

# Designing a Recreational Angling Survey

Cynthia M. Jones

Director, Center for Quantitative Fisheries Ecology



# Objectives of the Talk

- Discuss fundamental issues concerning angler-survey method choice
- Compare strengths and weakness of different methods

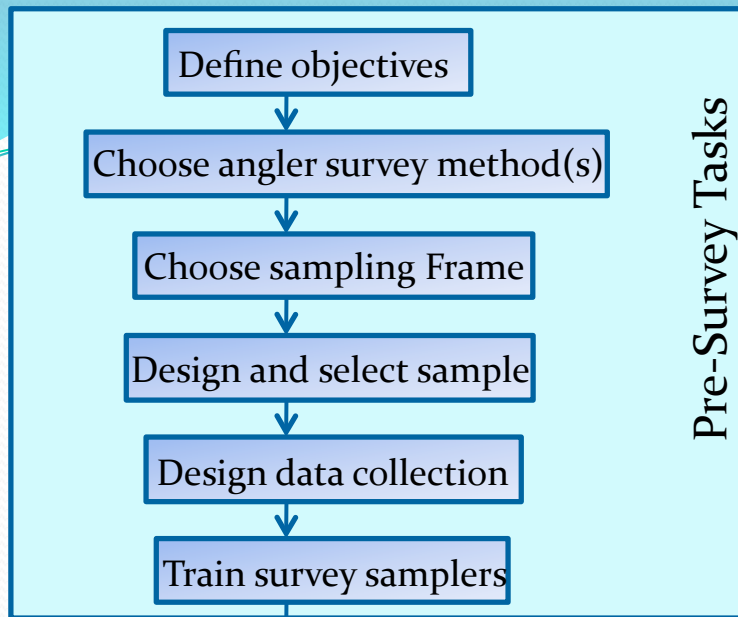


- Discuss fundamental issues concerning angler-survey method choice



# Sampling Approaches

		Type of Survey Method					
		Access Point	Roving	Telephone	Mail	Aerial	Diary
<b>Sampling Frame</b>		List of all access points used by the fishery & days	List of all water bodies used for fishing & days	List of angler telephone numbers or coastal country phone prefixes	List of address of all anglers	List of all water bodies used for fishing & days	List of address of all anglers
<b>Angler Contact Location</b>		On site at defined ramp, marina, location	On site by traversing the area of fishing	By telephone	By mail, by internet	On site by flying over	Diary mailed in or submitted via internet
<b>Effort</b>	Metric	Angler hours fished	Partial angler hours fished	Angler trip	Angler trip	Estimated number of anglers or boats	Angler trip
	Validation	Direct observation	Direct observation	Self report	Self report	Direct observation	Self report
<b>Catch</b>	Metric	Species & number	Species & number	Species & number	Species & number	NA	Species & number
	Validation	Direct observation	Direct observation	Self report	Self report	NA	Self report
	Biological metrics possible	Yes	Yes but difficult	No	No	No	No or Self report
<b>Cost per interview</b>							
<b>Sources of Bias</b>							



