

An Overview of Subsistence Research in Northwest Alaska

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Kotzebue, Alaska
2010

DIVISION OF
SUBSISTENCE



DEPARTMENT OF FISH & GAME

Selawik Team

Comprehensive Subsistence Survey, October 2011

- **Local Researchers**

- Jimmy Allen
- Lottie Ballot
- Kathy Davis
- Wynona Harris

- **Other Researchers**

- Jim Magdanz – Fish & Game, Project Lead
- Nikki Braem – Fish & Game
- Andrew Brenner – Fish & Game
- John Chase – Northwest Arctic Borough
- Katie Moerlein – University of Alaska

- **Observer**

- Carmen Mongold – Northwest Arctic Borough



Contents

An overview of subsistence research in Northwest Alaska

- **Part 1 - About Northwest Alaska**
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 - Noatak Harvest Estimates
 - Land Use
 - Food Security
 - Comparisons With Past Surveys
- **Part 3 - What Have We Learned?**
 - Are Subsistence Harvests Changing?
 - Does Community Size Matter?



Kivalina



Noatak



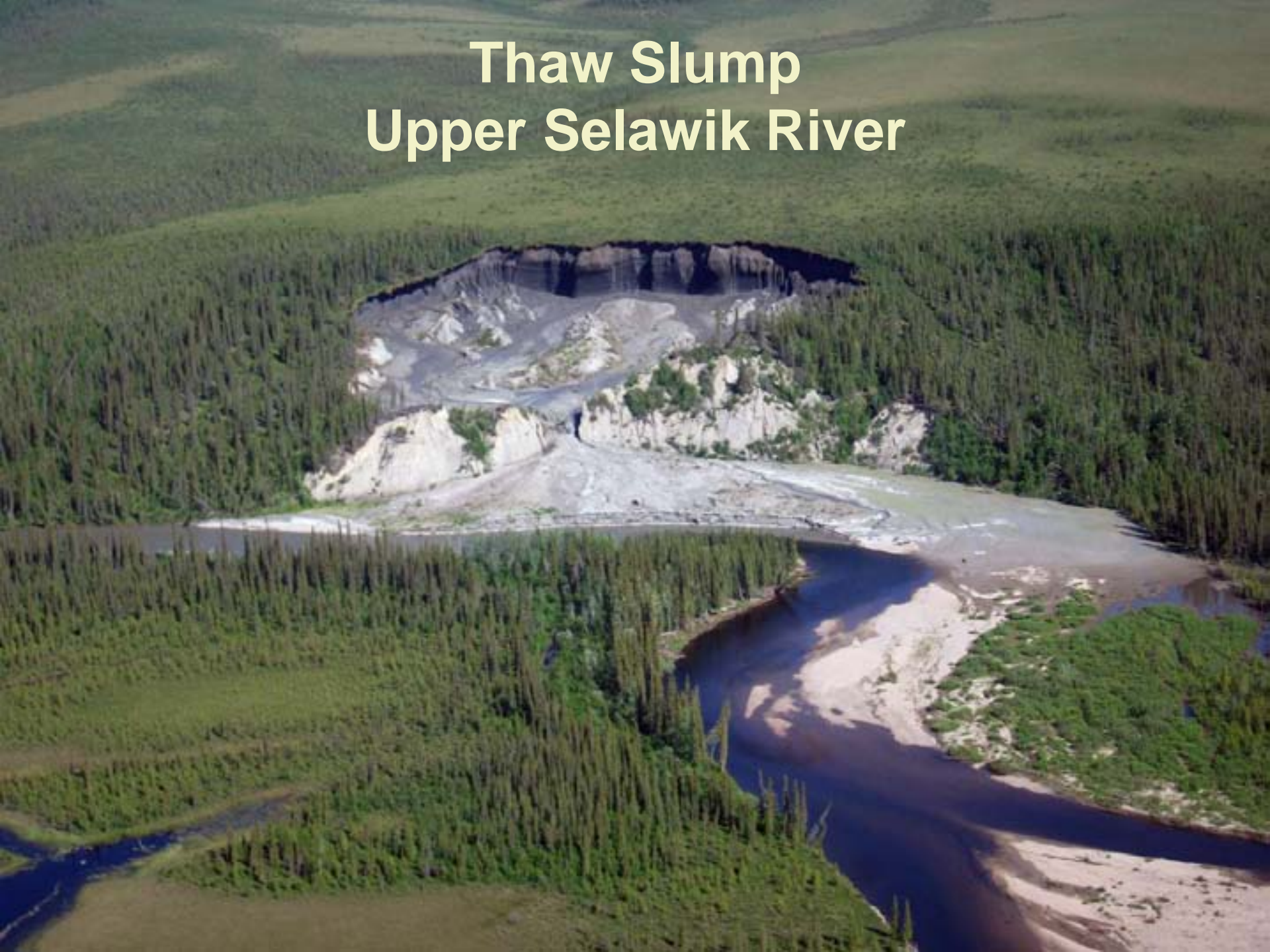
Skinning a Polar Bear Noatak



Butchering a Walrus Noorvik



Thaw Slump Upper Selawik River



Algae Bloom At Illivak in Kotzebue Sound



Part 2

Harvest Survey

Program

Kivalina & Noatak
2007 Survey Results

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Harvest Survey Program

Division of Subsistence, Alaska Department of Fish & Game

- **Cooperative**
 - Funding from State & Federal Agencies
 - Funding from Industry
 - Community Government Partners
- **Basic & Relevant**
 - Same Basic Survey, Used Many Times
 - Customized for Each Community
- **Community-Based**
 - Local Crews under Agency Supervision
 - NOT Limited to High Harvesting Households
- **Written Reports**
 - We Report What We Learned
 - We Also Report How We Did It



Survey Orientation Meeting

Reviewing the Survey Form, Page-by-Page, Noatak, 2008



Noatak survey team during orientation meeting: Hannah Onalik, Cheryl Booth, Roger Adams, Ben Arnold, Chris Shy, Amanda Porter, Emma Adams, Lola Arey, Nikki Braem, Davin Holen, Amy Russell, Liz Sears, and Raena Schraer.



Survey Orientation Meeting

Practicing Giving Surveys to Each Other, Kivalina 2008



The Kivalina survey team during orientation meeting: Stanley Hawley, Hilda Knox, Richard Sage, Eleanor Swan, Nelda Swan, Paul Lawrence, Amy Russell, Stephanie Schively, Nikki Braem, and Jim Magdanz



Example Harvest Survey Page

Filter Questions Speed Interview – Ask Only Relevant Questions

HARVESTS: LARGE LAND ANIMALS

HOUSEHOLD ID

Do members of your household USUALLY hunt for large land animals for subsistence, such as CARIBOU or MOOSE?..... N Y

Between JANUARY and DECEMBER, 2007 ...
 ...Did members of your household USE or TRY TO CATCH large land animals?..... N Y

IF NO, go to the next harvest page.

IF YES, continue on this page...

Please estimate how many large land animals ALL MEMBERS OF YOUR HOUSEHOLD CAUGHT for subsistence use this year. INCLUDE large land animals you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with others, report ONLY YOUR SHARE of the catch.

	IN 2007 DID MEMBERS OF YOUR HH...			IN 2007, HOW MANY (.....) DID MEMBERS OF YOUR HOUSEHOLD CATCH?													IN 2007...							
	...USE ?		...TRY TO CATCH ?		SEX	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	UNITS (ind...)	...DID YOUR HH SHARE	...DID OTHERS SHARE			
	(circle)	(circle)	(circle)	(circle)		(enter number by sex and month of take)														(circle)	(circle)			
CARIBOU <i>Tuttu</i> 211000000	N	Y	N	Y	M															ind	N	Y	N	Y
211000001					F																			
211000002					?																			
211000009					M																			
					F																			
					?																			

On map, mark where household SEARCHED FOR and CAUGHT caribou.

MOOSE <i>Timilka</i>	N	Y	N	Y	M															ind	N	Y	N	Y
					F																			



How Good Are Our Estimates?

In Some Cases, We Adjust our Estimates to Improve Accuracy

- **We Do Not Estimate Harvests Unless...**
 - We Survey AT LEAST 30 Households
 - Noatak and Kivalina Both Exceeded Minimum 30 HHs
- **When We Survey At Least 30 Households**
 - We Assume Surveyed and Unsurveyed Households are SIMILAR
- **We Check Our Assumption by...**
 - Reviewing Our Results
 - Comparing Our Results With Other Data for the Community
 - Looking for Expected Patterns



Survey Results Kivalina

*Conducted in February 2008
For Calendar Year 2007*

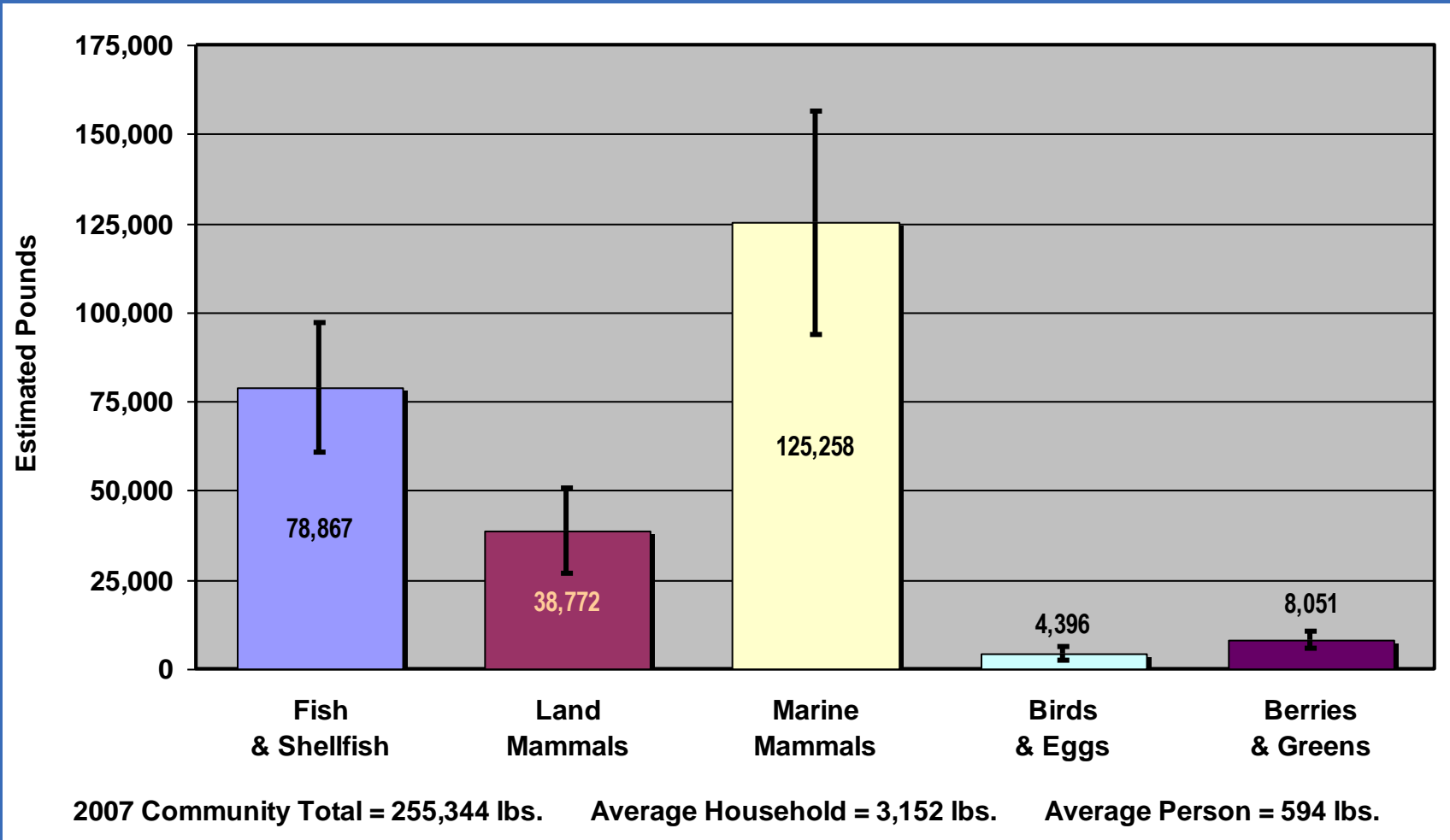
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Estimated Harvests, Kivalina, 2007

QUESTION: "How many _____ did members of your household harvest?"



Top 10 Subsistence Foods, Kivalina, 2007

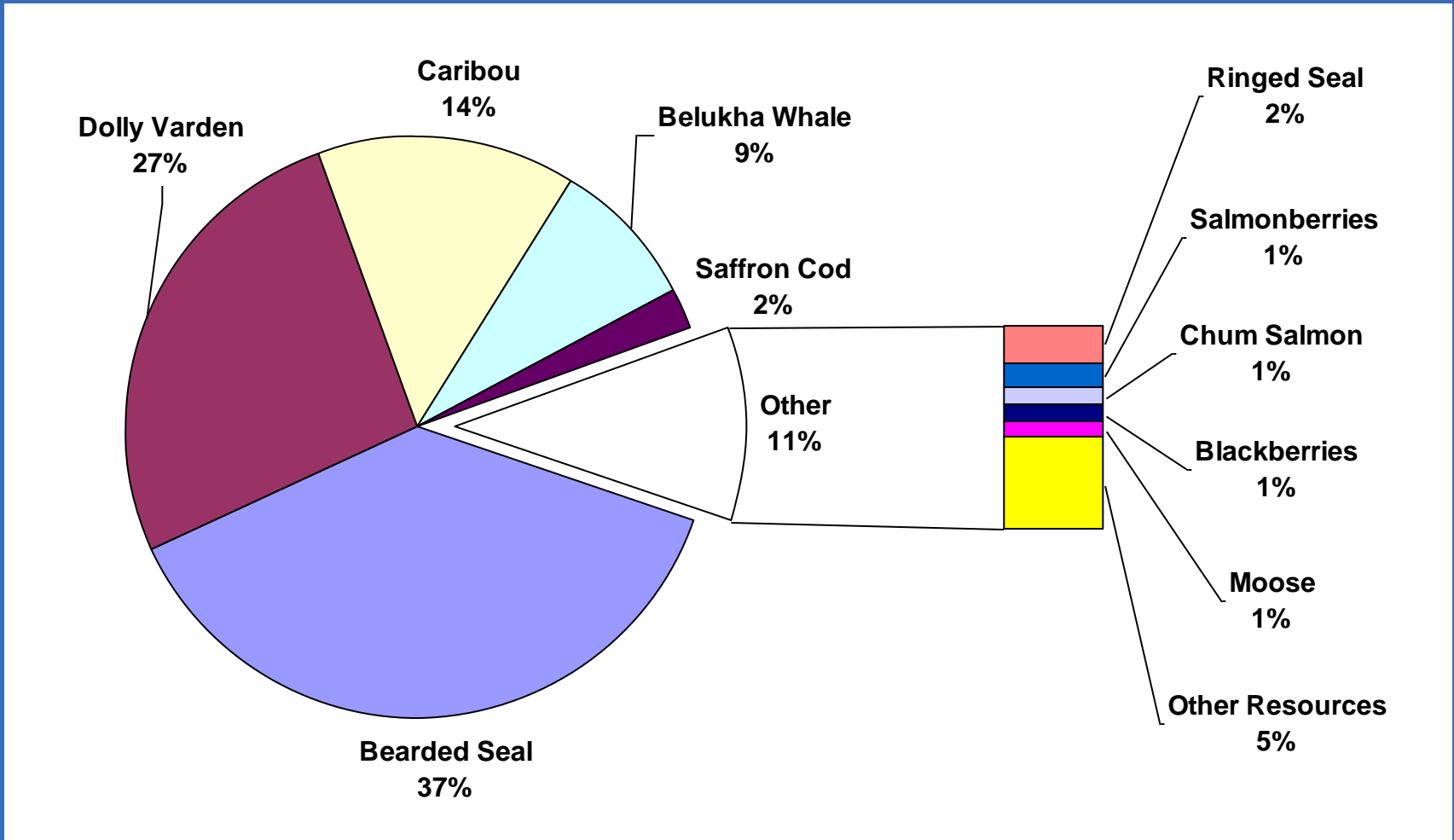
QUESTION: "How many _____ did members of your household harvest?"

