

Togiak and Twin Hills Ice Seal Harvest Report
2007 to 2011 Summary

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Report approved by the
Ice Seal Committee
19 January 2012

Background

The Alaska Native Harbor Seal Commission and the Alaska Department of Fish and Game have worked with the Bristol Bay Native Association to survey the subsistence harvest of harbor seals and sea lions in Togiak since 1992. In 2007 bearded, ringed, and ribbon seals or the “ice seals” were added to the survey. Funding for the harbor seal and sea lion part of the survey was discontinued in 2009. The ADF&G Arctic Marine Mammal Program and the Ice Seal Committee funded the surveys for 2010 and 2011. This report summarizes harvest in Togiak and Twin Hills from 1992 to 2011.

Survey methods

The retrospective surveys in Bristol Bay were conducted with methods outlined by Wolfe and Mishler (1993). The tables presented in this report summarize the data collected during this project. Special thanks to Elizabeth Myas for conducting the surveys in Togiak and Twin Hills for all of the surveys that included ice seals.

Tradition Knowledge

During the 2009 survey a TEK questionnaire was included as part of the survey. The majority of respondents expressed that the climate is rapidly changing. We also found that some folks felt the seal populations were decreasing and others thought there was no change. To get a better idea of what is going on with the changing seal populations and low ice seal harvest numbers we are proposing to do a more in depth TEK interview with selected households.

Literature Cited

Wolfe RJ, Mishler C (1993) The Subsistence Harvest of Harbor Seal and Sea Lion by Alaska Natives in 1992. State of Alaska, Department of Fish and Game, Division of Subsistence, Juneau, Alaska. Technical Paper No. 229

Table 64. BEARDED SEAL AND RINGED SEAL HARVEST: Togiak, 2008

<i>SAMPLING DESIGN:</i>		<u>Active</u>	<u>Other</u>	<u>Total</u>
<i>TWO-STRATA</i>				
	Total Native Households:	28	140	168
	Surveyed Households:	21	118	139
	Sampling Fraction	75.0%	84.3%	82.7%
	Sample Household Members	106	469	575
	Estimated Household Members	141.3	556.4	697.8
	2000 U.S. Census Estimated Native Population	---	---	750

HARVEST AND USE INFORMATION

<i>Percentage of Native Households:</i>			<i>Estimated Community Harvest and Take (Expanded):</i>		
	Bearded Seal	Ringed Seal		Bearded Seal	Ringed Seal
Used	2.9%	4.2%	Total Number Harvested	2.5	5.9
Hunted	2.9%	2.8%	Total Number Struck and Lost	1.2	0.0
Harvested	1.5%	2.8%	Total Number Taken	3.7	5.9
Received	1.4%	2.1%			
Gave Away	1.5%	2.8%	Number Harvested Per Capita	0.00	0.01

BEARDED SEAL HARVEST BY MONTH													Unknown Month	Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Struck & Lost	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total Take	0	0	0	0	0	0	0	0	1	2	0	0	0	3
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	2.5
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	1.2
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.5	0.0	0.0	0.0	3.7
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0		2.5
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0		1.2
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.5	0.0	0.0		3.7
Total Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	32.0%	68.0%	0.0%	0.0%		100.0%
Cum. Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	3.7	3.7	3.7		
Cum. Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	32.0%	100.0%	100.0%	100.0%		

RINGED SEAL HARVEST BY MONTH													Unknown Month	Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	1	0	0	0	1	1	2	0	0	5
Struck & Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Take	0	0	0	0	1	0	0	0	1	1	2	0	0	5
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.2	1.2	2.4	0.0	0.0	5.9
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.2	1.2	2.4	0.0	0.0	5.9
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.2	1.2	2.4	0.0		5.9
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Take	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.2	1.2	2.4	0.0		5.9
Total Take (%)	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	20.0%	20.0%	40.0%	0.0%		100.0%
Cum. Take	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.2	2.4	3.6	5.9	5.9		
Cum. Take (%)	0.0%	0.0%	0.0%	0.0%	20.0%	20.0%	20.0%	20.0%	40.0%	60.0%	100.0%	100.0%		

SOURCE: BBNA Household Surveys, 2009.

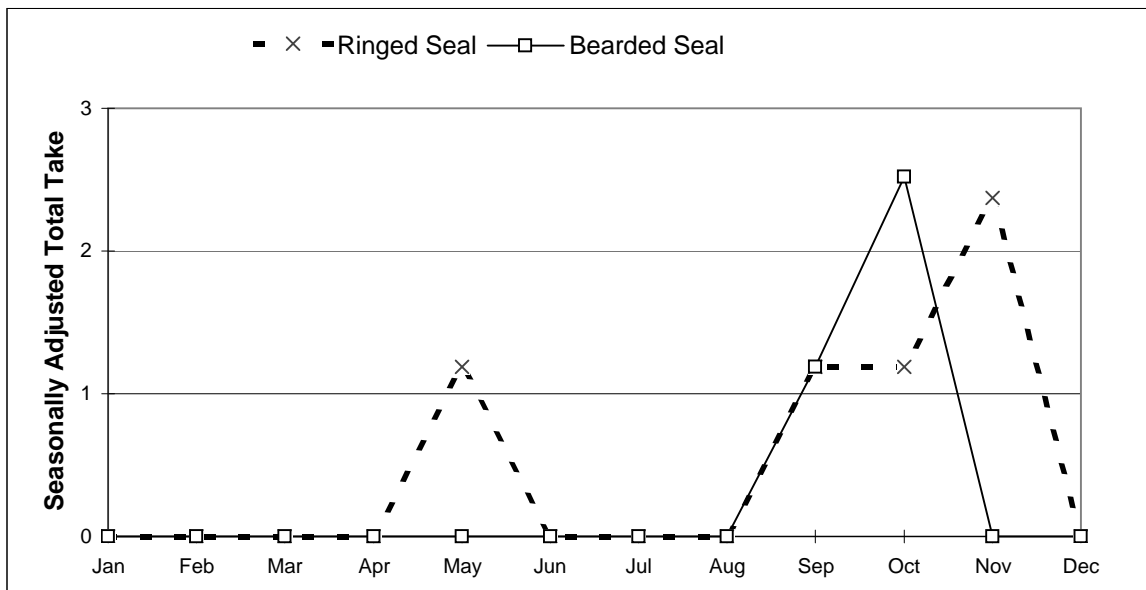
Table 64. (cont.) BEARDED SEAL AND RINGED SEAL HARVEST: Togiak, 2008

