

A large salmon is swimming in a river. The water is brown and rippled. In the background, there are tall, green grasses. The salmon has a silver body with a yellowish-green stripe along its side and a reddish-brown stripe below it. The text "Salmon Spawning Grounds and Mobile Data Collection in Washington State" is overlaid on the image in a white, serif font.

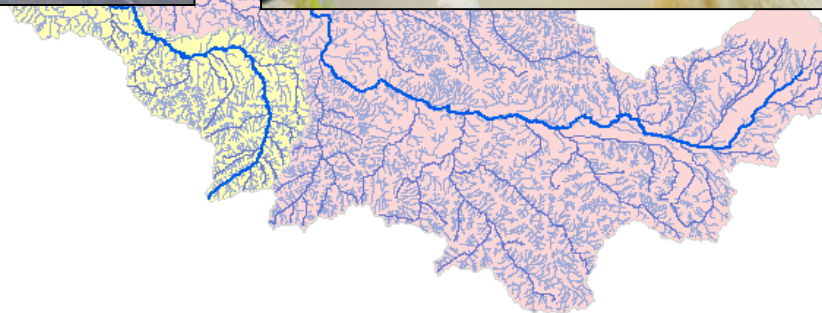
Salmon Spawning Grounds and Mobile Data Collection in Washington State

Are Strom and James Losee
Washington Department of Fish and Wildlife

Study Area-South Puget Sound



> 5 fish species



Pilot Project Objective

How accurate are the data collected electronically versus data collected using current methods?

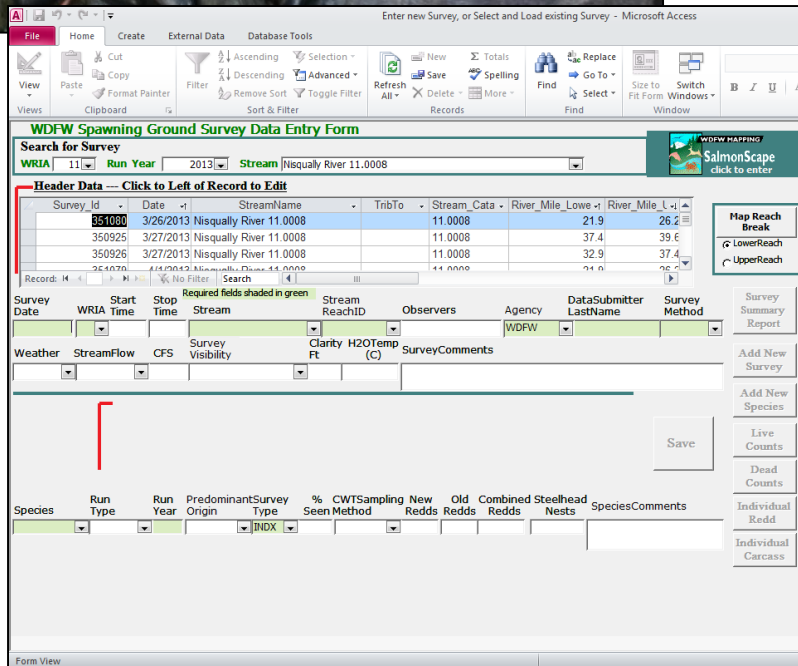
How efficient is electronic data versus current (paper) data collection methods?_

Are the devices (iPADs) and application reliable?

Are the units capable of standing up to normal outdoor field use in the variety of conditions and surroundings in which sampling takes place?

What improvements could be incorporated into the application or device to increase efficiency, accuracy, or ease of use?

Pilot Project Objectives/Questions?



WDFW Spawning Ground Survey Data Entry Form

Search for Survey
WRIA: 11 Run Year: 2013 Stream: Nisqually River 11.0008

Survey Id	Date	StreamName	TribTo	Stream_Cata	River_Mile_Lowe	River_Mile_U
351080	3/26/2013	Nisqually River 11.0008		11.0008	21.9	26.2
350925	3/27/2013	Nisqually River 11.0008		11.0008	37.4	39.6
350926	3/27/2013	Nisqually River 11.0008		11.0008	32.9	37.4
351070	3/27/2013	Nisqually River 11.0008		11.0008	34.6	36.2

Required fields shaded in green

Survey Date	WRIA	Start Time	Stop Time	Stream	Stream ReachID	Observers	Agency	DataSubmitter LastName	Survey Method
							WDFW		

Weather	StreamFlow	CFS	Survey Visibility	Clarity H2Otemp (C)	SurveyComments

Save

Species	Run Type	Run Year	PredominantSurvey Origin	Type	% CWTSampling Seen Method	New Redds	Old Redds	Combined Redds	Steelhead Nests	SpeciesComments
				INDX						

Improve:

- Accuracy
- Efficiency
- Flexibility
- Reliability

SAMPLER — METHOD — STREAM — SECTION — FLOW — VULNERABILITY — CLARITY (FT) — GPS UNIT# — REACH*

FOOT
RAFT
AERIAL

NEW

0-5

1-4

OBSERVATION*

LIVE

DEAD

REDD

SPECIES
CHINOOK COHO SH SOCKEYE...

