IDWR's Review of the Cumulative Effects of Water Right Transfers within the Eastern Snake Plain Aquifer (ESPA)

Presented by Shelley Keen

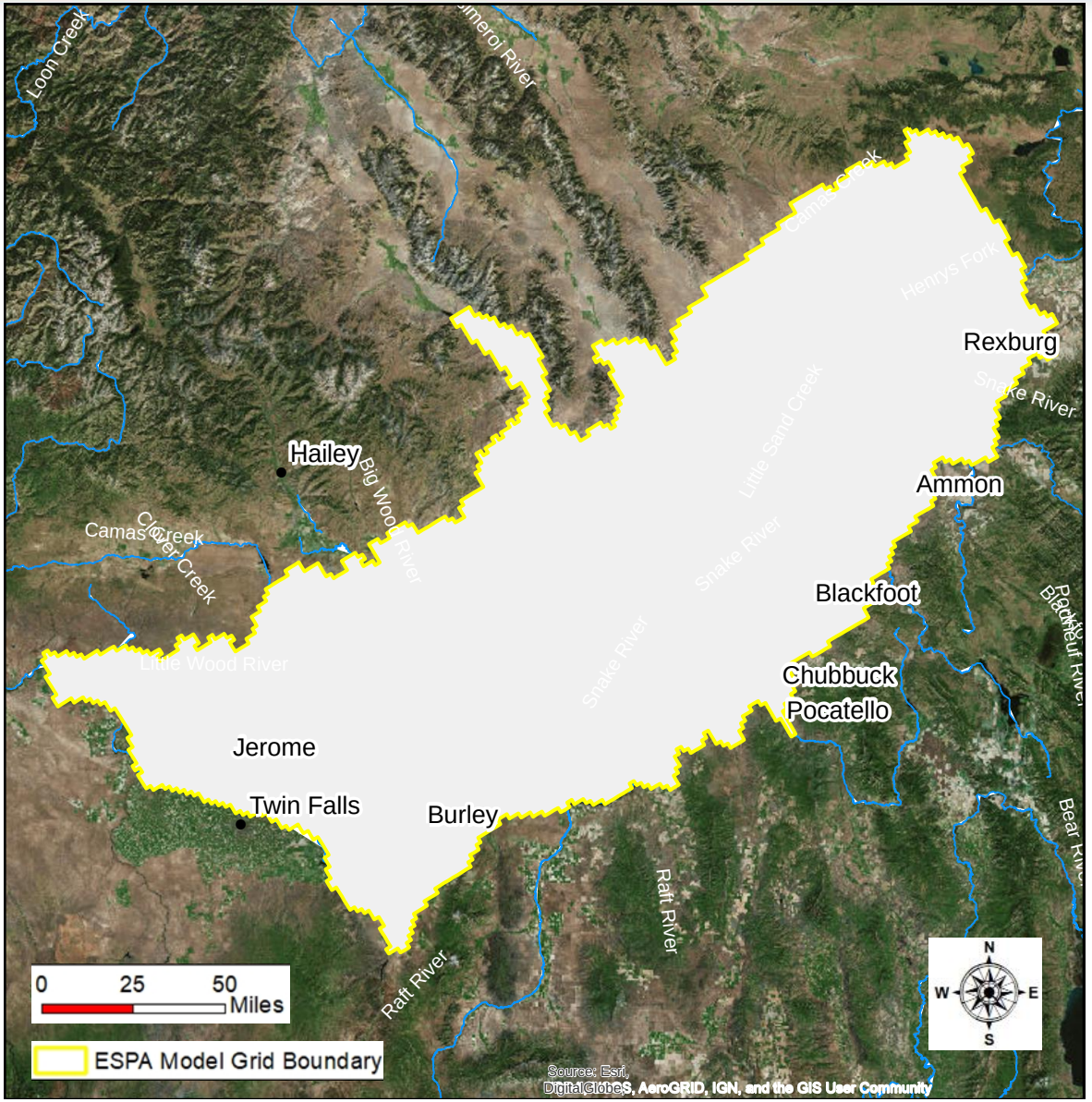
Date: September 12, 2019

Discussion Points

- ESPA Transfer Evaluation Policy
- Cumulative ESPA Transfer Review Process
- Results of IDWR's Cumulative Transfer Review
  1. All Transfers
  2. Transfers moving > 1 mile

- Since 1992 a ***moratorium*** order has been in place on new appropriations within the ESPA

- Main way to acquire a water right to divert from the ESPA is through a ***transfer***



Transfer Policy: What is the purpose?