HARVEST BY AGE AND SEX

	Bearded Seal				Ringed Seal			
	Reported by Sample		Community Est. (Expanded)		Reported by Sample		Community Est. (Expanded)	
	Number	%	Number	%	Number	%	Number	%
Adult Male	2	100.0%	2.5	100.0%	1	20.0%	1.2	20.0%
Adult Female	0	0.0%	0.0	0.0%	1	20.0%	1.2	20.0%
Adult Unknown Sex	0	0.0%	0.0	0.0%	1	20.0%	1.2	20.0%
Juvenile Male	0	0.0%	0.0	0.0%	0	0.0%	0.0	0.0%
Juvenile Female	0	0.0%	0.0	0.0%	0	0.0%	0.0	0.0%
Juvenile Unknown Sex	0	0.0%	0.0	0.0%	0	0.0%	0.0	0.0%
Pup Male	0	0.0%	0.0	0.0%	0	0.0%	0.0	0.0%
Pup Female	0	0.0%	0.0	0.0%	0	0.0%	0.0	0.0%
Pup Unknown Sex	0	0.0%	0.0	0.0%	1	20.0%	1.2	20.0%
Male Unknown Age	0	0.0%	0.0	0.0%	0	0.0%	0.0	0.0%
Female Unknown Age	0	0.0%	0.0	0.0%	0	0.0%	0.0	0.0%
Unknown Sex and Age	0	0.0%	0.0	0.0%	1	20.0%	1.2	20.0%
Total	2	100.0%	2.5	100.0%	5	100.0%	5.9	100.0%

* Harvest in unknown months is not included in the sample harvest, but is included in the community estimate column.

SEASONALLY ADJUSTED TAKE BY MONTH, BEARDED SEAL AND RINGED SEAL



ESTIMATED COMMUNITY HARVEST, STRUCK AND LOST, AND TAKE BY YEAR

BEARDED SEAL				RINGED SEAL			
Year	Harvest	Struck/Lost	Total Take	Year	Harvest	Struck/Lost	Total Take
2007	1.1	0.0	1.1	2007	2.2	0.0	2.2
2008	2.5	1.2	3.7	2008	5.9	0.0	5.9

SOURCE: BBNA Household Surveys, 2009.

Table 65. BEARDED SEAL AND RINGED SEAL HARVEST: Twin Hills, 2008

SAMPLING DESIGN:		<u>Total</u>
CENSUS	Total Native Households	22
	Surveyed Households	20
	Sampling Fraction	90.9%
	Sample Household Members	58
	Estimated Household Members	63.8
	2000 U.S. Census Estimated Native Population	65

HARVEST AND USE INFORMATION

Percentage of Sample Households:			Estimated Community Harvest and Take (Expanded):		
	Bearded Seal	Ringed Seal		Bearded Seal	Ringed Seal
Used	0.0%	0.0%	Total Number Harvested	0.0	0.0
Hunted	0.0%	0.0%	Total Number Struck and Lost	0.0	0.0
Harvested	0.0%	0.0%	Total Number Taken	0.0	0.0
Received	0.0%	0.0%			
Gave Away	0.0%	0.0%	Number Harvested Per Capita	0.00	0.00

BEARDED SEAL HARVEST BY MONTH													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Struck & Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Take	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take (%)	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cum. Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum. Take (%)	---	---	---	---	---	---	---	---	---	---	---	---	---	---

RINGED SEAL HARVEST BY MONTH													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Struck & Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Take	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take (%)	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cum. Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum. Take (%)	---	---	---	---	---	---	---	---	---	---	---	---	---	---

SOURCE: BBNA Household Surveys, 2009.