SEX
M F JACK SMD

AD-CLIPPED
YES NO UNKNOWN

SAMPLE Y N

COMMENTS

SPECIES
CHINOOK COHO...

SEX
M F JACK SMD

AD-CLIPPED?
YES NO UNKNOWN

NEW PREVIOUS

WDT

SPAWNING ACTIVITY
YES NO

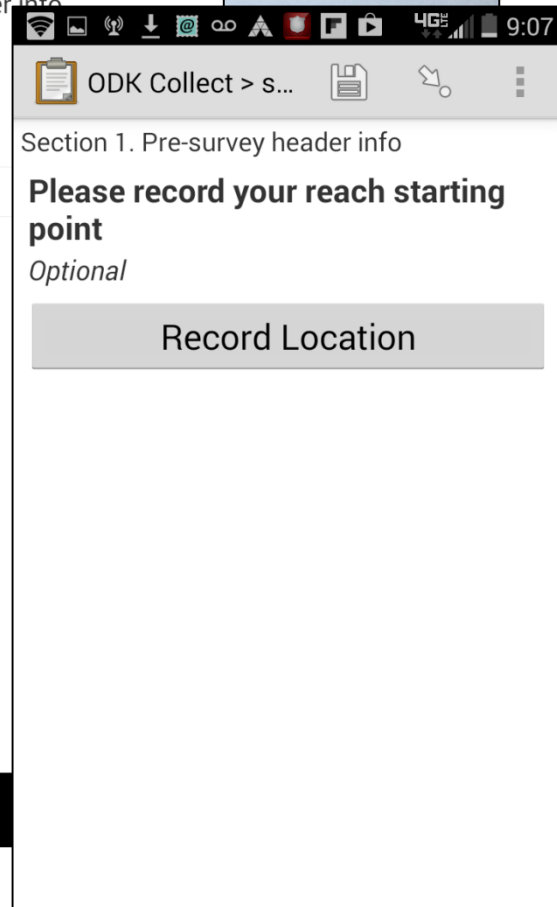
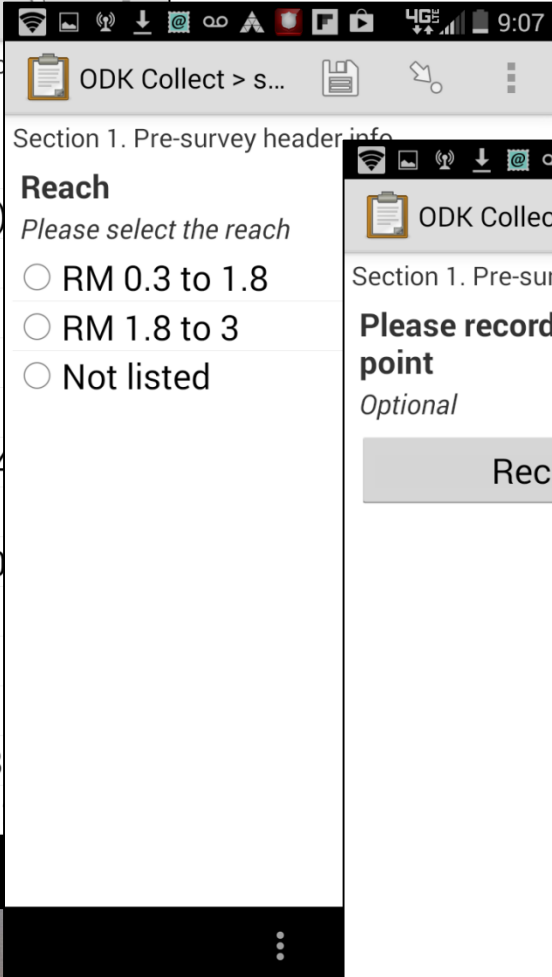
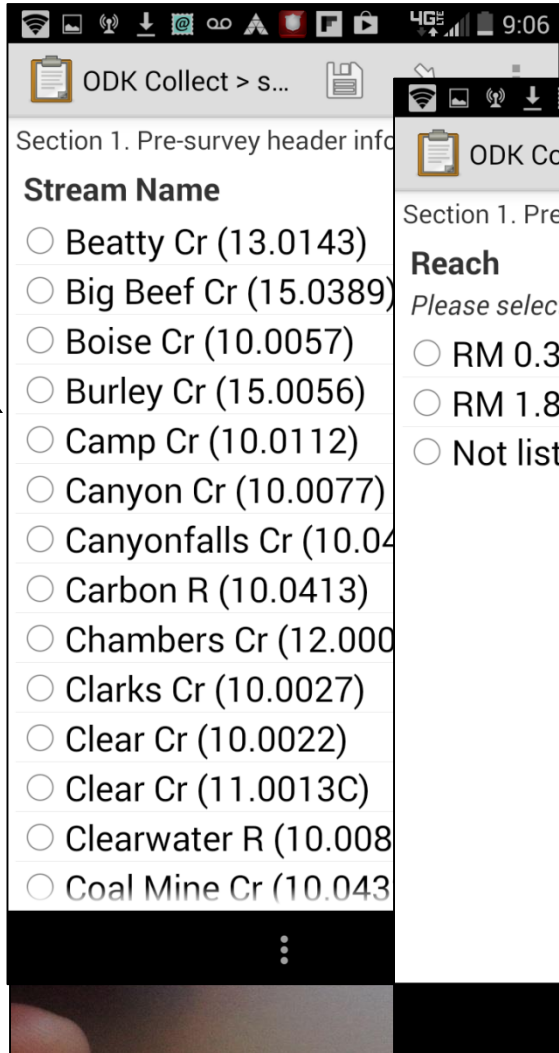
MALE FEMALE