Pre-Survey Tasks

Implement survey

*Survey agents taking data by phone or in field*

Quality control implementation

*Survey supervisor checking agents' work*

Code, enter, and edit data

*Use of field-hardened computers or CATI*

Make adjustments

*Adjust for probability-based sampling*

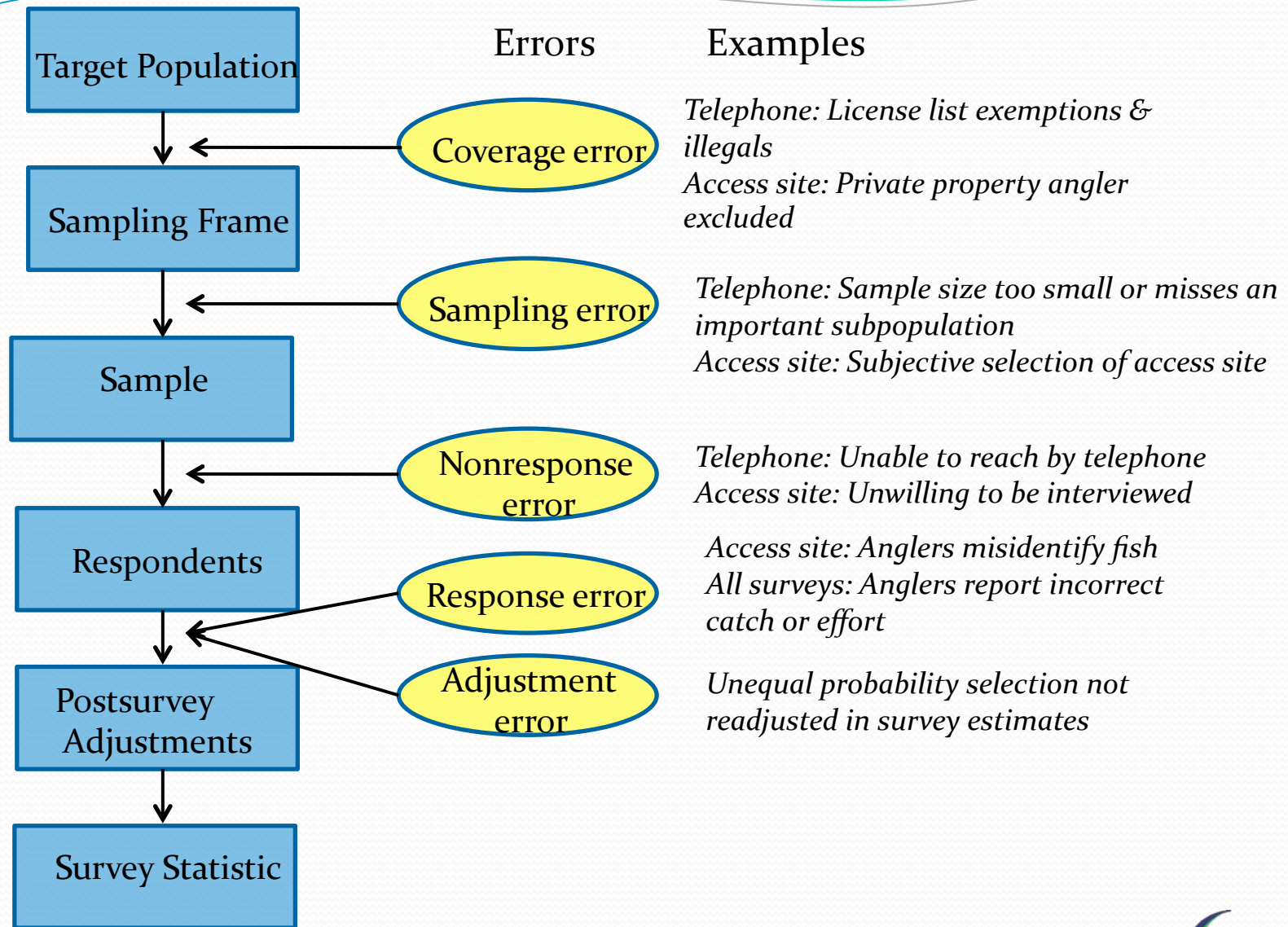
Perform analysis

*Use of validated computer programs*

Write report

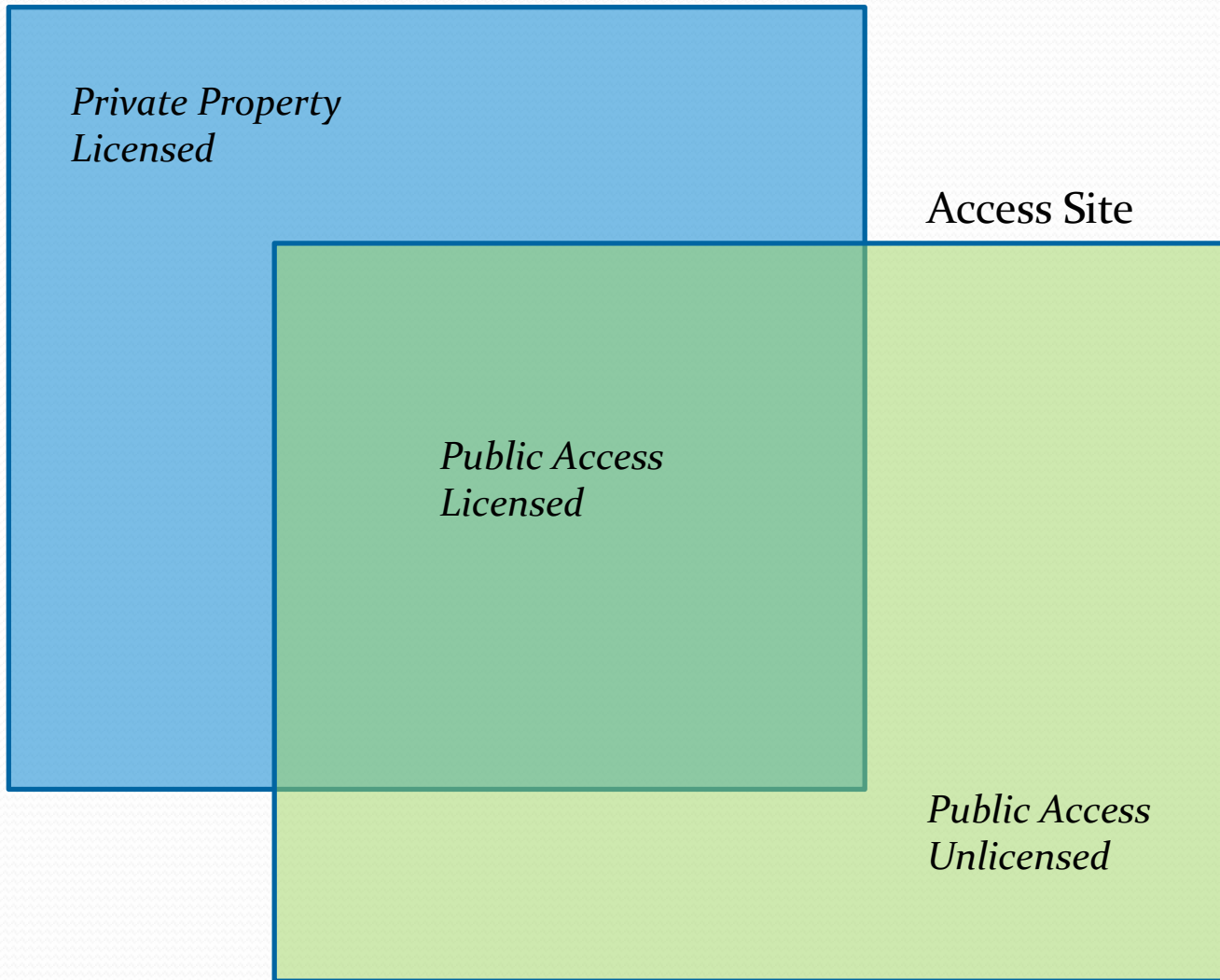
Evaluate Future Survey Improvements

## Survey Errors – Modified from Groves et al. 2009 Survey Methodology



## Sampling Frames and Coverage

Telephone or Mail



## **Undercoverage By RDD**

*Anglers without phones or  
With cells & non-coastal  
area codes*

## **Overcoverage By RDD**

*Random Dialing to coastal area codes  
(Landline and Cell)*

*Anglers with coastal area  
codes  
(Landline and cell)*





# Designing Angler Surveys

- List Frames
  - Area x Time Frames
- Choosing Days
- Choosing Locations

# Sample from a list frame

Daubenspeck T 2763 Burning Tree Ln Suffolk ----- 538-1942  
 W M 6001 Vineyard Ln Suffolk ----- 484-8547  
 Dauber B H 3982 Wyckoff Dr Virginia Beach ----- 431-2134  
 Daubers , Inc 5255 Henneman Dr Norfolk ----- 833-4097  
 Daubert James 8013 Baywood Dr Norfolk ----- 588-2628  
 James 3013 Pewter Rd Virginia Beach ----- 486-0367  
 Kevin 4017 Vaughan Town Ct Virginia Beach ----- 689-0141  
 Tim & Maureen 8246 Andrew Ln Norfolk ----- 480-3074  
 Dauda Edwin 8900 Old Ocean View Rd Norfolk ----- 228-3722  
 Dauer Christopher 5348 Chatham Lake Dr  
 Virginia Beach ----- 495-3847  