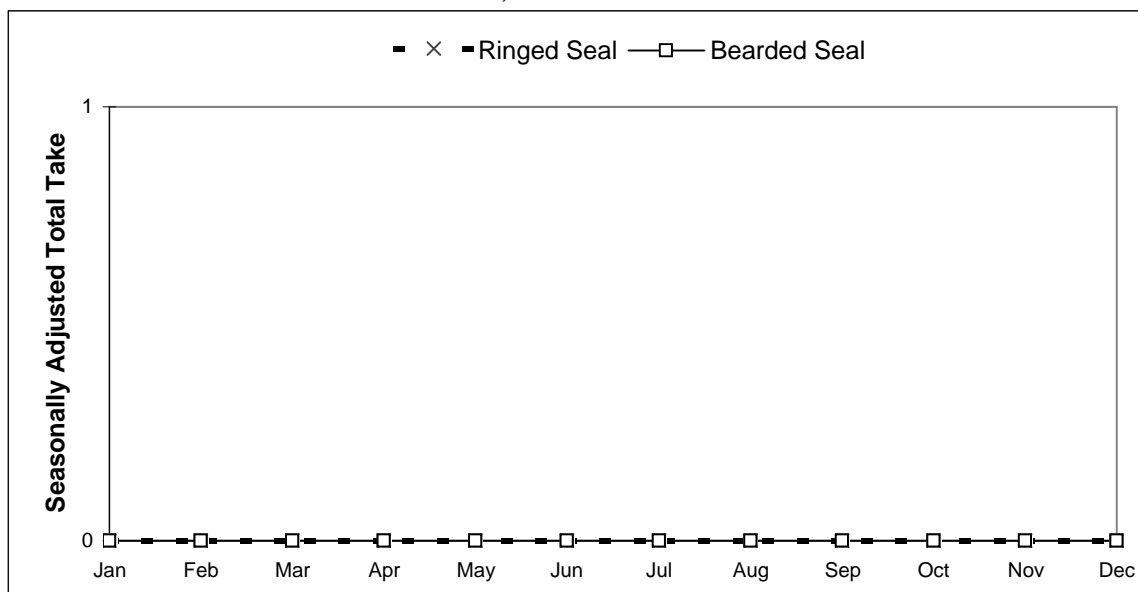
Table 65. (cont.) BEARDED SEAL AND RINGED SEAL HARVEST: Twin Hills, 2008

HARVEST BY AGE AND SEX

	Bearded Seal				Ringed Seal			
	Reported by Sample		Community Est. (Expanded)		Reported by Sample		Community Est. (Expanded)	
	Number	%	Number	%	Number	%	Number	%
Adult Male	0	---	0.0	---	0	---	0.0	---
Adult Female	0	---	0.0	---	0	---	0.0	---
Adult Unknown Sex	0	---	0.0	---	0	---	0.0	---
Juvenile Male	0	---	0.0	---	0	---	0.0	---
Juvenile Female	0	---	0.0	---	0	---	0.0	---
Juvenile Unknown Sex	0	---	0.0	---	0	---	0.0	---
Pup Male	0	---	0.0	---	0	---	0.0	---
Pup Female	0	---	0.0	---	0	---	0.0	---
Pup Unknown Sex	0	---	0.0	---	0	---	0.0	---
Male Unknown Age	0	---	0.0	---	0	---	0.0	---
Female Unknown Age	0	---	0.0	---	0	---	0.0	---
Unknown Sex and Age	0	---	0.0	---	0	---	0.0	---
Total	0	---	0.0	---	0	---	0.0	---

* Harvest in unknown months is not included in the sample harvest, but is included in the community estimate column.

SEASONALLY ADJUSTED TAKE BY MONTH, BEARDED SEAL AND RINGED SEAL



ESTIMATED COMMUNITY HARVEST, STRUCK AND LOST, AND TAKE BY YEAR

BEARDED SEAL				RINGED SEAL			
Year	Harvest	Struck/ Lost	Total Take	Year	Harvest	Struck/ Lost	Total Take
2007	0.0	0.0	0.0	2007	0.0	0.0	0.0
2008	0.0	0.0	0.0	2008	0.0	0.0	0.0

SOURCE: BBNA Household Surveys, 2009.

Ice seal and harbor seal harvest in Togiak 2009.

Total Native Households	174
Surveyed Households	151
Sampling Fraction	87%
Sample Household Members	610
Estimated Household Memebers	701
2000 U.S. Census Estimated Native Population	750

Spotted and Harbor Seals (harbor seals Jun-Sep)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
Reported harvest and take (Unexpanded)														
Harvest	3	7	6	4	9	0	0	4	3	24	31	8	0	99
Struck but Lost	1	1	0	2	1	0	0	0	0	8	8	0	0	21
Take	4	8	6	6	10	0	0	4	3	32	39	8	0	120
Estimated harvest and take (Expanded)														
Harvest	3	8	7	5	10	0	0	5	3	28	36	9	0	114
Struck but Lost	1	1	0	2	1	0	0	0	0	9	9	0	0	24
Take	5	9	7	7	11	0	0	5	3	37	45	9	0	138

Are spotted seal/harbor seal populations changing?

4% of households said they are increasing, 27% said decreasing, and 34% said no change while 36% did not observe.

Rigned Seals														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
Reported harvest and take (Unexpanded)														
Harvest	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Struck but Lost	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Take	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Estimated harvest and take (Expanded)														
Harvest	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Struck but Lost	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Take	0	0	0	0	0	0	0	0	0	0	1	0	0	1