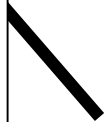
*TIMESTAMP

Accuracy-paper vs. electronic

Location



Date



Biological Data

Accuracy-paper vs. electronic

Location



STREAM: _____

WRIA	STREAM NUMBER	SUB #
<input type="text"/>	<input type="text"/>	<input type="text"/>
RM-LOWER END 1/10	RM-UPPER END 1/10	
<input type="text"/>	<input type="text"/>	
SPECIES NAME	LIVE COUNT	
<input type="text"/>	<input type="text"/>	
FISH PER MILE 1/10	SPECIES	
<input type="text"/>	<input type="text"/>	
TYPE COUNT	TYPE SURVEY	
<input type="text"/>	<input type="text"/>	

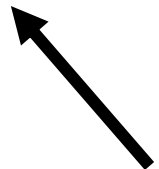
ODK Collect > s...

Section 1. Pre-survey header info

Survey start time

Jul	04	2013
Aug	05	2014
Sep	06	2015
20	03	
21	04	
22	05	

Date



Biological Data

Accuracy-paper vs. electronic

Location



STREAM:
WRIA STREAM NUMBER
RM-LOWER END 1/10 RM-UPPER
SPECIES NAME
FISH PER MILE 1/10
TYPE COUNT TYPE

ODK Collect > s... 9:19

Section 2. Survey counts (1)
Please enter the fish length (cm)