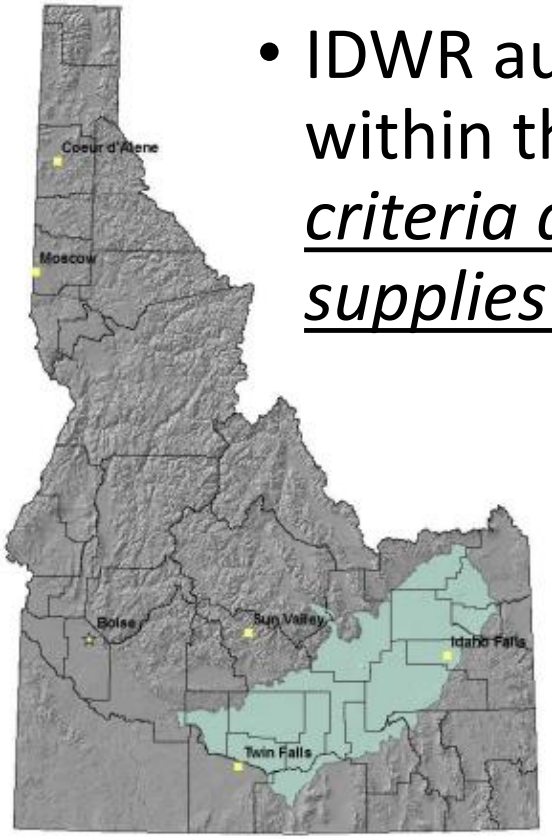
- Changes to ground water use can impact the Snake River and spring flows and the water rights that depend on them.
- Surface water in the Snake River and many tributary springs is fully appropriated at certain times.

ESPA Transfer Evaluation Policy

- In 2009 IDWR implemented its *current policy* for transfers of ground water rights within the ESPA.

- The policy is intended to allow some water right transfers while preventing injury to water rights that divert and use water from the Snake River and from springs tributary to the Snake River.

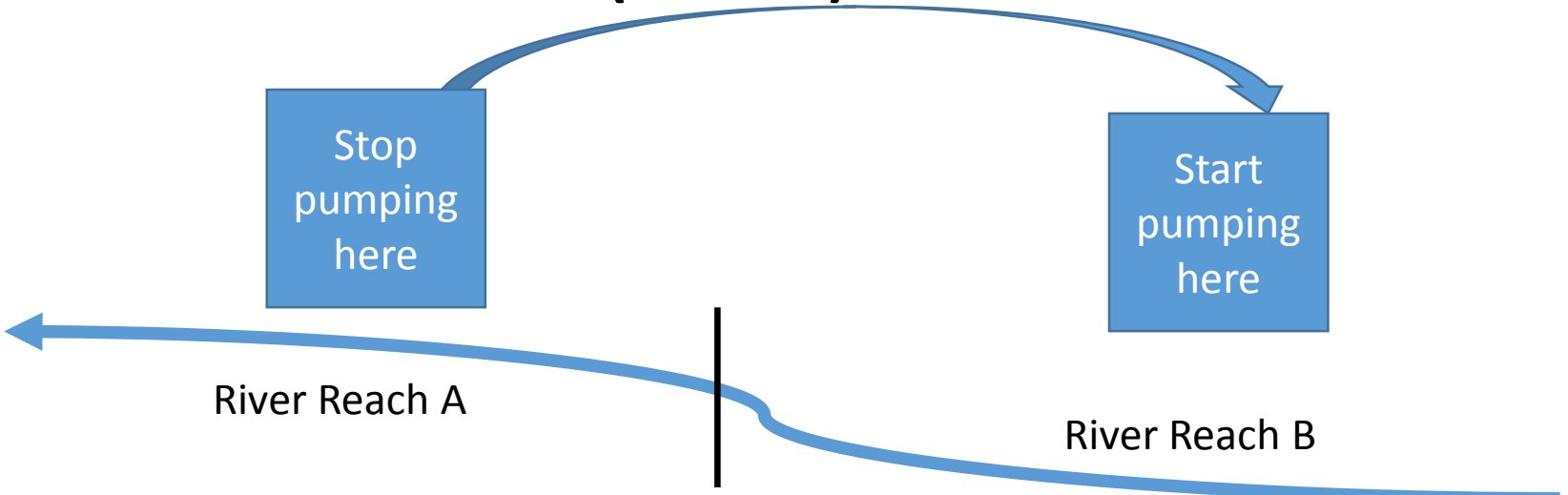
ESPA Transfer Evaluation Policy



- IDWR authorizes point-of-diversion transfers within the ESPA only when *certain threshold criteria are met*, or if the *transfer applicant supplies mitigation*.