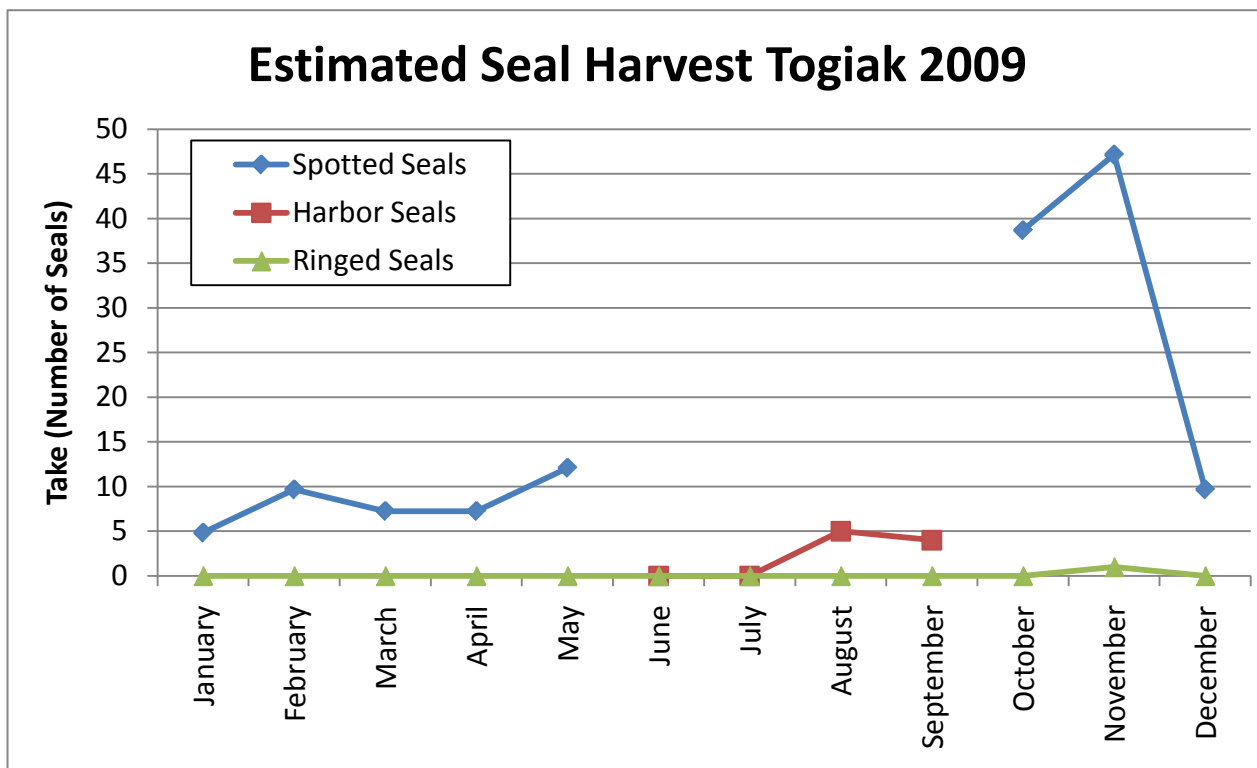
Are ringed seal populations changing?

Both households said they were decreasing.

Bearded Seals- No Recorded Harvest

Ribbon Seals- No Recorded Harvest

Ice seal and harbor seal harvest in Togiak 2009. (continued)



Expanded Take of seals by year.

Spotted seals year take	Harbor Seal year take	Ringed seals year take	Bearded Seal year take
1992 304	1992 26.3	1992	1992
1993 224	1993 40.7	1993	1993
1994 194	1994 0	1994	1994
1995 116	1995 3.3	1995	1995
1996 110	1996 3.9	1996	1996
1997 86.4	1997 6.7	1997	1997
1998 120	1998 15.5	1998	1998
2000 174	2000 6.3	2000	2000
2001 65.3	2001 5.3	2001	2001
2002 97.9	2002 17.4	2002	2002
2003 41.7	2003 22	2003	2003
2004 63.8	2004 16.8	2004	2004
2005 92.9	2005 10.6	2005	2005
2006 58.3	2006 11.5	2006	2006
2007 71.1	2007 10	2007 2.2	2007 1.1
2008 210	2008 60	2008 5.9	2008 3.7
2009 130	2009 8	2009 1	2009 0

Source: Alaska Department of Fish and Game Division of Subsistence Household Surveys 1992-1998, BBNA Household Surveys 2000-2009.

Ice seal and harbor seal harvest in Twin Hills 2009.

Total Native Households	17
Surveyed Households	13
Sampling Fraction	76%
Sample Household Members	28
Estimated Household Memembers	37
2000 U.S. Census Estimated Native Population	65

Spotted and Harbor Seals (harbor seals Jun-Sep)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
Reported harvest and take (Unexpanded)														
Harvest	0	0	0	2	0	0	0	0	0	1	1	0	0	4
Struck but Lost	0	0	0	2	0	0	0	0	0	0	2	0	0	4
Take	0	0	0	4	0	0	0	0	0	1	3	0	0	8
Estimated harvest and take (Expanded)														
Harvest	0	0	0	3	0	0	0	0	0	1	1	0	0	5
Struck but Lost	0	0	0	3	0	0	0	0	0	0	3	0	0	5
Take	0	0	0	5	0	0	0	0	0	1	4	0	0	11

Are spotted seal/harbor seal populations changing?

