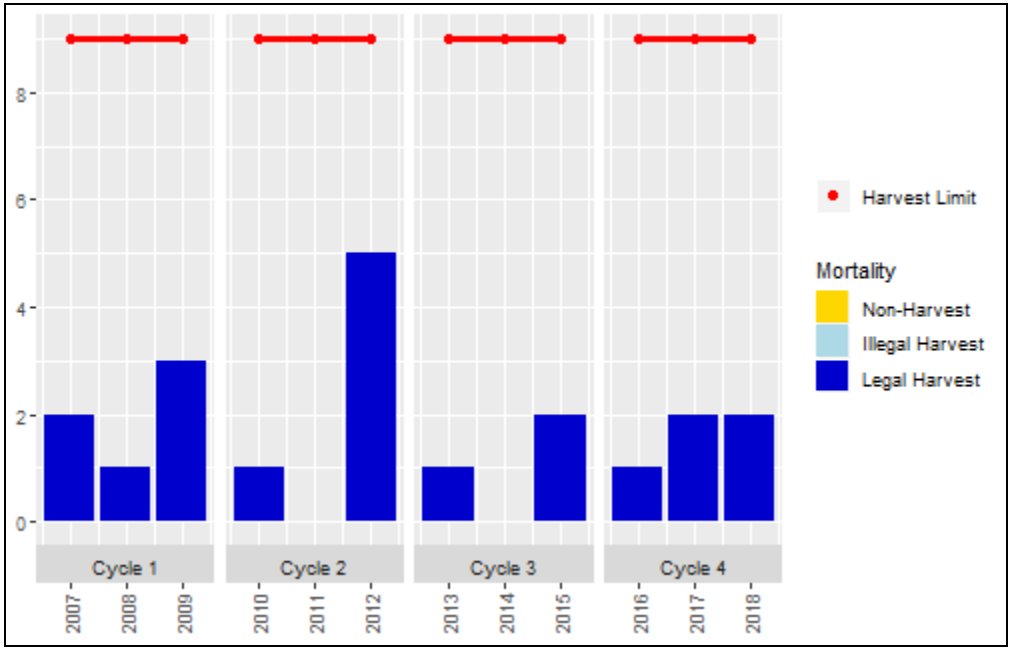
Hunt Area 14. (cont.)

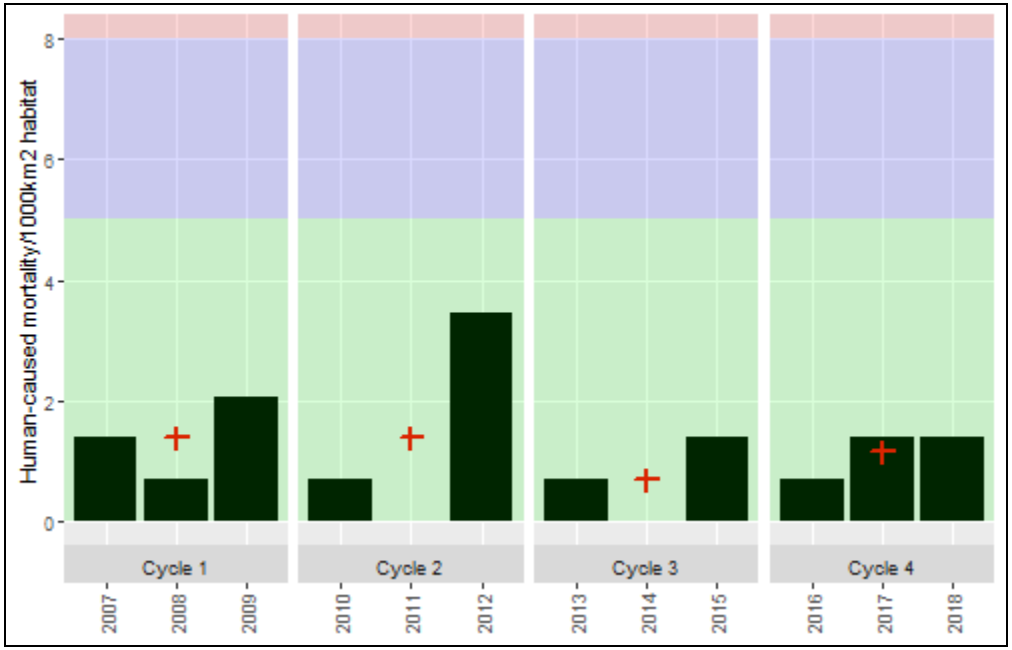
HY2016-HY2018 Regional Objective : Stable management

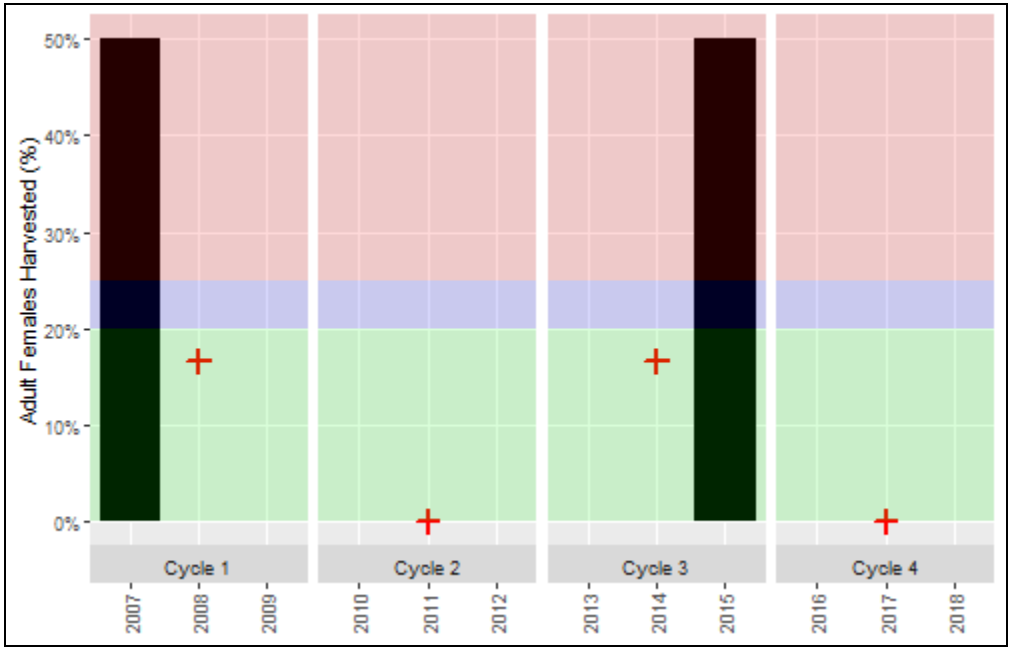
Assessment

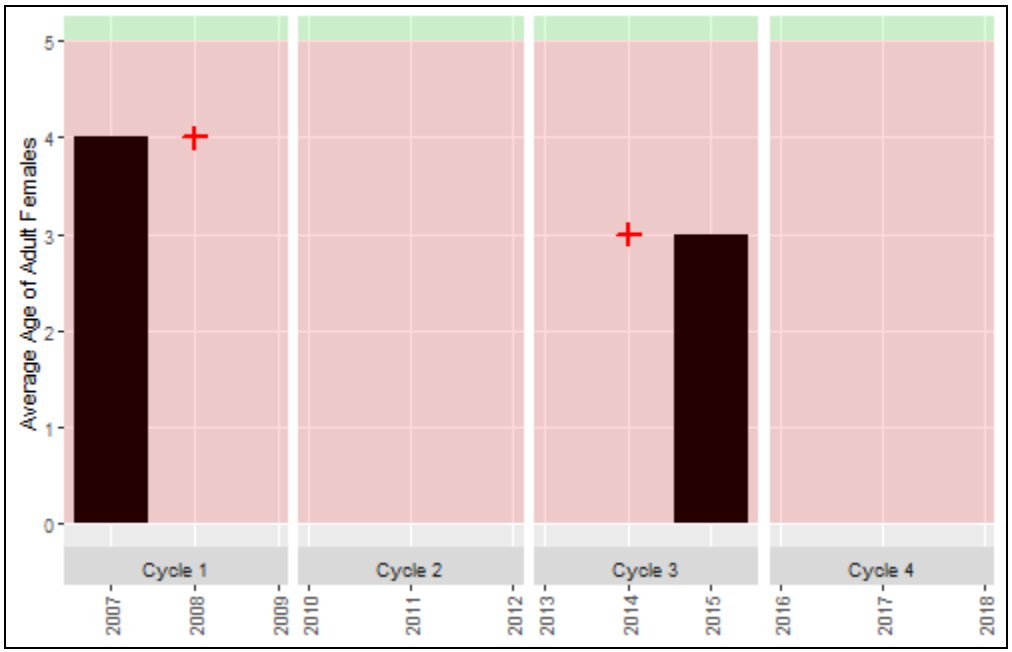
STABLE/SINK: In HA 14, previous reports of elevated adult female harvest (HY 2011, HY 2012, HY 2013, and HY 2015), coupled with a decrease in the age of those adult females and in overall harvest demonstrated Sink function. While the removal of these adult females impacted this area, it incurs moderate harvest. The majority of harvest was sub-adult animals, and low adult female harvest ages with fewer old adult males has shifted the overall age of harvest near 3 years. This area is likely stable but may still be influenced by the removal of adult females, evidenced by reduction in adult female harvest and the younger age of adult females. Selectivity has been variable. As expected, during years of high selectivity and low harvest more adult animals were taken (e.g., HY 2012, HY 2015). Reported guided hunts have declined. About 80% of harvest occurs on public land.

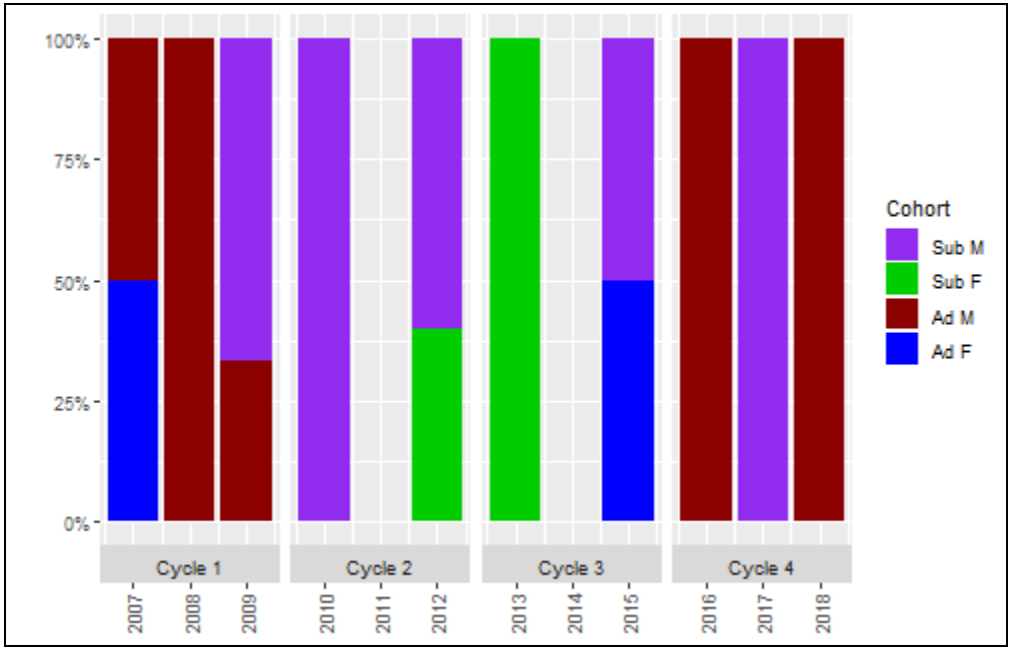
Hunt Area 17.

