Annual Report to the Alaska Board of Game on Intensive Management for Sitka Black-Tailed Deer With wolf Predation Control In Portion of GMU 3

Prepared by the Division of Wildlife Conservation
February 2017

1) Description of IM Program[1] and Department recommendation for reporting period

A) **This report is an annual evaluation for a predation control program authorized by the Alaska Board of Game (Board) under 5 AAC 92.127.**

B) Month this report was submitted by the Department to the Board: February 2017

C) **Program name**: Intensive Management of Sitka Black-tailed Deer In a Portion of Game Management Unit 3

D) **Existing program** has **an associated Operational Plan:** *Operational Plan for Intensive management of Sitka Black-tailed Deer In a portion of Game management Unit 3.* Version 1. February 2013

E) **Game Management Unit(s) fully or partly included in IM program area:** Unit 3

F) IM objectives for Unit 3 **deer: population size** 15,000 **harvest** 900

G) Month and year the current predation control program was originally authorized by the Board: March 2013**. Indicate date(s) if renewed: N/A**

H) **Predation control is** inactive **in this IM area**. While the intensive management plan for a portion of Unit 3 was authorized by the BOG in March 2013, predator control has remained inactive pending refinement of techniques for accurately measuring changes in deer and wolf abundance.

I) **If active, month and year the current predation control program**: The predation control program in a portion of Unit 3 has never been active.

J) **A habitat management program funded by the Department or from other sources is currently active in this IM area:** No. The operational plan for Unit 3 does not include a habitat enhancement component.

K) **Size of IM program area (square miles) and geographic description:** The experimental wolf reduction area encompasses approximately 1,680 km^2 (648 mi^2) or approximately 22% of the approximately total 7,770 km^2 (3,000 mi^2) land area in Unit 3. The treatment area includes Woewodski Island, Mitkof Island, and the Lindenberg Peninsula on eastern Kupreanof Island, (including Wildlife Analysis Areas (WAAs) #2007, #2008, #5135, #5136, #5137 and #5138). To evaluate whether or not treatments are working (if wolf numbers are reduced by trapping and if deer numbers increase), and to determine if deer numbers also increase in areas where wolves are not significantly reduced by trapping, an approximately 1,200 km^2 (475 mi^2) non-treatment or "comparison area" will be established on western Kupreanof Island (including WAAs 5130, #5133 and #5134) (Fig. 1).

[1] For purpose and context of this report format, see *Intensive Management Protocol, section on Tools for Program Implementation and Assessment*

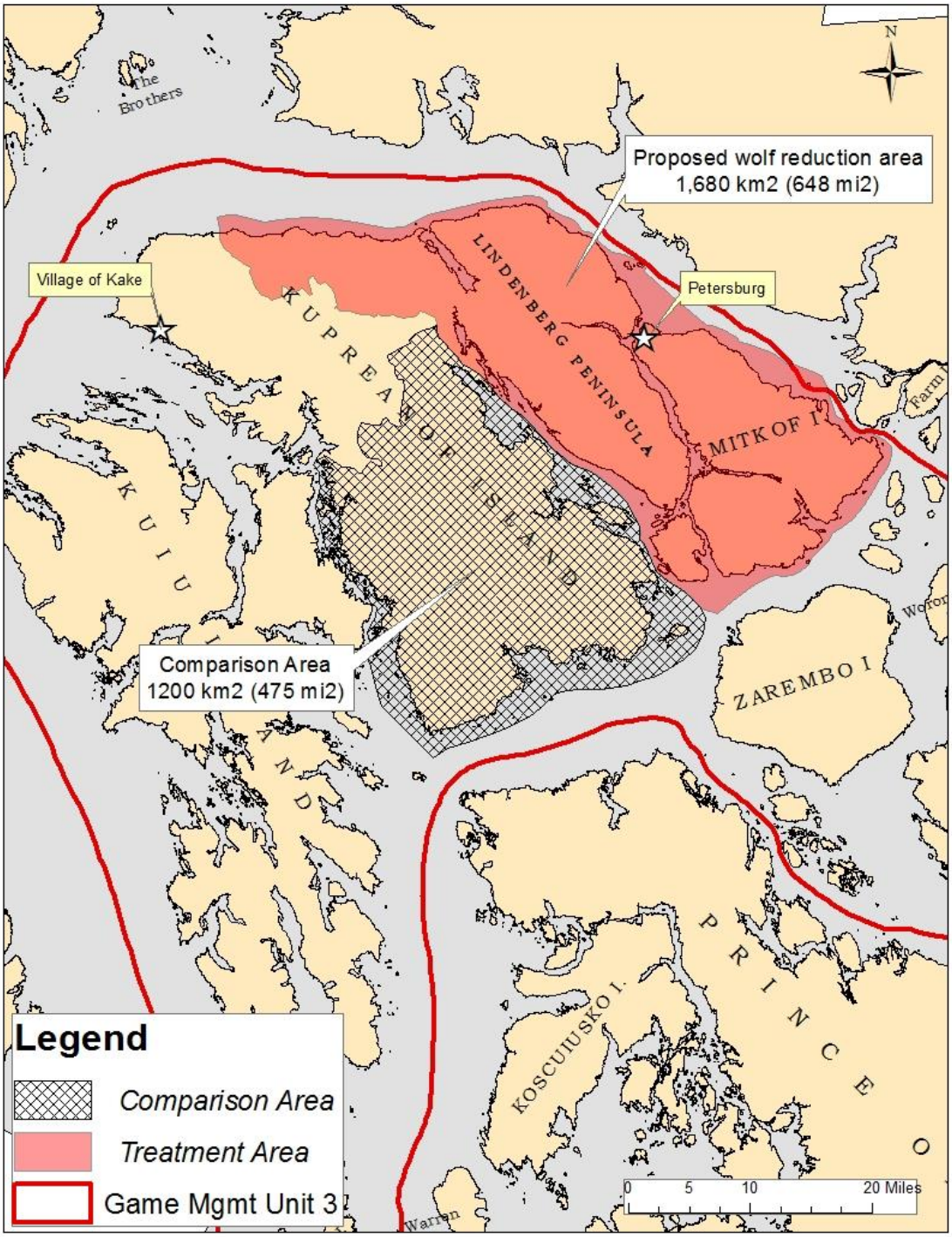

Figure 1. Game Management Unit 3 (3,000 mi^2) and the IM Treatment Area (648 mi^2) and Comparison Area (475 mi^2).

L) **Size and geographic description of area for assessing ungulate abundance:** Deer – 2,909 km^2 (1,123 mi^2) area, including both Treatment and Comparison areas (Fig. 2).

M) **Size and geographic description of area for ungulate harvest reporting:** Harvest reporting for deer, wolves, and bears is required throughout GMU 3 (3,000 mi^2).

N) **Size and geographic description of area for assessing predator abundance:** No attempt has yet been made to assess predator (wolf) abundance within the Unit 3 IM area (1,123 mi^2).

O) **Size and geographic description of predation control area:** The wolf reduction area encompasses approximately 1,680 km^2 (648 mi^2) or approximately 22% of the total land area in Unit 3. The treatment area includes Woewodski Island, Mitkof Island, and the Lindenberg Peninsula on eastern Kupreanof Island, (including WAAs #2007, #2008, #5135, #5136, #5137 and #5138).