ESPA Transfer Evaluation Policy

- If the application for transfer proposes to move the point of diversion for a ground water right from one location to another within the ESPA, the applicant must submit an attachment with results from the **ESPA transfer tool (ETRAN)**.

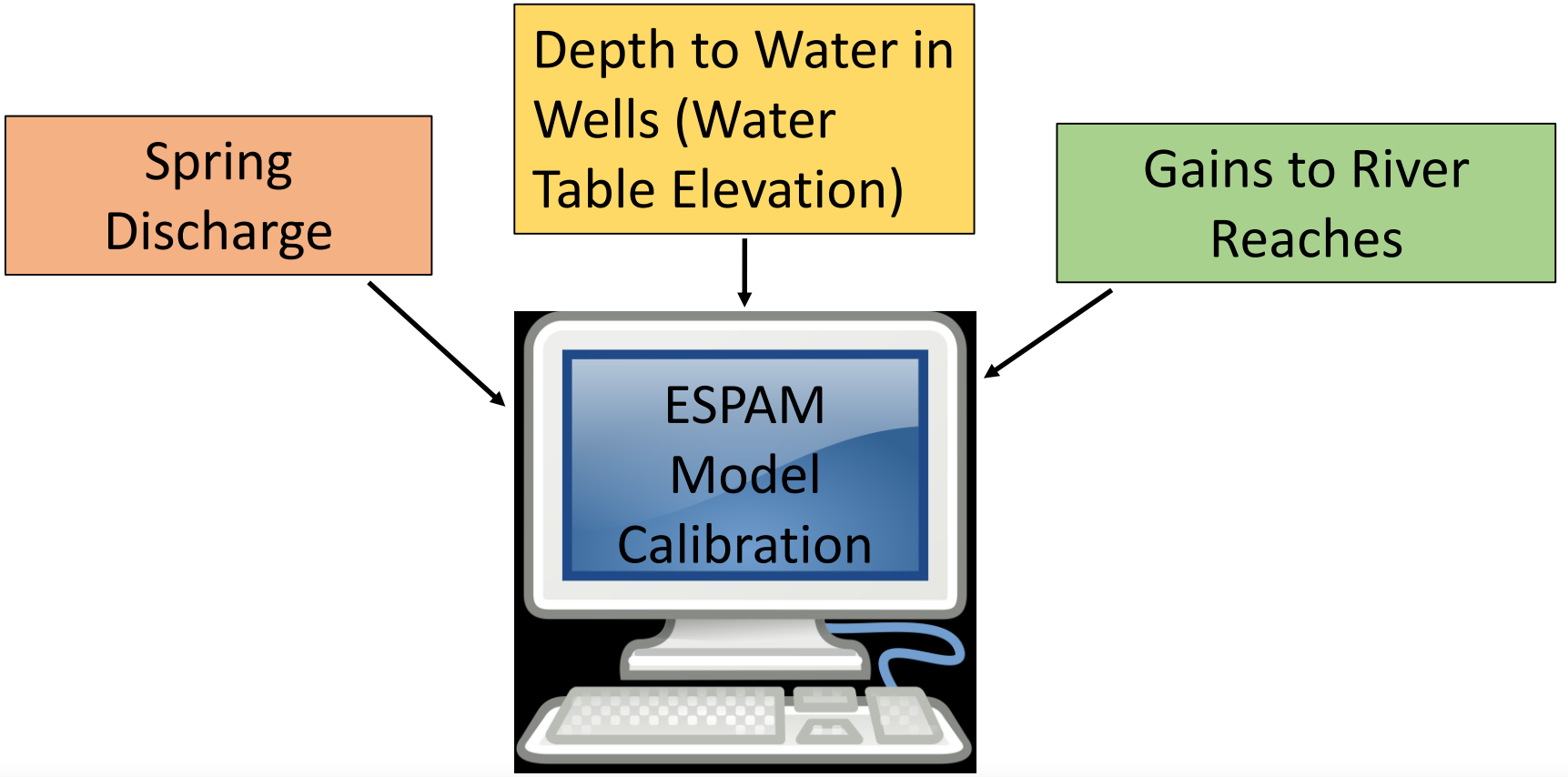


What is the ESPA Transfer Tool?