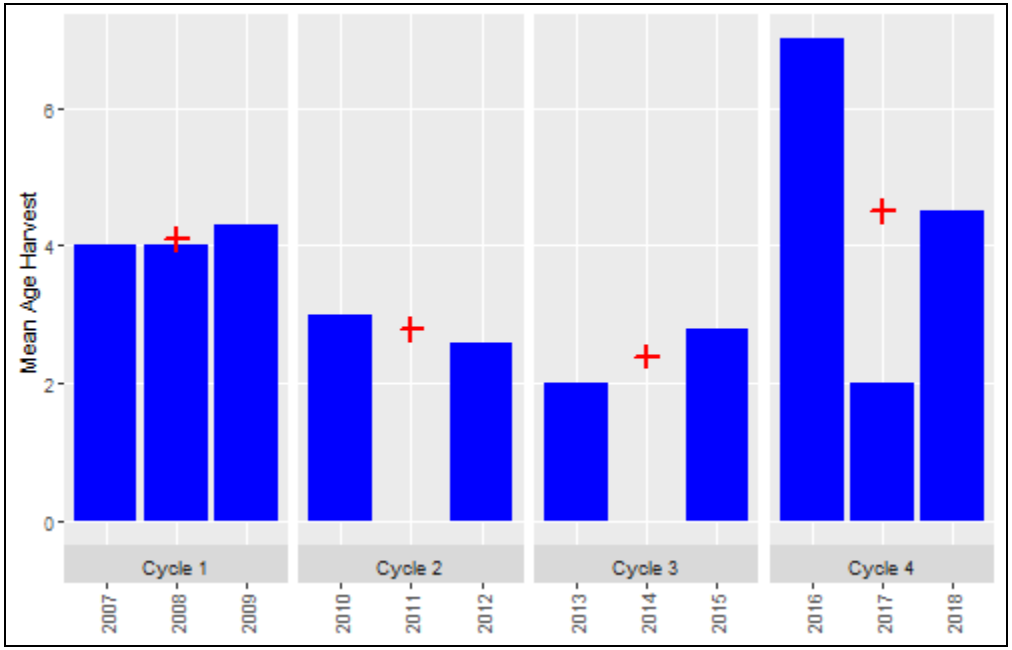

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

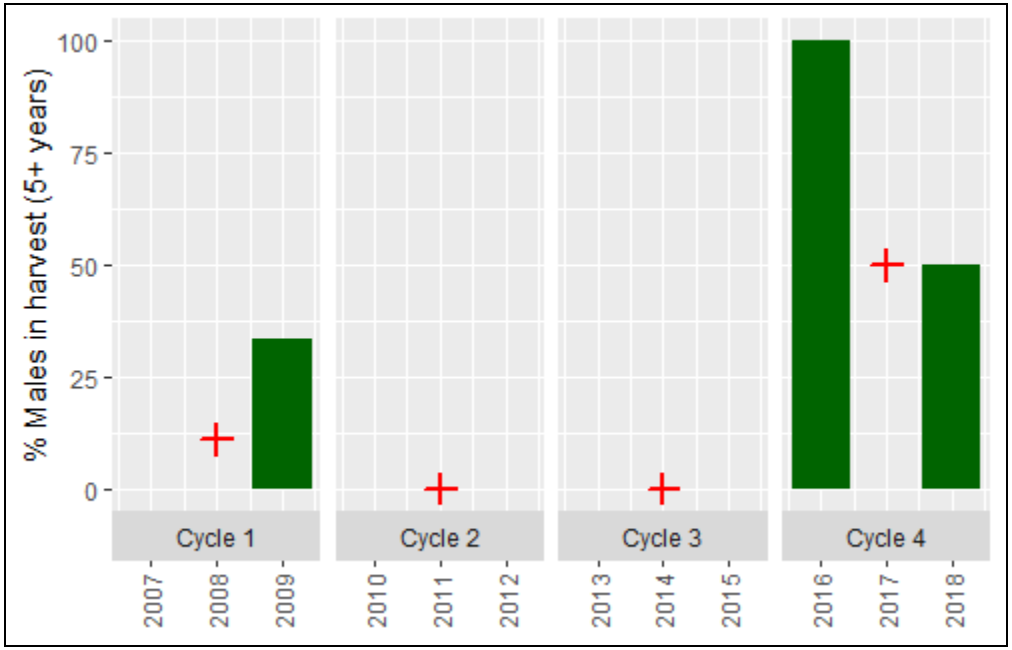

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

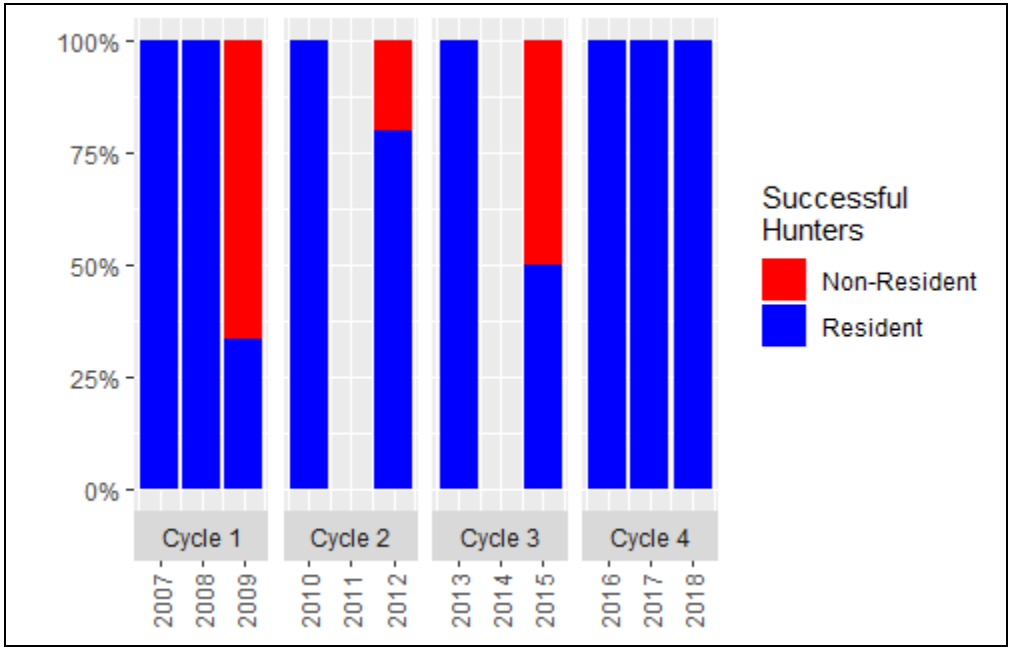

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Cohort
Sub M
Sub F
Ad M
Ad F


Mean Age Harvest
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
100
75
50
25
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Successful Hunters
Non-Resident
Resident

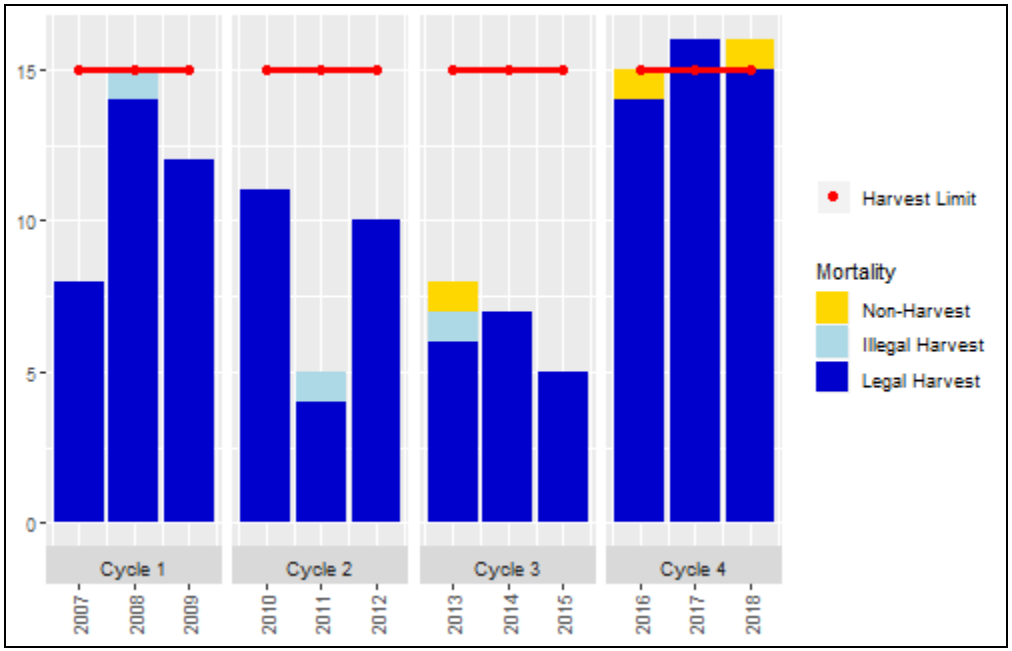
Hunt Area 17. (cont.)