	ESTIMATED NUMBER		ESTIMATED EDIBLE POUNDS			
	Community Total	Average Per Household	Community Total	Average Per Household	Average Per Person	95% CI
Bearded Seal	229 seals	2.8 seals	96,188 lbs.	1,188 lbs.	224 lbs.	± 27%
Trout	20,527 trout	253.4 trout	67,739 lbs.	836 lbs.	158 lbs.	± 23%
Caribou	268 caribou	3.3 caribou	36,458 lbs.	450 lbs.	85 lbs.	± 29%
Belukha Whale	22 whales	0.3 whales	21,890 lbs.	270 lbs.	51 lbs.	--
Tomcod	25,824 fish	318.8 fish	5,423 lbs.	67 lbs.	13 lbs.	± 28%
Ringed Seal	71 seals	0.9 seals	5,280 lbs.	65 lbs.	12 lbs.	± 38%
Salmonberries	490 gallons	6.0 gallons	3,184 lbs.	39 lbs.	7 lbs.	± 38%
Chum Salmon	401 salmon	5.0 salmon	2,406 lbs.	30 lbs.	6 lbs.	± 50%
Blackberries	357 gallons	4.4 gallons	2,320 lbs.	29 lbs.	5 lbs.	± 36%
Moose	4 moose	0.05 moose	2,075	26	5	± 81%
All Other	--	--	14,457 lbs.	178 lbs.	34 lbs.	
TOTAL	--	--	255,344 lbs.	3,152 lbs.	594 lbs.	± 23%



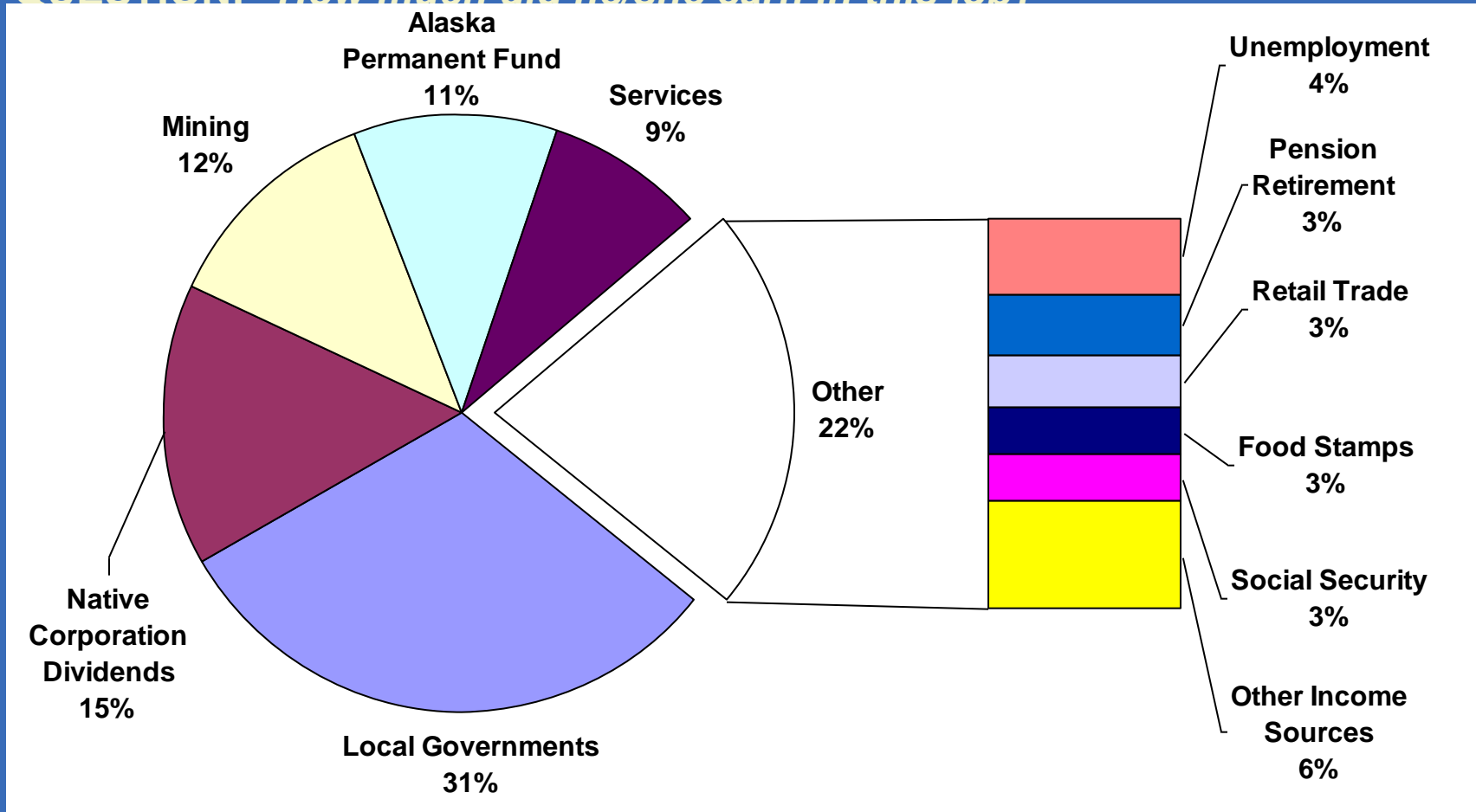
Top 10 Subsistence Foods, Kivalina, 2007

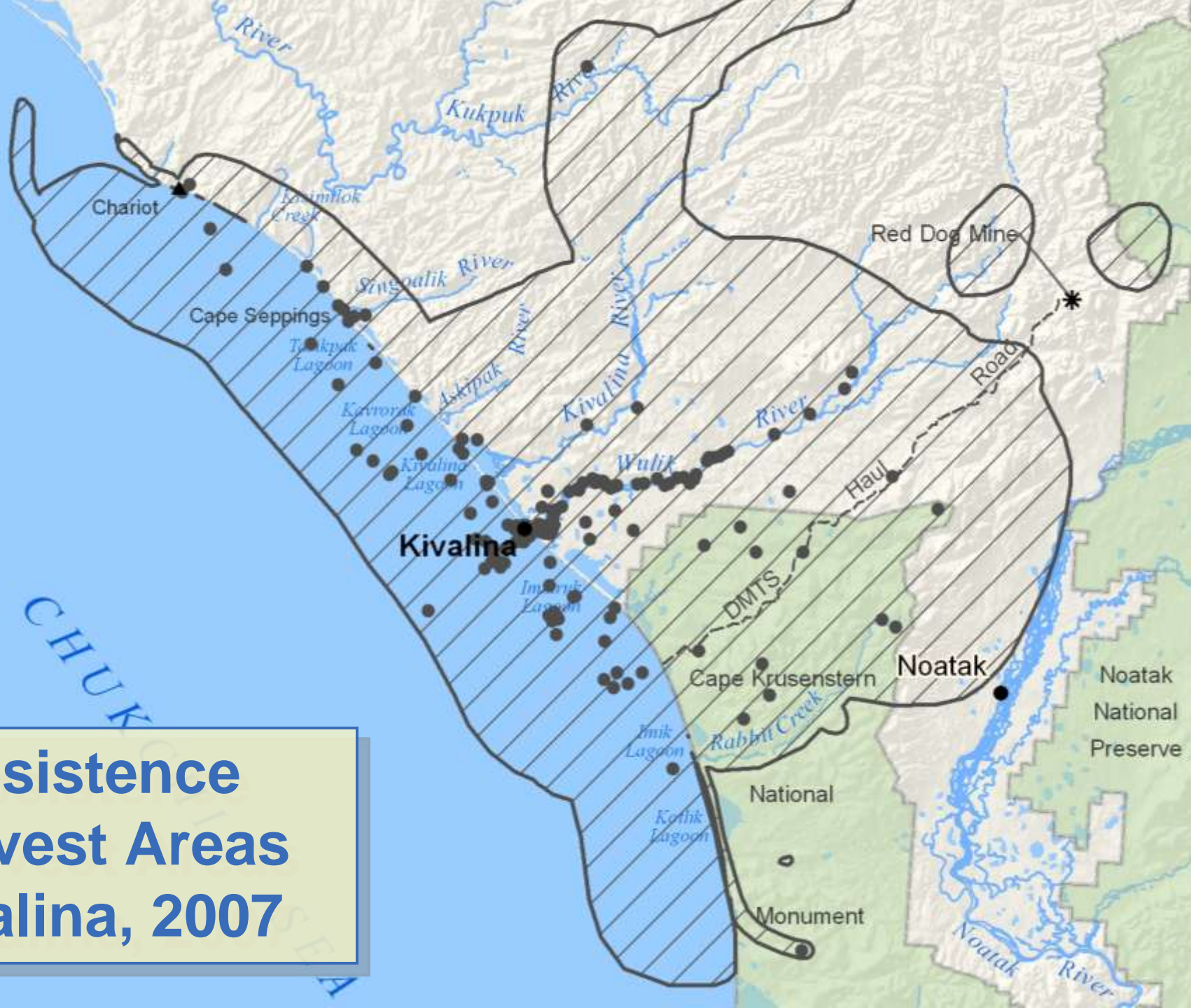
QUESTION: "How many _____ did members of your household harvest?"



Top 10 Income Sources, Kivalina, 2007

QUESTION: "How much did he/she earn in this job?"





**Subsistence
Harvest Areas
Kivalina, 2007**

Survey Results Noatak

*Conducted in February 2008
For Calendar Year 2007*

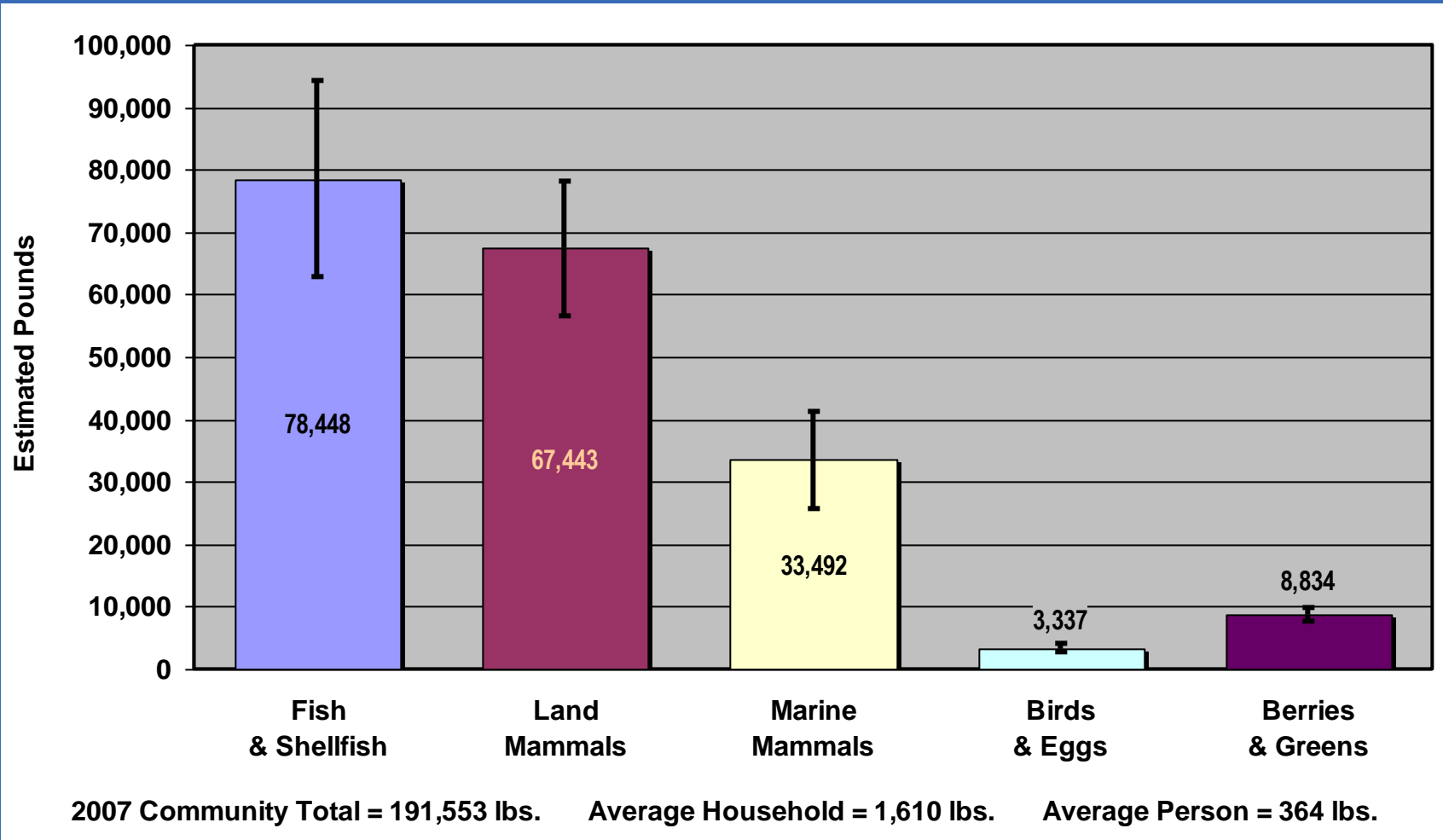
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Estimated Harvests, Noatak, 2007

QUESTION: "How many _____ did members of your household harvest?"



Top 10 Wild Foods, Noatak, 2007

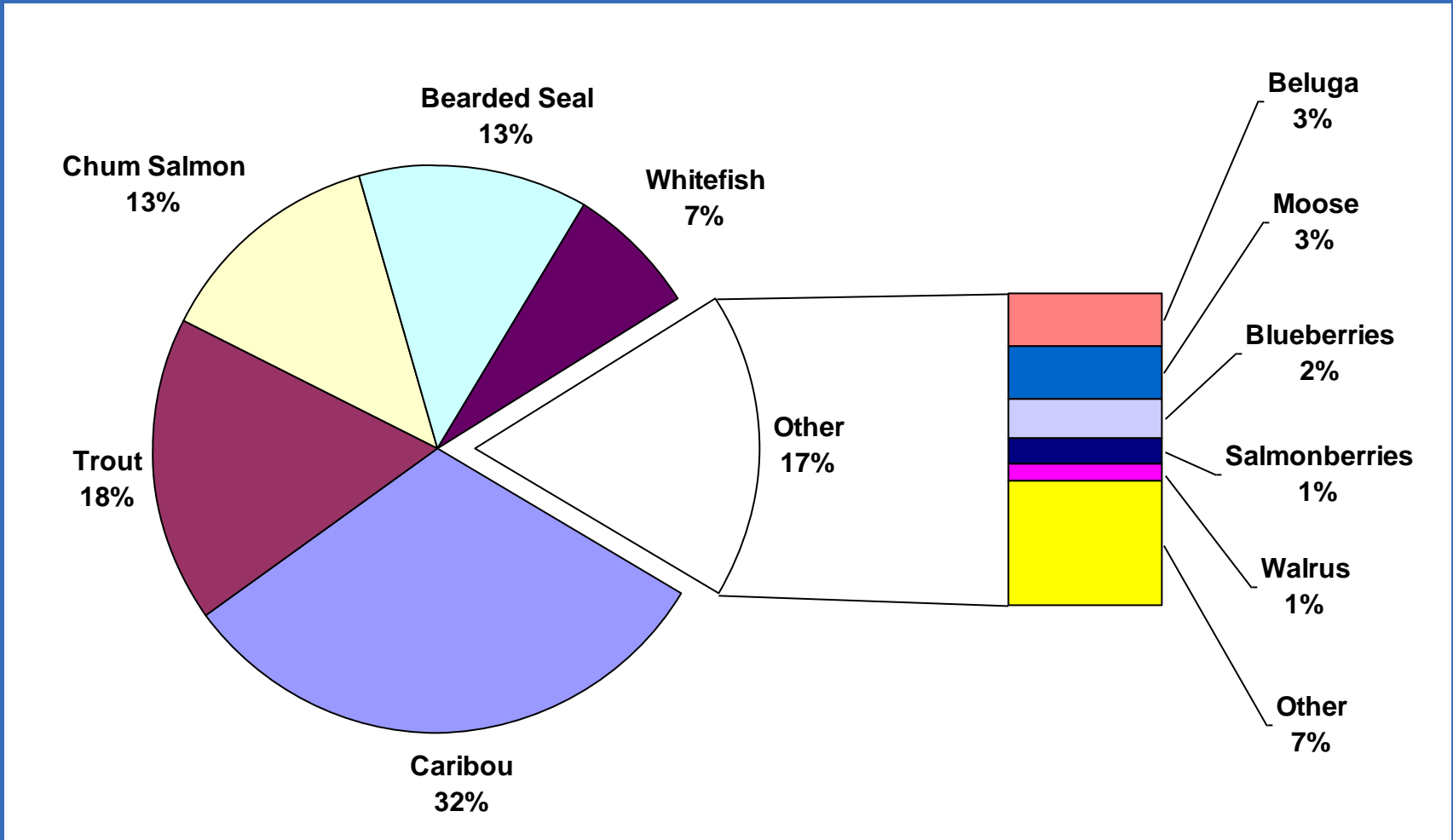
QUESTION: "How many _____ did members of your household harvest?"