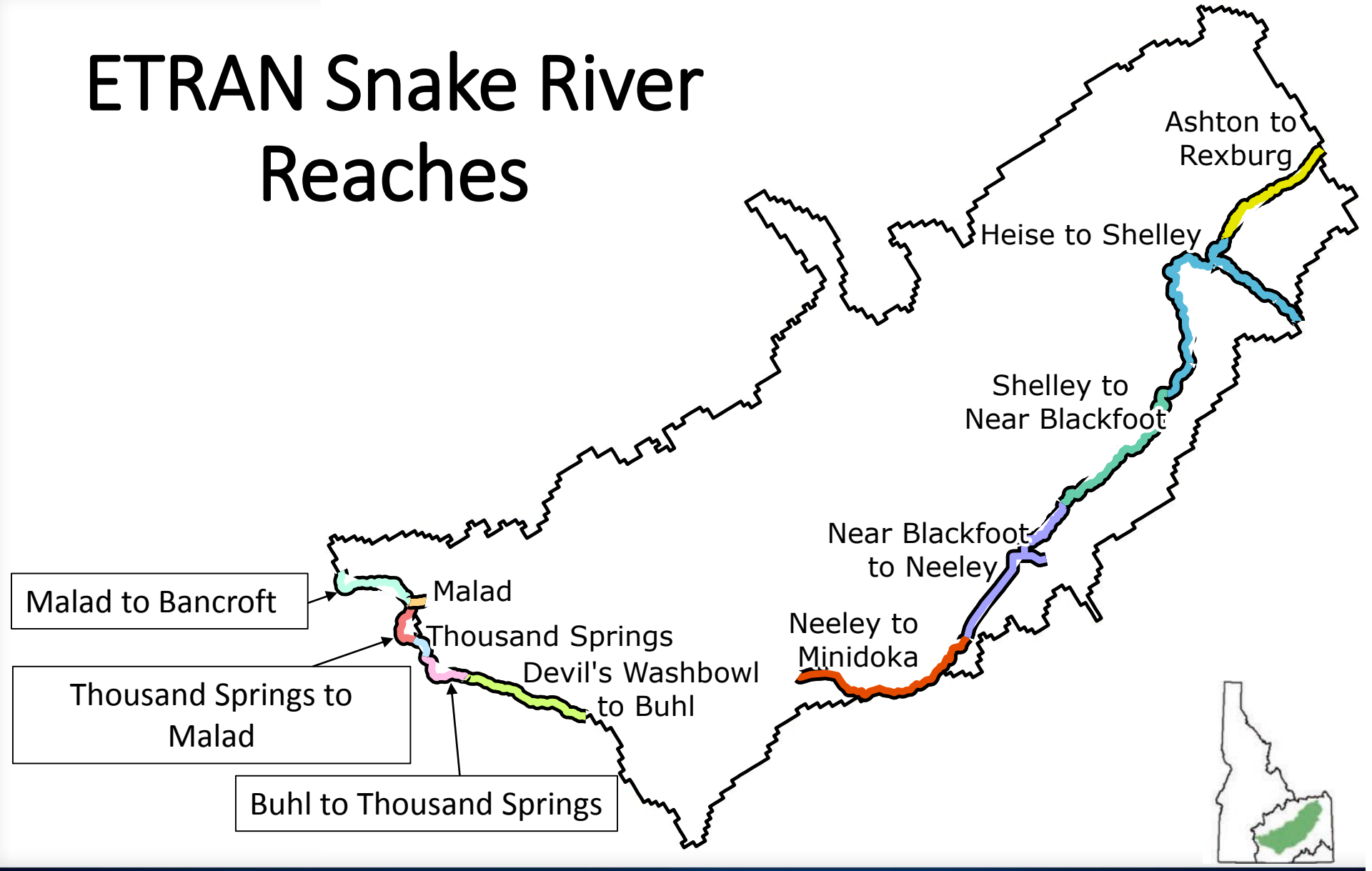
- The ESPA Transfer Tool (ETRAN) uses the ESPA Model (ESPAM) to quantify changes in depletions to each of the designated Snake River reaches *if the proposed transfer were authorized*.

ESPA Model Predictive Quality

What observations are used to calibrate the model?