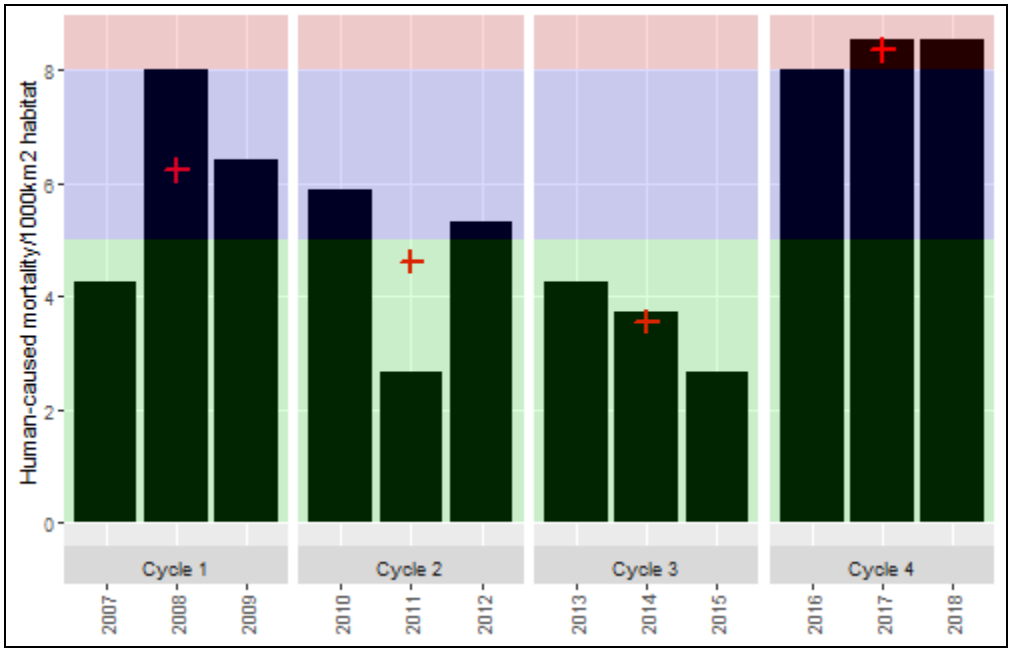
HY2016-HY2018 Regional Objective : Stable/Source management

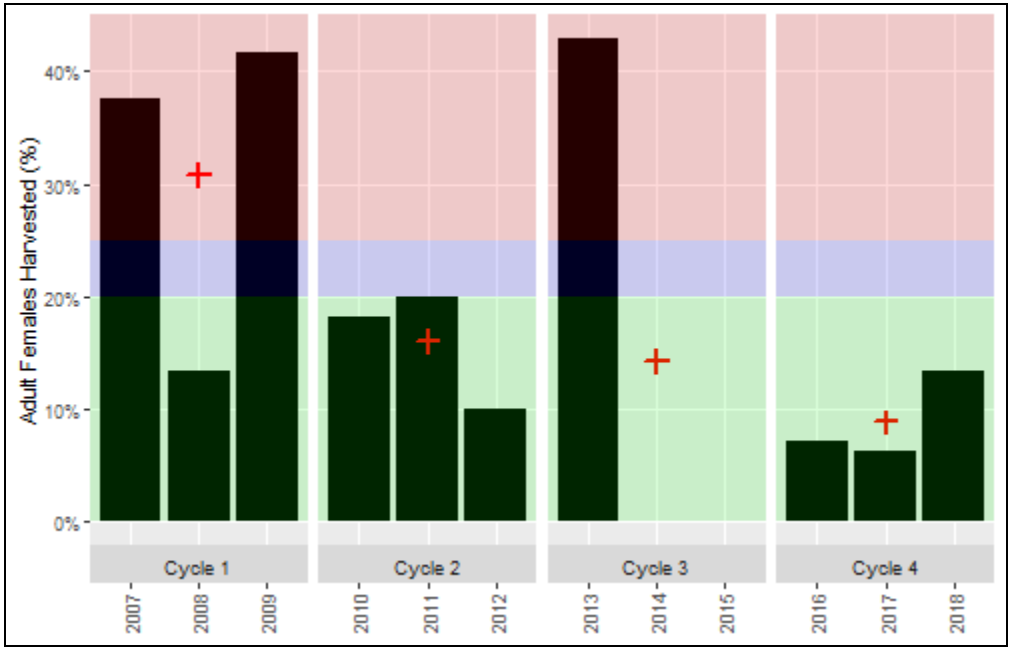
Assessment

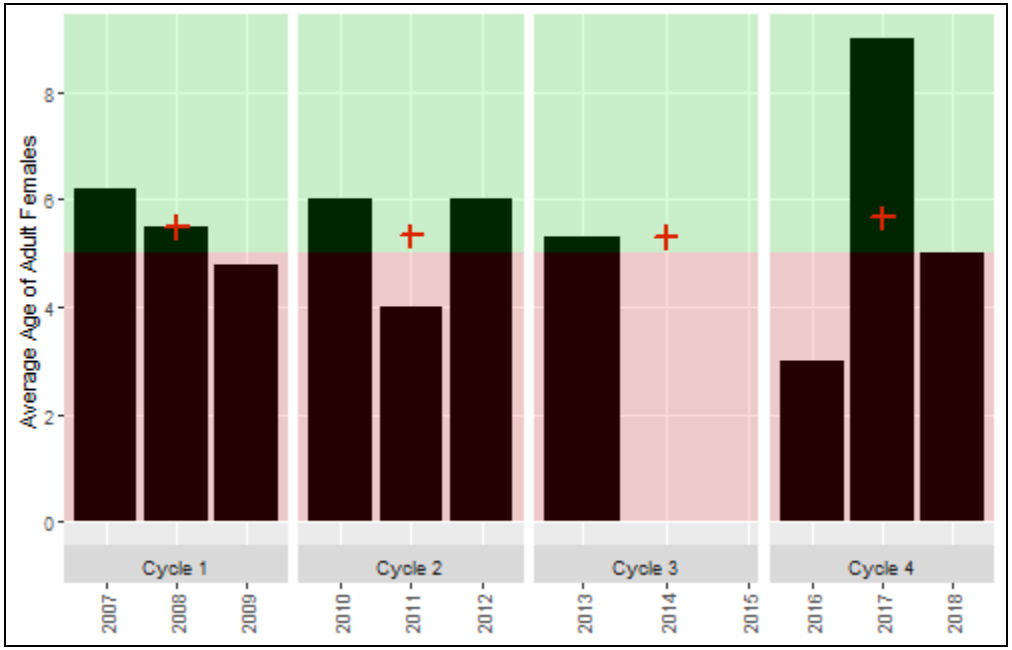
STABLE/SOURCE: HA 17 has very few harvests and mortality densities remain low. Low sample sizes result in unreliable age/sex trend data, but all five harvests over the past three years were male cohorts from selective hunters. Mountain lion densities are likely low in the area. All harvest during this cycle occurred on public land, and no non-resident harvest or guided hunts were reported. Because of the minimal harvest and high amount of habitat, this area still may function at a Stable or even Source levels, but the reality of lower densities likely indicates this area not contributing much dispersal to other areas.

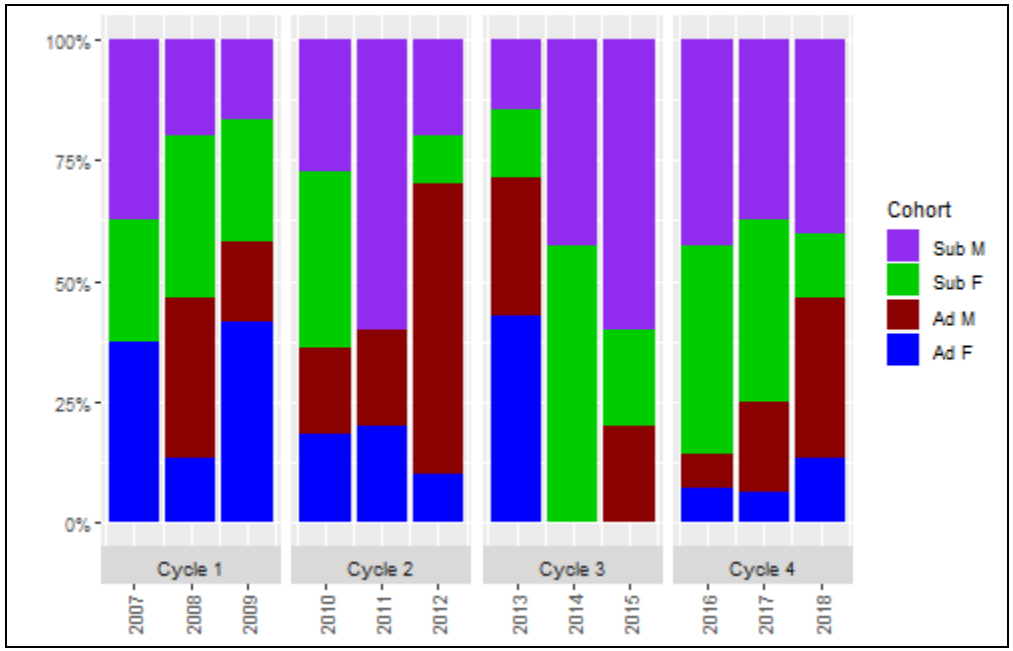
Hunt Area 26.

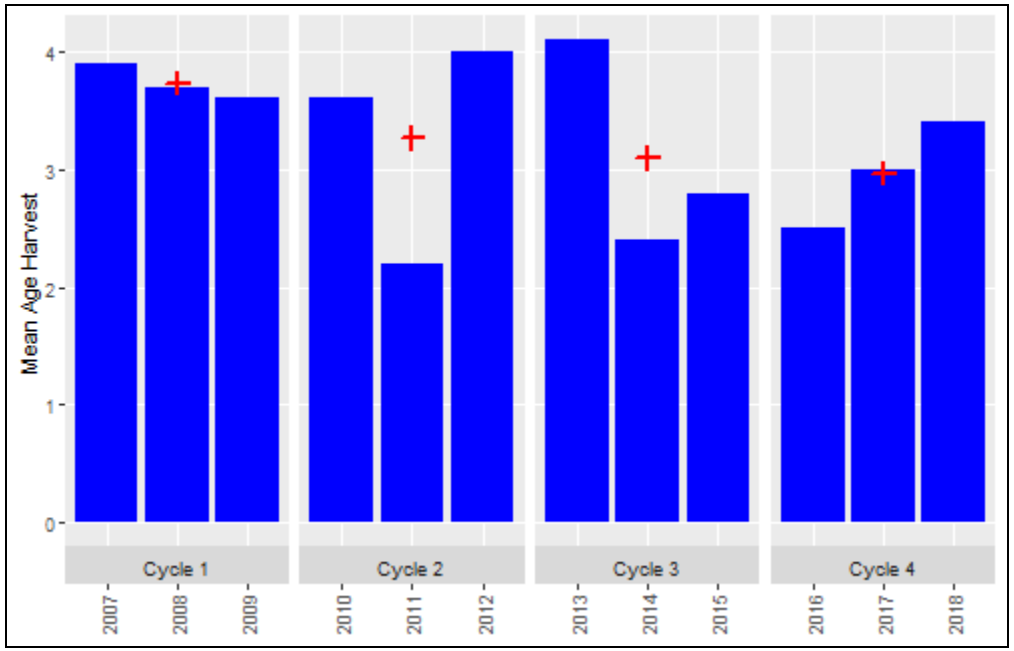

15
10
5
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest

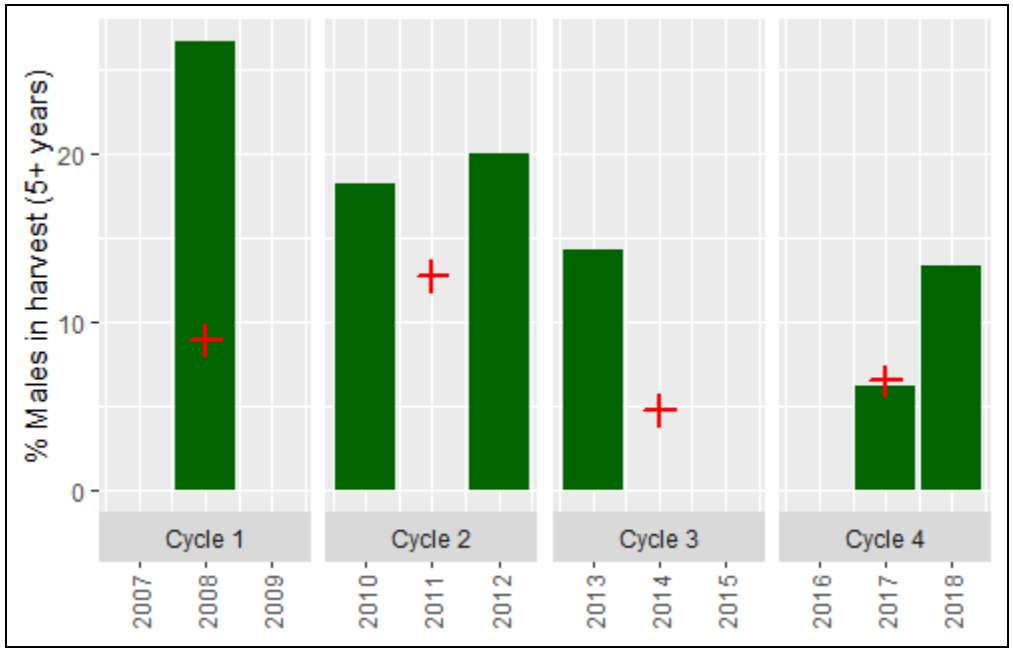

Human-caused mortality/1000km2 habitat
8
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