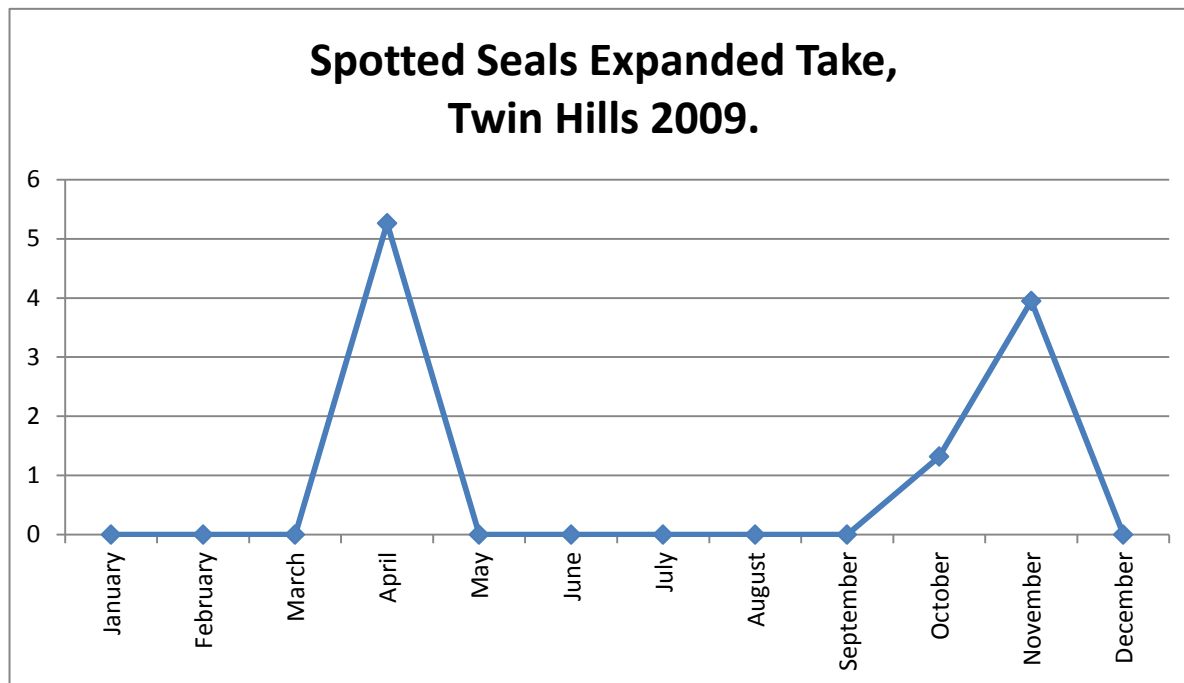
25% of households said decreasing, 38% said no change, and 38% did not observe.

Ringed Seals- No Harvest Recorded

Bearded Seals- No Harvest Recorded

Ribbon Seals- No Harvest Recorded

Ice seal and harbor seal harvest in Twin Hills 2009. (continued)



Expanded Take of seals by year.

Spotted seals year take	Harbor Seal year take	Ringed seals year take	Bearded Seal year take
1992	1992	1992	1992
1993	1993	1993	1993
1994	1994	1994	1994
1995	1995	1995	1995
1996 7.8	1996 29.8	1996	1996
1997 3.2	1997 10.5	1997	1997
1998 22.1	1998 4.4	1998	1998
2000 8.2	2000 1.6	2000	2000
2001 2.5	2001 0	2001	2001
2002 11.7	2002 3.3	2002	2002
2003 4.2	2003 7	2003	2003
2004 1.8	2004 8.8	2004	2004
2005 4.9	2005 2.5	2005	2005
2006 8	2006 1	2006	2006
2007 4	2007 3	2007 0	2007 0
2008 11	2008 0	2008 0	2008 0
2009 11	2009 0	2009 0	2009 0

Source: Alaska Department of Fish and Game Division of Subsistence Household Surveys 1992-1998, BBNA Household Surveys 2000-2009.

<u>Questions from the survey.</u>	<u>Number of respondents</u>		
	<u>Total (N)</u>	<u>yes</u>	<u>no</u>
Has freezup or breakup changed?	96	64 (67%)	32 (33%)
How is it changing?	64	<u>no explanation</u> 24 (38%)	<u>warmer (later freezup, earlier breakup)</u> 39 (61%)
Has there been changes in weather?	114	97 (85%)	17 (15%)
What kind of changes?	97	<u>warmer climate</u> 29 (30%)	<u>colder spring and summer</u> 23 (24%)
Is the ocean changing?	68	30 (44%)	38 (56%)
is the wind changing?	106	69 (65%)	37 (35%)
How is the wind changing?	69	<u>stronger</u> 39 (57%)	<u>more consistent</u> 10 (14%)
Are seal populations increasing or decreasing?	75	42 (56%)	<u>increasing</u> 4 (5%)
How is the seal blubber?	104	81 (78%)	<u>decreasing</u> 29 (39%)
How is the seal meat?	109	105 (96%)	<u>good-no change</u> 22 (21%)
How is the seal oil?	110	86 (78%)	<u>thin/skinny</u> 2 (2%)
Are belugas changing?	77	30 (39%)	<u>changing</u> 5 (6%)
Are walrus changing?	81	38 (47%)	<u>don't see them</u> 26 (32%)
Are sea lions changing?	78	35 (45%)	<u>other (listed below)</u> 25 (32%)
Any other comments?	23	8 (35%)	15 (65%)

Some of the "other" comments.

1. Sea lions are a nuisance during herring season.
2. We are catching big logs in the deepest part of the the ocean.
3. Is it illegal to hunt sea lions?
4. Sport hunters and fishers are hurting the local resources.
5. We see different bugs now.
6. Need to study why the climate is warming.
7. We see more dead seabirds on the beach now.
8. We are seeing changes in freshwater fish too (taste different, flesh texture is different).
9. DO NOT LITTER.
10. Maklak moved north, but are still pupping so population might not be changing.

Seal harvest in Togiak 2010.