P) **Criteria for evaluating progress toward IM objectives**: Changes in deer abundance as determined by trends in traditional and DNA based deer pellet group transects, aerial alpine surveys, and estimated deer harvest.

Q) **Criteria for success with this program**:

Thresholds for continuing and suspending wolf control in the treatment area.

Deer Abundance:

1) If a combination of 2 of the 4 indices of abundance indicate that deer abundance has tripled in the treatment area within 5 years, control will be suspended and normal hunting and trapping of wolves in the treatment area will be allowed to continue.

2) If a combination of 2 of the 4 indices of abundance indicate that deer abundance has not changed in the treatment area versus the comparison area after 5 years we will reevaluate the program and make changes or suspend it.

Wolf Abundance:

1) if the wolf population estimate for the control area reliably falls below the minimum management objective of 10 wolves, predator control activities will be suspended (see: Section 2);

2) If indices of wolf abundance indicate that wolf control has been effective (i.e. most wolves have consistently been removed from the treatment area each year), but indices of deer abundance have not changed in the treatment area compared with the comparison area, program will be reevaluated, and the Department will initiate research to determine the major causes of deer mortality within the treatment area.

3) If there is some indication that wolf numbers have been reduced in the treatment area after 5 years and there is also some indication that deer numbers in the treatment area have improved, but have not increased as much as expected (i.e.

tripled), the wolf trapping program with be reevaluated to determine if there are ways to make it more effective.

4) If indices of wolf abundance indicate that abundance within the treatment area has not changed after 5 years of the enhanced (i.e. Department sponsored) trapping program, Department sponsored trapping within the treatment area will be reevaluated to see if there are more feasible ways to reduce wolf numbers.

Prey Harvest Catch Per Unit Effort.

1) Catch per unit effort will be important indices of both wolf numbers and deer numbers.

R) **Department recommendation for IM program in this reporting period**: **(details provided in sections 6 or 7).** Continue alpine deer surveys during 2017 and 2018 and analyze deer harvest statistics for 2016 and 2017. Evaluate ways to monitor trend in wolf abundance including DNA mark-recapture or developing an index of wolf abundance based on fresh scats found per mile of logging road during 2017 and 2018. Continue to encourage trappers to harvest wolves in popular deer hunting areas in Unit 3 (Mitkof Island and the Lindenberg Peninsula and Portage Bay road systems on Kupreanof Island). Evaluate use and condition of winter browse to investigate possible competition with a growing moose population.

Refer to one or more scaled maps in the Operational Plan for areas described in this section. See Figure 1, in the "Operational Plan For Intensive Management Of Sitka Black-tailed Deer In A Portion Of Game Management Unit 3."

2) Prey data

Date(s) and method of most recent abundance assessment for deer include:

- April 2016 - Traditional Pellet-group Transects
- April 2016 - DNA mark-recapture pellet group transects
- July and August 2016 - Alpine deer aerial surveys

We examined statistical trends in abundance of deer fecal pellets derived from Traditional Pellet-group Transects (Figures 2-4) and deer observed in Alpine Deer Surveys (Figures 5-6) using linear regression**.**

Traditional Pellet Group Density Transects

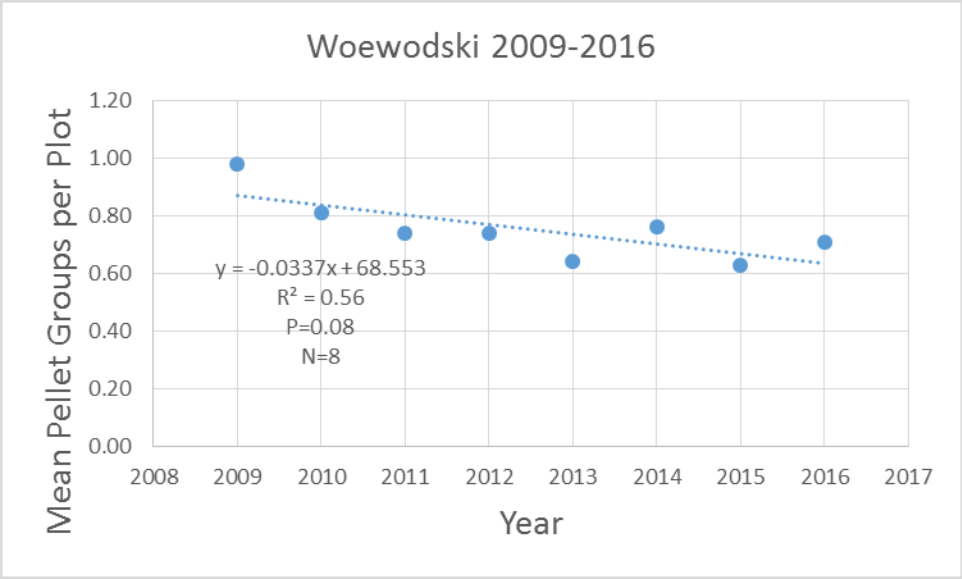

Figure 2. Mean deer pellet groups per plot in the Woewodski Island survey area (southern Wrangell Narrows, Game Management Unit 3 treatment area), 2009-2016. No significant trend is apparent.

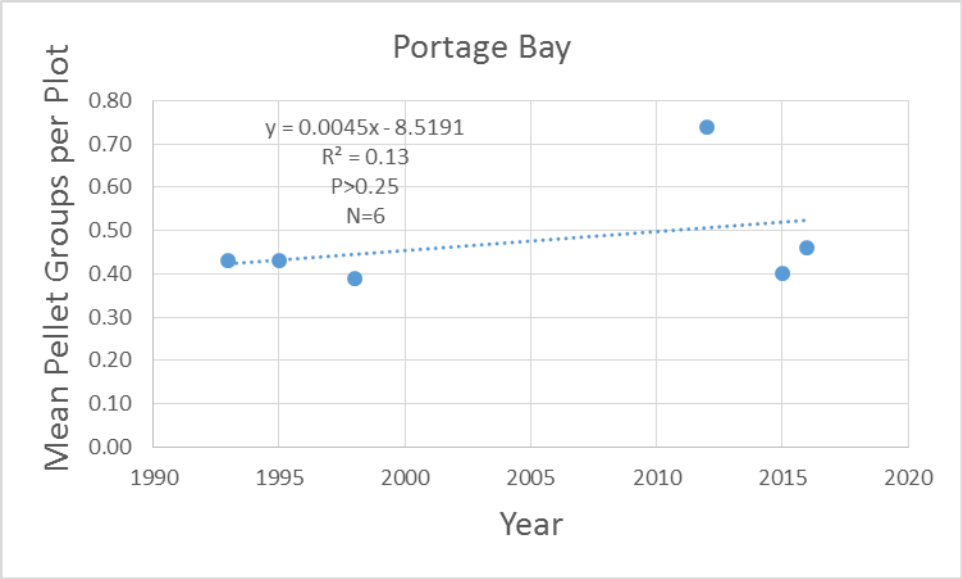

Figure 3. Mean deer pellet groups per plot in the Portage Bay survey area (northern Kupreanof Island, Game Management Unit 3 treatment area), 1993-2016. No significant trend is apparent.