ETRAN Snake River Reaches

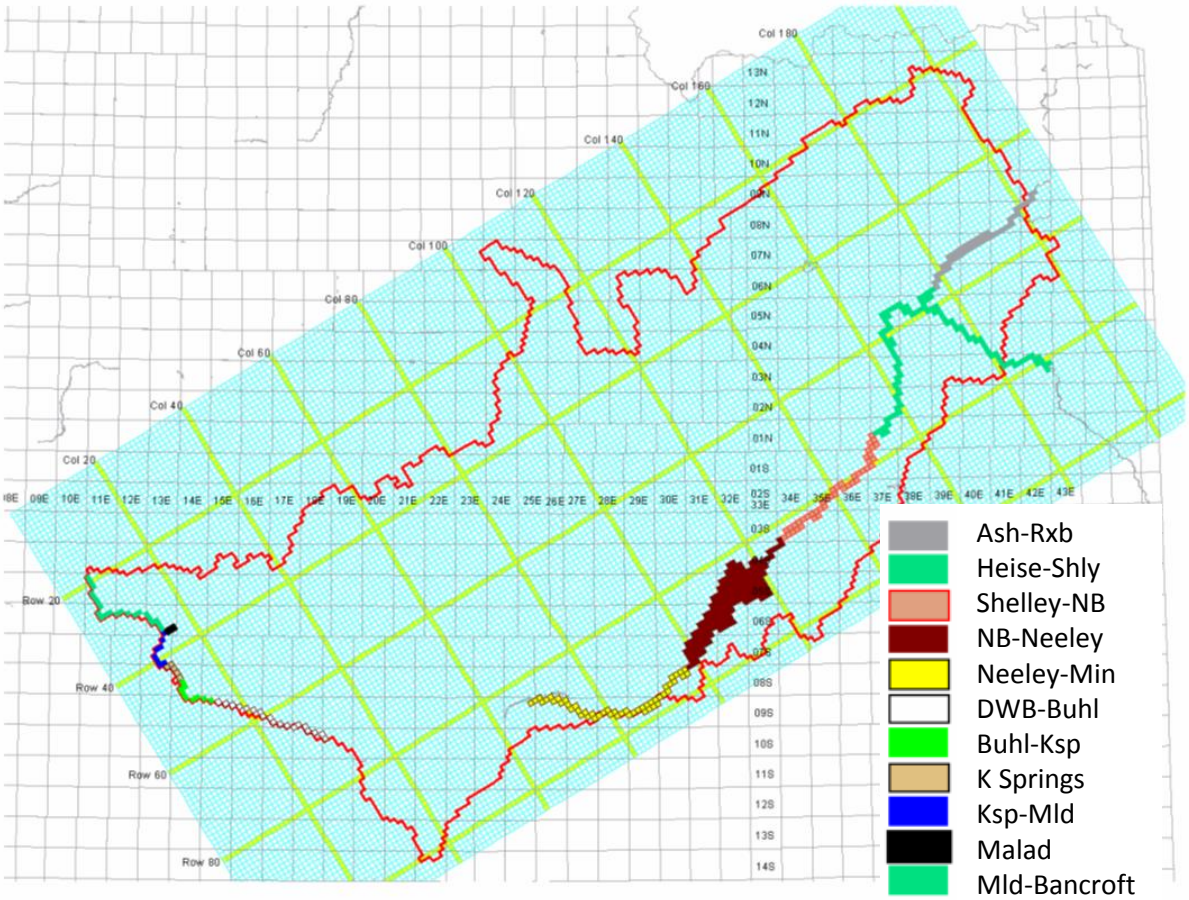


Three Part Test to Determine Whether Mitigation is Required for a Specific Reach

- IDWR does not require the ETRAN analysis if the new point of diversion is within the ***same model grid cell or an adjacent cell***.

* Note: Each model grid cell is one square mile

- Otherwise, IDWR applies the following three tests to the ETRAN results for <u>each</u> of the 11 Snake River reaches.



Three Part Test to Determine Whether Mitigation is Required for Transfer Approval

The transfer will not be approved or mitigation will be required if…

1.) The depletion to any reach increases by 10% or more, unless . . .

2.) The depletions in the reach increase by *2 ac-ft/trimester* or less, or . . .

3.) The depletion to the reach is *no greater* than *10%* of the total volume pumped.