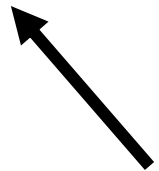
1

Length must be between 2cm and 400cm

1 2 3 -
4 5 6 ,
7 8 9 ~~x~~
_ 0 . ←

RES: OF: 9: 73
MONTH DAY
LENGTH 1/10
TOTAL COUNT
REDD COUNT
COMMENT

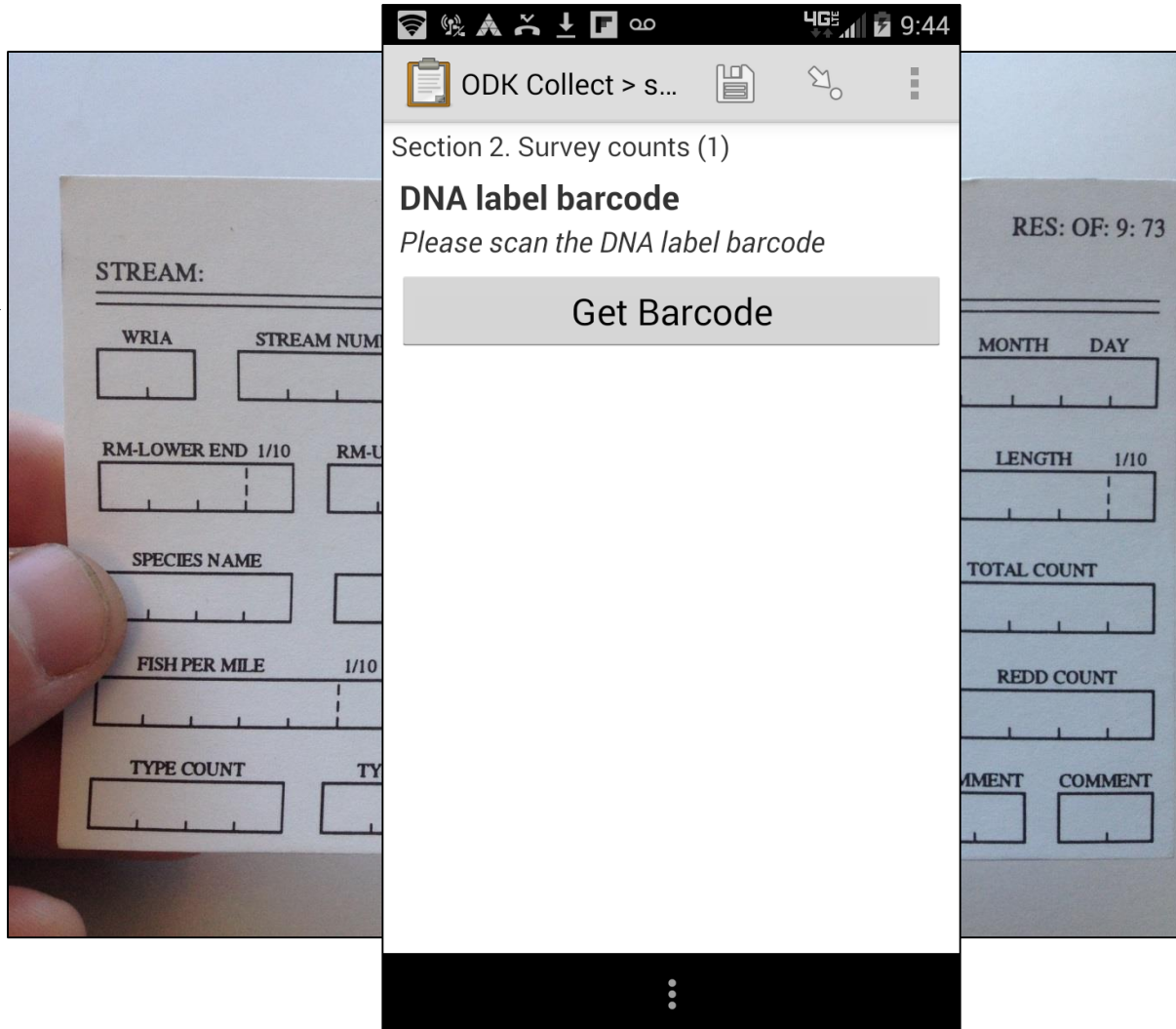
Date



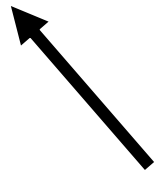
Biological Data

Accuracy-paper vs. electronic

Location



Date

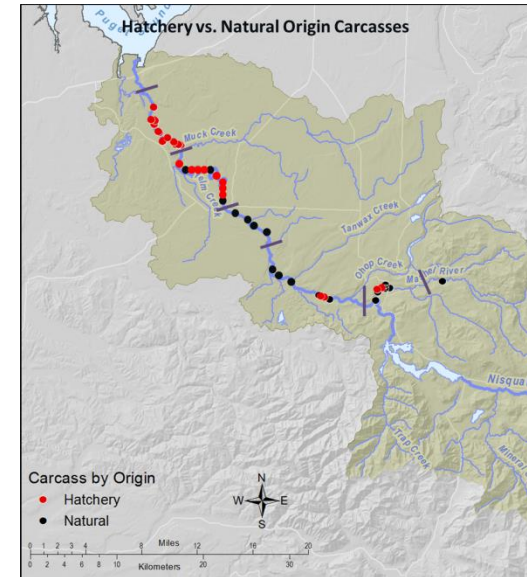


Biological
Data

Efficiency-paper vs. electronic data collection



Survey ID	Date	Stream Name	TribTo	Stream Cate	River Mile Lowe	River Mile L
351080	3/26/2013	Nisqually River 11.0008		11.0008	21.9	26.2
350925	3/27/2013	Nisqually River 11.0008		11.0008	37.4	39.6
350926	3/27/2013	Nisqually River 11.0008		11.0008	32.9	37.4