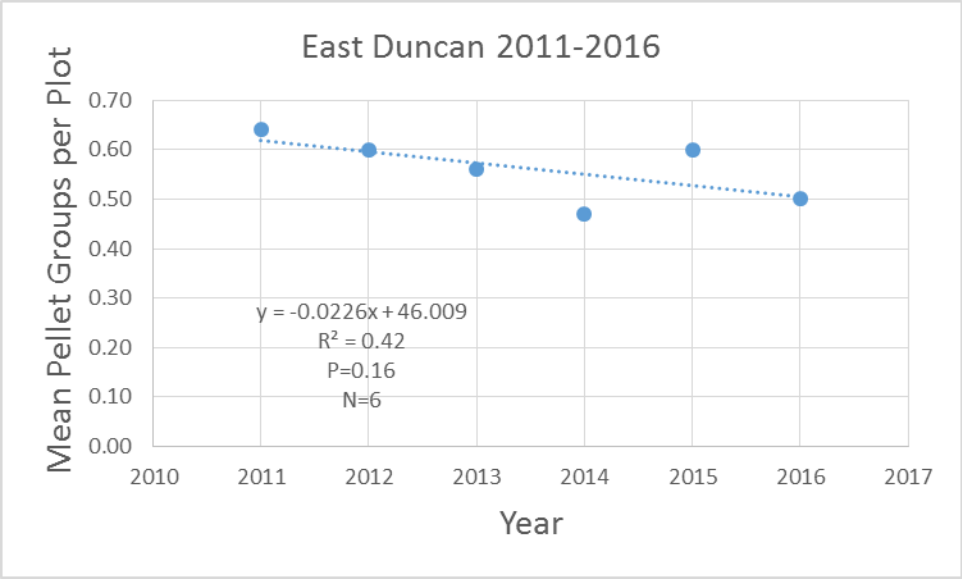

Figure 4. Mean deer pellet groups per plot in the East Duncan survey area (Lindenberg Peninsula, Kupreanof Island, Game Management Unit 3 treatment area), 2011-2016. No significant trend is apparent.

Summer Alpine Deer Survey Counts

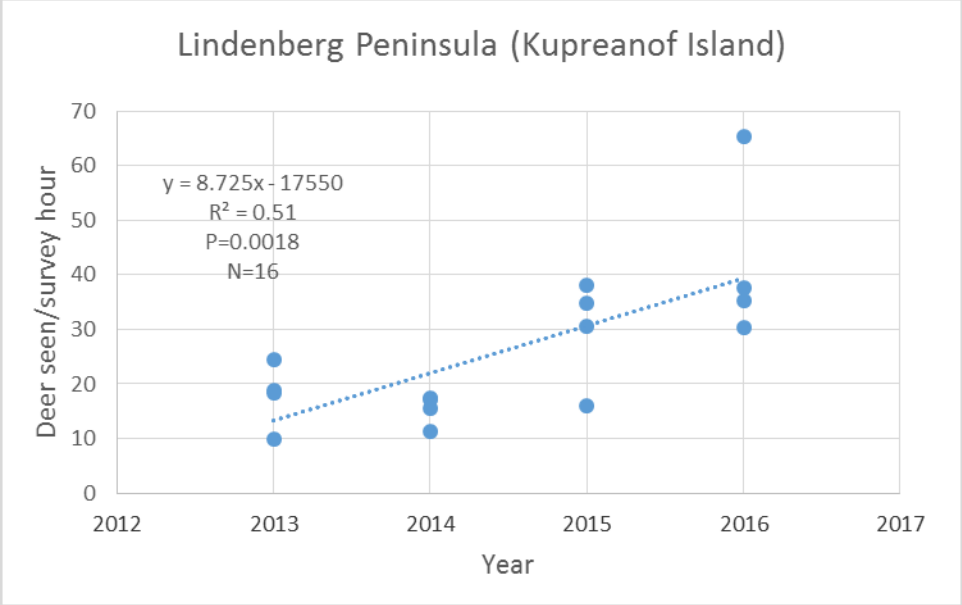

Figure 5. Deer observed per survey hour in the Lindenberg Peninsula aerial alpine deer survey area (Kupreanof Island Unit 3 treatment area), 2013-2016. A significant increasing trend is apparent, especially during 2014 to 2016.

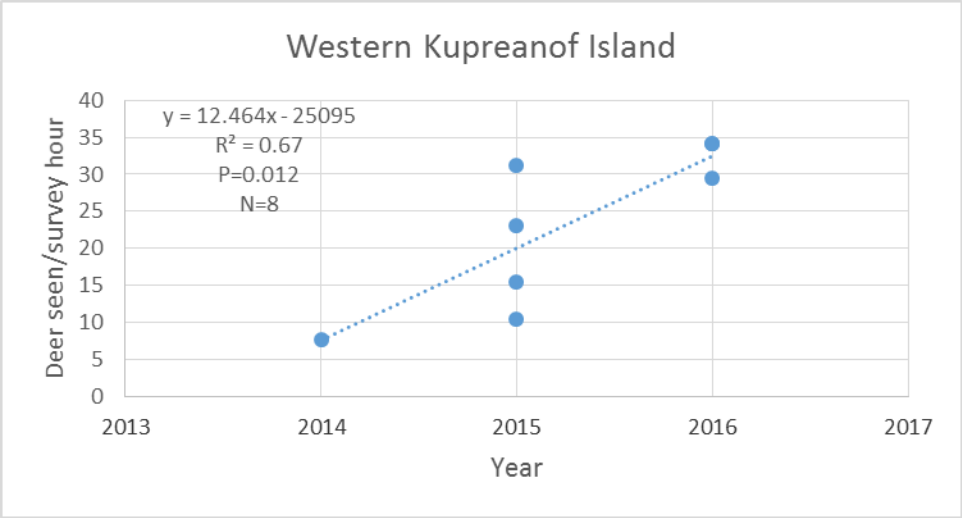

Figure 6. Deer observed per survey hour in the Western Kupreanof aerial alpine deer survey area (Kupreanof Island Unit 3 non-treatment area), 2014-2016. A significant increasing trend is apparent.

Compared to IM area, was a similar trend and magnitude of difference in abundance observed in nearby non-treatment area(s) since program inception Yes **and in the last year** Yes. **Describe comparison if necessary:** We conducted an initial assessment of deer density in the IM Comparison Area in 2013 using DNA based pellet group transects, however, that method failed to provide an estimate of deer abundance due to a low recapture rate and was not repeated. Traditional pellet group surveys in three survey areas in the treatment area showed no trend in deer abundance (Figs. 2-4). No traditional pellet group surveys were conducted in the non-treatment area.

Aerial alpine survey results indicated that deer abundance increased in both the treatment and non-treatment areas (Figs. 5 and 6). The increase in the treatment area primarily resulted from a strong increase in numbers of small (i.e. young) bucks (Fig. 7). There is very little true alpine habitat (>2,500 feet elevation) in the non-treatment area, so habitat included in the survey of that area was largely sub-alpine muskeg (2,000-2,500 feet elevation) rather than true alpine (>2,500 feet elevation). The lower elevation survey area had a higher proportion of does and fawns than the higher elevation survey area of the treatment area, so comparisons of composition may not be valid.

Estimated hunter harvest in Unit 3 as a whole, and within both the IM treatment and non-treatment areas, increased from 2013 to 2015 (Tables 3, 4, and 5).

Date(s) of most recent age and sex composition survey (if statistical variation available, describe method here and show result in Table 1): No composition surveys were conducted in the Unit, but numbers of small bucks observed in aerial alpine deer surveys increased significantly in the treatment area (Fig. 7). Data were insufficient to determine if numbers of small bucks also increased in the non-treatment area. Numbers of does, fawns, and unknown deer also appeared to increase in both the treatment and non-treatment areas, but trends were not

statistically significant.