Total Native Households	174
Surveyed Households	135
Sampling Fraction	78%
Sample Household Members	554
Estimated Household Members	701
2000 U.S. Census Estimated Native Population	750

Spotted and Harbor Seals (harbor seals Jun-Sep)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
Reported harvest and take (Unexpanded)														
Harvest	0	0	11	7	21	2	1	0	7	30	5	3	0	87
Struck but Lost	0	0	0	0	4	0	0	0	4	10	4	2	0	24
Take	0	0	11	7	25	2	1	0	11	40	9	5	0	111
Estimated harvest and take (Expanded)														
Harvest	0	0	14	9	27	3	1	0	9	38	6	4	0	112
Struck but Lost	0	0	0	0	5	0	0	0	5	13	5	3	0	31
Take	0	0	14	9	32	3	1	0	14	51	12	6	0	142

Are spotted seal/harbor seal populations changing?

Out of 67 households that observed spotted/harbor seals during 2010: 57% reported no change, 27% reported a decrease, and 16% reported an increase in spotted/harbor seal populations.

Ringed Seals														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
Reported harvest and take (Unexpanded)														
Harvest	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Struck but Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Take	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Estimated harvest and take (Expanded)														
Harvest	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Struck but Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Take	0	0	0	0	0	0	0	0	0	1	0	0	0	1

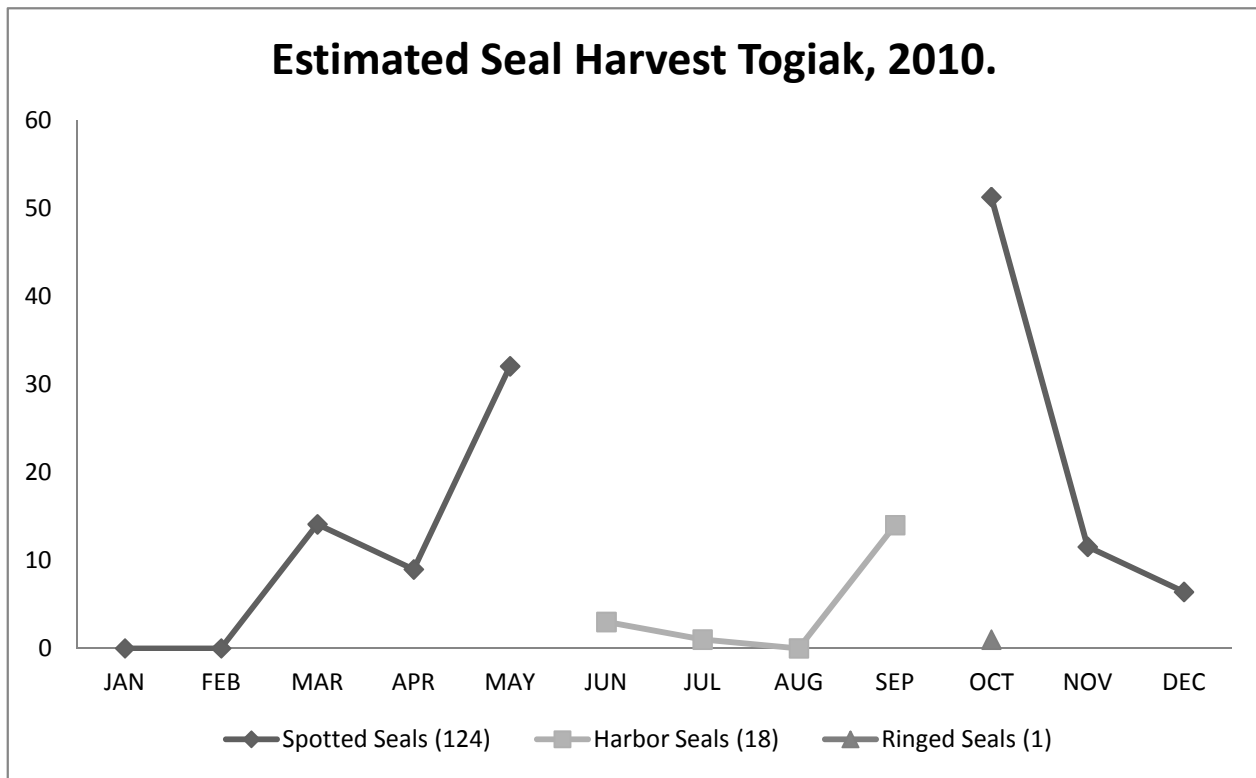
Are ringed seal populations changing?

Only one household observed ringed seals during 2010 and did not note any changes in the populations.

Bearded Seals- No Recorded Harvest

Ribbon Seals- No Recorded Harvest

Seal harvest in Togiak 2010. (continued)



Expanded Take of seals by year.

Spotted seals year take	Harbor Seal year take	Ringed seals year take	Bearded Seal year take
1992 304	1992 26.3	1992	1992
1993 224	1993 40.7	1993	1993
1994 194	1994 0	1994	1994
1995 116	1995 3.3	1995	1995
1996 110	1996 3.9	1996	1996
1997 86.4	1997 6.7	1997	1997
1998 120	1998 15.5	1998	1998
2000 174	2000 6.3	2000	2000
2001 65.3	2001 5.3	2001	2001
2002 97.9	2002 17.4	2002	2002
2003 41.7	2003 22	2003	2003
2004 63.8	2004 16.8	2004	2004
2005 92.9	2005 10.6	2005	2005
2006 58.3	2006 11.5	2006	2006
2007 71.1	2007 10	2007 2.2	2007 1.1
2008 210	2008 60	2008 5.9	2008 3.7
2009 130	2009 8	2009 1	2009 0
2010 124	2010 18	2010 1	2010 0

Source: Alaska Department of Fish and Game Division of Subsistence Household Surveys 1992-1998, BBNA Household Surveys 2000-2009.