Data Collection



Data Entry/Error checking

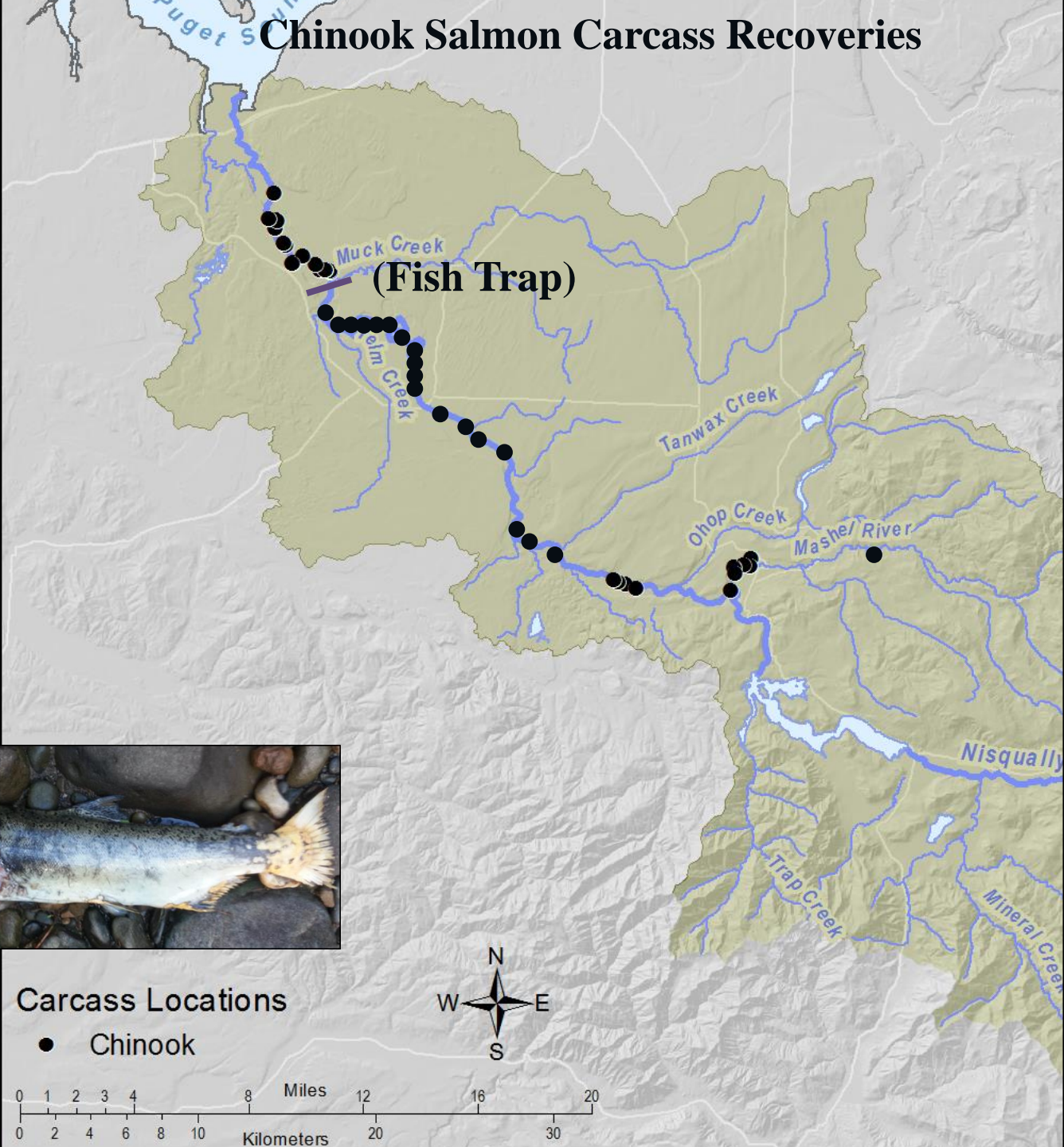
Analysis - escapement estimates, publications, data sharing etc.

Flexibility

(Fish Trap)