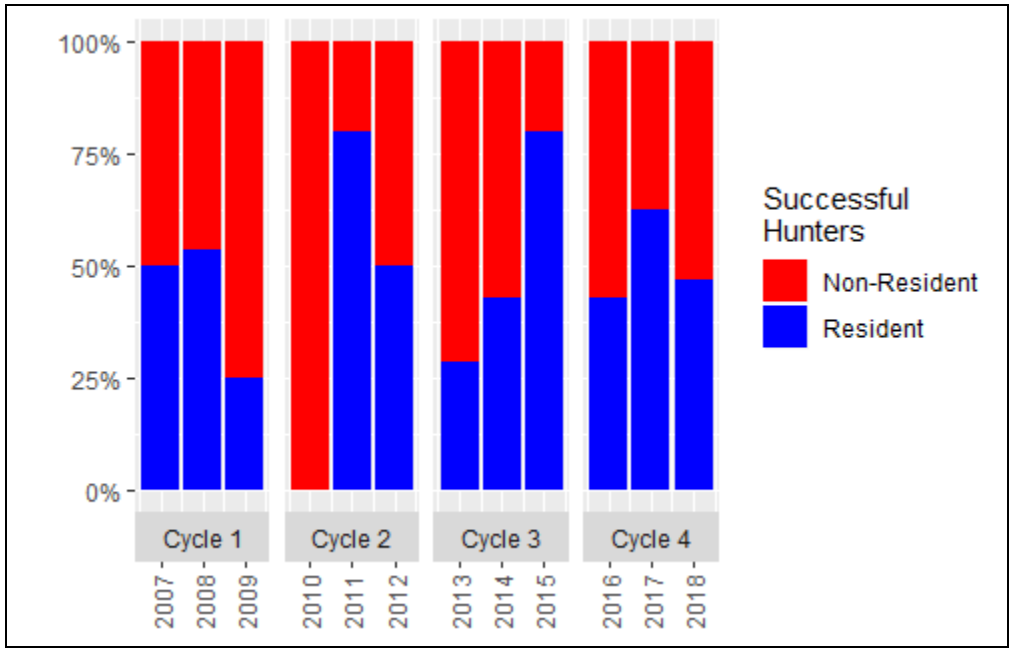

Adult Females Harvested (%)
40%
30%
20%
10%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Average Age of Adult Females
8
6
4
2
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Cohort
Sub M
Sub F
Ad M
Ad F


Mean Age Harvest
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Successful Hunters
Non-Resident
Resident

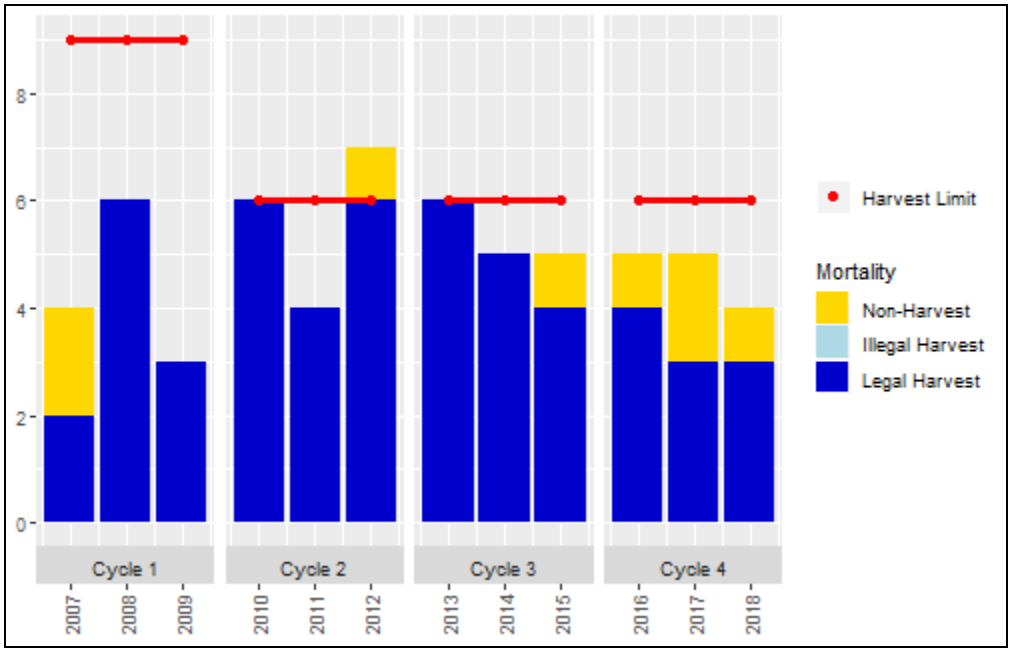
Hunt Area 26. (cont.)

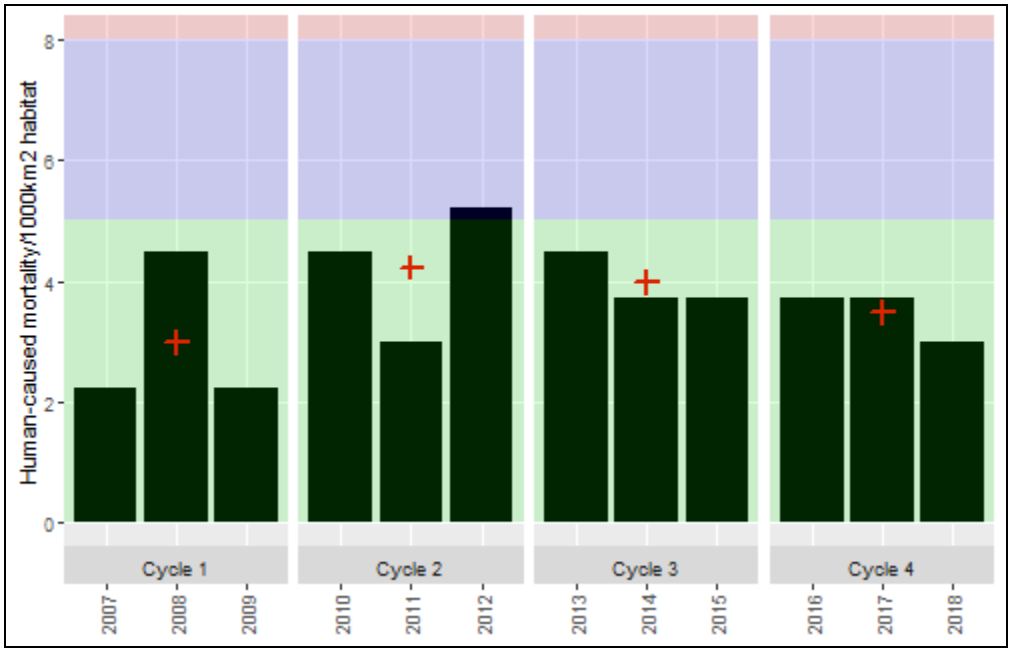
HY2016-HY2018 Regional Objective : Stable/Sink management