	ESTIMATED NUMBER		ESTIMATED EDIBLE POUNDS			
	Community Total	Average Per Household	Community Total	Average Per Household	Average Per Person	95% CI
Caribou	442 caribou	3.7 caribou	60,061 lbs.	505 lbs.	114 lbs.	± 16%
Trout	10,234 trout	83.8 trout	33,771 lbs.	284 lbs.	64 lbs.	± 21%
Chum Salmon	4,167 salmon	35.0 salmon	25,002 lbs.	210 lbs.	48 lbs.	± 19%
Bearded Seal	60 ugruk	0.5 ugruk	24,990 lbs.	210 lbs.	47 lbs.	± 22%
Whitefish	6,778 whitefish	57.0 whitefish	14,234 lbs.	120 lbs.	27 lbs.	± 28%
Beluga Whale	6 belukha	0.1 belukha	5,773 lbs.	49 lbs.	11 lbs.	--
Moose	11 moose	0.1 moose	5,691 lbs.	48 lbs.	11 lbs.	± 33%
Blueberries	657 gallons	5.5 gallons	4,268 lbs.	36 lbs.	8 lbs.	± 12%
Salmonberries	410 gallons	3.4 gallons	2,666 lbs.	22 lbs.	5 lbs.	± 13%
Walrus	3 walrus	0.02 walrus	1,851 lbs.	16 lbs.	4 lbs.	± 99%
All Other	--	--	73,308 lbs.	616 lbs.	139 lbs.	
TOTAL	--	--	191,553 lbs.	1,610 lbs.	364 lbs.	± 18%



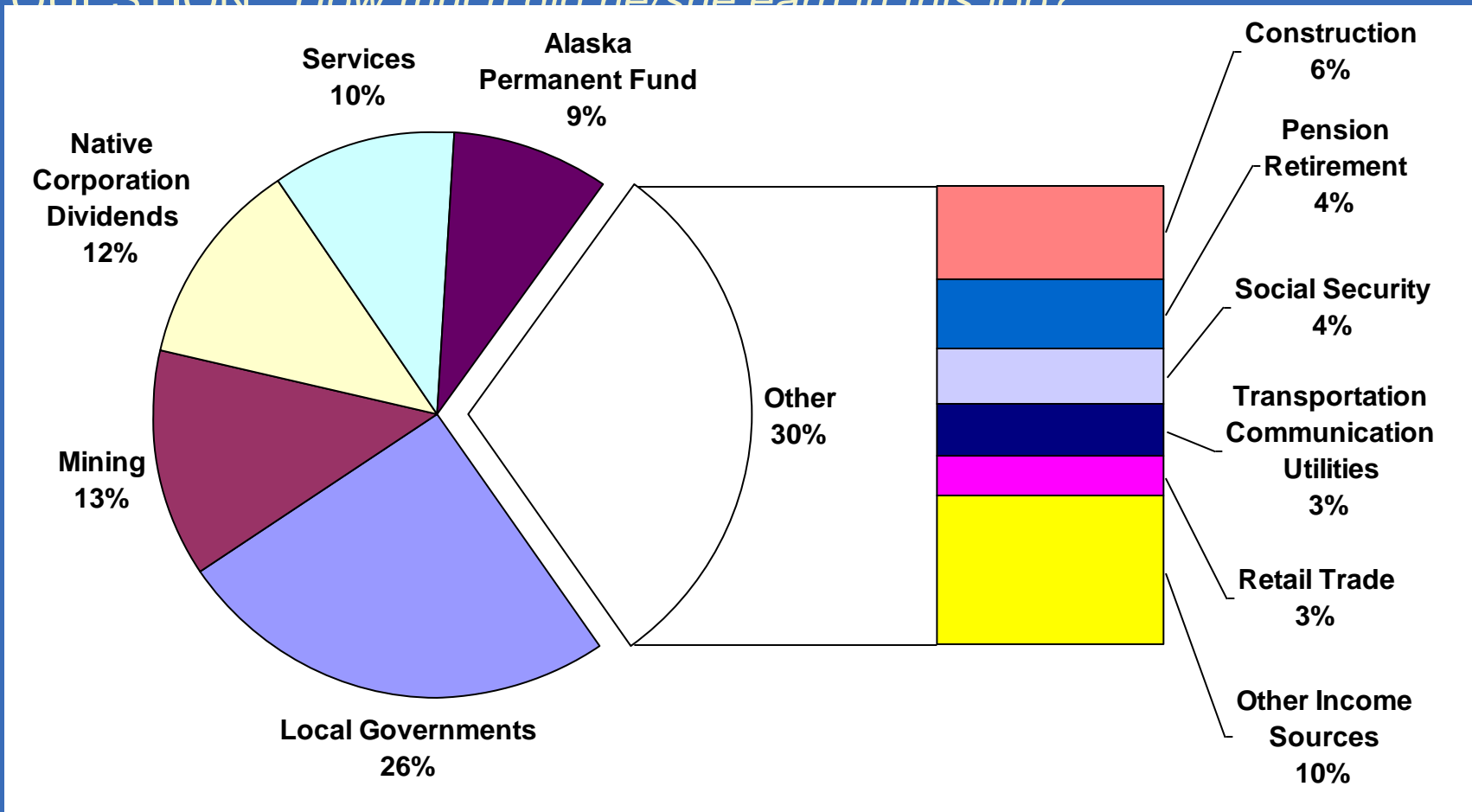
Top 10 Wild Foods, Noatak, 2007

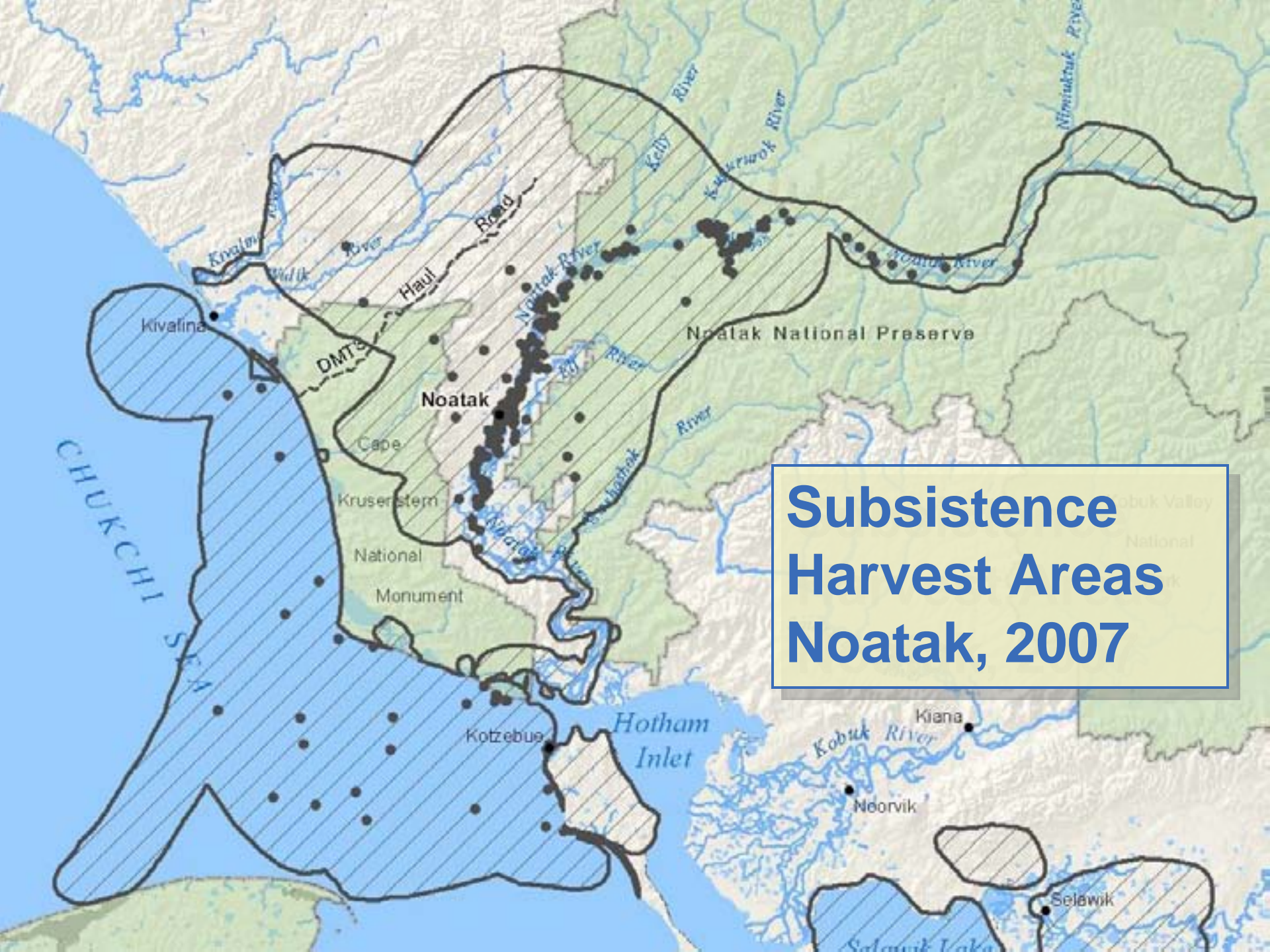
QUESTION: "How many _____ did members of your household harvest?"



Top 10 Income Sources, Noatak, 2007

QUESTION: "How much did he/she earn in this job?"





**Subsistence
Harvest Areas
Noatak, 2007**

How Did Subsistence Harvests in 2007 Compare with the Past?

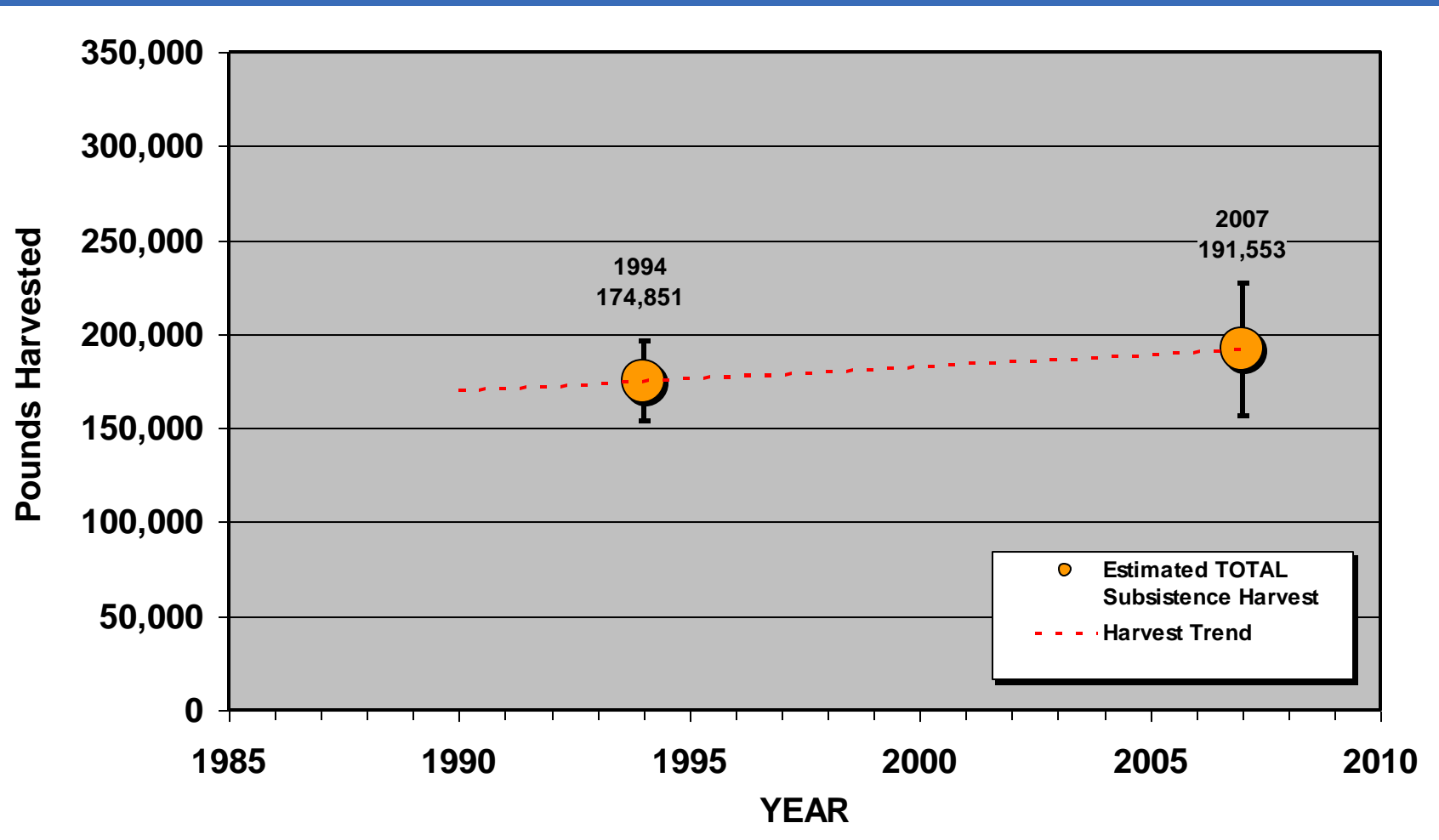
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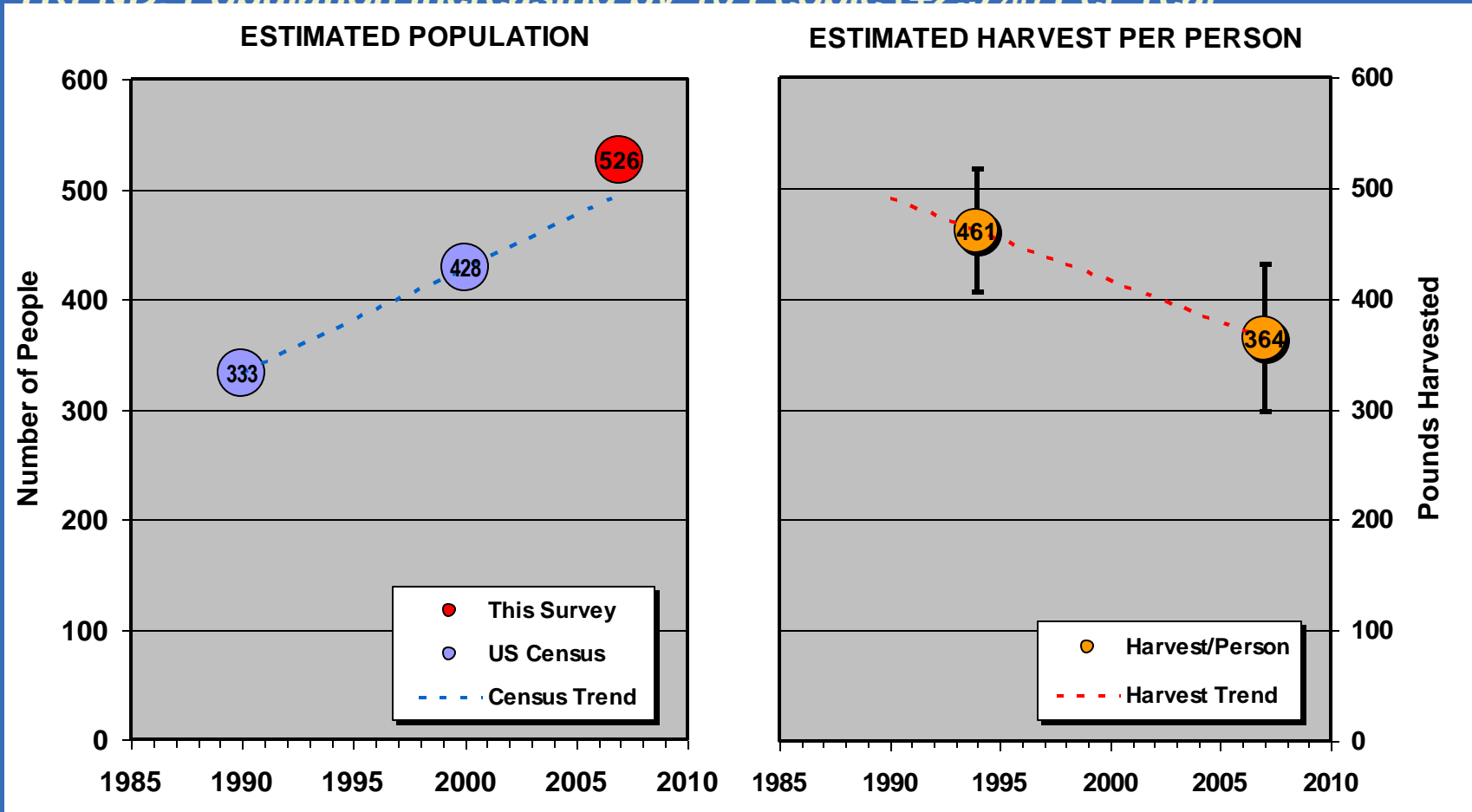
Estimated TOTAL Harvests, Noatak