Three Part Test to Determine Whether Mitigation is Required for Transfer Approval

- If the three conditions are not met for any single hydraulically-connected reach of the Snake River . . .

  the applicant ***must fully*** mitigate the effects of the proposed transfer on that reach, or . . .

  the transfer ***will not*** be approved.

Three Part Test to Determine Whether Mitigation is Required for Transfer Approval

If the depletions exceed the policy thresholds, the applicant can:

- Adjust the transfer proposal (and re-run the transfer proposal in ETRAN), or
- Offer mitigation.

IDWR's Cumulative Review Overview

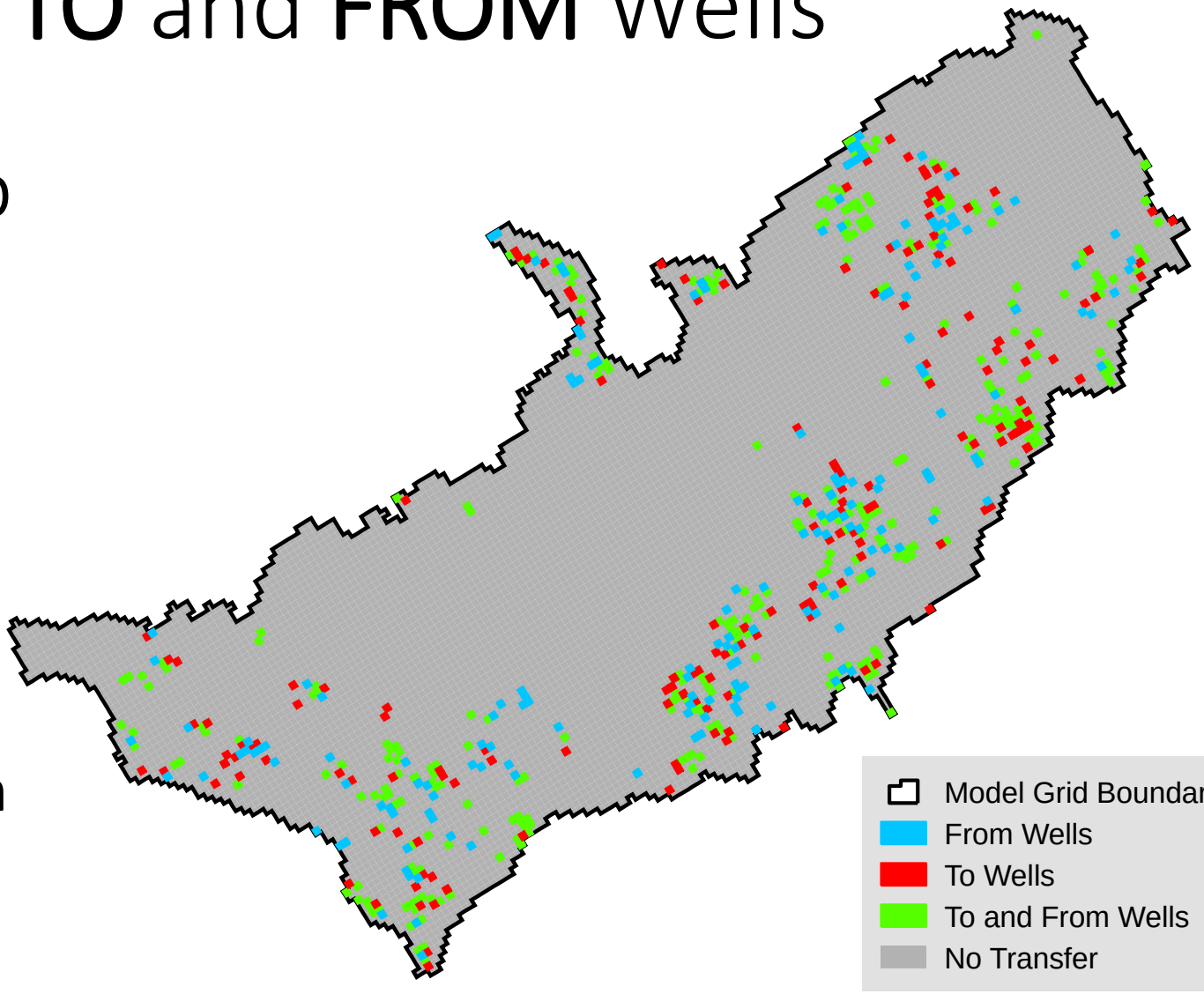
- ***426*** transfers between **1/1/2012** and **8/31/2018** involving pumping from the ESPA.
- Approximately 400 personnel hours from Water Rights Section Staff
- Model grid cells and average annual pumping rate were determined for 685 ***"TO"*** *wells* and 679 ***"FROM"*** wells.
- The cumulative effects of the 426 ESPA transfers were analyzed using version 2.1 of the ESPAM (IDWR, 2013).