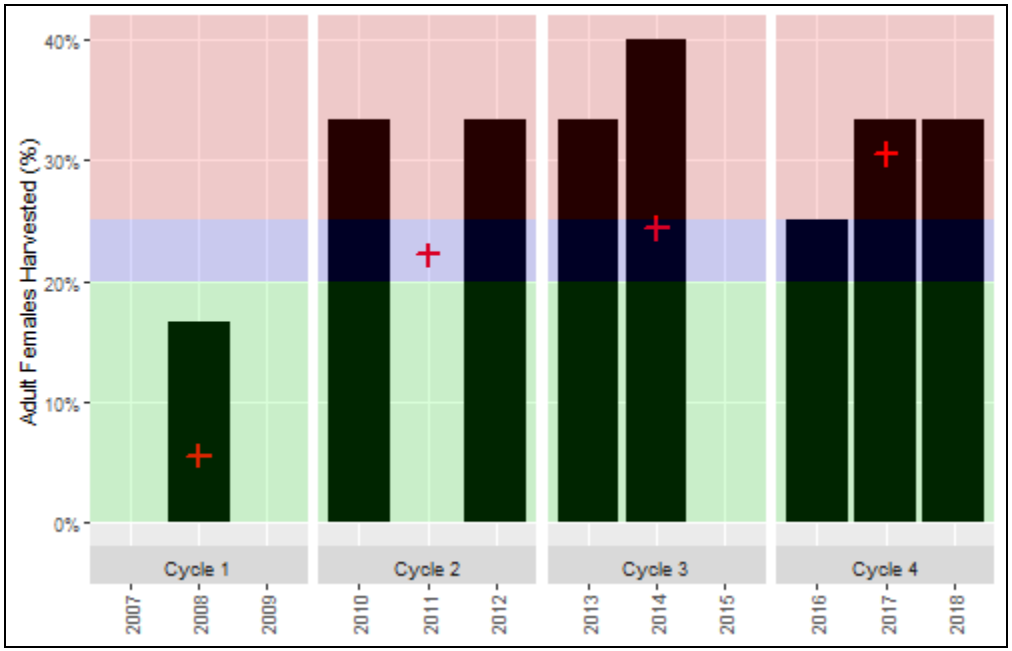
Assessment

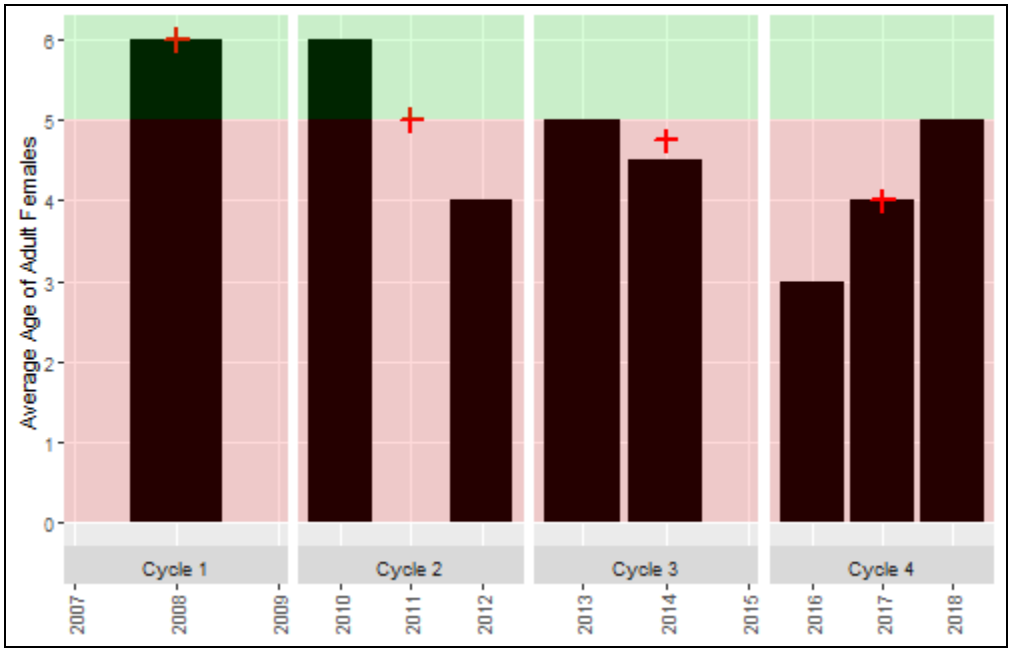
STABLE/SINK: HA 26 has shown similar trends as HA 14 to the south. Early spikes in adult female harvest probably impacted this population, followed by a steady reduction in overall harvest. However, populations responded to the lack of harvest that coincided with high reported selectivity during the 3rd cycle while younger aged animals reestablished the area. Recently, reports in hunter selectivity declined and harvest increased with limits met or exceed in the last two years - resulting in mortality densities indicative of population reduction. Selectivity may be causing less adult females to be taken, but the overall age has declined due to more sub-adult animals present. During the current cycle, increased harvest indicates more animals are available and/or hunters are more willing to take younger aged mountain lions. Similar to HA 14, about half of harvests are reported by non-resident hunters and guided hunts represent less of total harvest.

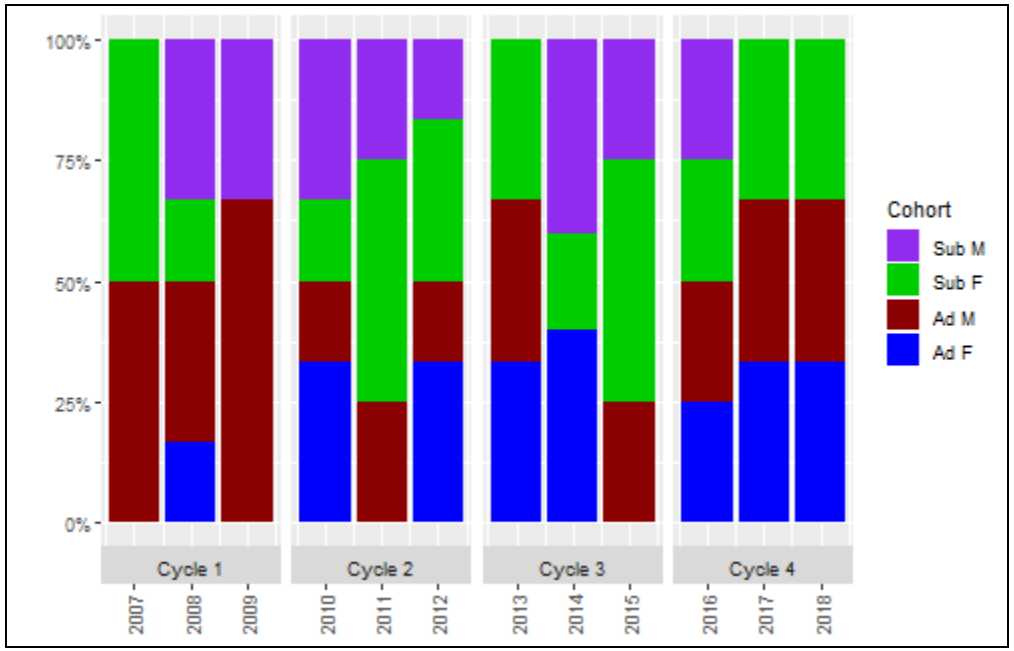
Hunt Area 29.

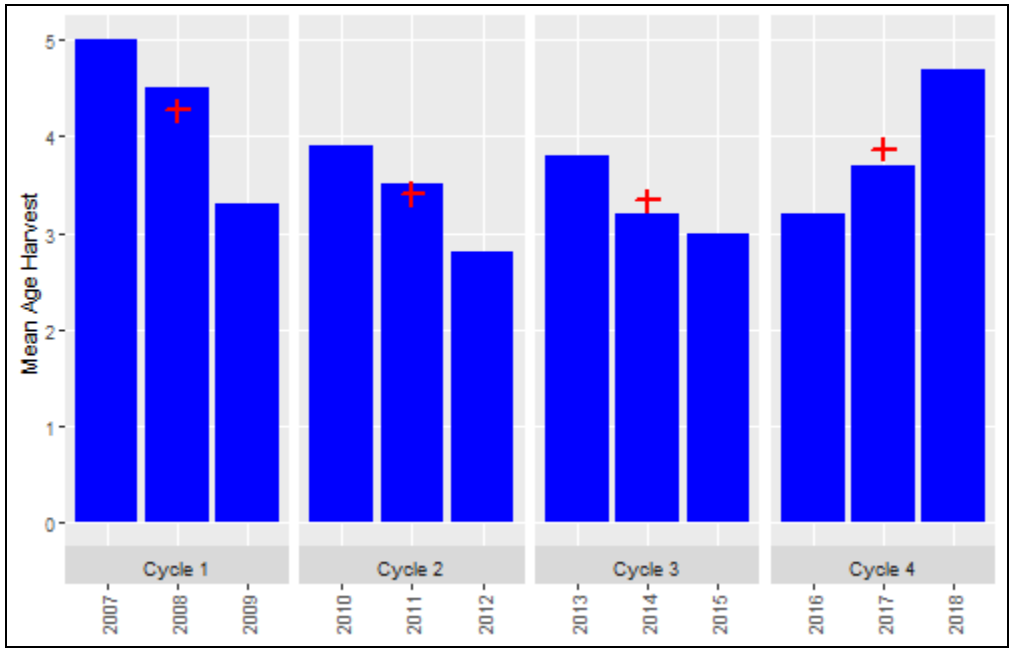

Harvest Limit
Mortality
Non-Harvest
Illegal Harvest
Legal Harvest
Cycle 1
Cycle 2
Cycle 3
Cycle 4

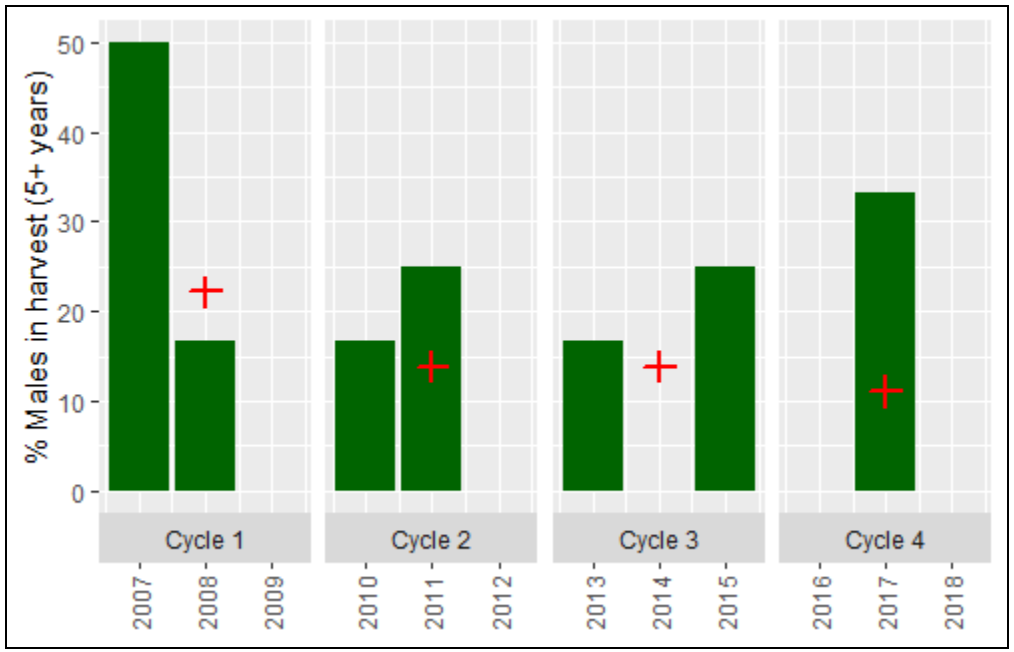

Human-caused mortality/1000km2 habitat
Cycle 1
Cycle 2
Cycle 3
Cycle 4

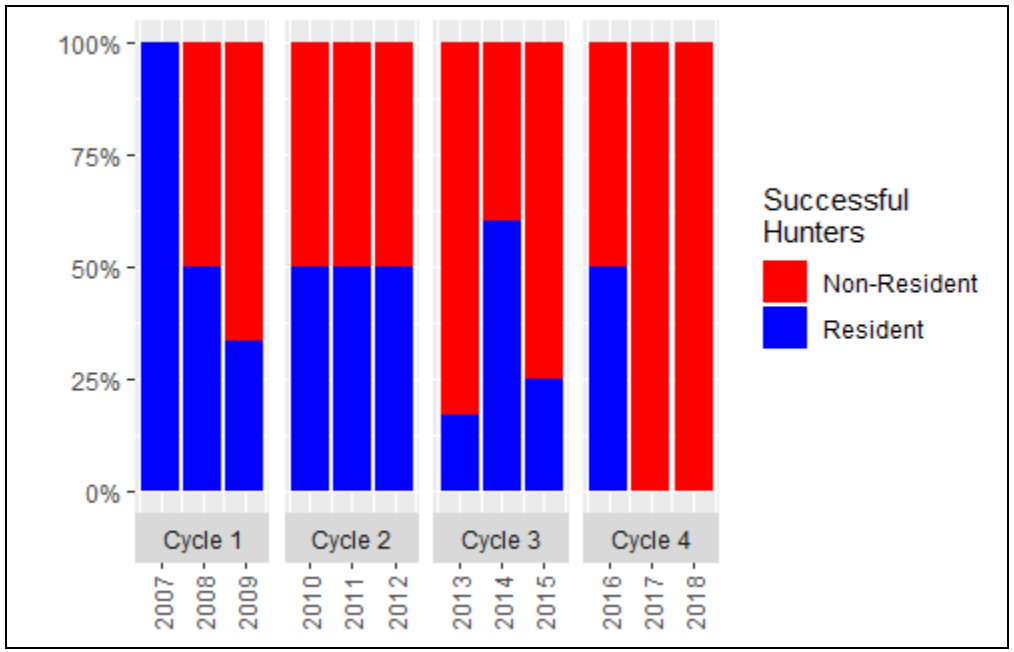

Adult Females Harvested (%)
Cycle 1
Cycle 2
Cycle 3
Cycle 4


Average Age of Adult Females
Cycle 1
Cycle 2
Cycle 3
Cycle 4


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Cohort
Sub M
Sub F
Ad M
Ad F


Mean Age Harvest
5
4
3
2
1
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


% Males in harvest (5+ years)
50
40
30
20
10
0
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


100%
75%
50%
25%
0%
Cycle 1
Cycle 2
Cycle 3
Cycle 4
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Successful Hunters
Non-Resident
Resident

Hunt Area 29. (cont.)