TREND: Total harvests increasing about 1,285 pounds (1%) per year

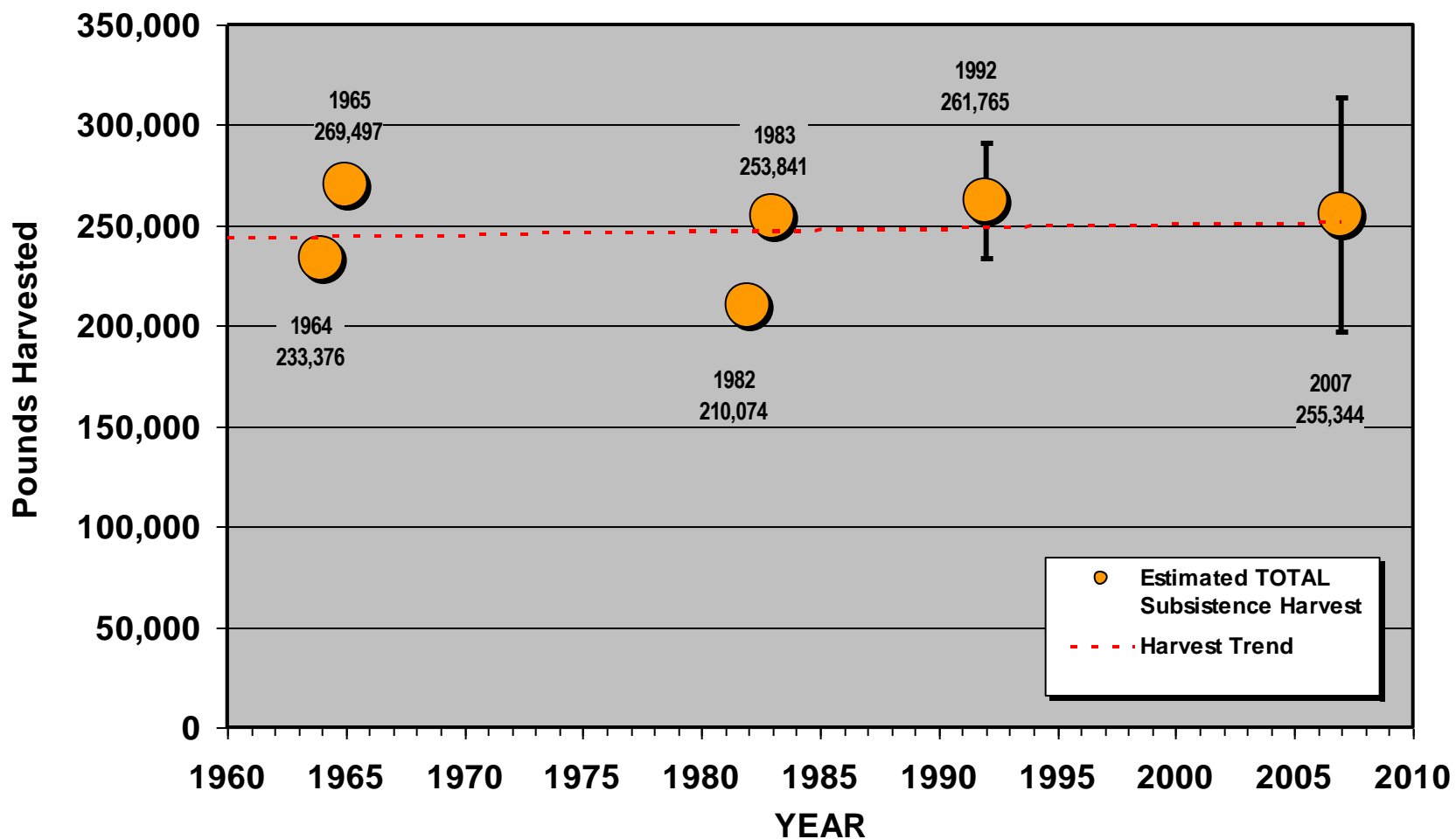


Estimated Per Capita Harvests, Noatak

TREND: Population Increasing by 10 People (+2.9%) Per Year

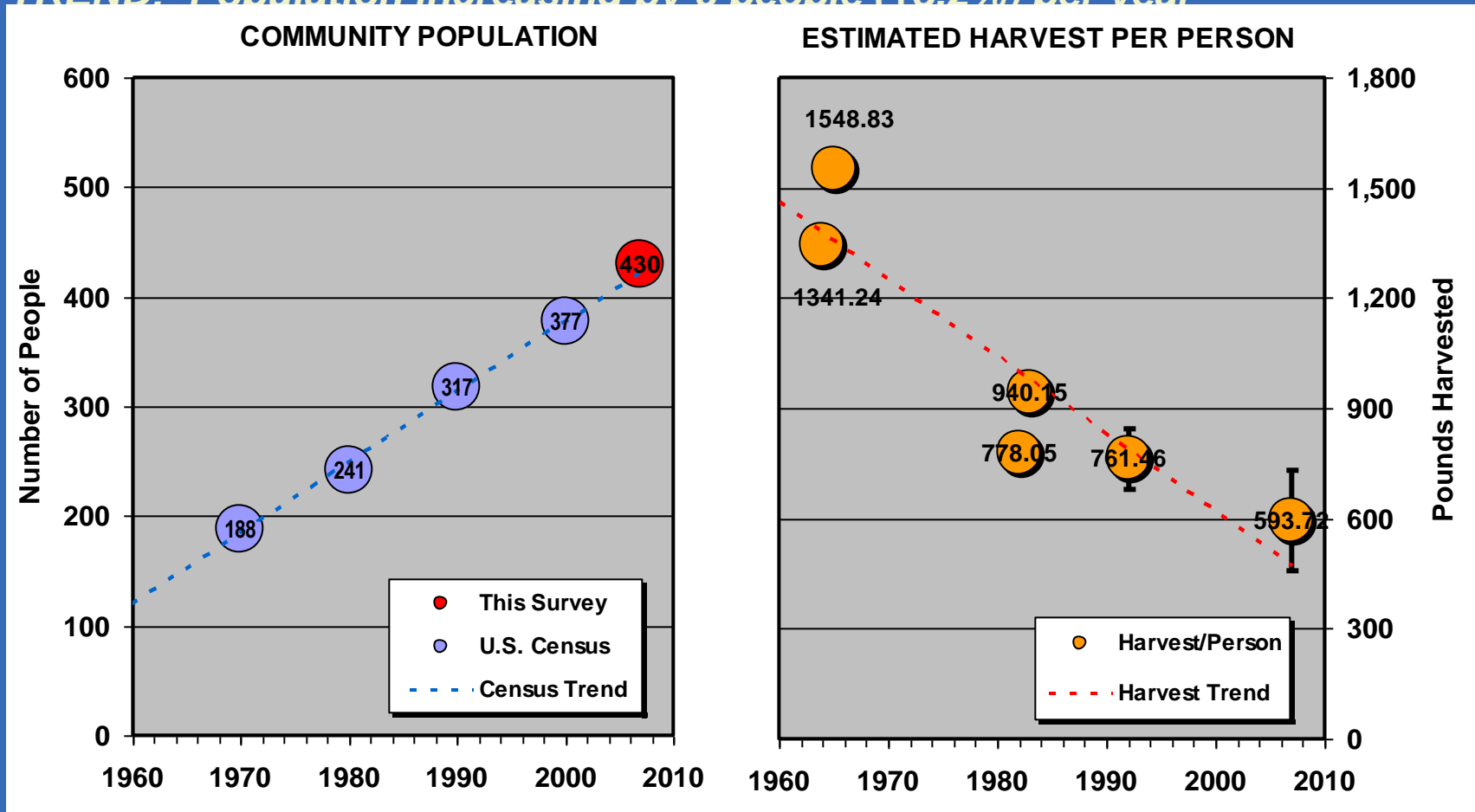


Estimated TOTAL Harvests, Kivalina



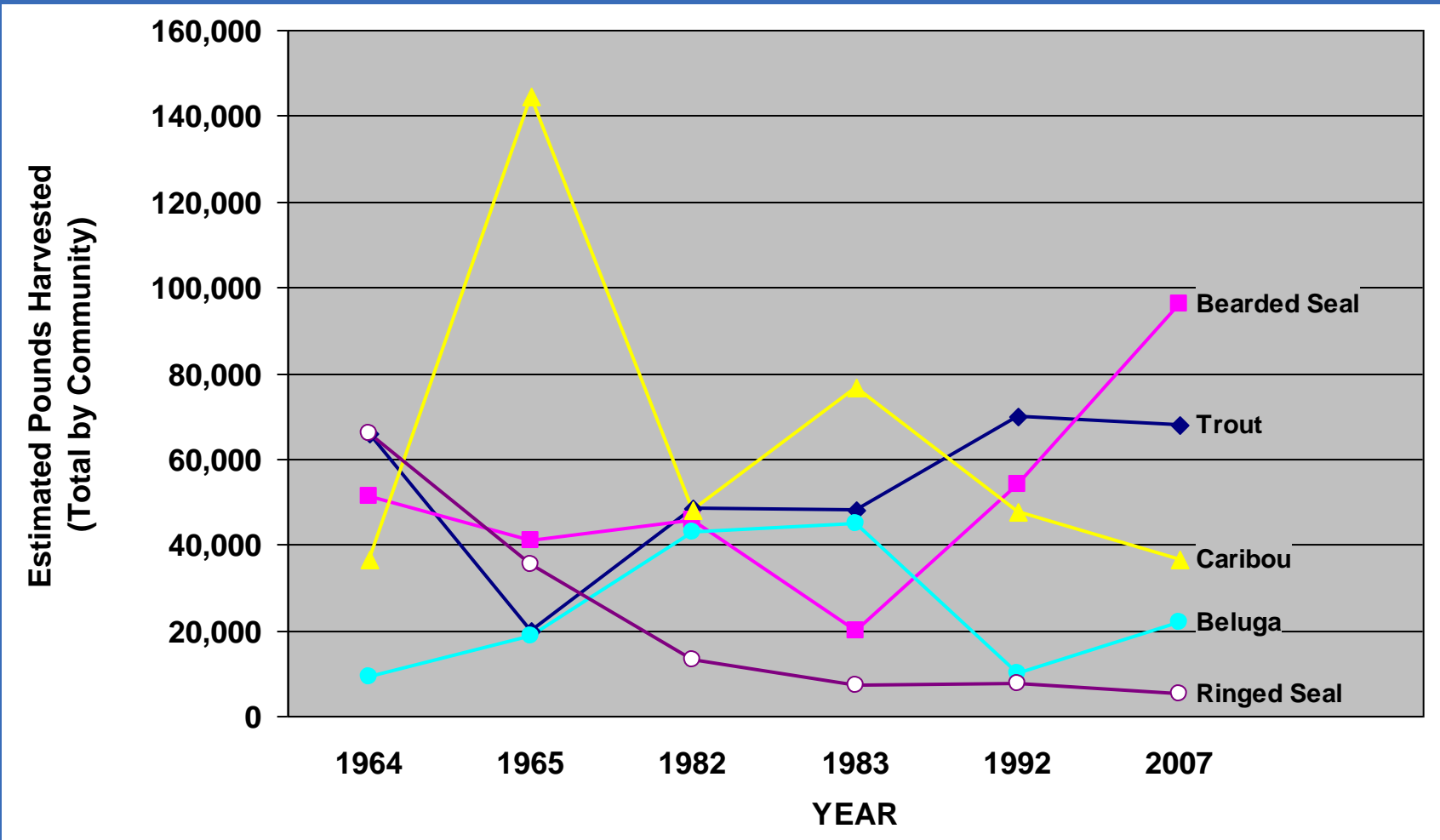
Estimated Per Capita Harvests, Kivalina

TREND: Population increasing by 6 people (+3.2%) per year



Harvest Composition, Kivalina

Bearded Seal UP, Trout UP, Ringed Seal DOWN – 1964-2007



So...

What Can We Learn?

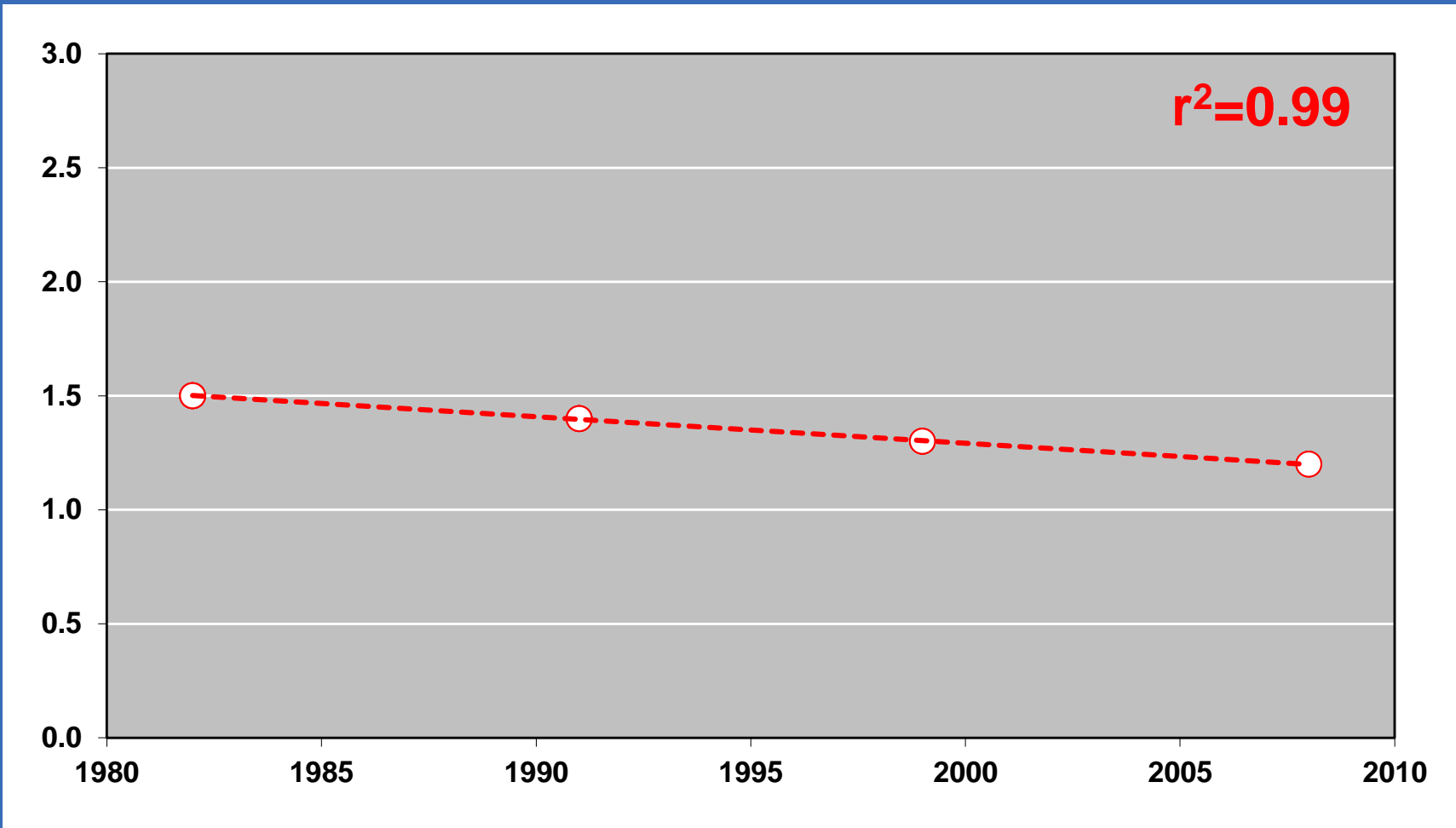
Have Subsistence Harvests Changed Over Time?
Do Changes in Community Populations Affect Harvests?