TO and FROM Wells

RED = extraction = TO well

Blue = cessation = FROM well

Green = both TO and FROM wells



IDWR's Cumulative Review

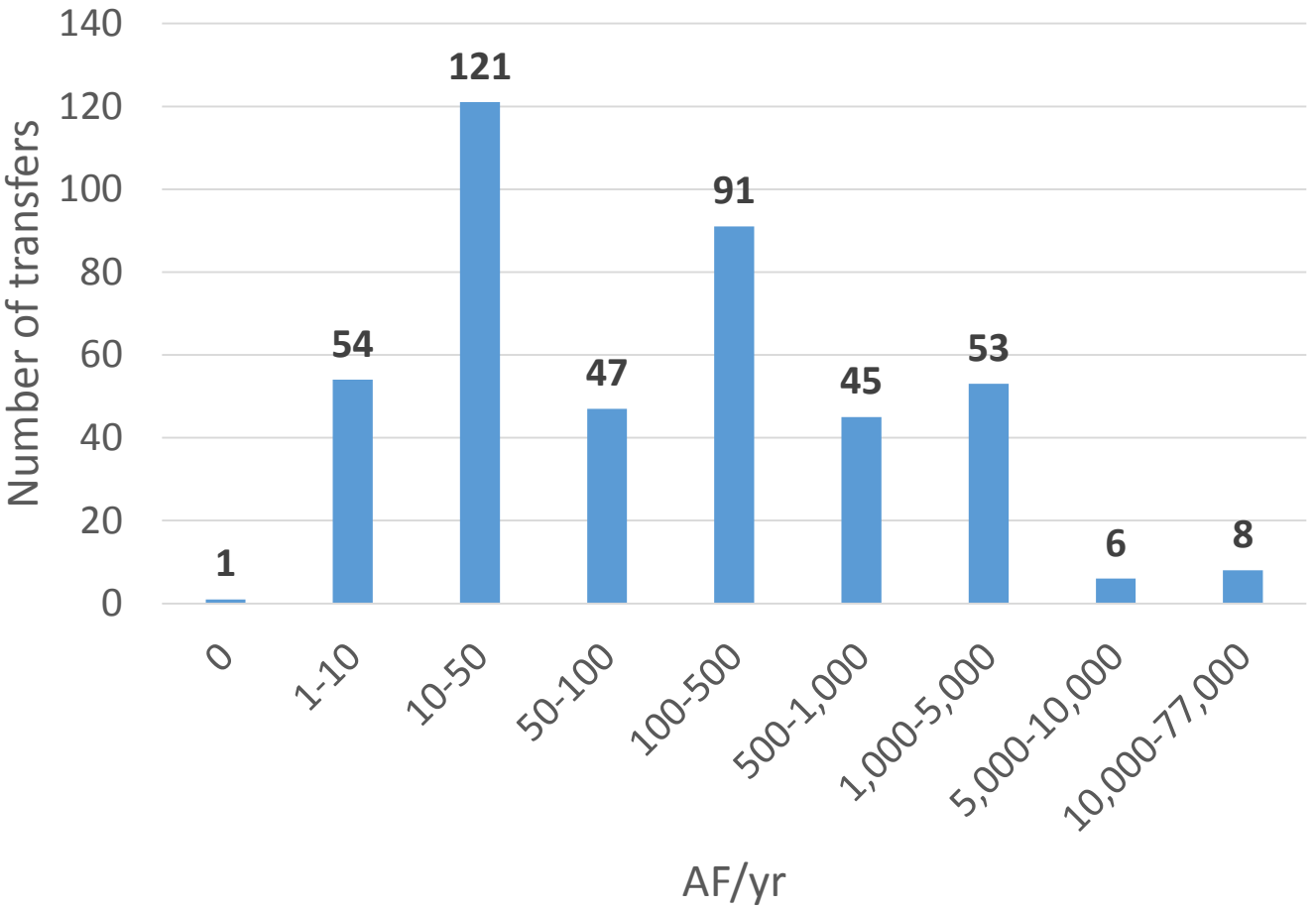
- Reduced pumping at the ***FROM*** wells total about 412,728 AF of positive (+) impact to the aquifer

- Increased pumping at the ***TO*** wells total about 412,210 AF of depletion (-) to the aquifer.