 Daniel 3660 Kanburke Trl Chesapeake ----- 484-5057  
 Matthew 3557 Chesapeake Blvd Norfolk ----- 623-0043  
 Pamela 3224 E Ocean View Av Norfolk ----- 962-1119  
 Thomas & Amy 521 Carneo Terr Chesapeake ----- 382-0732  
 Wesley J 5701 Constance Ct Virginia Beach ----- 490-9765  
 Dauge Bernadette 4832 Clifony Dr Virginia Beach -- 495-5958  
 Daughdrill M J 3100 Shore Dr Virginia Beach ----- 496-1404  
 Oliver 1561 Willimantic Dr Virginia Beach ----- 467-5794  
 Daughdrille John & Cheryl 840 Old Bridge Ln  
 Chesapeake ----- 819-7597  
 Daugherty Associates Architects 248 W Bute Ste 200  
 Norfolk ----- 623-0051  
 Daugherty B H 1327 Hodges Ferry Rd Portsmouth -- 465-5410  
 Debra 5319 Shorebird Ct Chesapeake ----- 558-0977  
 Brian & Kelly 2312 Shorebird Ct Chesapeake ----- 558-1248  
 Brian & Susann 1513 Captains Ct Virginia Beach ----- 467-6318  
 Bruce 22764 Spivey Town Rd ----- 242-3152  
 Carl 115 N Main St Franklin ----- 569-1171  
 Christopher 1614 Sword Dancer Dr Virginia Beach -- 301-6511  
 Dale 122 Kimberly Ln Norfolk ----- 271-4447  
 Dale 122 Kimberly Ln Norfolk ----- 271-8790  
 Darlene 20380 Garrison Dr Wind ----- 242-6636  
 David W & Nancey A 1625 Mill Landing Rd  
 Virginia Beach ----- 721-5027  
 Dawn 500 Dunkirk Ct Virginia Beach ----- 703-9300  
 Donald N Lor 2332 Wood Ur Virginia Beach ----- 461-2990  
 Doug 3024 Glastonbury Dr Virginia Beach ----- 468-5380  
 Earl 6315 Adair Av Norfolk ----- 466-1792  
 Ethan ----- 275-9373  
 G W ----- 430-9052  
 George S 1041 Baker Rd ----- 464-5502  
 Guy E & Sherry 1700 Catherine Ct Virginia Beach -- 481-7916  