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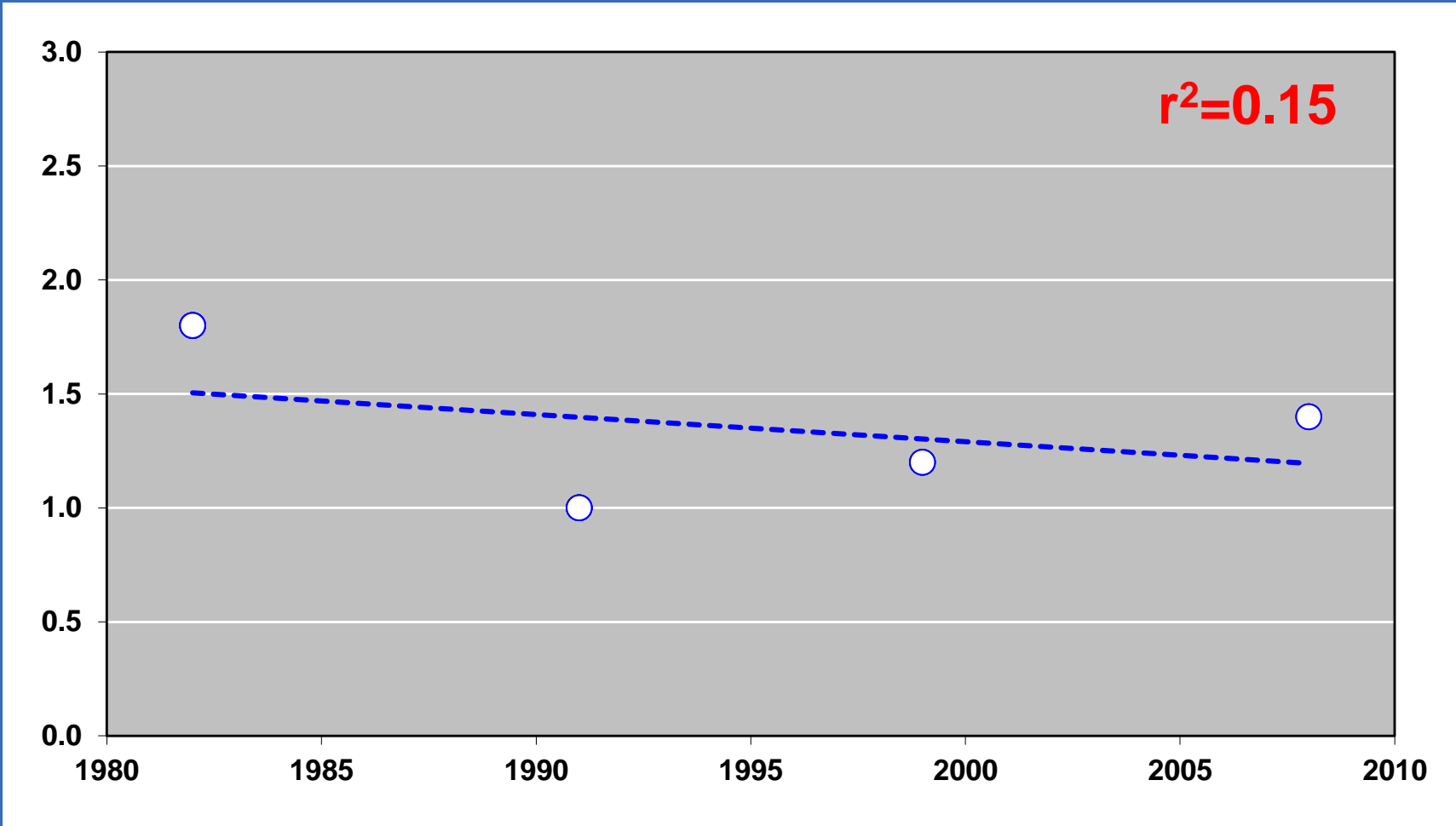


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About Graphs: Trend Lines



About Graphs: Trend Lines



Question 1

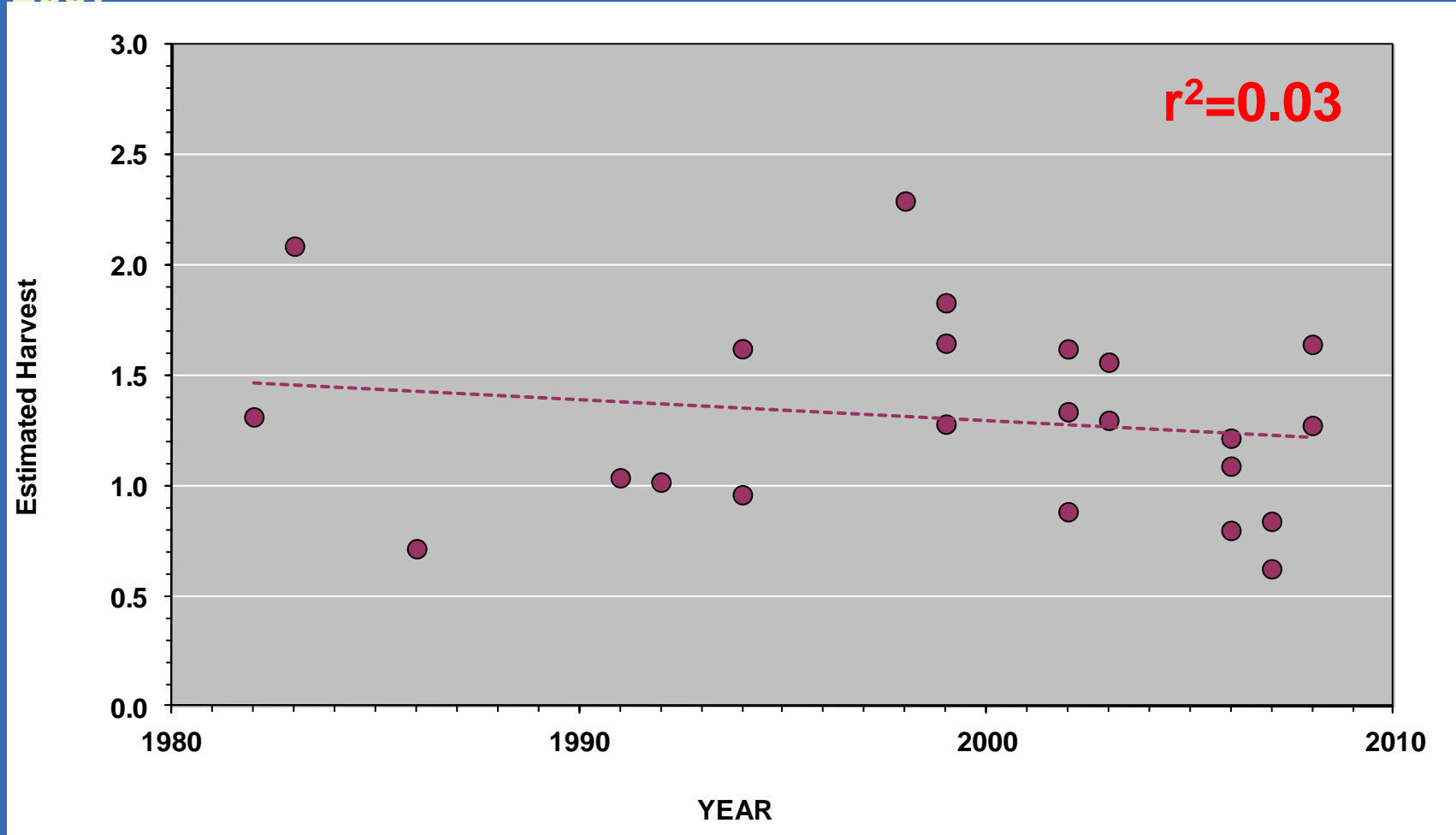
Are subsistence harvests changing?

- **We Usually Compare Harvests Per Person**
 - If we took your whole community's annual harvest, and
 - Gave exactly the same amount to each person,
 - How much would YOU get?
 - This allows us to compare harvests in large and small communities.
- **First, Caribou and Salmon**
 - Because we have lots of estimates for caribou and salmon
 - We don't survey every community ever year (limitation)
 - Caribou and salmon go up and down on their own (limitation)
 - Communities are different (limitation)
- **Then, ALL Species**
 - We don't have so many estimates
 - Nonetheless, a more useful analysis



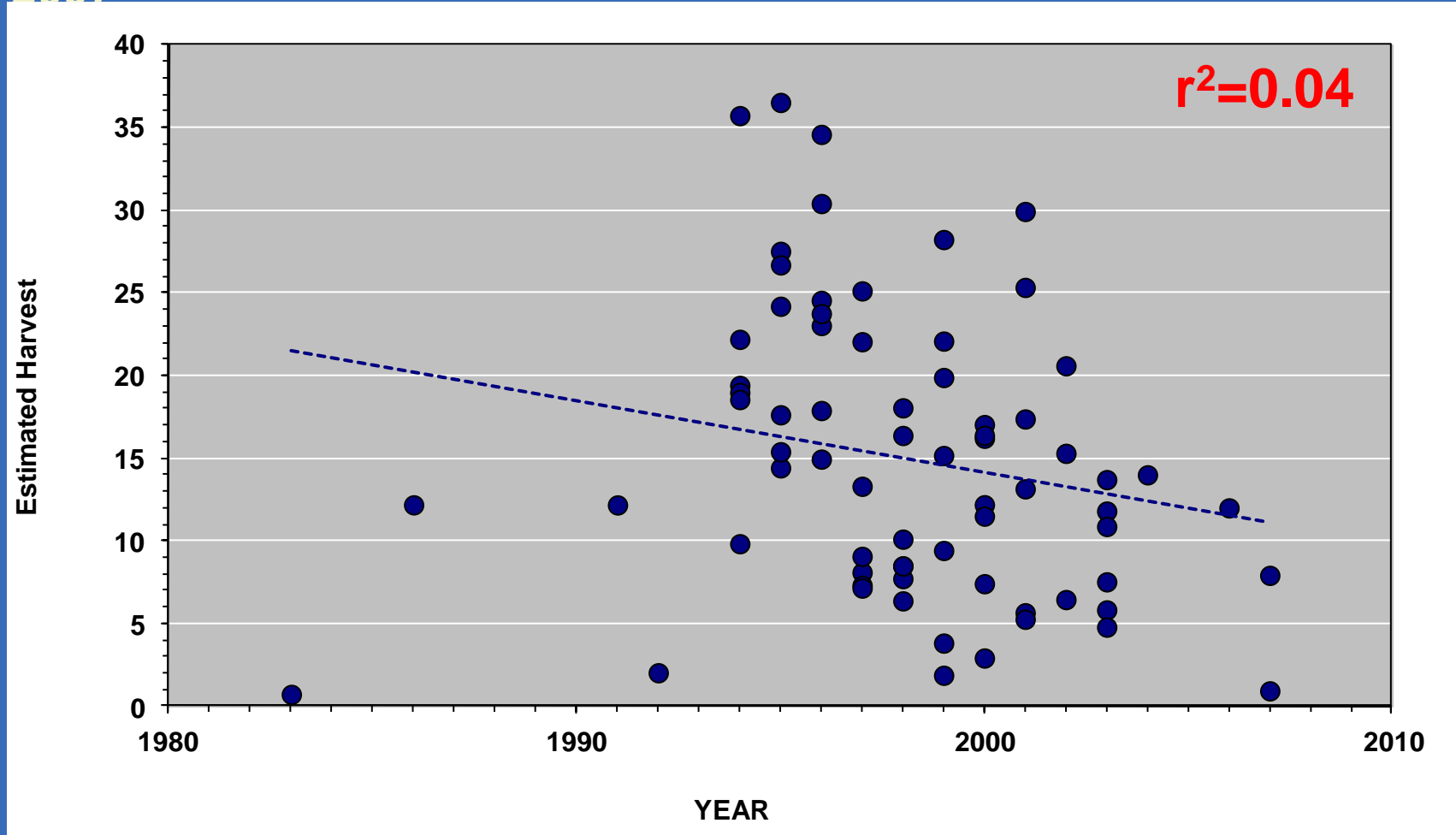
Are Caribou Harvests Changing?

Average Number of Caribou Harvested Per Person Per Year, 1984-2007

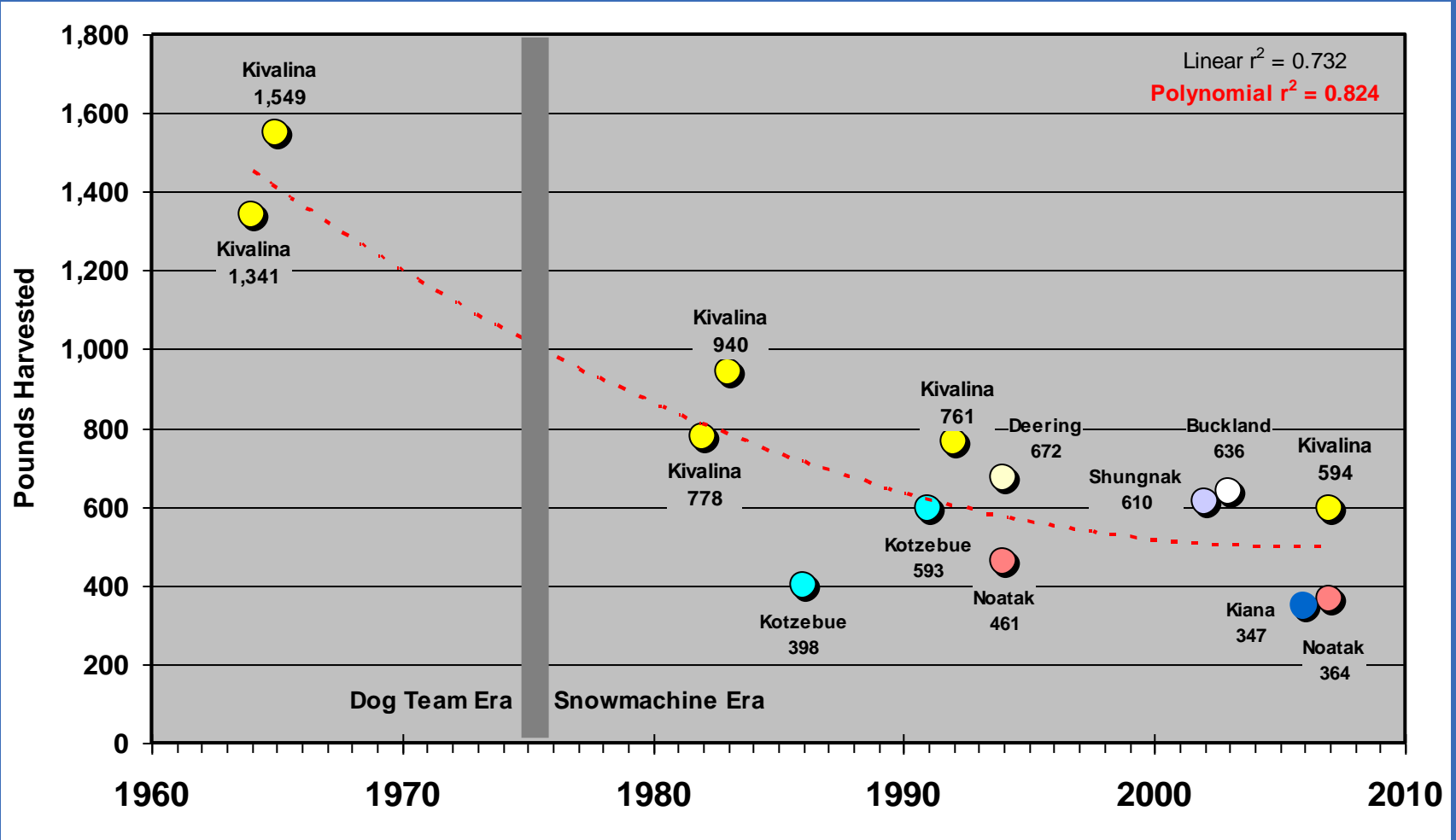


Are Salmon Harvests Changing?