Seal harvest in Twin Hills 2010.

Total Native Households	17
Surveyed Households	13
Sampling Fraction	76%
Sample Household Members	32
Estimated Household Memebers	37
2000 U.S. Census Estimated Native Population	65

Spotted and Harbor Seals (harbor seals Jun-Sep)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
Reported harvest and take (Unexpanded)														
Harvest	0	0	0	2	2	0	0	1	0	6	0	0	0	11
Struck but Lost	0	0	0	0	0	0	0	0	0	3	0	0	0	3
Take	0	0	0	2	2	0	0	1	0	9	0	0	0	14
Estimated harvest and take (Expanded)														
Harvest	0	0	0	3	3	0	0	1	0	8	0	0	0	14
Struck but Lost	0	0	0	0	0	0	0	0	0	4	0	0	0	4
Take	0	0	0	3	3	0	0	1	0	12	0	0	0	18

Are spotted seal/harbor seal populations changing?

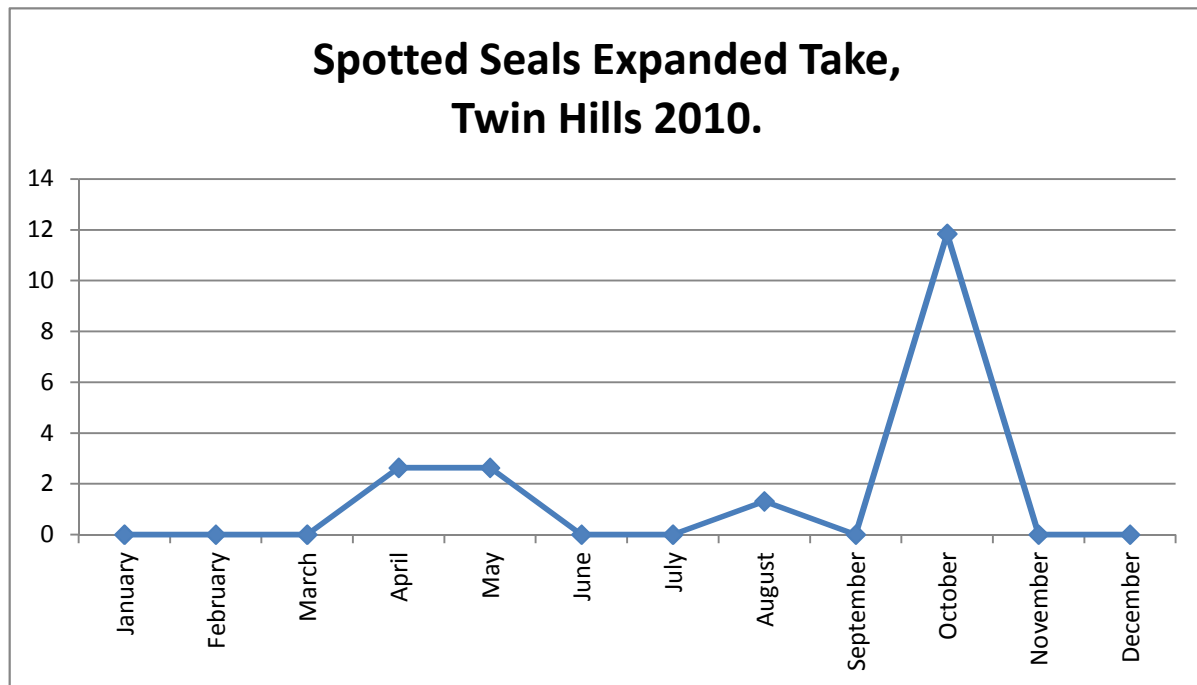
Three households said spotted/harbor seal populations are not changing, two said they are decreasing, and one said they are increasing.

Ringed Seals- No Harvest Recorded

Bearded Seals- No Harvest Recorded

Ribbon Seals- No Harvest Recorded

Seal harvest in Twin Hills 2010. (continued)



Expanded Take of seals by year.

Spotted seals year take	Harbor Seal year take	Ringed seals year take	Bearded Seal year take
1992	1992	1992	1992
1993	1993	1993	1993
1994	1994	1994	1994
1995	1995	1995	1995
1996 7.8	1996 29.8	1996	1996
1997 3.2	1997 10.5	1997	1997
1998 22.1	1998 4.4	1998	1998
2000 8.2	2000 1.6	2000	2000
2001 2.5	2001 0	2001	2001
2002 11.7	2002 3.3	2002	2002
2003 4.2	2003 7	2003	2003
2004 1.8	2004 8.8	2004	2004
2005 4.9	2005 2.5	2005	2005
2006 8	2006 1	2006	2006
2007 4	2007 3	2007 0	2007 0
2008 11	2008 0	2008 0	2008 0
2009 11	2009 0	2009 0	2009 0
2010 17	2010 1	2010 0	2010 0

Source: Alaska Department of Fish and Game Division of Subsistence Household Surveys 1992-1998, BBNA Household Surveys 2000-2009.

Ice seal and harbor seal harvest in Togiak 2011.