 Hunter 1725 Meredith Rd Virginia Beach ----- 460-3399  
 J 6224 Hightower Rd Portsmouth ----- 671-6816  
 J B 293 Corporate Blvd Norfolk ----- 803-9254  
 J S 5044 Rugby Rd Virginia Beach ----- 233-0444  
 James 2552 Elson Green Av Virginia Beach ----- 721-2079  
 James W 244 Lucille Av ----- 623-9529  
 Jennifer 1756 Aquamarine Dr Virginia Beach ----- 321-0389  
 John & Linda 313 46th St Virginia Beach ----- 962-7290  
 K J 710 Roosevelt Av Virginia Beach ----- 306-1205  
 Kimberly 2869 Augusta Cir Virginia Beach ----- 301-9484  
 Kimberly 3496 Thurston St Norfolk ----- 853-3534  
 Lalkia 2621 Harline Dr Chesapeake ----- 963-7520  
 Larry Melanie 628 Manor Dr Virginia Beach ----- 463-1094  
 Larry R 748 Waters Dr Virginia Beach ----- 495-4290  
 Melissa 1021 Bowling Green Tr Chesapeake ----- 410-9195  
 Misty ----- 233-9735  
 Mitch ----- 491-2350  
 P N 900 Le Cove Dr Virginia Beach ----- 420-6870  
 Phillip 4321 Two Woods Rd Virginia Beach ----- 460-7855  
 Raymond 901 Northwood Dr Chesapeake ----- 546-5035  
 Roger A 1132 Roanoke Arch Chesapeake ----- 482-1867  
 S Clark 311 Suburban Pkwy Norfolk ----- 531-8058  
 Scott 843 Park Place Dr Virginia Beach ----- 428-5111  
 Selden F 4420 Cambria St Virginia Beach ----- 687-6517  
 T R ----- 498-0416  
 Vicky 408 Constitution Dr Virginia Beach ----- 473-1640  
 Daugherty Bobbie 1235 Picadilly St Norfolk ----- 853-6518  
 J C 4816 Manor Av Portsmouth ----- 484-1367  
 Joseph 2000 Pine Tree Ct Suffolk ----- 934-1146  
 Pamela 453 Ballhack Rd Chesapeake ----- 204-4817  
 Robert 1221 Renoir Ct ----- 427-9038