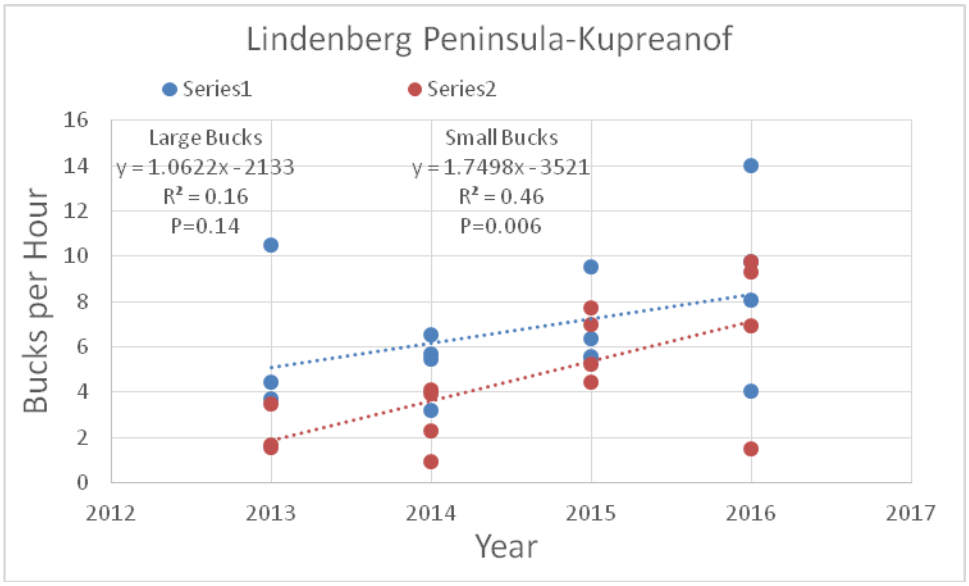

Figure 7. Trends in numbers of large bucks and small bucks observed per hour in Lindenberg Peninsula (treatment area) aerial alpine survey area, 2013-2016. Significantly increasing trend in numbers of small bucks is apparent.

Compared to IM area, was a similar composition trend and magnitude of difference in composition observed in nearby non-treatment area(s) since program inception and in the last year? N/A **Describe comparison if necessary:** No comparison was possible because of limitations in the aerial alpine survey data for the non-treatment area.

Deer abundance, age and sex composition in assessment area (L) since program implementation in year 1 to reauthorization review in year RY 2019 **in a portion of Unit 3. Regulatory year is 1 July to 30 June (e.g, RY 2010 is 1 July 2010 to 30 June 2011).**

Traditional pellet group transects have been conducted annually within portions of the proposed IM Treatment Area. Unlike the alpine deer surveys and estimated hunter harvest, which indicate increasing deer abundance in 2014 and 2015, pellet group densities derived from traditional pellet group surveys have remained relatively stagnant at low levels (Figures 2-6). Traditional pellet groups surveys do not appear to be useful in detecting relatively short-term trends in deer populations.

We experimented with a relatively new DNA-based mark recapture technique to determine deer abundance in a small part of the treatment area (Duncan Canal) in 2013 and 2014. Both attempts failed to produce an estimate, and the method was not repeated in 2015. We tried the technique again in 2016 in the Woodpecker Creek drainage of Mitkof Island (treatment area), but the results were not available for inclusion in this report. This technique of monitoring deer abundance also requires several weeks of fieldwork and only estimates abundance in a small area, in this case <5% of the treatment area. Consequently, findings may not reflect trends in

portions of the treatment area with differing aspects, elevations, and habitat compositions. We conclude that the DNA-based mark recapture technique to determine deer abundance is not well suited to this application.

We began developing a new technique to estimate deer abundance and trend using aerial surveys of alpine areas in 2013. After two years of testing (2013 and 2014), we fully implemented the technique in several areas of Game Management Units 2, 3, and 4 in 2015 and 2016. The technique consisted of flying a repeated two-hour survey of alpine areas >2,500 feet elevation (or sub-alpine muskeg) with each survey ending approximately at sunset. We strived for four repetitions under similar weather and daylight conditions per survey area per year. We expressed abundance as deer seen per survey hour. During the aerial alpine surveys, deer were classified as large bucks, small bucks, does, fawns, or unknown.

The alpine survey technique appears more useful for monitoring changes in deer abundance across the landscape than traditional deer pellet transects or DNA-based density estimates. There have been three consecutive mild winters in Unit 3, and so far, deer seen per hour in alpine surveys appears to track changes in deer harvest and qualitative observations of department staff and the public. At least in the Lindenberg Peninsula survey area, this technique appeared to indicate a significantly increasing trend in numbers of small bucks (Fig. 7). We do not yet know if trends seen in alpine surveys reflect trends in the larger deer population, but hunter harvest suggests they do.

Describe trend in abundance or composition: Based on results of the aerial alpine deer surveys and analyses of hunter harvest for 2013-2016, it appears that deer numbers are increasing in both the treatment and non-treatment areas of Unit 3. In the Kupreanof Island aerial alpine survey unit there was a stronger increasing trend in the numbers of small bucks than large bucks (Fig. 7). Harvest data also indicate a general increase in deer numbers throughout Unit 3 (islands) and adjacent Unit 1B (mainland) during the three mild winters of 2013-14 through 2015-16.

Estimated deer harvest in assessment area (M). Methods for estimating unreported harvest are described in Survey and Inventory reports.

Table 1. Unitwide (GMU 3) Deer Harvest Estimates

Period	RY	Estimated harvest		Estimated		Total harvest	Other mortality[a]	Total
		Male	Female[b]	Unreported	Illegal[c]			
Year 1	2013	459	0	NA	NA	459	-	459
Year 2	2014	503	0	NA	NA	503	-	503
Year 3	2015	724	0	NA	NA	724	-	724
Year 4	2016	Estimate not yet available						

[a]Some deer mortality occurs as a result of vehicle collisions or other causes unrelated to hunting, however, such instances are not well reported to the department.
[b]Deer harvest in Unit 3 is restricted to bucks only.
[c]Poaching of deer undoubtedly occurs in the Unit, however, the extent of which is unknown.

Table 2. Proposed IM Treatment Area Deer Harvest Estimates

Period	RY	Estimated harvest		Estimated		Total harvest	Other mortality[a]	Total
		Male	Female[b]	Unreported	Illegal[c]			
Year 1	2013	54	0	NA	NA	54	-	54
Year 2	2014	61	0	NA	NA	61	-	61
Year 3	2015	128	0	NA	NA	128	-	128
Year 4	2016	Estimates not yet available						

[a]Some deer mortality occurs as a result of vehicle collisions or other causes of unrelated to hunting, however, such instances are not well reported to the department.
[b]Deer harvest in Unit 3 is restricted to bucks only.
[c]Poaching of deer undoubtedly occurs in the Unit, however, the extent of which is unknown.