HY2016-HY2018 Regional Objective : Stable/Source management

Assessment

STABLE: Though mortality densities remain low in HA 29, the proportion of adult females harvested remains consistently high. Three (3) of the ten harvests during the current cycle were adult females, and the age of adult females also has declined. A few adult males were harvested, and one sub-adult male during this cycle. Non-selective hunters took all females, while selective hunters took mostly adult males. Most harvest during the current cycle was from non-resident hunters, and about half reported using guide services. While adult female harvest is a high proportion, overall harvest is low and HA 29 is relatively stable based on available data. Selective hunters still find adult animals to harvest and the average age of harvested animals increased from previous cycles.

STATEWIDE CONCLUSIONS

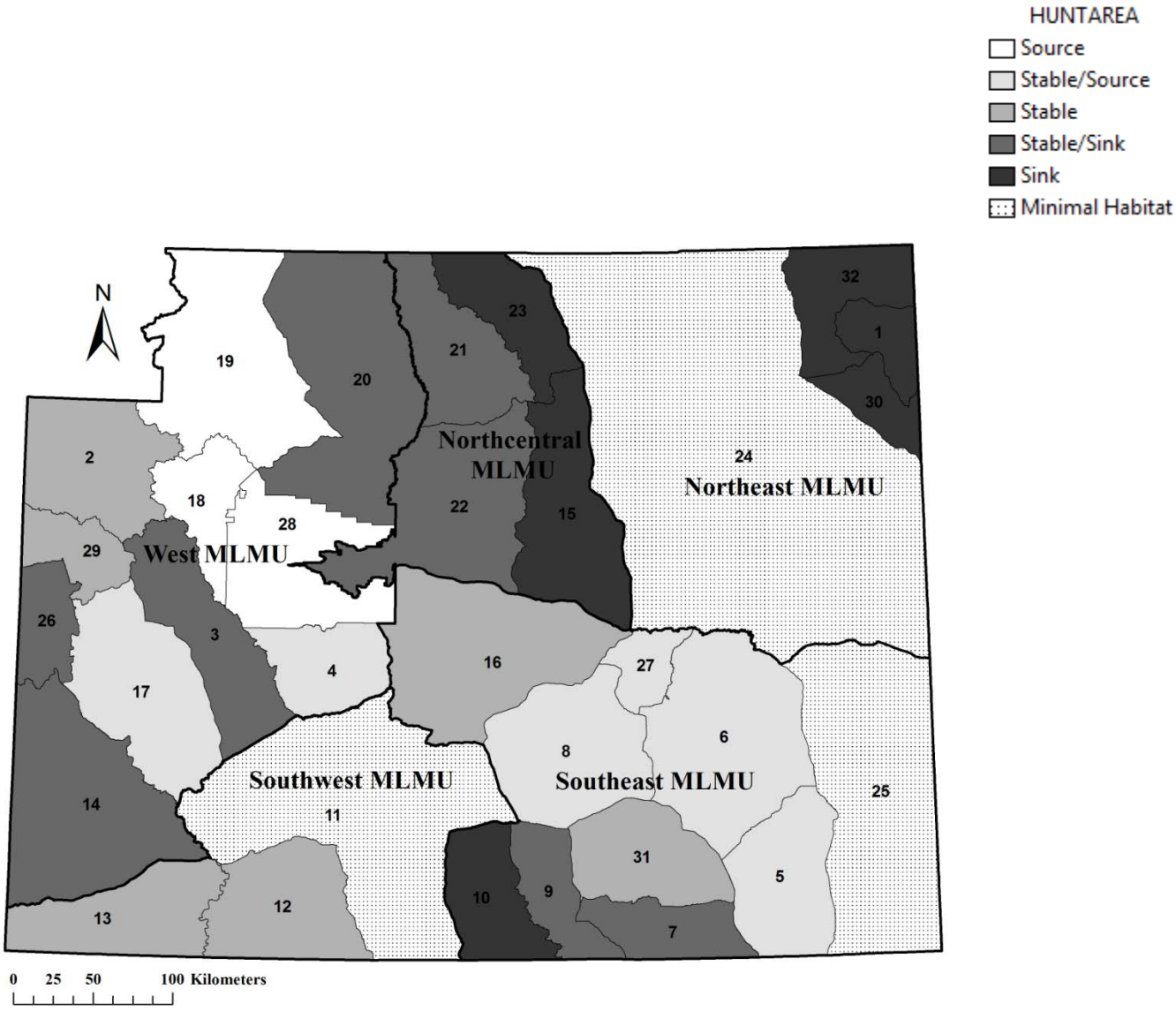

HUNTAREA
Source
Stable/Source
Stable
Stable/Sink
Sink
Minimal Habitat
N
19
20
21
23
32
1
30
2
Northcentral MLMU
24
Northeast MLMU
18
22
15
28
29
West MLMU
26
3
4
16
27
17
8
6
Southwest MLMU
Southeast MLMU
25
14
11
31
5
10
9
7
13
12
0 25 50 100 Kilometers

Figure 5. Map of population function for mountain lion hunt areas in Wyoming during the fourth management cycle, HYs 2016-2018.

The current management cycle assessment resulted in 9 hunt areas exhibiting Source or Stable/Source trends, 6 hunt areas showing Stable trends, and 14 areas showing Stable/Sink or Sink trends (Figure 5). Mountain lion populations shifted statewide after local Sink objectives were set for specified hunt areas across the state during previous management cycles. Increased limits corresponded to an increase in statewide mortality, followed by a reduction in mortality during the third cycle. Many areas have stabilized after local reductions occurred, and this resulted in slightly less mature animals available for harvest. More sub-adult animals are now represented on the landscape than in early HYs. These shifts are reflected in statewide trends (Figure 6 & Figure 7).

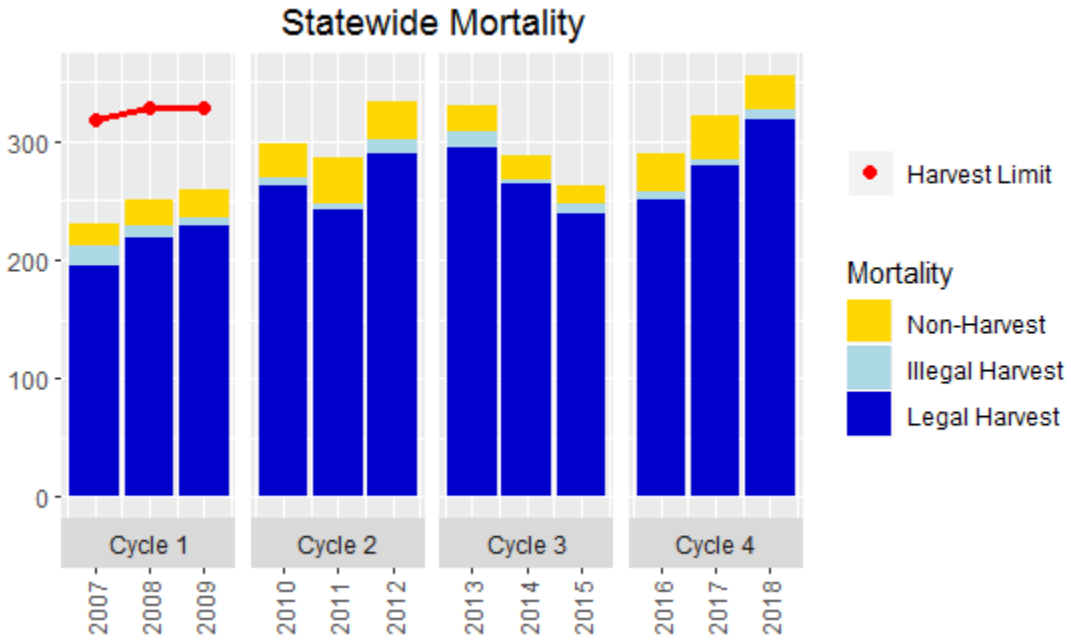


Figure 6. Statewide annual mountain lion harvest and mortality data for Wyoming, HYs 2007-2018. Some hunt areas allow unlimited harvest, therefore limits are represented by the last applicable and numerical limit.

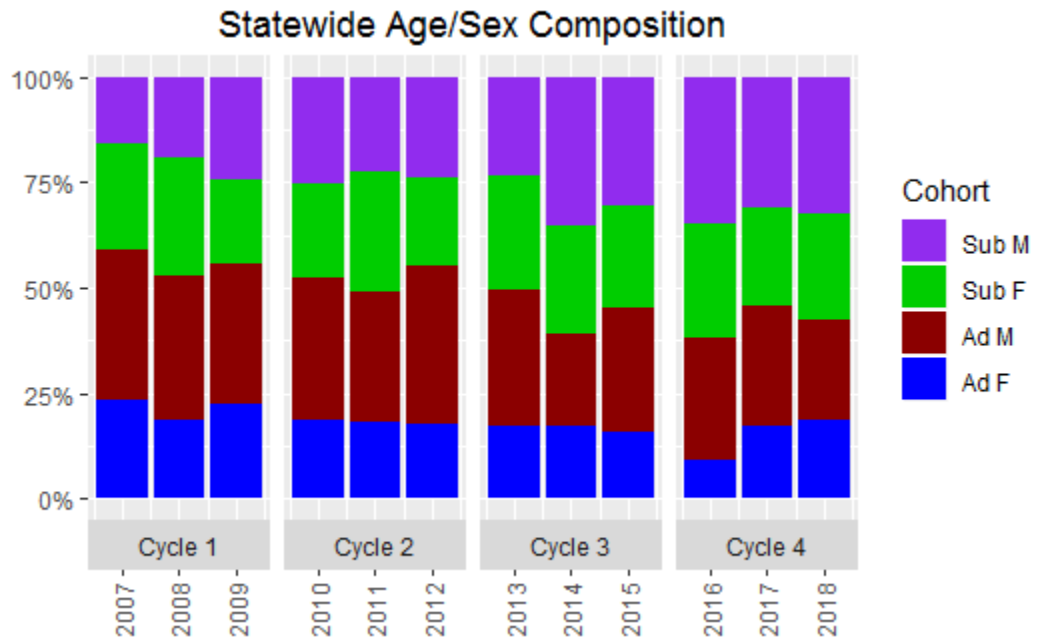


Figure 7. Statewide age and sex composition of mountain lions harvested in Wyoming , HYs 2007-2018.

Because local reductions in mountain lion densities generally result in the adult segment of the population being suppressed and often follow with a decrease in harvest, these data indicate many objectives were successful. Source and Stable/Source areas continue to provide quality hunting opportunity while additional areas (e.g., HA 6, HA 19) have recently undergone management changes intended to maintain or increase quality hunting opportunity and Source function.