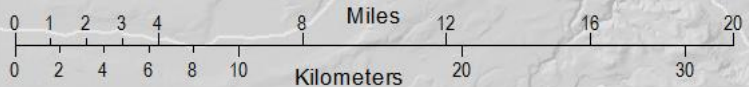


Chinook Salmon Carcass Recoveries

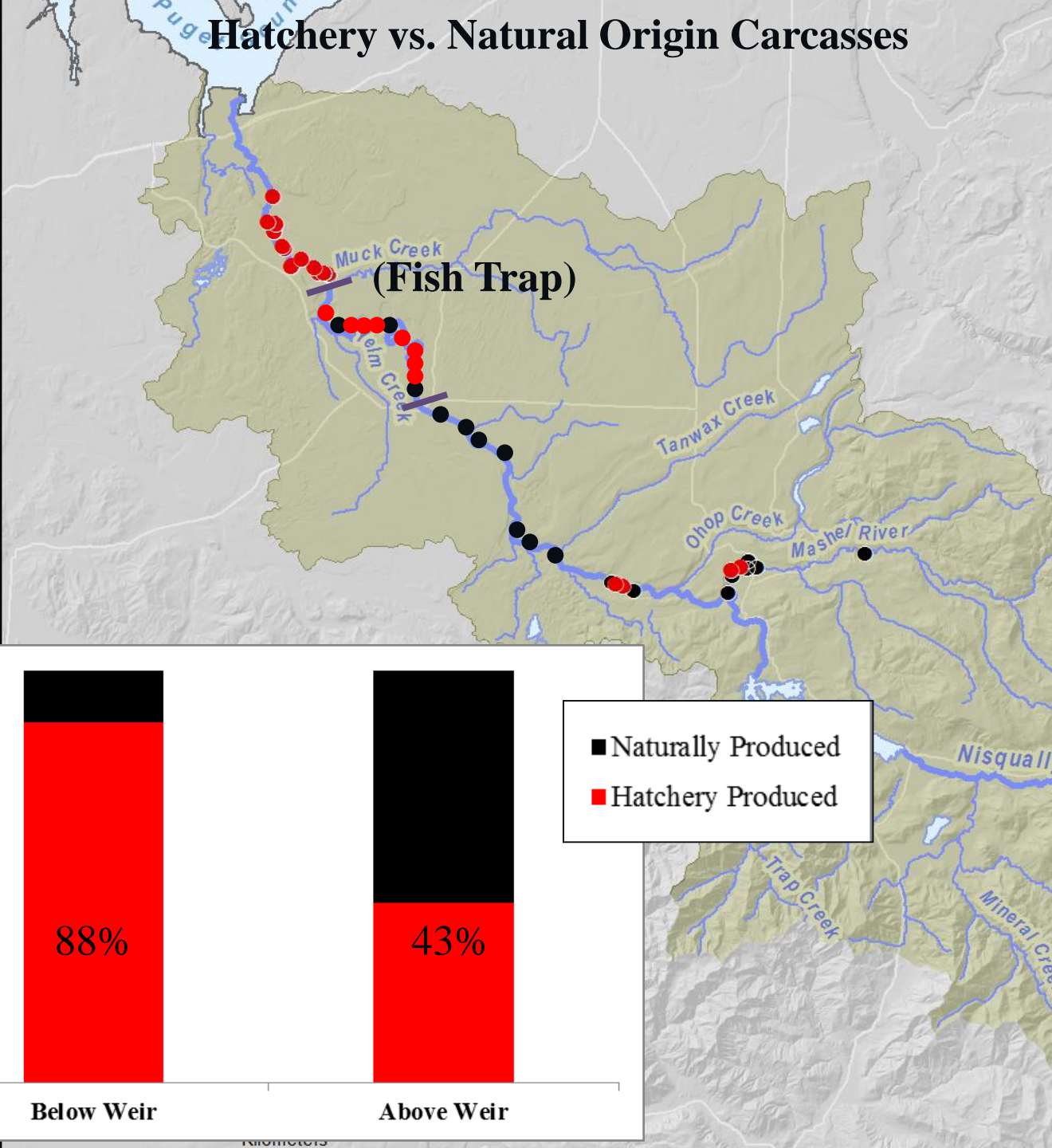


Carcass Locations

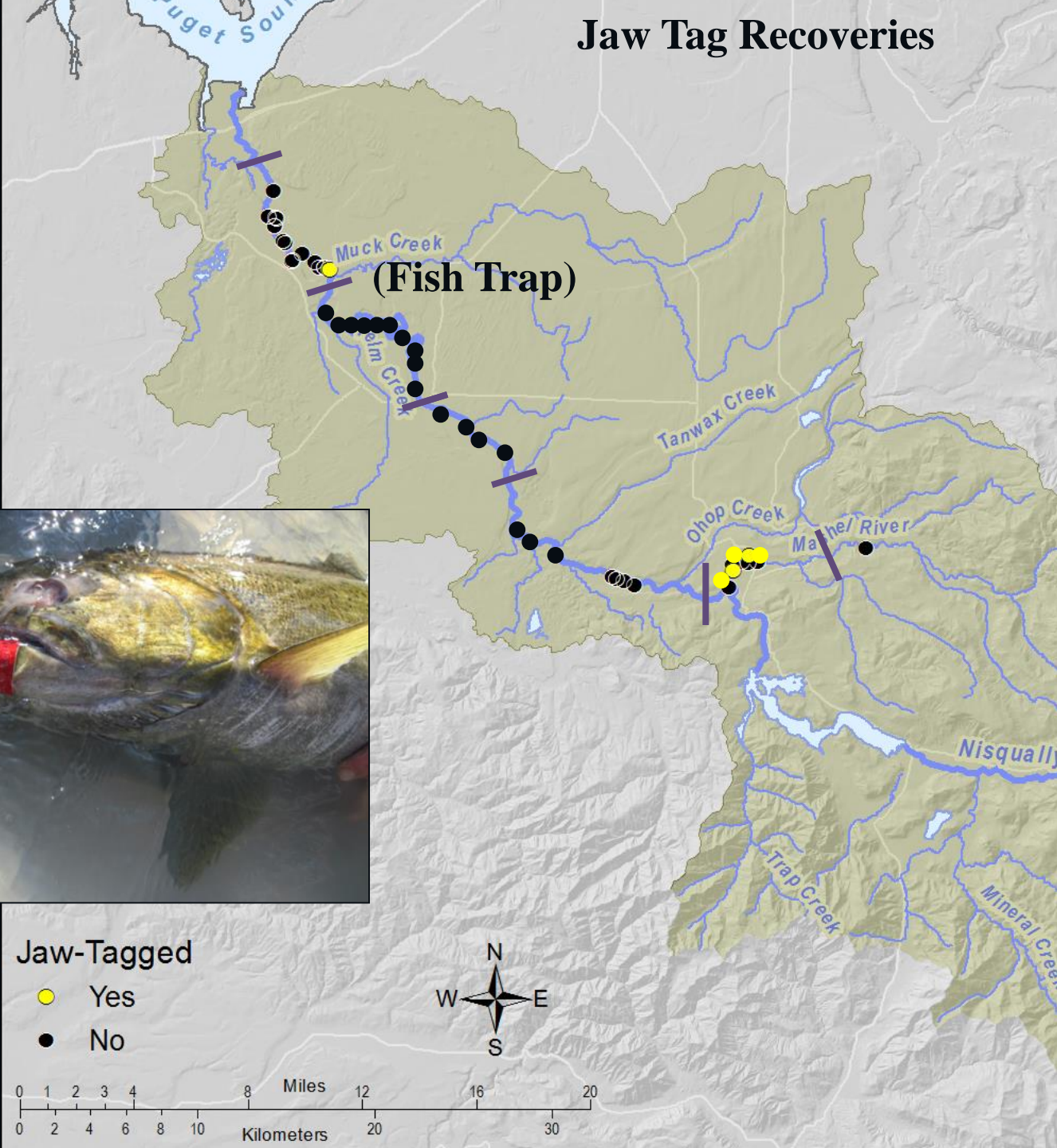
- Chinook



Hatchery vs. Natural Origin Carcasses



Jaw Tag Recoveries



(Fish Trap)