Table 3. Proposed IM Comparison Area Deer Harvest Estimates

Period	RY	Estimated harvest		Estimated		Total harvest	Other mortality[a]	Total
		Male	Female[b]	Unreported	Illegal[c]			
Year 1	2013	7	0	NA	NA	7	-	7
Year 2	2014	10	0	NA	NA	10	-	10
Year 3	2015	20	0	NA	NA	20	-	20
Year 4	2016	Estimates not yet available						

[a]Some deer mortality occurs as a result of vehicle collisions or other causes unrelated to hunting, however, such instances are not well reported to the department.
[b]Deer harvest in Unit 3 is restricted to bucks only.
[c]Poaching of deer undoubtedly occurs in the Unit, however, the extent of which is unknown.

Describe trend in harvest: The estimated deer harvest in Unit 3 (Figure 4), including harvest within both the treatment area (Figure 5) and the comparison area (Figure 6) all show an increasing trend in 2014 and 2015. Although the increase was minor from 2013 to 2014, the estimated harvest increased dramatically from 2014 to 2015. While deer harvest estimates are not currently available for the 2016 season, anecdotal reports from hunters suggest that the unitwide harvest is likely to further increase in 2016.

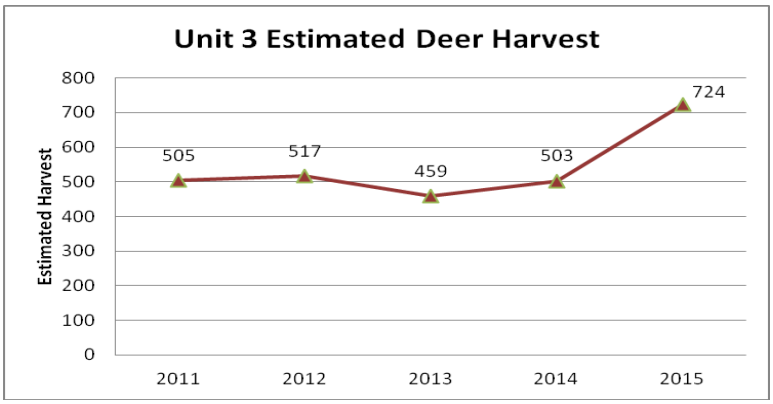

Figure 8. Estimated Unit 3 deer harvest (2011–2015).

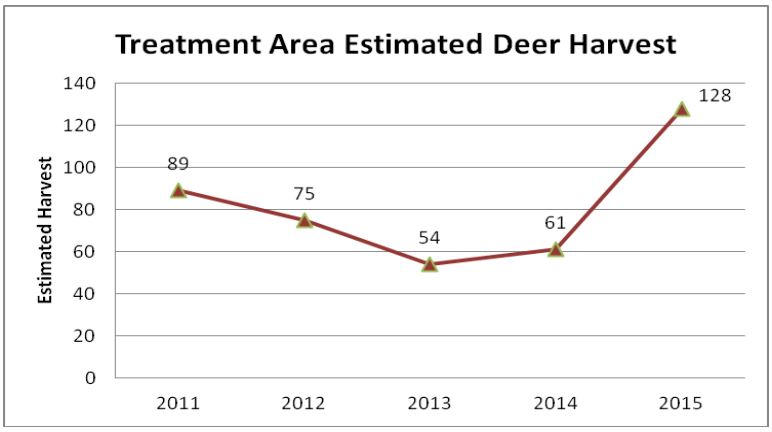

Figure 9. Estimated deer harvest within IM treatment area (2011–2015).

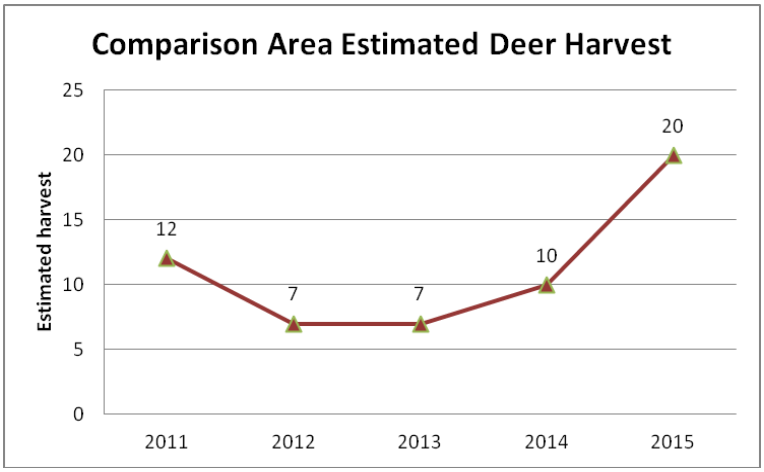

Figure 10. Estimate deer harvest within IM comparison area (2011–2015).

Describe any other harvest related trend if appropriate: Hunters in the Tonka road system of the Lindenberg Peninsula reported seeing relatively high numbers of small bucks, similar to our observations from the Lindenberg alpine deer surveys**.**

Deer Hunter Catch Per Unit Effort: In conjunction with increases in the Unit 3 deer harvest estimates observed in 2014 and 2015, we saw a corresponding increase in deer hunter catch per unit effort (CPUE) in Unit 3 and within the IM project area. The estimated number of days of effort required to harvest a deer in Unit 3 decreased from 2013 to 2014 and decreased again from 2014 to 2015 (Figure 7). Similar increases in CPUE were observed within both the IM treatment and comparison areas (Figures 8 and 9). The apparent upward trend of deer populations in both the treatment and comparison areas suggests changes are related to mild winters.

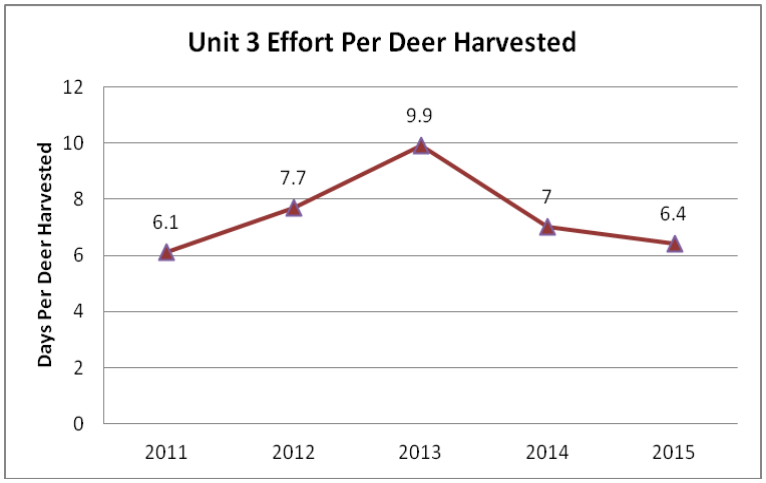

Figure 7. Average days of effort per harvested deer in Unit 3 (2011–2015).

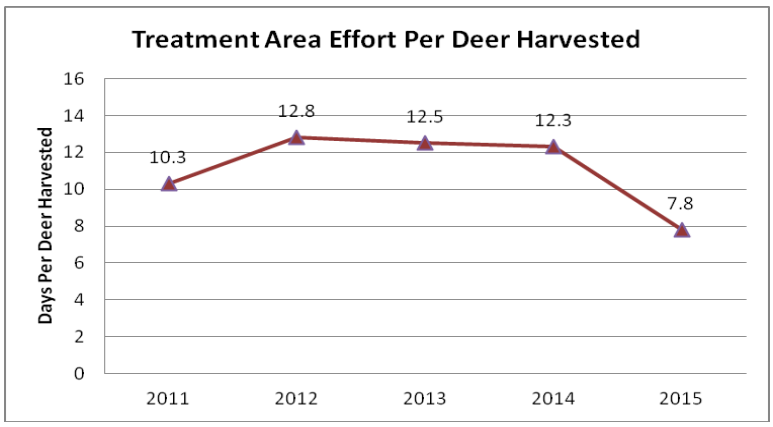

Figure 8. Average days of effort per harvested deer within IM treatment area (2011–2015).