Total Native Households	166
Surveyed Households	92
Sampling Fraction	55%
High harvester fraction	44%
Other HH fraction	58%
Sample Household Members	380
2000 U.S. Census Estimated Native Population	842

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Reported (not estimated)														
Harvest	high	0	0	0	0	0	0	0	0	1	9	0	0	10
	random	0	0	0	7	3	0	0	0	0	4	2	0	16
Struck but Lost	high	0	0	0	0	0	0	0	0	0	4	0	0	4
	random	0	0	0	0	0	0	0	0	0	5	0	0	5
	Take	0	0	0	7	3	0	0	0	1	22	2	0	35
Estimated														
Harvest	high	0	0	0	0	0	0	0	0	2	20	0	0	23
	random	0	0	0	12	5	0	0	0	0	7	3	0	28
Struck but Lost	high	0	0	0	0	0	0	0	0	0	9	0	0	9
	random	0	0	0	0	0	0	0	0	0	9	0	0	9
	Take	0	0	0	12	5	0	0	0	2	45	3	0	68

Are spotted seal populations changing?

8 households said they were decreasing, 11 said no change.

Ringed Seals- No Recorded Harvest

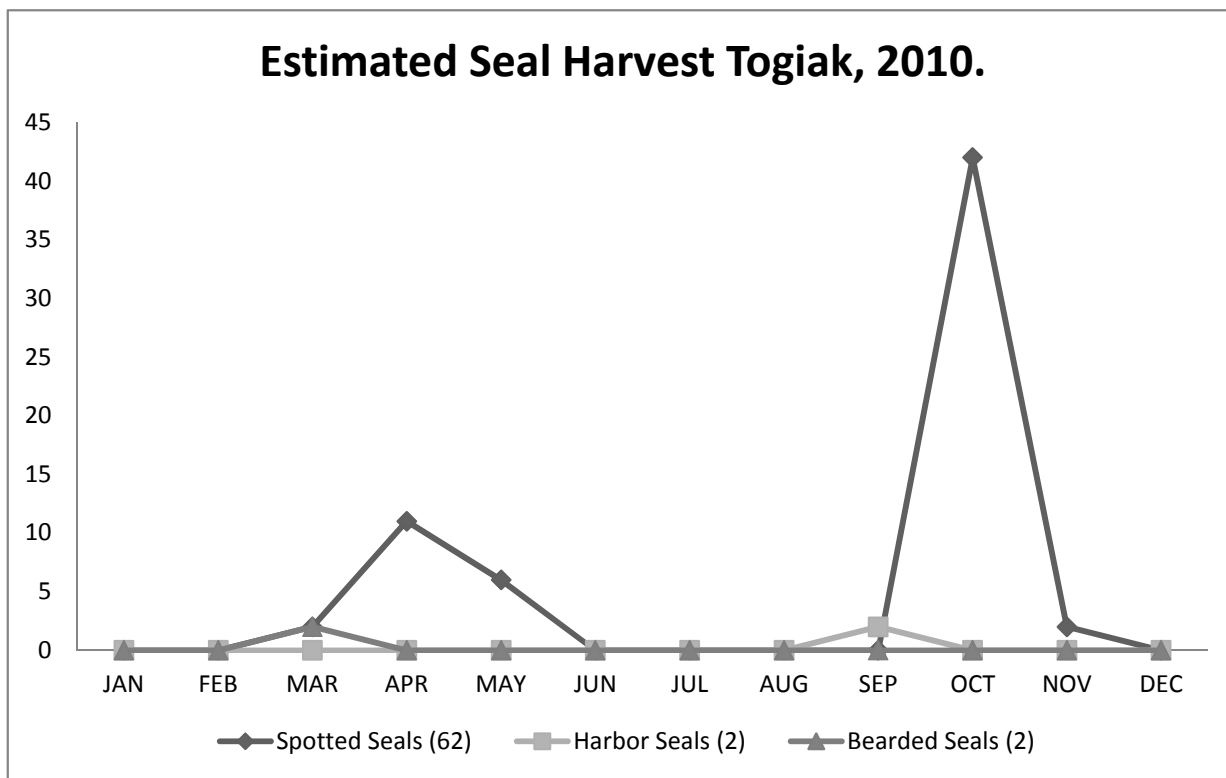
Bearded Seals- 2 harvested in March

Are bearded seal populations changing?

Two households said they were decreasing.

Ribbon Seals- No Recorded Harvest

Ice seal and harbor seal harvest in Togiak 2009. (continued)



Expanded Take of seals by year.

Spotted seals		Harbor Seal		Ringed seals		Bearded Seal	
year	take	year	take	year	take	year	take
1992	304	1992	26	1992		1992	
1993	224	1993	41	1993		1993	
1994	194	1994	0	1994		1994	
1995	116	1995	3	1995		1995	
1996	110	1996	4	1996		1996	
1997	86	1997	7	1997		1997	
1998	120	1998	16	1998		1998	
2000	174	2000	6	2000		2000	
2001	65	2001	5	2001		2001	
2002	98	2002	17	2002		2002	
2003	42	2003	22	2003		2003	
2004	64	2004	17	2004		2004	
2005	93	2005	11	2005		2005	
2006	58	2006	12	2006		2006	
2007	71	2007	10	2007	2	2007	1
2008	210	2008	60	2008	6	2008	4
2009	130	2009	8	2009	1	2009	0
2010	124	2010	8	2010	1	2010	0
2011	64	2011	2	2011	0	2011	2

Source: Alaska Department of Fish and Game Division of Subsistence Household Surveys 1992-1998, BBNA Household Surveys 2000-2011.