Jaw-Tagged

- Yes
- No



Flexibility



SURVEY CA
O

B #

10

T

ES % JACKS



Reliability

Are electronic devices:

- Reliable?-Device crash, data loss etc.
- Durable?-Waterproof, dropped etc.





Open data kit - Experiment

2012



2013





Open data kit - Tools



ODK Collect

Open Data Kit Productivity

Everyone

This app is compatible with all of your devices.

(On device)

Submissions	Exported Submissions													
sgsDungeness	Filter: none													
Save	Save All													
Submissions per page: 100	Filters Applied													
Previous	sgsDungeness													
Next														
log_header startdate	log_header enddate	log_header deviceid	log_header phone_number	log_header district	log_header data_source	log_header data_submitter	log_header entry_method	log_header entry_screen	log_header survey_start_datetime	log_header survey_start_data	log_header sampler_number	log_header sampler_string	log_header survey_method	log_header status
17:33:31 UTC 2015	17:35:22 UTC 2015	9900043666404	3602804422	11	63	Evans	2	1	Fri Oct 23 00:00:00 UTC 2015		Frazier		3	1007
17:35:27 UTC 2015	17:36:43 UTC 2015	9900043666404	3602804422	11	63	Evans	2	1	Fri Oct 23 00:00:00 UTC 2015		Frazier		3	2149
18:55:38 UTC 2015	17:29:28 UTC 2015	990004937012619	3608900320	11	63	Losee	1		Fri Oct 23 16:55:00 UTC 2015		Freeman		4	1324
17:29:33 UTC 2015	18:05:25 UTC 2015	990004937012619	3608900320	11	63	Losee	1		Fri Oct 23 17:29:00 UTC 2015		Freeman		4	1324
18:06:28 UTC 2015	19:08:36 UTC 2015	990004937012619	3608900320	11	63	Losee	1		Fri Oct 23 18:06:00 UTC 2015		Freeman		4	1324
19:08:38 UTC 2015	19:59:28 UTC 2015	990004937012619	3608900320	11	63	Losee	1		Fri Oct 23 19:08:00 UTC 2015		Freeman		3	1324
19:59:30 UTC 2015	21:21:59 UTC 2015	990004937012619	3608900320	11	63	Losee	1		Fri Oct 23 19:59:00 UTC 2015		Freeman		4	1324
21:22:02 UTC 2015	21:35:42 UTC 2015	990004937012619	3608900320	11	63	Losee	1		Fri Oct 23 21:22:00 UTC 2015		Freeman		4	1324
21:35:45 UTC 2015	21:55:45 UTC 2015	990004937012619	3608900320	11	63	Losee	1		Fri Oct 23 21:35:00 UTC 2015		Freeman		4	1324
21:55:48 UTC 2015	22:24:26 UTC 2015	990004937012619	3608900320	11	63	Losee	1		Fri Oct 23 21:55:00 UTC 2015		Freeman		4	1324

ODK Briefcase (desktop)

Aggregate server (cloud)

Pull Push Export

Pull data from: Aggregate 1.0

URL: https://pss-odk.appspot.com

Forms to Pull:

Selected	Form Name	Pull Status	Details...
<input checked="" type="checkbox"/>	sgsDungeness		Details...
<input type="checkbox"/>	pssTestFish		Details...
<input type="checkbox"/>	pssBoatRamp		Details...

Select all Pull Cancel

Open source

Total cost ODK tools: \$0.00



Home-brew - Tools

SGS Mobile Data

Fetch

Map

Data

Upload

Download survey data from the ODK Aggregate server and create a new set of local folders where the data can be stored and inspected



Select the survey form:

sgsDungeness

Create Data Folders

There were 24 new surveys in the sgsDungeness instances directory...pulled from the ODK Aggregate Server today. There were 24 new surveys added to the District folders that will be copied to the S-Drive. There are 0 surveys that are unaccounted for.



Home-brew - Tools

SGS Mobile Data Fetch Map Data Upload



Select your District:

District 11

Select the ODK Collect survey data (.xml):

Choose File submission.xml

Upload complete

Do you have a gps track file (.gpx) to display?

Display Track

Note:

This web-app should only be used to process output from ODK forms 'sgsMobile' or 'sgsDungeness' versions 20150114 or later.

It may output incorrect comments if used with 'sgsNisqually'.