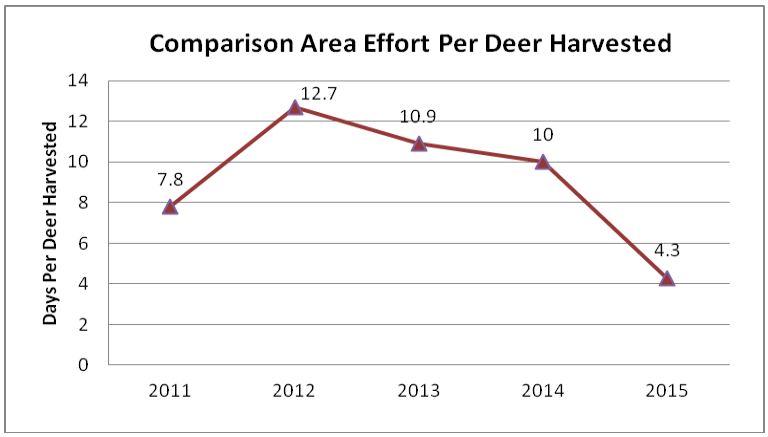

Figure 9. Average days of effort per harvested deer within IM comparison area (2011–2015).

Deer Hunter Success Rates: As with increases in both the unit-wide harvest and CPUE estimates, we observed corresponding increases in deer hunter success rates within Unit 3 as a

whole, and within the IM Treatment and Comparison areas.

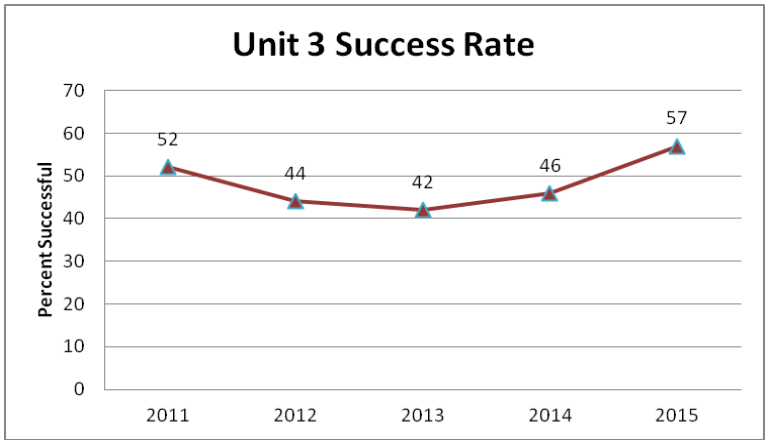

Figure 10. Deer hunter success rate in Unit 3 (2011–2015).

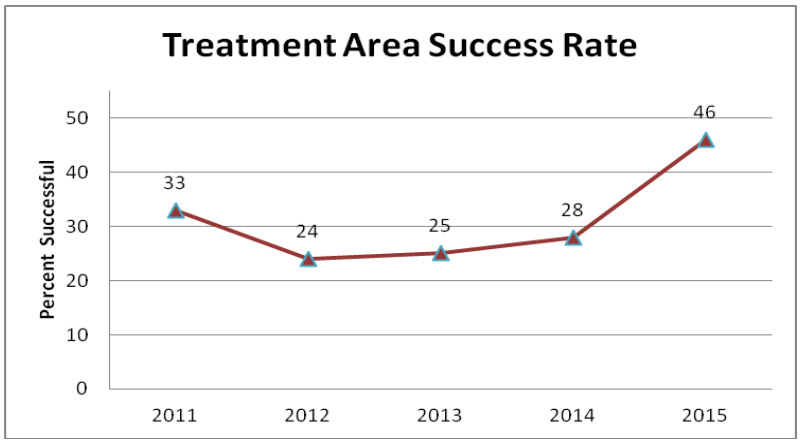

Figure 11, Deer hunter success rate within IM treatment area (2011–2015).

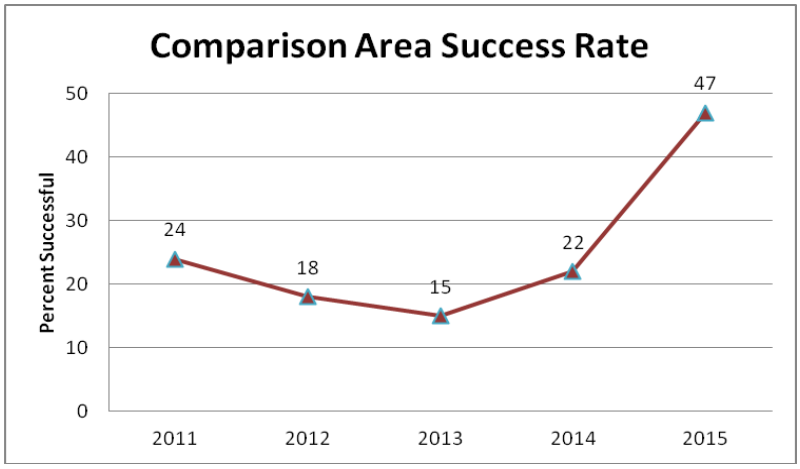

Figure 12, Deer hunter success rate within IM comparison area (2011–2015).

3) Predator data

Date(s) and method of most recent spring abundance assessment for wolves (if statistical variation available, describe method here and list in Table 2): No spring abundance surveys have been conducted for wolves in Unit 3 or within the IM area.

Date(s) and method of most recent fall abundance assessment for wolves (if statistical variation available, describe method here and list in Table 2): No fall abundance surveys have been conducted for wolves in Unit 3 or within the IM area.

Other research or evidence of trend or abundance status in wolves: Despite the Unit 3 predator control program being inactive, we observed record high wolf harvests by the public in 2011 and 2013 (Figure 13). Those exceptionally high harvests are likely the result of one or more of the following factors: 1) high wolf abundance in the unit, 2) weather conditions favorable to wolf trapping, 3) recent regulatory changes intended to increase wolf harvest opportunity in the Unit (e.g. 1-month extension of the wolf hunting season, and elimination of the nonresident locking-tag fee for wolves in the Unit, and 3) public interest in assisting efforts to rebuild the Unit 3 deer population.

While the department has yet to engage in state sponsored wolf reduction efforts, we have nonetheless been encouraging public trappers to increase their wolf harvest efforts. In addition to soliciting increased public participation, the Petersburg Area office has been assisting wolf trappers by providing trap bait whenever possible. We collect and hold butcher scraps from hunter harvested moose and deer (heads, bones, trimmings, etc.) and make them available to wolf trappers. We also make available for use as wolf trapping bait the carcasses of road-killed deer that are so badly damage or tainted as to be unfit for human consumption.

While no attempted has yet been made to assess wolf numbers in any portion of Unit 3, it is possible that the exceptionally high wolf harvests documented in Unit 3 from 2011–2013, followed by a decline in wolf harvest during 2014 and 2015 may signify a reduction in wolf abundance.