Average Number of Salmon Harvested Per Person Per Year, 1984-2007



Subsistence Harvests, Northwest Alaska



Question 2

Do BIG Communities Use More Subsistence Food Than SMALL Communities?

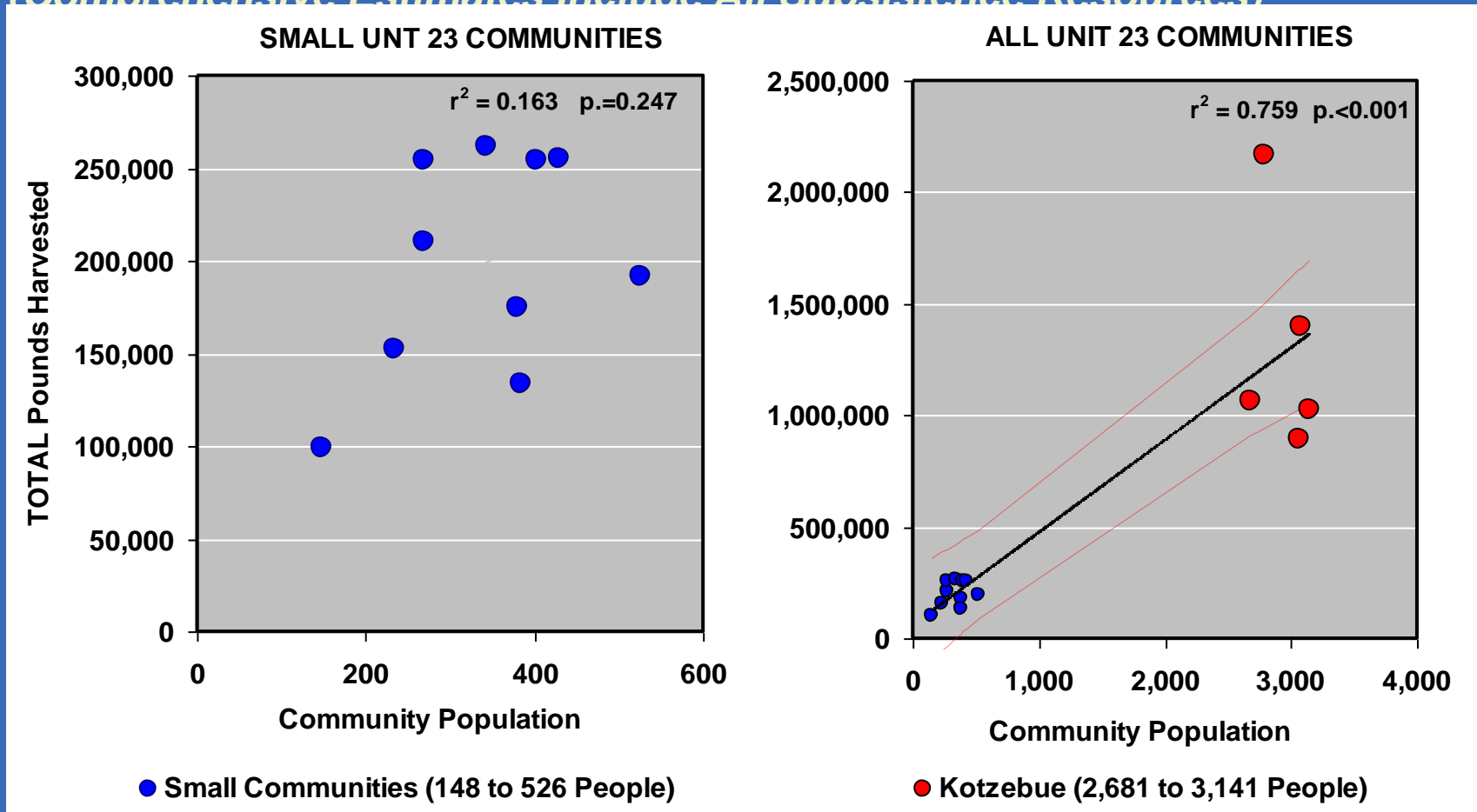
- **Total Subsistence Harvest by Community Size**
 - Observation: Rural Communities Are Growing
 - IF People in Smaller and Larger Communities Use Similar Amounts of Subsistence Foods,
 - THEN a Graph of TOTAL harvests by Community Size will show an UPWARD LINE
- **Harvest Per Person by Community Size**
 - IF Every Additional Person Uses Same Amount of Subsistence Food,
 - THEN a Graph of Harvests Per Person by Community



Total Harvest by Community Size

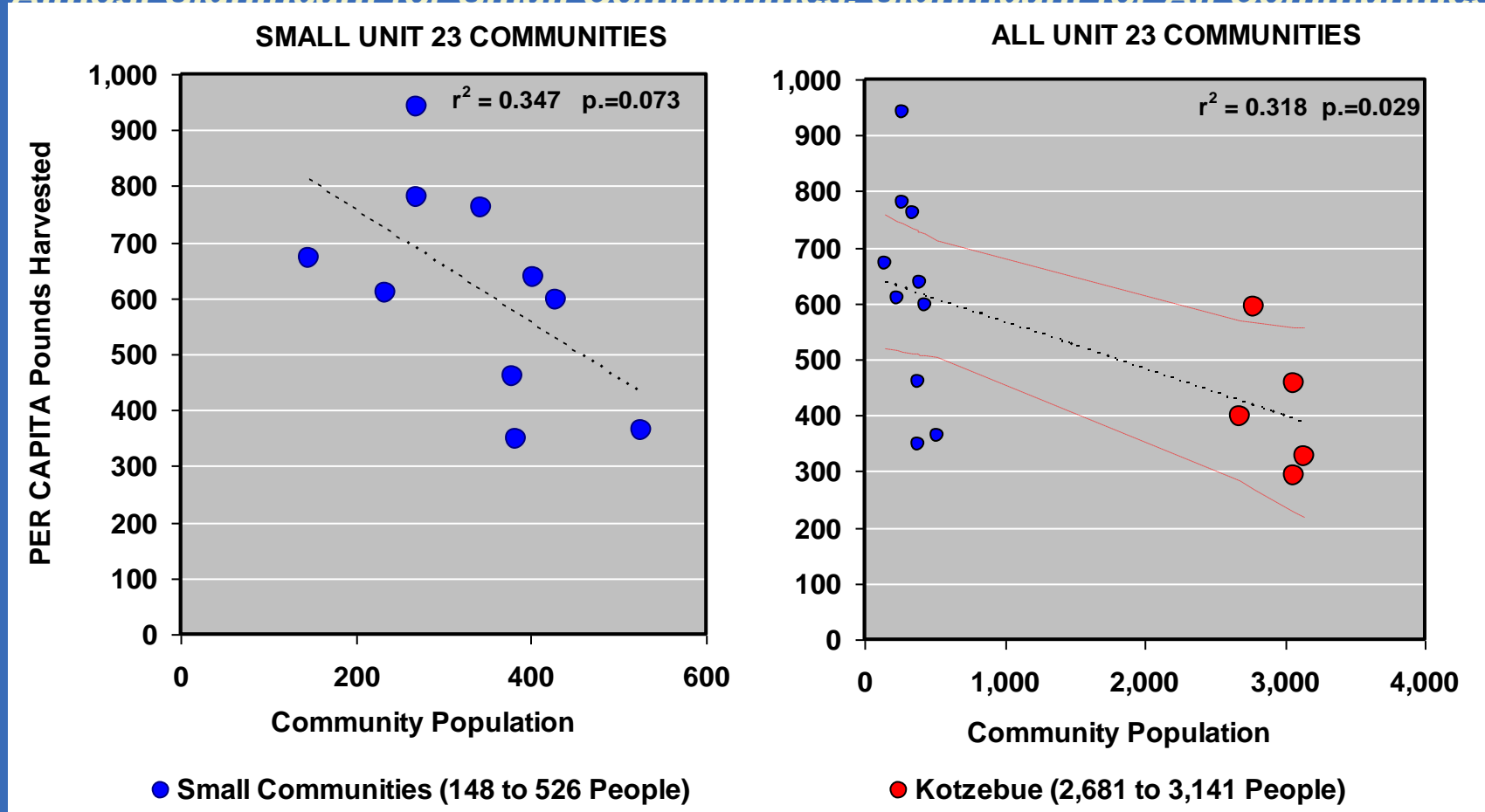
Not Significant for Small Communities, Significant for All Communities in Unit 23

(Comprehensive Estimates Include All Subsistence Resources)



Per Capita Harvest by Community Size

Almost Significant for Small Communities. Significant for All Communities



So What Can We Say?

- **Not Much Change in TOTAL Community Harvests**
- **Declining Harvests PER PERSON**
- **People Still Use a LOT of Subsistence Food**
 - Kivalina: 594 Pounds Per Person Per Year
 - Noatak: 364 Pounds Per Person Per Year
- **No Significant Trends for Key Species**
 - Caribou Harvests Appear Stable
 - Salmon Harvests Appear Stable
- **Community Size Does Matter**

But not as much as you might think

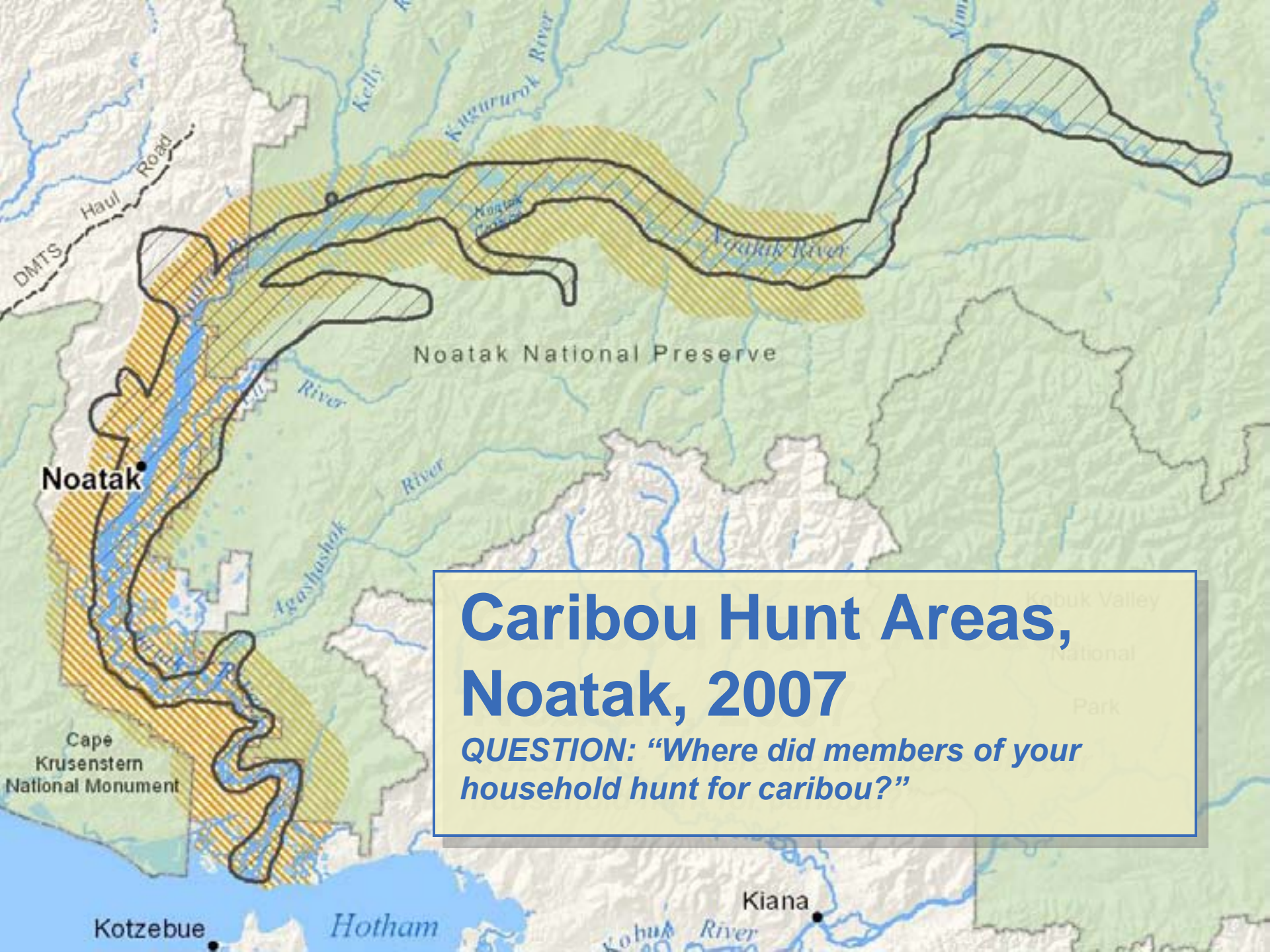


The End

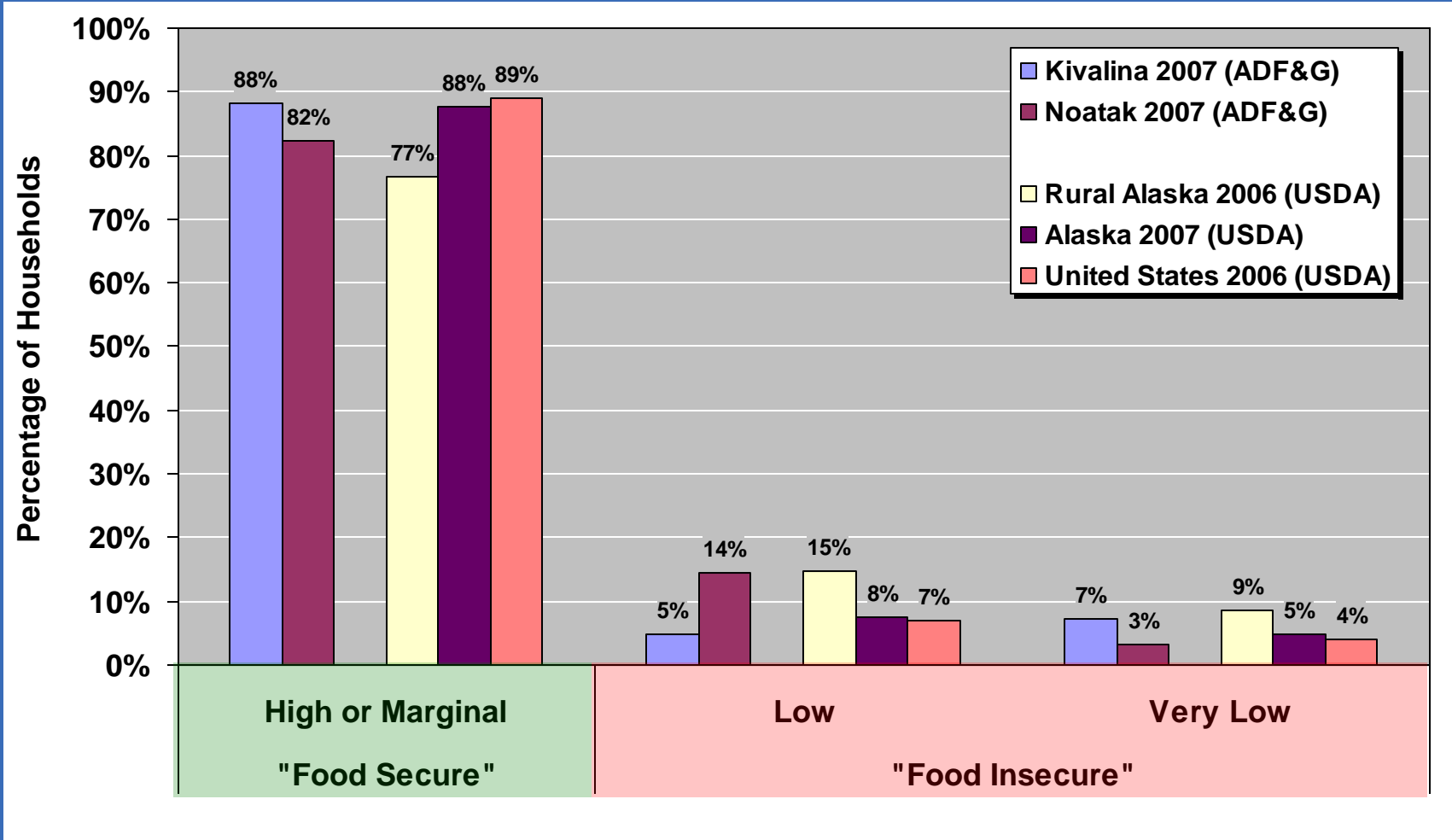
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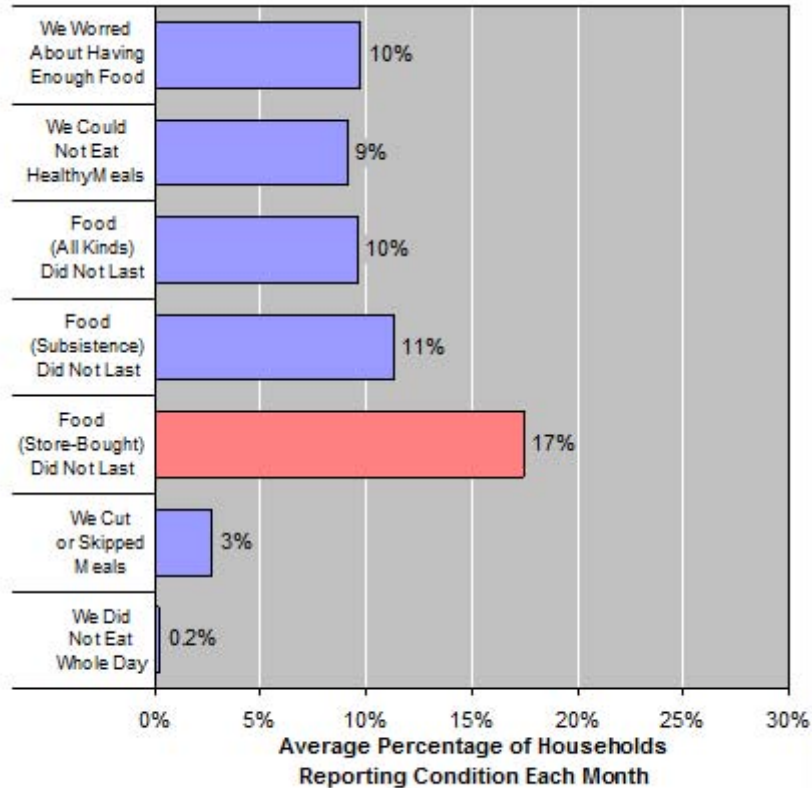