During the current cycle, areas that had previously incurred heavy harvest were likely recruiting younger aged animals during years of lower harvest pressure (e.g., HAs 14, 15, 26), and these areas have rebounded harvest levels, albeit with generally younger mountain lions. In addition, the past two seasons provided favorable snow with good tracking conditions across the state for mountain lion hunters. Consistent snow not only makes finding tracks easier, but heavier snow conditions can shift ungulate prey toward lower elevations into areas more accessible by hunters or result in more tracks found opportunistically. Therefore, good tracking conditions also contributed a recent increase in harvest, and many areas that rarely reach limits closed during HY 2018.

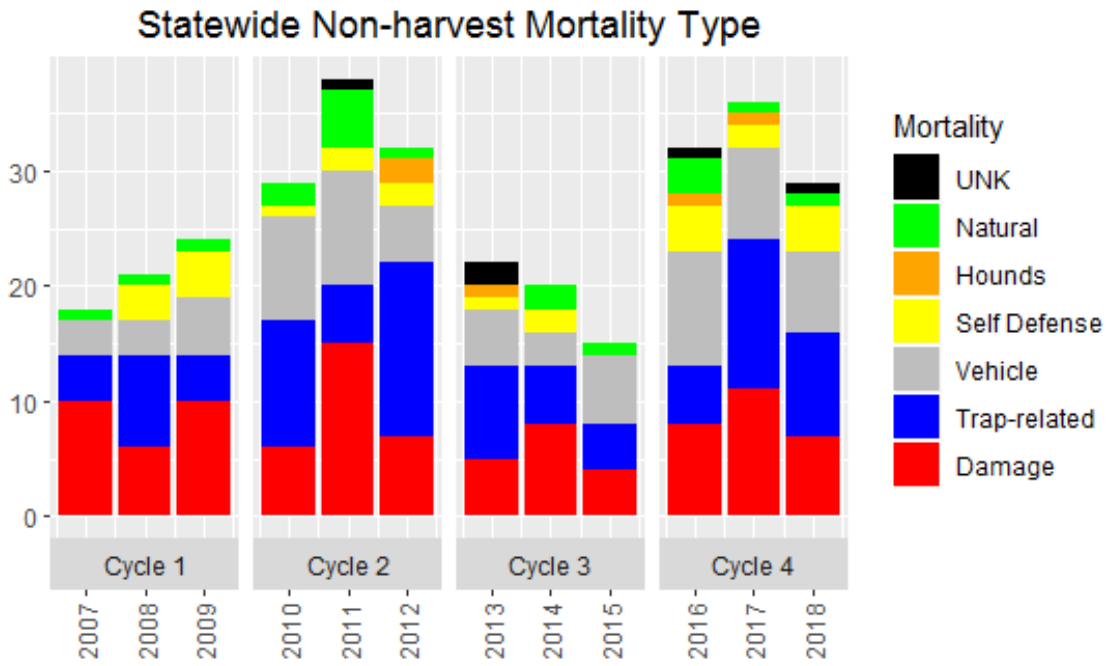


Figure 8. Statewide non-harvest mountain lion mortality in Wyoming, HYs 2007-2018.

Statewide non-harvest and conflict

Non-harvest mortality typically follows the same trend as harvest numbers (Figure 8). Non-harvest mortality was comprised primarily from damage removals, incidental traps/snares, and vehicle collisions during the 4th management cycle.

Mountain lion conflicts reported via the statewide Department conflict database were categorized into four main categories including: natural encounters/observations, mountain lions reported in proximity to homes or urban areas, depredation or property damage caused by mountain lions, and behavioral conflicts with mountain lions (Figure 9). Typically, natural encounters or observations are not considered conflicts, but are used to keep track of animal sightings if future conflicts occur in the area. Mountain lions reported in proximity to dwellings or other urban settings may or may not be considered a conflict (reports range from mountain lion deer cache in a back yard, seen in a pasture, or treed by ranch dogs), but not causing immediate harm to people, livestock, or property. Depredation and property damage are conflicts where livestock or pets were injured or killed by mountain lions, or when property damage occurred. Finally,

behavioral conflicts include instances where encounters occurred and the lion acted aggressively or was reluctant to leave. These include self defense actions.

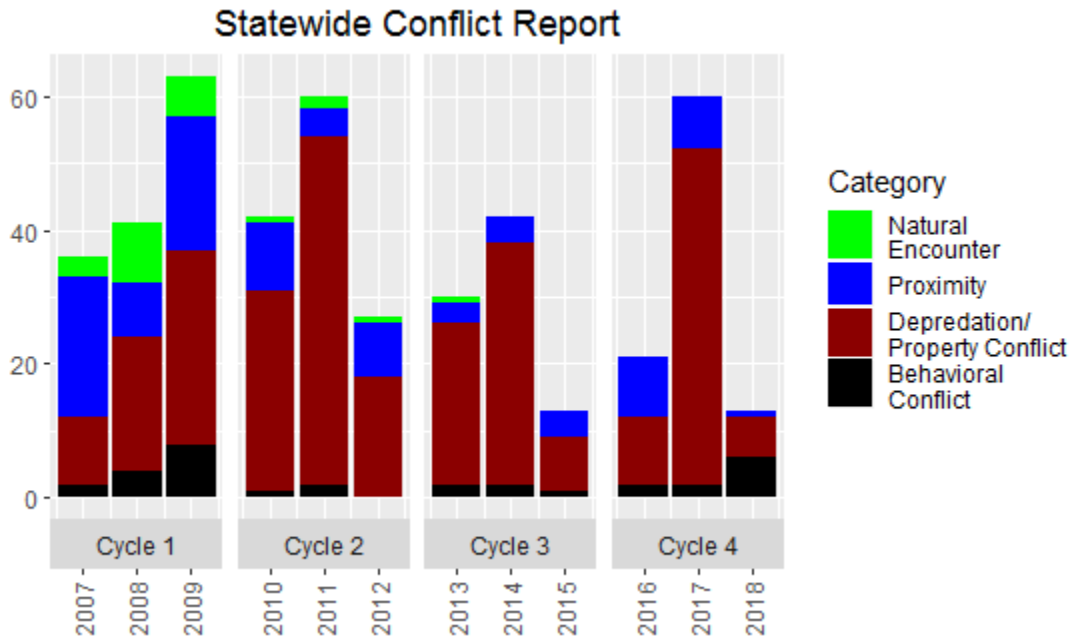


Figure 9. Statewide mountain lion conflicts reported in Wyoming, HYs 2007-2018.

Within depredation and property loss conflicts, sheep damage consistently dominates depredation events (Figure 10). A spike in sheep depredation occurred in HY 2017, mostly due to depredation events in HA 15 accounting for half of all depredation/property damage events for that year. However, these reports are depredation events, and in many cases multiple livestock can incur damage during a single event, increasing the severity of the loss.

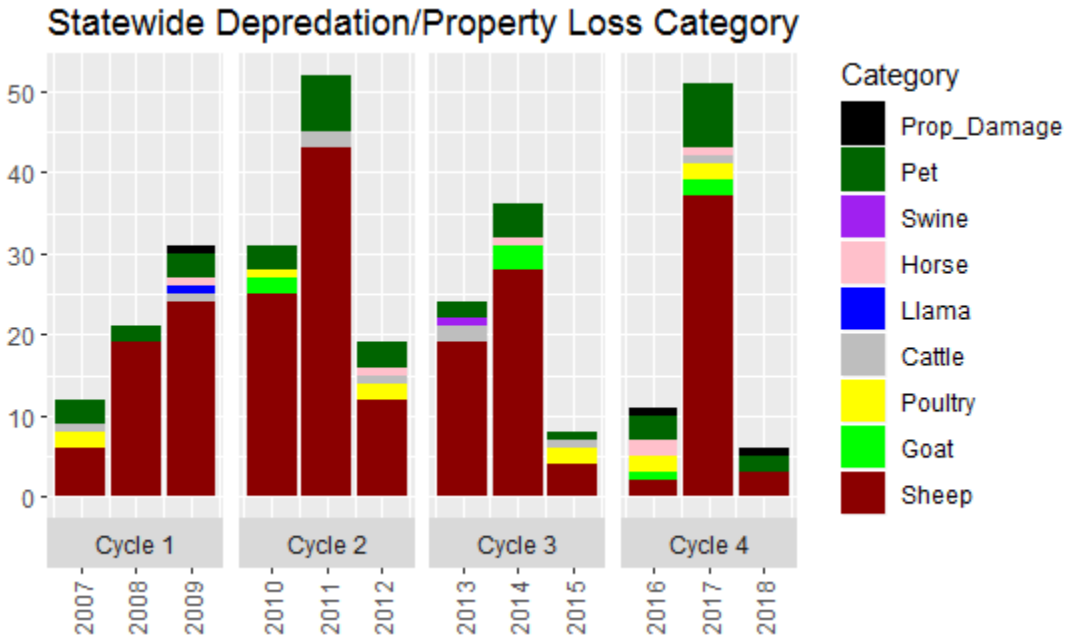


Figure 10. Statewide totals for mountain lion depredation or property damage conflict events in Wyoming, HYs 2007-2018.

The Department maintains the most effective way to mitigate conflict damage for any large carnivore is the immediate targeted removal of the offending animal(s). If offending animals are not removed, conflict usually continues and public tolerance wanes.

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APPENDIX A. Statewide hunt areas, season dates, and limitations HY 2018.

Hunt Area	Dates of Seasons	Mortality Limit	Limitations
1	Sep. 1 - Mar. 31	Resident Limit – 20 Nonresident Limit – 4	
2	Sep. 1 - Mar. 31	3	
3	Sep. 1 - Mar. 31	8	
4	Sep. 1 - Mar. 31	10	
5	Sep. 1 - Mar. 31	12	Additional license valid
	Apr. 1 - Apr. 30		Valid off national forest
6	Sep. 1 - Apr. 30	15	
7	Sep. 1 - Aug. 31	14	Additional license valid
8	Sep. 1 - Aug. 31	10	Additional license valid
9	Sep. 1 - Aug. 31	12	Additional license valid
10	Sep. 1 - Mar. 31	7	
11	Sep. 1 - Mar. 31	4	
12	Sep. 1 - Mar. 31	6	
13	Sep. 1 - Mar. 31	5	
14	Sep. 1 - Mar. 31	15	
15	Sep. 1 - Aug. 31	Unlimited	Additional license valid
16	Sep. 1 - Mar. 31	6	Additional license valid
17	Sep. 1 - Mar. 31	9	
18	Sep. 1 - Mar. 31	12	
19	Sep. 1 - Mar. 31	20	Additional license valid
20	Sep. 1 - Aug. 31	18	
21	Sep. 1 - Mar. 31	20	
22	Sep. 1 - Aug. 31	25	
23	Sep. 1 - Mar. 31	20	
24	Sep. 1 - May 31	Unlimited	Additional license valid
25	Sep. 1 - Mar. 31	12	Additional license valid
26	Sep. 1 - Mar. 31	15	
27	Sep. 1 - Aug. 31	Unlimited	Additional license valid
28	Sep. 1 - Mar. 31	3	
29	Sep. 1 - Mar. 31	6	
30	Sep. 1 - Mar. 31	12	
31	Sep. 1 - Aug. 31	11	Additional license valid
32	Sep. 1 - Mar. 31	25	

***Brown = year-round harvest *Orange = extended season dates**

APPENDIX B. Estimated mountain lion habitat (km^2) by hunt area, unit, and statewide.