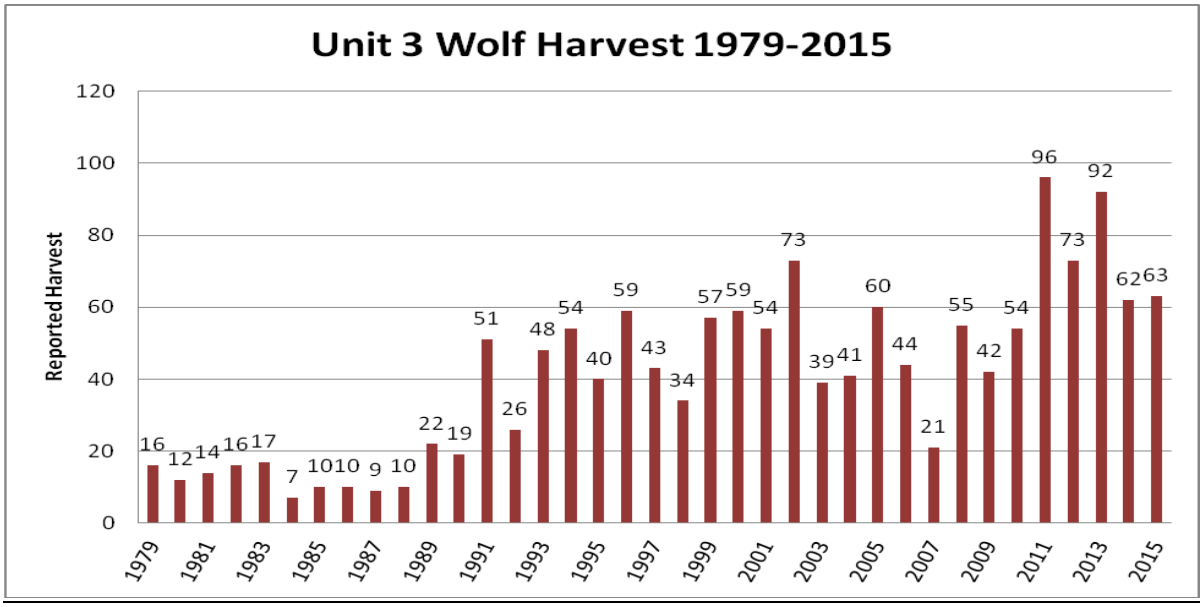

Figure 13. Unit 3 wolf harvest, regulatory years 1979–2015.

Wolf abundance objectives and removal in wolf assessment area (N) of the Unit 3 IM Area. **Removal objective is** 80 % **of pre-control fall abundance in year 1 of wolf predation control program, so estimated or confirmed number remaining by spring each RY in the wolf assessment area (N) must be** at least 11 wolves remaining**. If non-lethal predation control methods used by Department personnel, clarify with footnote in control removal tally.**

Table 4. Wolf Removal from proposed IM Treatment Area

Period	RY	Fall abundance (variation) in area N	Harvest removal from area N		Dept. control removal from area O	Public control removal from area O	Total removal[a] from area N	Spring abundance (variation) in area N
			Trap	Hunt				
Year 1	2013	-	11	5	0	16	16	-
Year 2	2014	-	12	3	0	15	15	-
Year 3	2015	-	8	0	0	8	8	-

[a] We believe some level of illegal and/or unreported wolf harvest is occurring in the Unit, however, the extent of which remains unknown.

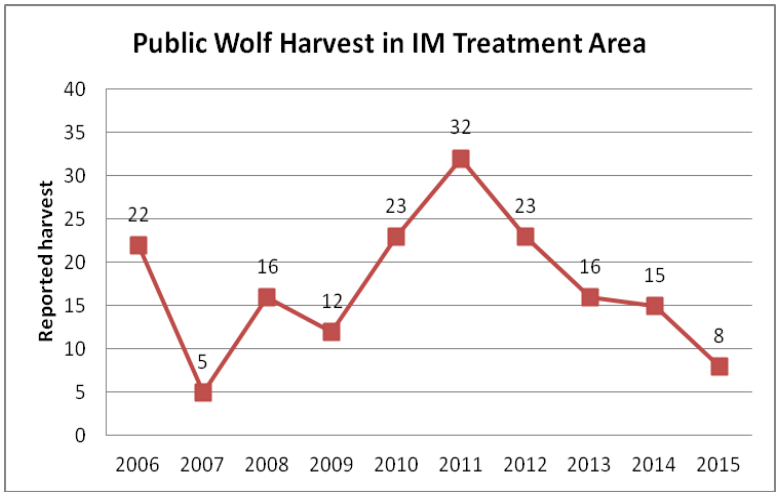

Figure 14. Public wolf harvest within IM treatment area (2006–2015).

Table 5. Wolf Removal from proposed IM Comparison Area (2013–2015).

Period	RY	Fall abundance (variation) in area N	Harvest removal from area N		Dept. control removal from area O	Public control removal from area O	Total removal[a] from area N	Spring abundance (variation) in area N
			Trap	Hunt				
Year 1	2013	-	11	0	0	11	11	-
Year 2	2014	-	10	1	0	11	11	-
Year 3	2015	-	6	3	0	9	9	-

[a] We believe some level of illegal and/or unreported wolf harvest occurs in the Unit, however, the extent of which remains unknown.

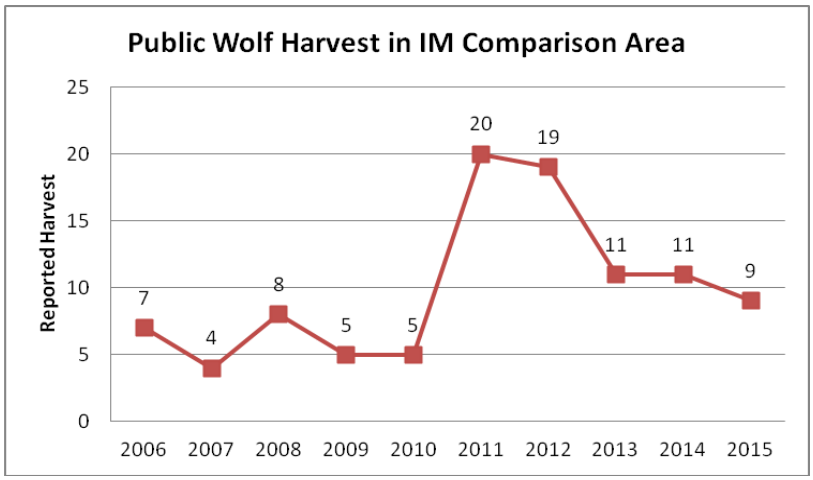

Figure 15. Wolf harvest within IM comparison area (2006–2015).

Date(s) and method of most recent spring abundance assessment for black or brown bears

(if statistical variation available, describe method here and list in Table 3. The current operational plan and considered predator control technique (hired trappers) is specific to wolves, and does not target black bears or brown bears for population reduction. Therefore, no attempt was made to evaluate black bear or brown bear abundance within the Unit 3 IM area.

Date(s) and method of most recent fall abundance assessment for black or brown bears (if statistical variation available, describe method here and list in Table 3): No attempt was made to evaluate black bear or brown bear abundance within the Unit 3 IM area.

The Department has not established abundance or removal objectives for black or brown bears in the assessment area (N) of Unit 3.