Food Security

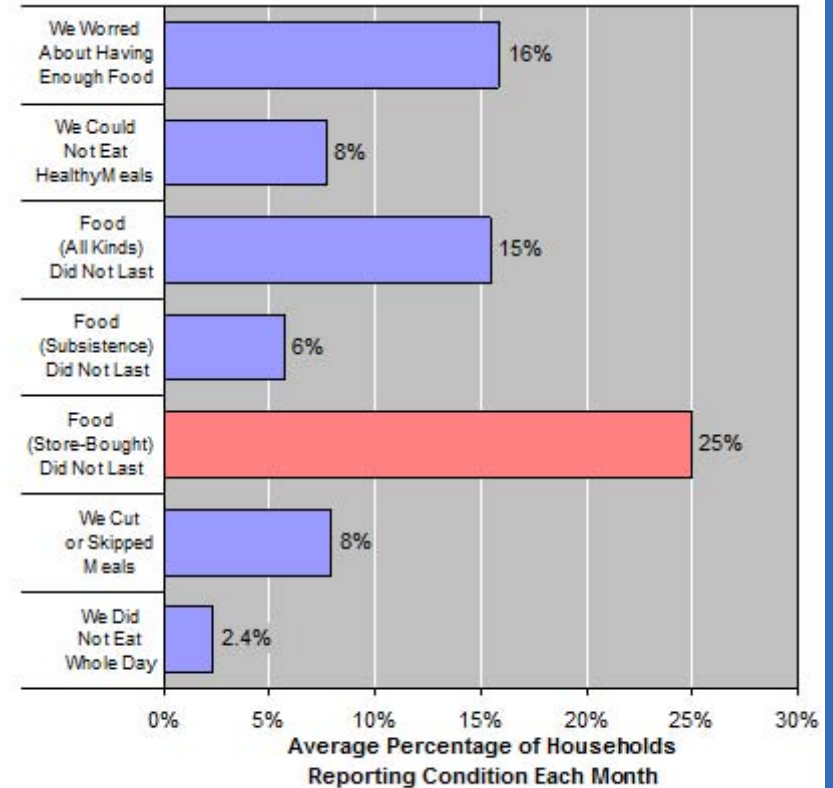


Food Security

NOATAK

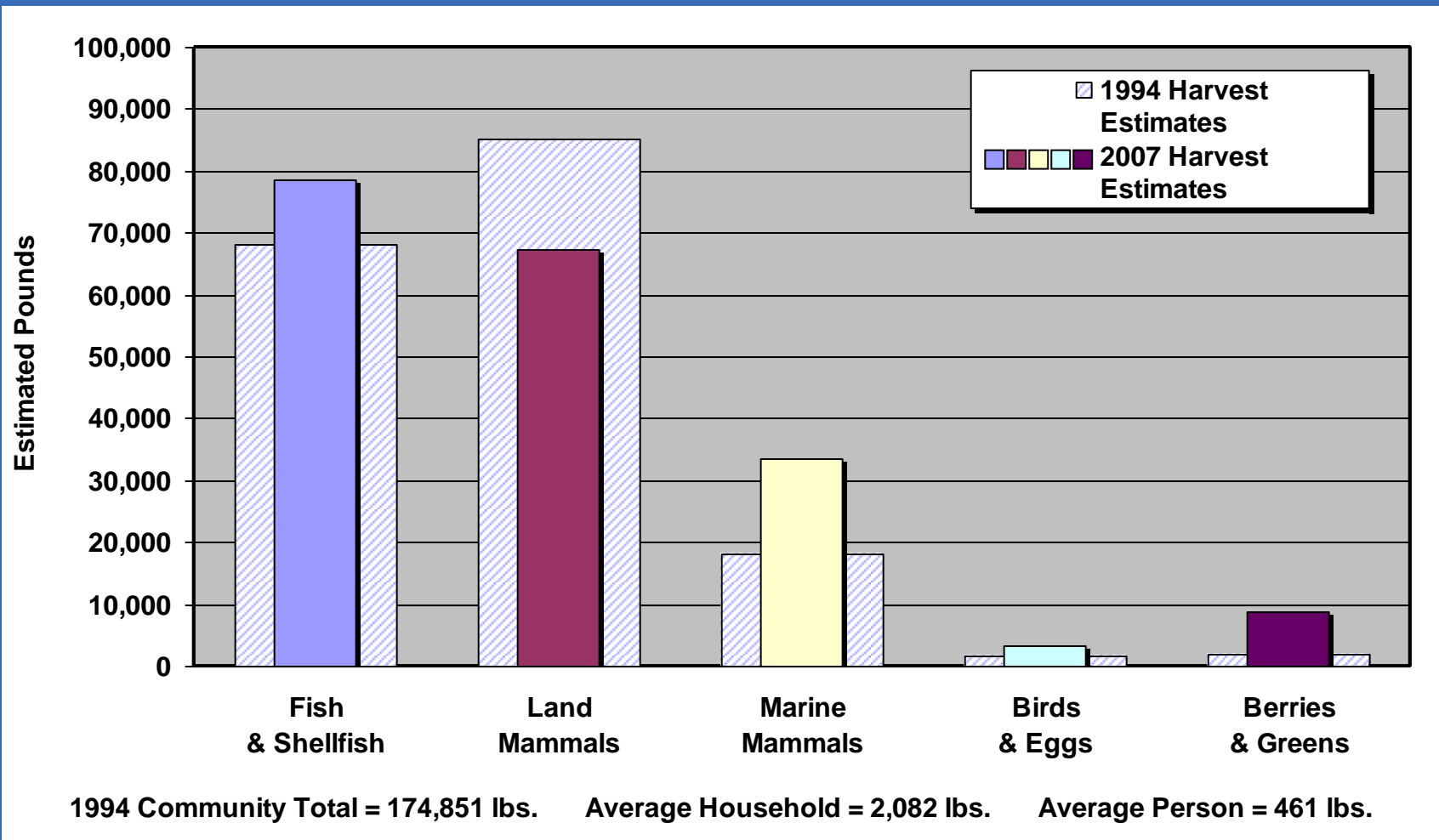


KIVALINA

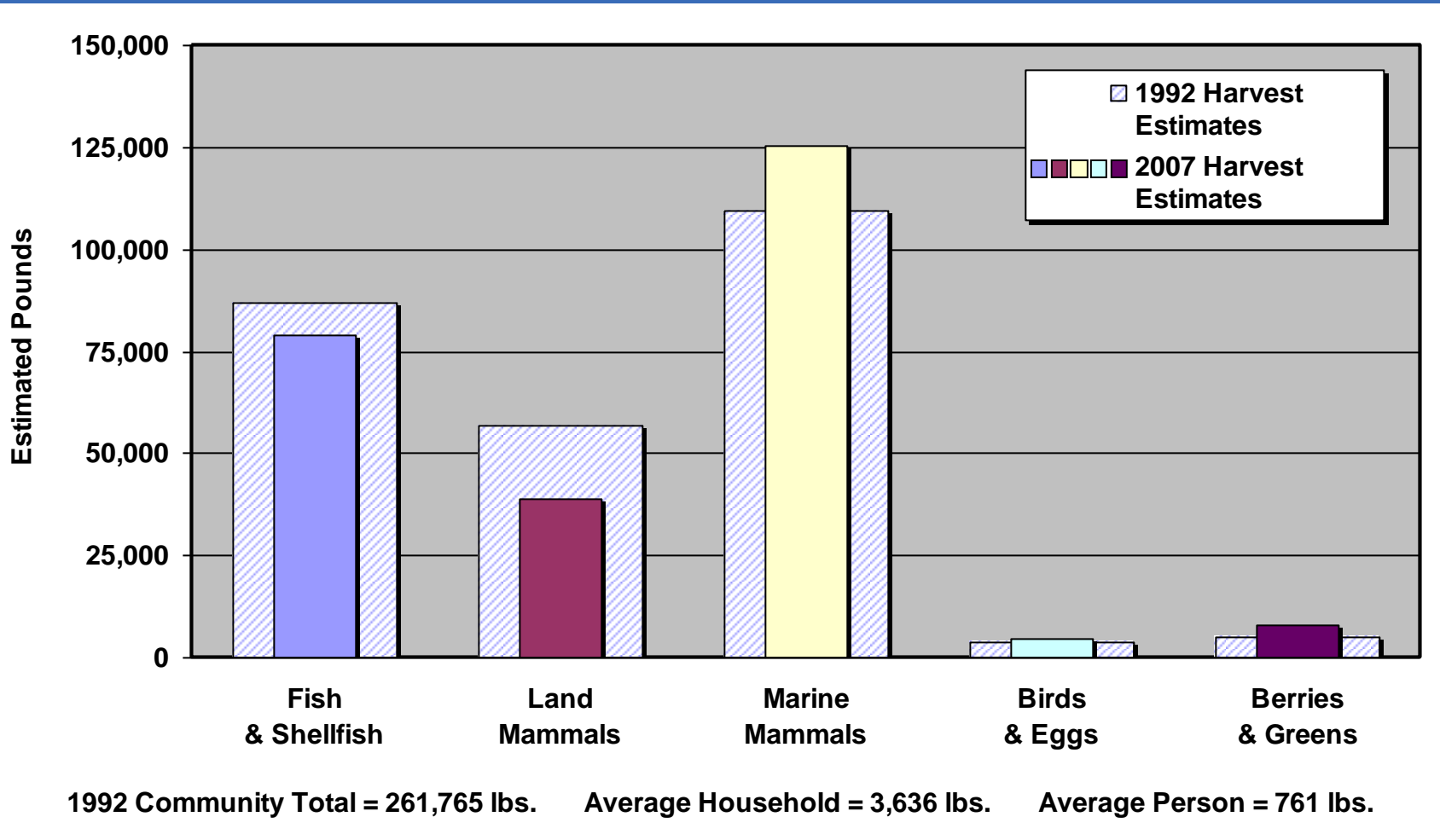


Harvest Changes, Noatak, 1994-2007

Fish & Shellfish UP, Land Mammals DOWN, Marine Mammals UP



Harvest Changes, Kivalina, 1992-2007



Question 3

Moose Harvests are NOT Related to Caribou Harvests

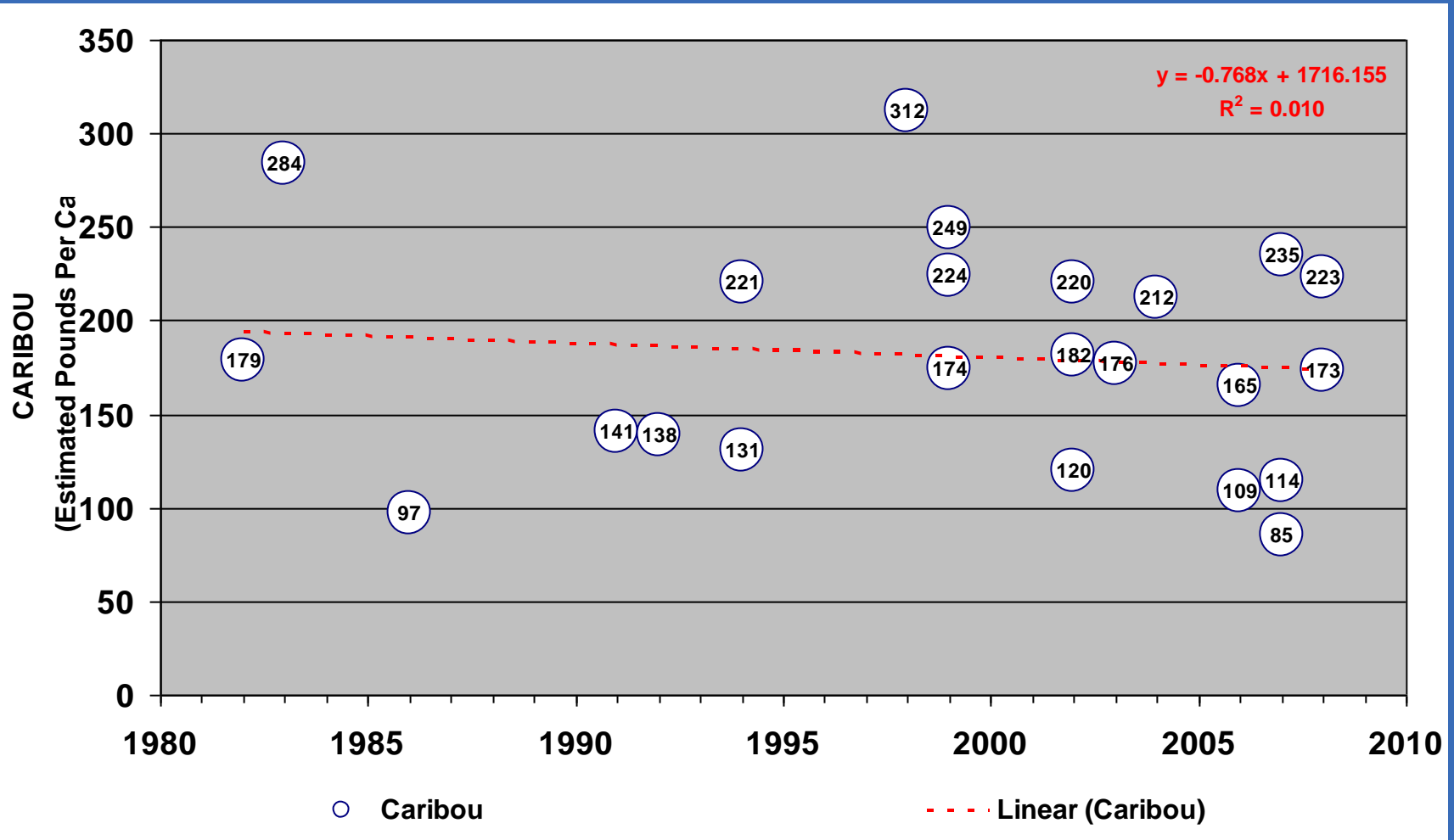
- **1970s: Caribou Scarce, Moose Abundant**
 - Assumption: People Harvested More Moose
 - But We Have Insufficient Harvest Data for 1970s

- **Since 1980, Caribou Increased, Moose Declined**
 - Assumption: Caribou Replaced Moose in Subsistence Diet
 - We Have SOME Reliable Harvest Data