SurveyDate	StreamName	StreamCode	RiverMiles	StartTime	EndTime	SamplerNames	SurveyMethod
10/02/2015	Nisqually River 11.0008	11.0008	37.4-32.9	12:26	14:06	Frazier,Freeman	Raft





Home-brew - Tools

SGS Mobile Data Fetch Map **Data** Upload

Download

Observations:

Show entries

Search:

ID	SurveyDirection	BankSurveyed	SurveyType	RunType	RunYear	StreamFlowType	StreamVisibility	WaterClarity	SurveyComments	SpeciesSurveyed	Origin
1			Index	Fall	2015	Medium-low	Poor	0		Chinook	
2			Index	Fall	2015	Medium-low	Poor	0		Chinook	
3			Index	Fall	2015	Medium-low	Poor	0		Pink	
4			Index	Fall	2015	Medium-low	Poor	0		Pink	
5			Index		2015	Medium-low	Poor	0		Coho	

Showing 1 to 5 of 5 entries

Previous **1** Next



Open data kit – real cost

Aggregate Server (Google App Engine):

- Number of field staff: 35-40
- Added billing account...Dec. 2014
- Surveys uploaded to cloud: 2,440
- Total cost – cloud services: \$0.12

Cost of one developer: Not free



Open data kit – Results



Advantages:

- Remote sync capability
- Preloading data
- Javascript



New developments

ODK Collect:

- OSM integration
- Compass
- Styling

GeoODK:

- Offline mapping
- ArcGIS, OSM integration

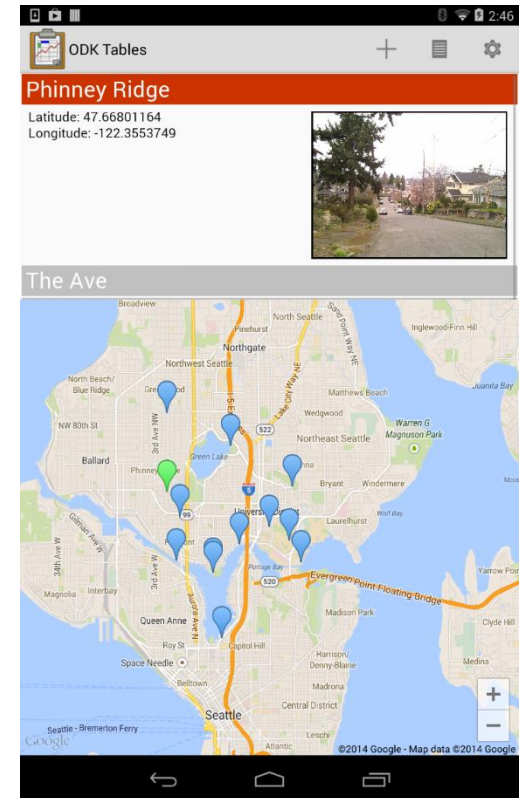
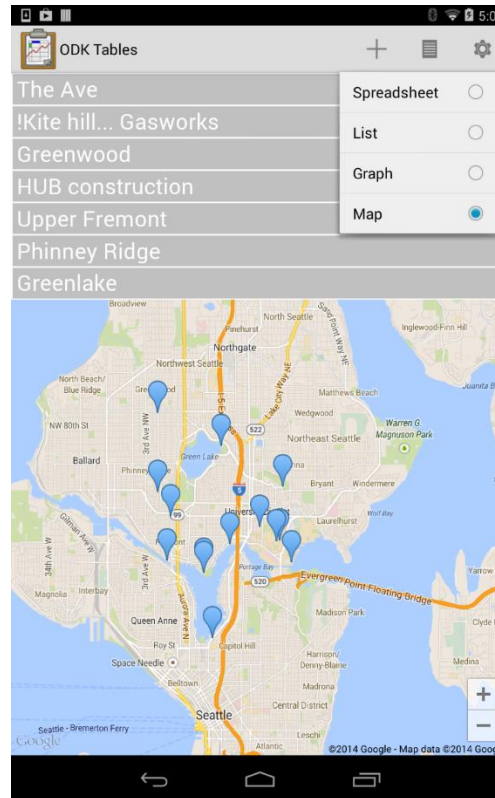




2.0 Back to an ODK future?

Tools in Alpha & Beta status:

- Survey
- Sync
- Tables
- Form designer
- App packager



https://opendatakit.org/use/2_0_tools/

A man wearing a grey cap, a red life vest, and grey waders stands in a river next to a red kayak. The kayak has a white logo that says "FISH CATCH". The river is shallow and clear, showing rocks on the bottom. The background is a lush, green bank with tall grasses and trees. The word "Questions?" is written in a large, black, serif font in the center of the image.

Questions?

Acknowledgements

Geatano Borriello and the ODK team

Mark Baltzell, Puget Sound Sampling

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Tara Livingood-Schott, WDFW biologist

Chris O'Connell, WDFW biologist

All our WDFW field samplers...front-line testers