4) Habitat data and nutritional condition of prey species

Where active habitat enhancement is occurring or was recommended in the Operational Plan, describe progress toward objectives: No deer habitat enhancement activities or attempts to evaluate deer nutritional condition were proposed in the current IM operational plan.

Preliminary browse assessment and protocol development: In late-March and early-April 2014 staff initiated a pilot study designed to test a low cost and efficient methodology for assessing the quantity of key deer overwinter forage plants, and their utilization, to aid in the assessment of deer carrying capacity in portions of Unit 3. The main question to be investigated was whether or not the existing overwinter range in a portion of the IM Treatment Area could support more deer.

While this initial effort focused in large part on developing an efficient method to determine the density, condition, and overwinter utilization of key deer browse species, it also provided initial insights into the current condition of deer winter range in a very small portion of the IM treatment area. While the number of plots samples was small, the preliminary results indicate that browsing is more intense on Lindenberg Peninsula than on Mitkof Island. On Mitkof Island deer appear to be far enough below the carrying capacity of the existing habitat that nutrition is not believed to be a major factor in the recent population decline and slow recovery. The Lindenberg Peninsula on Kupreanof Island exhibited higher browsing intensity with a higher proportion of decadent shrubs, 24%, versus 16% on Mitkof and only 4% on Gravina Island in Unit 1A. Within Unit 3 moose are thought to be most abundant on Kupreanof Island where they likely compete with deer for winter forage.

Habitat enhancement

The Unit 3 landscape has been considerably altered by decades of forest management, which continues to reduce carrying capacity for deer, particularly during severe winters. The recent decline in the deer population occurred across areas with and without histories of logging suggesting that the decline was most likely related to severe winters from 2006 – 2009 exacerbated in logged areas by a decline in availability of quality winter habitat. Predation by wolves and competition with a sympatric moose population may have also played roles. Nonetheless, anecdotal evidence suggests deer are currently below carrying capacity of the

existing habitat for normal winters. That the deer population appears to have rebounded during three consecutive mild winters supports that conclusion.

While generally considered a silviculture prescription, precommercial thinning of the dense second-growth stands resulting from clear-cut logging can temporarily increase forage production, delay eventual canopy closure and stem exclusion, and accelerate forest succession to an old growth forest condition. As such, precommercial thinning provides the only real opportunity to improve habitat conditions for deer. While precommercial thinning of dense second-growth stands can provide some benefit to deer for a 5-25 year period following treatment, such treatments provide little benefit to deer in the near-term. Furthermore, most of the unit is comprised of Federal lands (National Forest) and it is not within the State's authority to undertake such activities. Even if habitat enhancement were feasible, we would not expect such efforts to significantly improve deer numbers in the near-term. No habitat enhancement efforts are being considered.

Describe any substantial change in habitat not caused by active program: Extensive forest management activities (both recent and historical) have occurred within the IM project area, including extensive clearcut and partial/selective harvest of old growth forest stands, related road construction activities, and precommercial thinning of young second-growth stands have occurred within the proposed IM treatment area.

Nutritional indicators for deer **in assessment area (L) of Unit 3**.

Where objectives on nutritional condition were listed in the Operational Plan, describe trend in condition indices since inception of (a) habitat enhancement or (b) enhanced harvest: No habitat enhancement activities or attempts to evaluate deer nutritional condition were proposed as a part of the current IM operational plan.

5) Costs specific to implementing Intensive Management

Cost ($1000 = 1.0) of agency salary based on estimate of proportional time of field level staff and cost of operations for intensive management activities (e.g., predator control or habitat enhancement beyond normal Survey and Inventory work) performed by personnel in the Department or contractors in the Unit 3 IM Area. **Fiscal year (FY) is also 1 July to 30 June but the year is one greater than the comparable RY (e.g, FY 2010 is 1 July 2009 to 30 June 2010).**

Table 6. Costs of the Unit 3 IM Project

Period	FY	Predation control[a]		Other IM activities		Total IM cost	Research cost[d]
		Time[b]	Cost[c]	Time	Cost		
Year 1	2013	-	-	-	-	-	Alpine Srvy 6.5 K DNA pellet 22.1 K Pellet trans 12.9 K
Year 2	2014	-	-	-	-	-	Alpine Srvy 9.6 K Veg Survey 9.0K DNA pellet 64.8 K

							Pellet trans 9.0 K
Year 3	2015	-	-	-	-	-	Alpine 16 .0 K Pellet Trans 11.0 K Camera traps 4.5
Year 4	2016	-	-	-	-	-	DNA pellet 58.0 K Pellet trans 11.0 K Alpine Srvy 30.4 K Snow Stakes 2.3 K Wolf hair snagging - experiment 24.1 K

[a]State or private funds only.
[b]Person-months (22 days per month)
[c]Salary plus operations
[d]Separate from implementing IM program but beneficial for understanding of ecological or human response to management treatment (scientific approach that is not unique to IM).

6) Department recommendations[2] for annual evaluation 1 February, 2018 following Year 4 for a portion of Unit 3.

Has progress toward defined criteria been achieved? Yes. Deer numbers appear to be increasing (deer seen per hour in alpine surveys and harvest), and harvest will likely approaching or exceed the IM objective in RY 2016.

Has achievement of success criteria occurred? Not as of the time of this report.

Recommendation for IM practice(s)

Refine techniques for measuring changes in deer abundance:

Continue and expand alpine deer surveys in 2017 and 2018.

Efforts to assess the quantity of key deer overwinter forage, and its utilization, as a means of assessing of deer carrying capacity:

Deer numbers in Unit 3 in general, and in the treatment area in particular, are relatively low compared with other areas of similar habitat in Southeast Alaska. However, over the last 25 years moose have colonized most of Unit 3 and the population currently supports harvest of over 100 bulls. Competition between moose and deer was not considered in the feasibility assessment or operational plan. We recommend developing a "quick cruise" winter browse survey technique to investigate whether availability of winter forage may limit deer.

Employ methods to assess wolf abundance within the IM Project area:

We recommend evaluating the type of information needed and using the technique most likely to efficiently produce that information. Methods to consider include the DNA-based mark-recapture technique and/or developing an index to wolf abundance based on

[2] Prior sections include primarily objective information from field surveys; Sections 6 and 7 involve professional judgment by area biologists to interpret the context of prior information for the species in the management area.

wolf scats detected per mile of logging road. We will also continue to cooperate with trappers and hunters and gather observations of numbers and colors of wolves.

Actively engage in wolf control efforts:

Continue encouraging trappers to take wolves and helping trappers with information about location of wolf packs and providing bait from road killed deer and moose.

Plans for 2017 Field Season:

- Discontinue DNA-based deer density estimation efforts and prepare a final report.
- Continue Alpine Deer Aerial Surveys of Kupreanof Island, and incorporate alpine areas on Mitkof Island, Etolin Island, and mainland Unit 1B.
- Develop, and if possible, implement a quick-cruise method for assessing deer browse conditions on Mitkof Island and Lindenberg Peninsula.
- Conduct Traditional Pellet-group surveys on Mitkof and Lindenberg Peninsula.
- Develop and implement a protocol to obtain wolf population estimates for Mitkof Island and Lindenberg Peninsula and develop an index to wolf abundance based on scats per mile of logging road.
- Continue to closely monitor deer harvest estimates for Unit 3, the IM Treatment and Comparison Areas.