Unit	HY2013-HY2015	HY2016-HY2018	Resulting change
1	1515	1685	170
30	965	1314	358
32	1455	2336	881
24	970	NA	- 970
NE	4905	5335	430
15	1224	2406	1182
21	1296	1339	43
22	2170	3518	1348
23	1379	1324	- 55
NC	6069	8587	2518
5	2905	2878	- 27
6	2751	3889	1138
7	1107	1120	13
8	1478	1384	- 94
9	636	674	38
10	503	529	26
16	818	1183	365
25	NA	NA	NA
27	983	1069	86
31	1086	1143	57
SE	12267	13869	1602
11	NA	NA	NA
12	850	1932	1082
13	650	658	8
SW	1500	2590	1090
19*	3672	5505	NA
20*	3057	1754	NA
ABS_DAU	6729	7259	530
3	2026	2297	271
4	1404	1342	- 62
18	1261	1320	59
28	1769	1947	178
WR_DAU	6460	6906	446
2	2195	2342	147
14	2175	2893	718
17	1884	1442	- 442
26	1807	1875	68
29	1268	1340	72
WYR_DAU	9329	9892	563
WE	22518	24057	1539
Statewide	47259	54438	7233

*** - Hunt area boundaries were redrawn for HY2016-HY2018 management cycle at the time of reclassification.**

APPENDIX C. WGFD form documenting mountain lion mortality data in Wyoming in 2019.

MOUNTAIN LION MORTALITY FORM

Hunt Area _____ Region _____

Date of kill: _____ TYPE: Legal_____; Illegal_____; Damage Control_____; Other_____; Unknown_____

If "Other" or "Unknown", probable cause of mortality _____

PERSON WHO HARVESTED LION: Name: _____

Address: _____ City: _____

State: _____ Zip: _____ Phone: _____ Resident: _____ Nonresident: _____

METHODS/EFFORT: Days hunted: _____ Were dogs used? (Y/N) _____ If not, how was lion harvested? _____

Was a guide/outfitter used? (Y/N): _____ Name: _____ Dog owner: _____

Number of lions observed including harvest: _____ Weapon used: _____

Were you selective while hunting? (Y/N): _____ Number treed and released: _____

Number of lions that were marked: _____ (Ear tag / tattoo / radio collar frequency : _____)

Number of fresh tracks not pursued: _____ (How many were single adults?: _____ How many were adults with kittens?: _____)

LOCATION/DRAINAGE: Where was lion harvested? _____

Sec: _____ Twnshp: _____ Rng: _____ **UTM Zone: _____**

UTM Easting: _____ UTM Northing: _____

SEX AND AGE: Sex: _____ Est. Age: _____

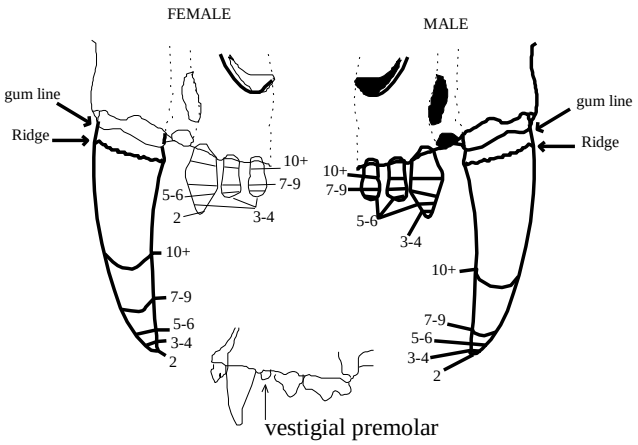
If female, presently lactating? (Y[≥2] / N) _____

Appear to have lactated in past? (Y / N) _____

Canine ridge below gumline? (Y[≥2.5] / N) _____

Any visible spotting on rear legs? (Y[≤3] / N / ?) _____

Visible bars on inside of front legs? (Y[<4] / N / ?) _____



REQUIRED SAMPLES:

Teeth collected (Y/N):_____ Pictures of teeth (Y/N): _____

Tissue sample (Y/N):_____

Remarks:

_____

_____

_____

Date Biological Services Called: _____

I, _____ of _____

being duly sworn, depose and say that I am the holder of Wyoming Mountain Lion license # _____,

and lawfully took the above lion on _____ - _____, 20_____ in Hunt Area # _____.

_____ _____ _____

Inspected by / GF Number Date Hunter's Signature

Any person who makes a false statement on the registration form regarding the date the mountain lion was taken or the hunt area in which it was taken shall be in violation of this regulation and, such violation shall be punishable as provided by Title 23, Wyoming statutes for violation of Commission regulations.

Note: The person that checked the lion should forward the completed form and all samples to the Regional Office of registration and call Biological Services to update the harvest database. The Regional Office of registration will keep a copy of the completed form and send the original, along with the tooth and hair samples to the Large Carnivore Section. Revised 6/16.

APPENDIX D. Table of mountain lion data relative to WGFD mountain lion management plan monitoring criteria for current management cycle (HY2016-HY2018).

		Mortalities/1,000 km^2			% Adult Female Harvest			Mean Age of Adult Females		
MLMU	**HA**	**2016**	**2017**	**2018**	**2016**	**2017**	**2018**	**2016**	**2017**	**2018**
Northeast	HA 1	14.84	14.84	17.21	8.3	25.0	32.0	4.5	3.8	4.3
	HA 30	1.52	3.81	5.33	100.0	0.0	0.0	10.0	NA	NA
	HA 32	8.56	10.70	9.42	10.5	27.3	25.0	3.0	4.2	3.7
	HA 24	*	*	*	11.1	0.0	20.0	4.0	NA	4.0
	TOTAL	10.68	11.43	12.00	11.3	21.8	24.6	4.8	4.0	4.1
Northcentral	HA 15	9.56	7.90	14.13	13.6	11.1	26.5	5.3	3.0	5.8
	HA 21	11.95	11.43	16.43	0.0	13.3	20.0	NA	4.5	4.2
	HA 22	4.26	7.39	7.96	0.0	29.2	15.4	NA	4.8	4.8
	HA 23	12.08	9.82	11.33	6.2	25.0	13.3	3.0	5.3	3.8
	TOTAL	8.15	8.73	11.53	5.9	20.3	20.0	4.8	4.6	5.1
Southeast	HA 5	1.74	2.08	4.52	25.0	25.0	0.0	4.0	4.0	NA
	HA 6	3.34	3.34	4.37	11.1	8.3	13.3	3.0	3.0	4.5
	HA 7	9.82	9.82	12.50	9.1	40.0	14.3	6.0	4.5	3.5
	HA 8	4.34	4.34	5.06	0.0	25.0	14.3	NA	11.0	8.0
	HA 9	7.42	16.32	16.32	0.0	18.2	36.4	NA	4.5	4.2
	HA 10	13.23	11.34	15.12	16.7	0.0	0.0	NA	NA	NA
	HA 16	2.54	5.07	2.54	33.3	0.0	33.3	4.0	NA	3.0
	HA 25	*	*	*	0.0	100.0	0.0	NA	4.0	NA
	HA 27	4.68	1.87	1.87	0.0	50.0	50.0	NA	4.0	3.0
	HA 31	7.87	5.25	7.87	14.3	20.0	62.5	5.0	7.0	4.1
	TOTAL	4.69	4.90	6.20	10.5	21.1	19.8	4.4	5.0	4.2
Southwest	HA 11	*	*	*	0.0	0.0	0.0	NA	NA	NA
	HA 12	4.14	3.62	2.59	0.0	16.7	20.0	NA	4.0	4.0
	HA 13	3.04	7.60	7.60	0.0	0.0	0.0	NA	NA	NA
	TOTAL	4.63	4.63	5.02	0.0	9.1	7.7	NA	4.0	4.0
Absaroka DAU	HA 19	1.63	4.36	4.54	42.9	15.0	10.0	4.3	5.0	8.5
	HA 20	6.84	6.84	7.41	12.5	0.0	8.3	8.0	NA	5.0
	TOTAL	2.89	4.96	5.23	26.7	10.0	9.4	5.2	5.0	7.3
Wind River DAU	HA 3	3.05	3.05	1.31	0.0	0.0	0.0	NA	NA	NA
	HA 4	2.98	8.20	6.71	0.0	0.0	12.5	NA	NA	3.0
	HA 18	6.82	5.30	3.79	11.1	14.3	25.0	5.0	5.0	8.0
	HA 28	1.54	0.51	0.51	0.0	100.0	0.0	NA	11.0	NA
	TOTAL	3.33	3.76	2.61	4.8	8.0	13.3	5.0	8.0	5.5
Wyoming Range DAU	HA 2	0.85	1.71	0.43	100.0	66.7	100.0	9.0	7.5	4.0
	HA 14	4.84	5.18	4.49	0.0	7.1	15.4	NA	4.0	4.5
	HA 17	0.69	1.39	1.39	0.0	0.0	0.0	NA	NA	NA
	HA 26	8.00	8.53	8.53	7.1	6.2	13.3	3.0	9.0	5.0
	HA 29	3.73	3.73	2.99	25.0	33.3	33.3	3.0	4.0	5.0
	TOTAL	3.74	4.25	3.64	9.1	13.2	17.6	5.0	6.4	4.7
STATEWIDE	TOTAL	5.24	5.88	6.50	9.3	17.2	18.7	4.8	4.9	4.7

*****Represents a Hunt Area with minimal mountain lion habitat and not managed by WGFD for long term population viability.

APPENDIX E. Table of mountain lion mortality and harvest age/sex data for Wyoming for the current management cycle, HY2016-HY2018.

MLMU	HY	Adult Females	Adult Males	Subadult Females	Subadult Males	Non-Harvest Mortality	Total Mortality
Northeast	HY 2016	6	4	15	28	4	57
	HY 2017	12	7	13	23	6	61
	HY 2018	14	5	17	21	7	64
	Total	32	16	45	72	17	182
Northcentral	HY 2016	4	22	20	22	3	71
	HY 2017	14	20	17	18	6	75
	HY 2018	19	25	22	29	4	99
	Total	37	67	59	69	13	245
Southeast	HY 2016	6	19	13	19	8	65
	HY 2017	12	16	17	12	11	68
	HY 2018	16	23	20	22	5	86
	Total	34	58	50	53	24	219
Southwest	HY 2016	0	6	2	2	2	12
	HY 2017	1	5	0	5	1	12
	HY 2018	1	0	7	5	0	13
	Total	2	11	9	12	3	37
Absaroka DAU	HY 2016	4	3	3	5	6	21
	HY 2017	3	11	8	8	6	36
	HY 2018	3	10	10	9	7	39
	Total	10	24	21	22	19	96
Wind River DAU	HY 2016	1	14	3	3	3	24
	HY 2017	2	13	3	7	1	26
	HY 2018	2	4	2	7	3	18
	Total	5	31	8	17	7	68
Wyoming Range DAU	HY 2016	3	6	13	11	6	39
	HY 2017	5	10	8	15	5	43
	HY 2018	6	11	4	13	3	37
	Total	14	27	25	39	14	119
STATEWIDE	HY 2016	24	74	69	90	32	289
	HY 2017	49	82	66	88	36	321
	HY 2018	61	78	82	106	29	356
	Total	134	234	217	284	97	966