# Choosing Days:

Simple random sample where we choose 13 days to sample. This produces the following sampling calendar

Random draw	Random number	Used?	Date
1	16	yes	16
2	10	yes	10
3	6	yes	6
4	21	yes	21
5	22	yes	22
6	17	yes	17
7	1	yes	1
8	27	yes	27
9	14	yes	14
10	21	no duplicate	
11	3	yes	3
12	14	no duplicate	
13	16	no duplicate	
14	5	yes	5
15	24	yes	24
16	18	yes	18

Mon	Tues	Wed	Thur	Fri	Sat	Sun
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28



## Sampling access sites



The three lakes are our Primary sampling unit in the first stage of our design.

We can't sample every access site in a day-- say we can only sample 2 in a day. In week 1 at Lake 3 we can sample both sites, but in week 2 at Lake 1 we must chose 2 out of the three sites and in week 3 we must chose 2 out of 4. Again we do this by choosing without replacement. We chose sites 1 and 4 in week 2 at Lake 1. The access sites are our Secondary sampling units in this second stage of our sampling design.

## Example of a roving survey with three routes that take 8 hours each to traverse

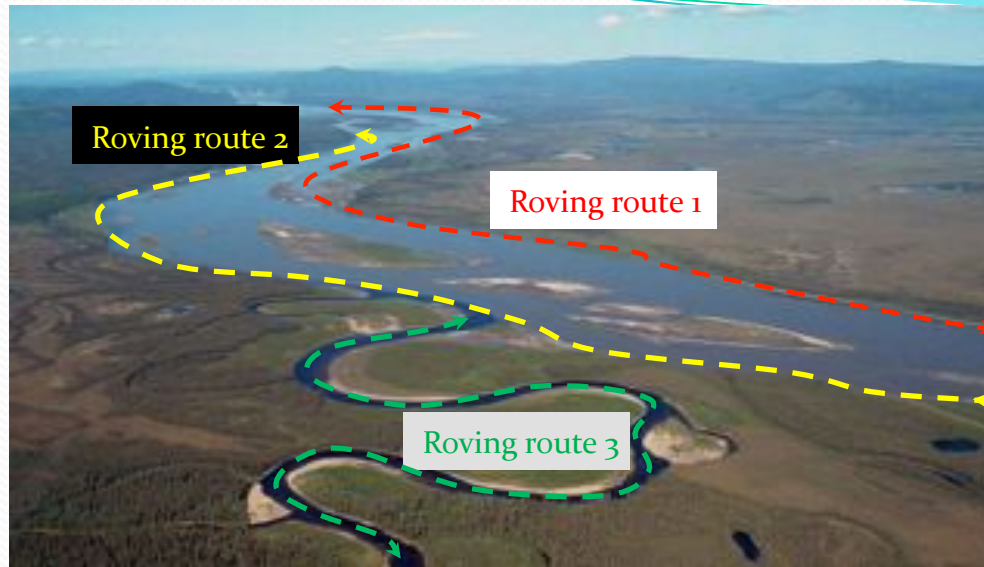
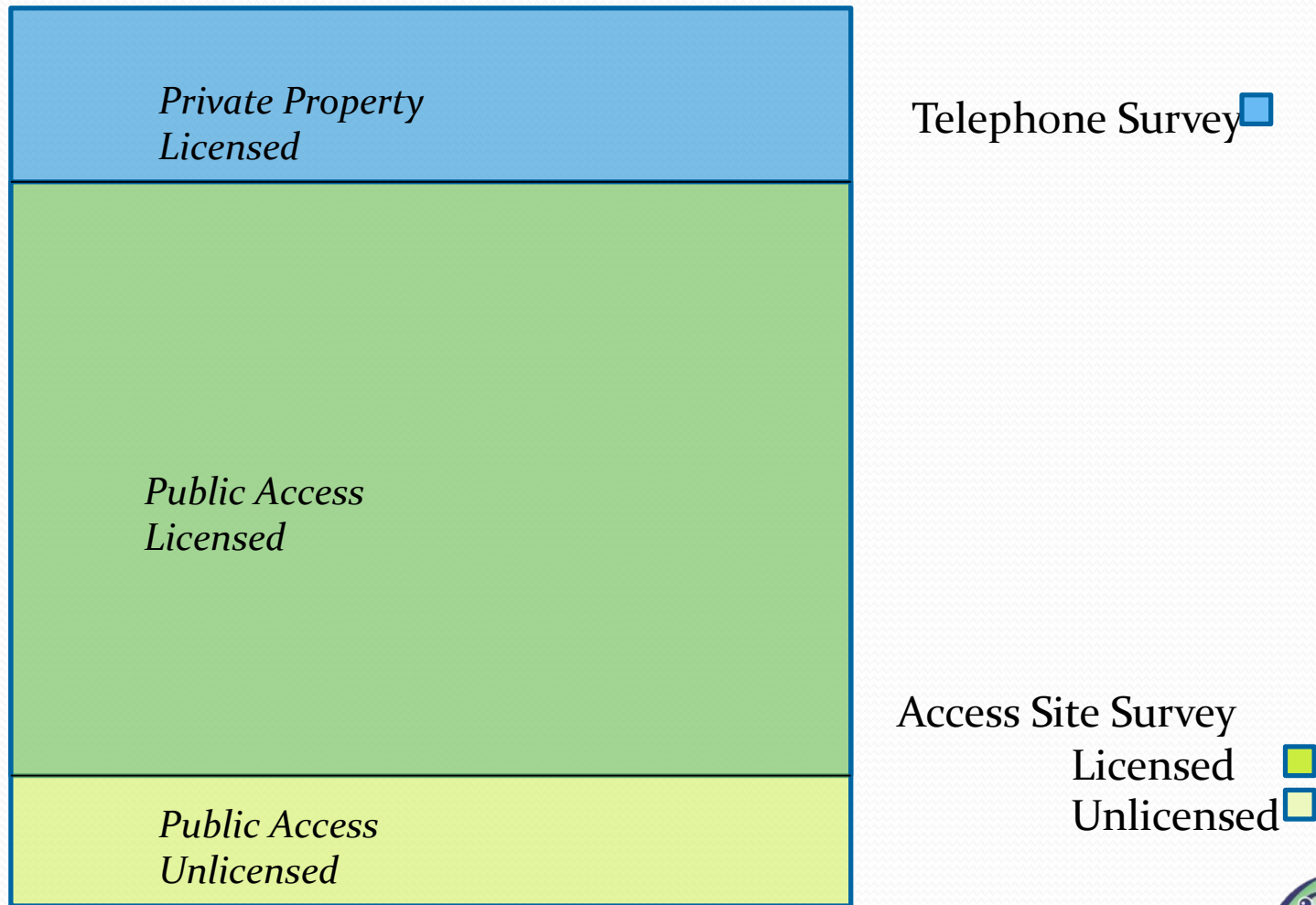


Photo Of Yukon River, Alaska by USGS

Roving routes have been randomly selected to include one weekend day and two week days per month for each of the routes. Route 1 selected days are in red; route 2 in yellow; route 3 in green.

Mon	Tue	Wed	Thur	Fri	Sat	Sun
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

**Sampling Frames and Coverage** - The rectangle below represents the sampling frame of all anglers. Anglers fishing from private property can be interviewed by telephone through license lists or random digit dialing if unlicensed. Anglers fishing from public access can be interviewed on site, whether they are licensed or not.



# Compare strengths and weakness

		Type of Survey Method					
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	Biological metrics possible	Yes	Yes but difficult	No	No	No	No or Self report
<b>Cost per interview</b>		High	Very High	Low	Low	NA	Low
<b>Sources of Bias</b>		Incomplete list Avidity	Incomplete list Length-of-stay	Incomplete list Refusal Recall Prestige Species mis-identification	Incomplete list Non-response Recall Prestige Species mis-identification	Incomplete list	Incomplete list Non-response Recall Prestige Species mis-identification





Questions?