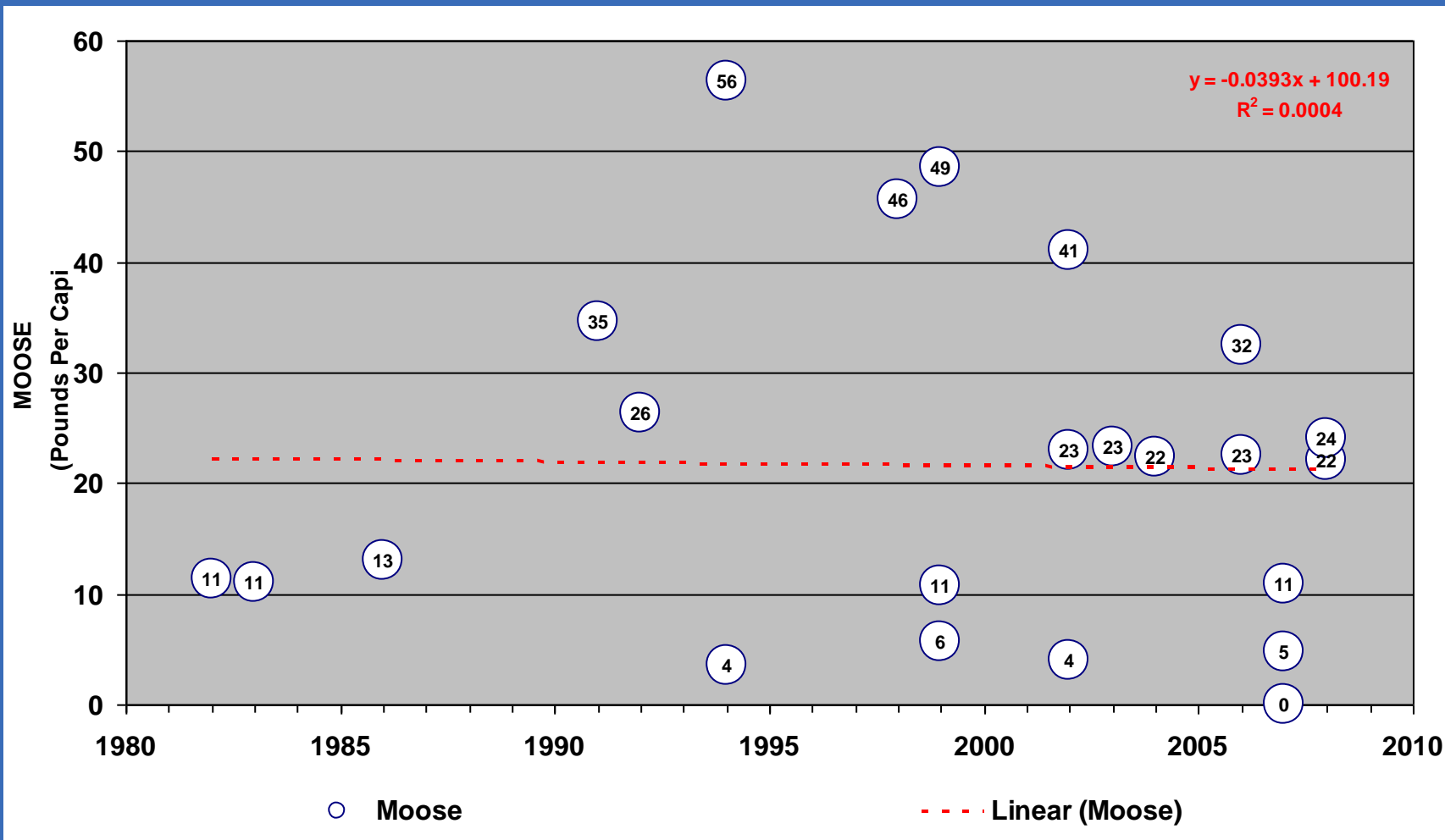
Caribou Harvests Have Not Changed

Average Pounds of Caribou Harvested, Per Person, 1984-2007



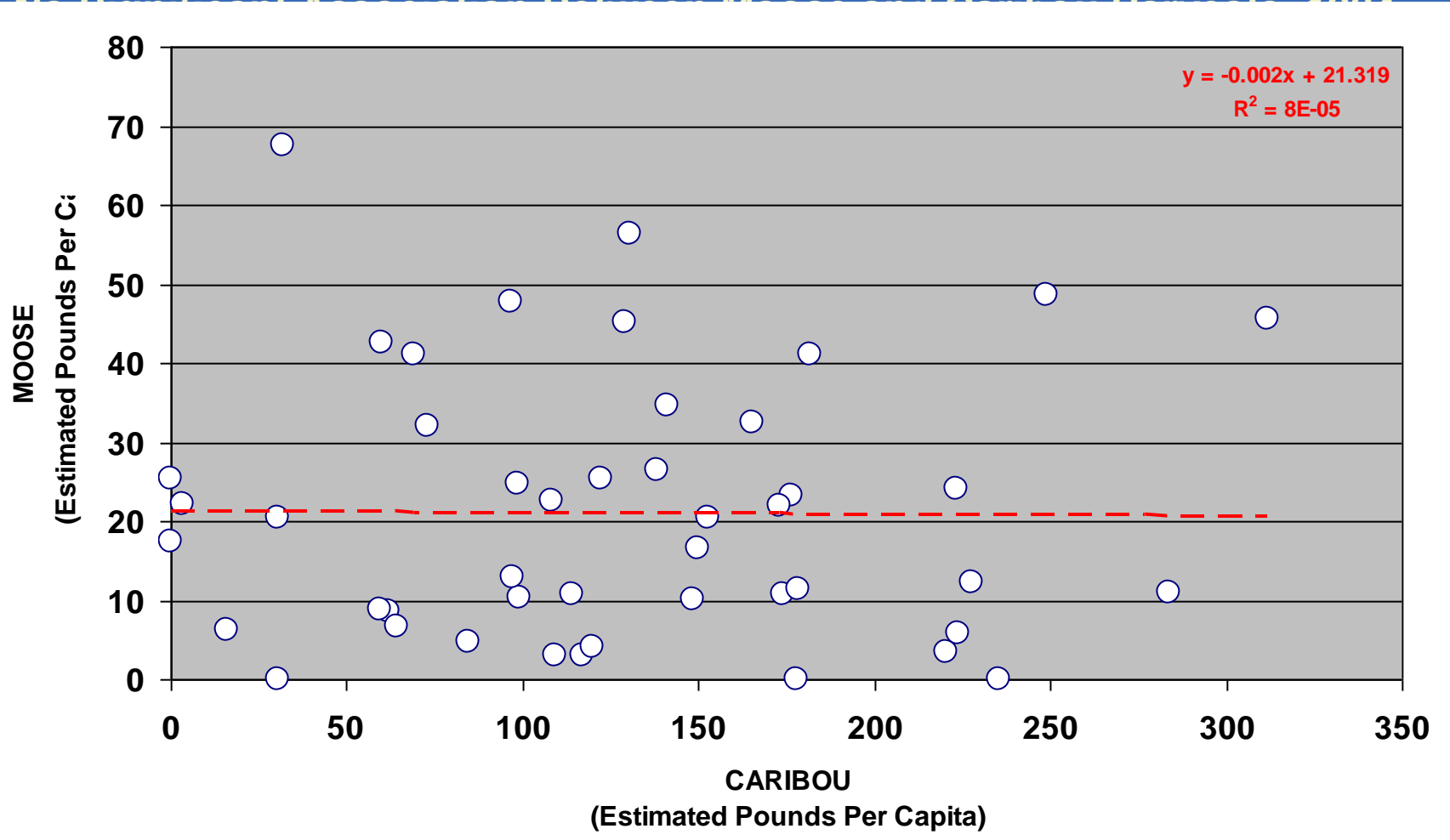
Moose Harvests Have Not Changed

Average Pounds of Moose Harvested, Per Person, 1984-2007



Harvests Were NOT Associated, NW & Arctic

No Significant Association Between Moose and Caribou Harvests, 1994



How We Estimate Harvests

Rarely Are We Able to Survey EVERY Household

- **How We Calculated the Noatak Estimates**

- We Surveyed 90 of 119 Households
- So We Multiplied our Survey Totals by $119/90$, or 1.3
- 334 Reported Caribou = 442 Estimated Caribou
($334 \times 1.3 = 442$)
- Estimate Includes 95% Confidence Interval ($\pm 16\%$)

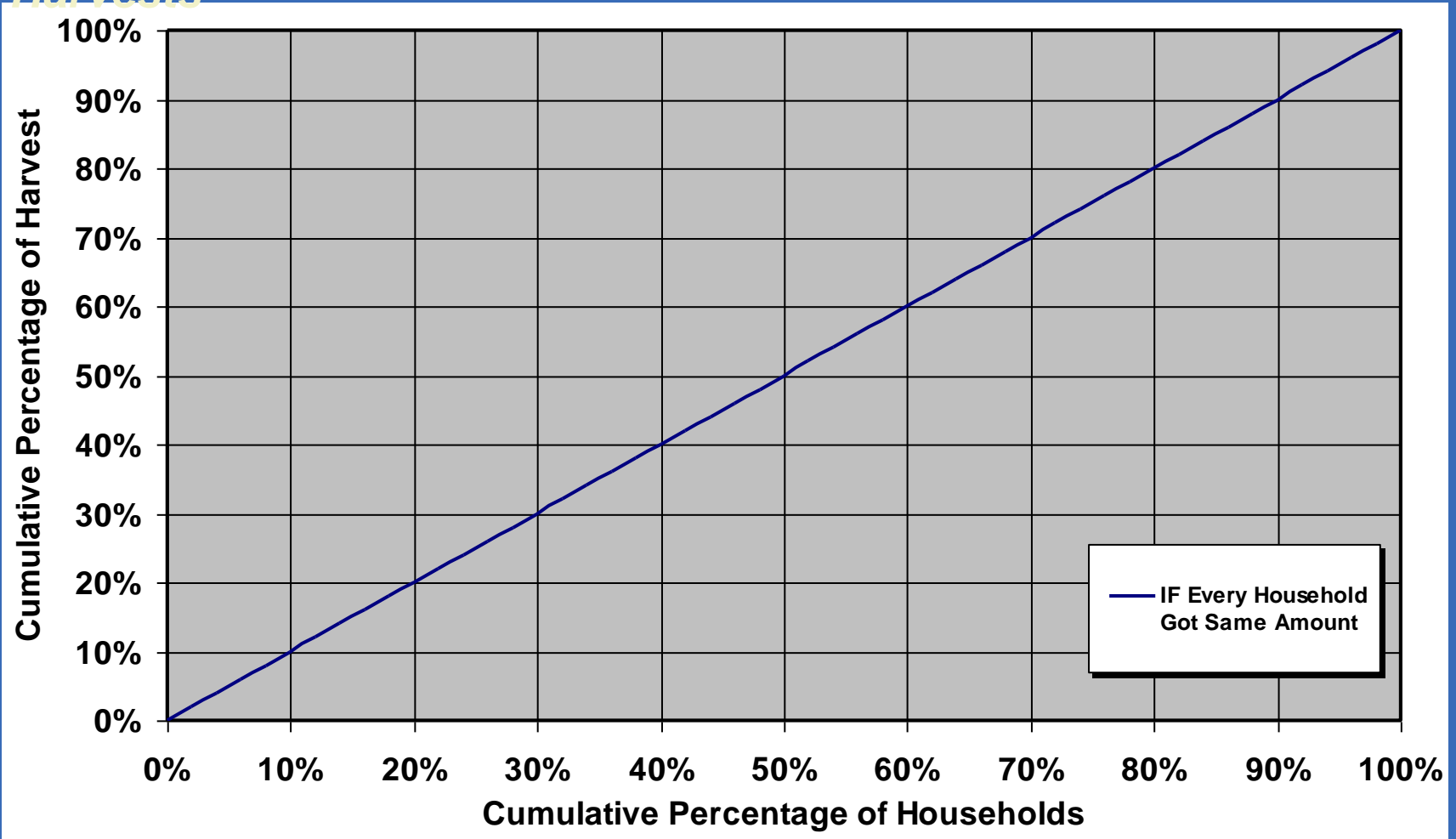
- **How to Read The Estimates**

- $334 (\pm 16\%) = 334 \pm 53$ caribou = 281 to 386 caribou



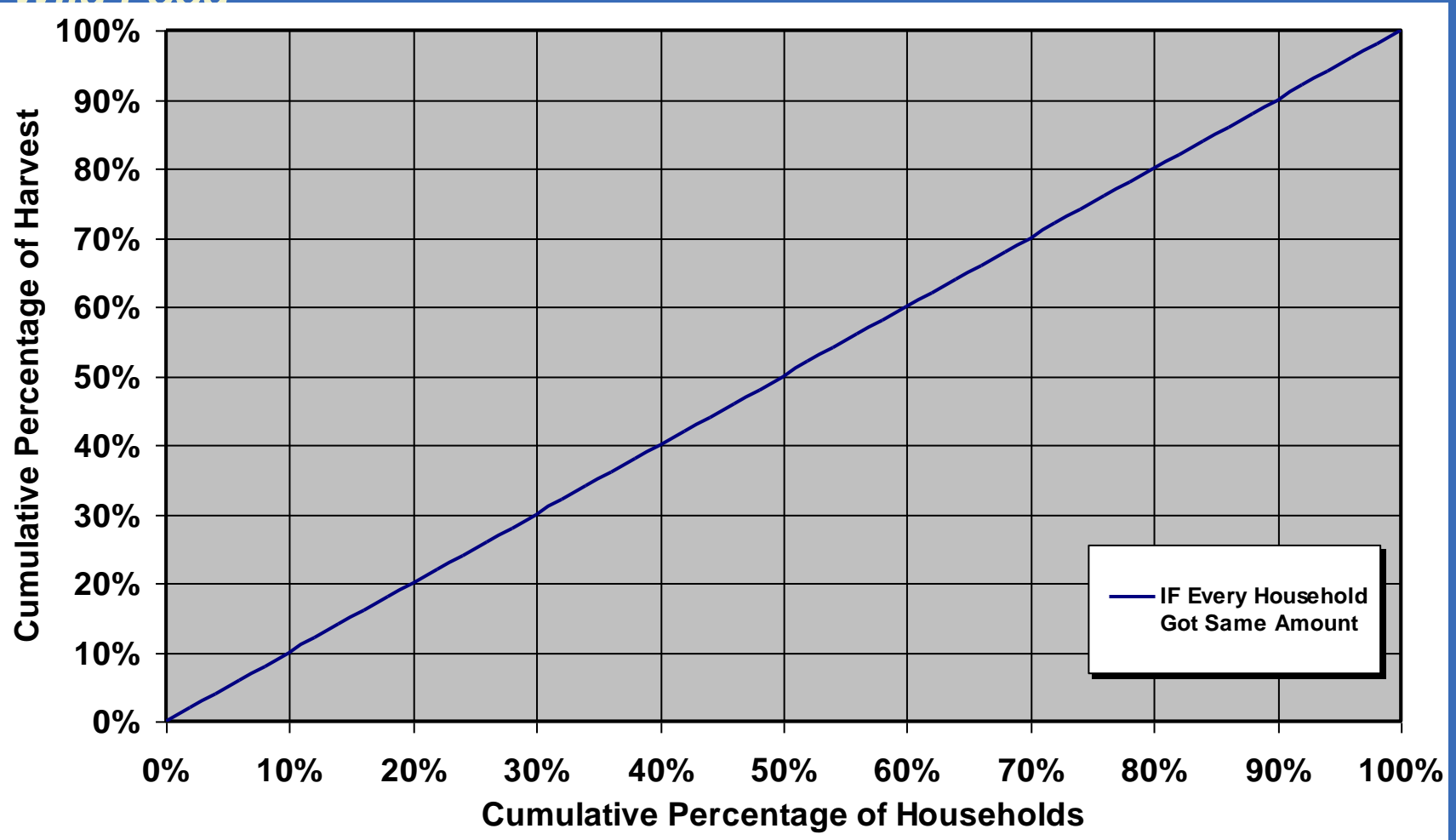
A Unlikely Harvest Pattern

A Cumulative Distribution Function for Identical Household Harvests



An Observed Harvest Pattern

In Rural Communities, 30% of the Households Take 70% of the Wild Food



Harvest Patterns Compared

Results from Noatak and Kivalina Are Similar to the Expected Pattern