*This indicates that the 426 transfers do not inadvertently result in an increase in aquifer depletions as a whole.

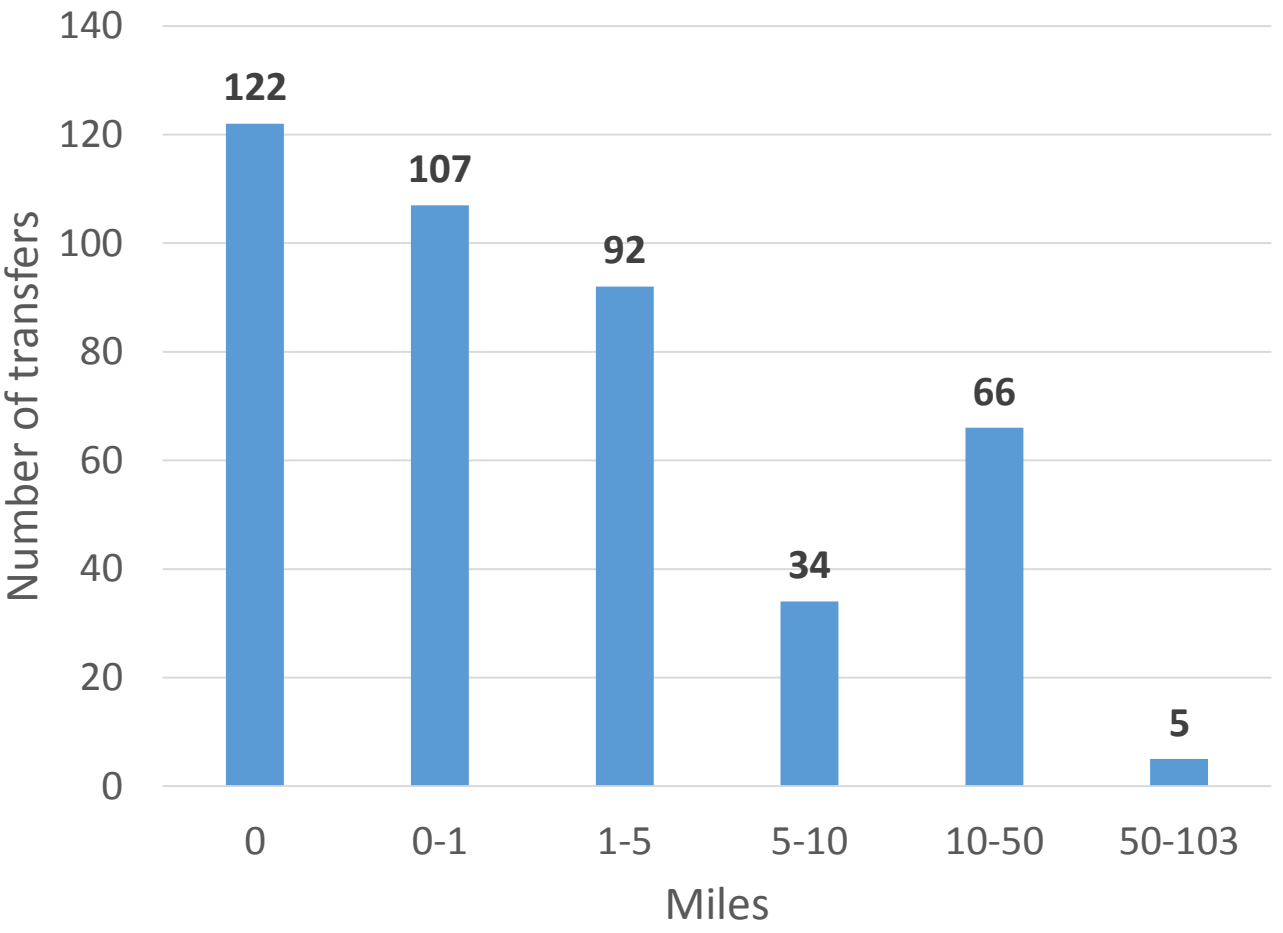
Transfer Pumping Volume

- Most transfers involve small amounts of water
- Approximately 50% of transfers relocate 100 AF/yr (0.14 cfs) or less

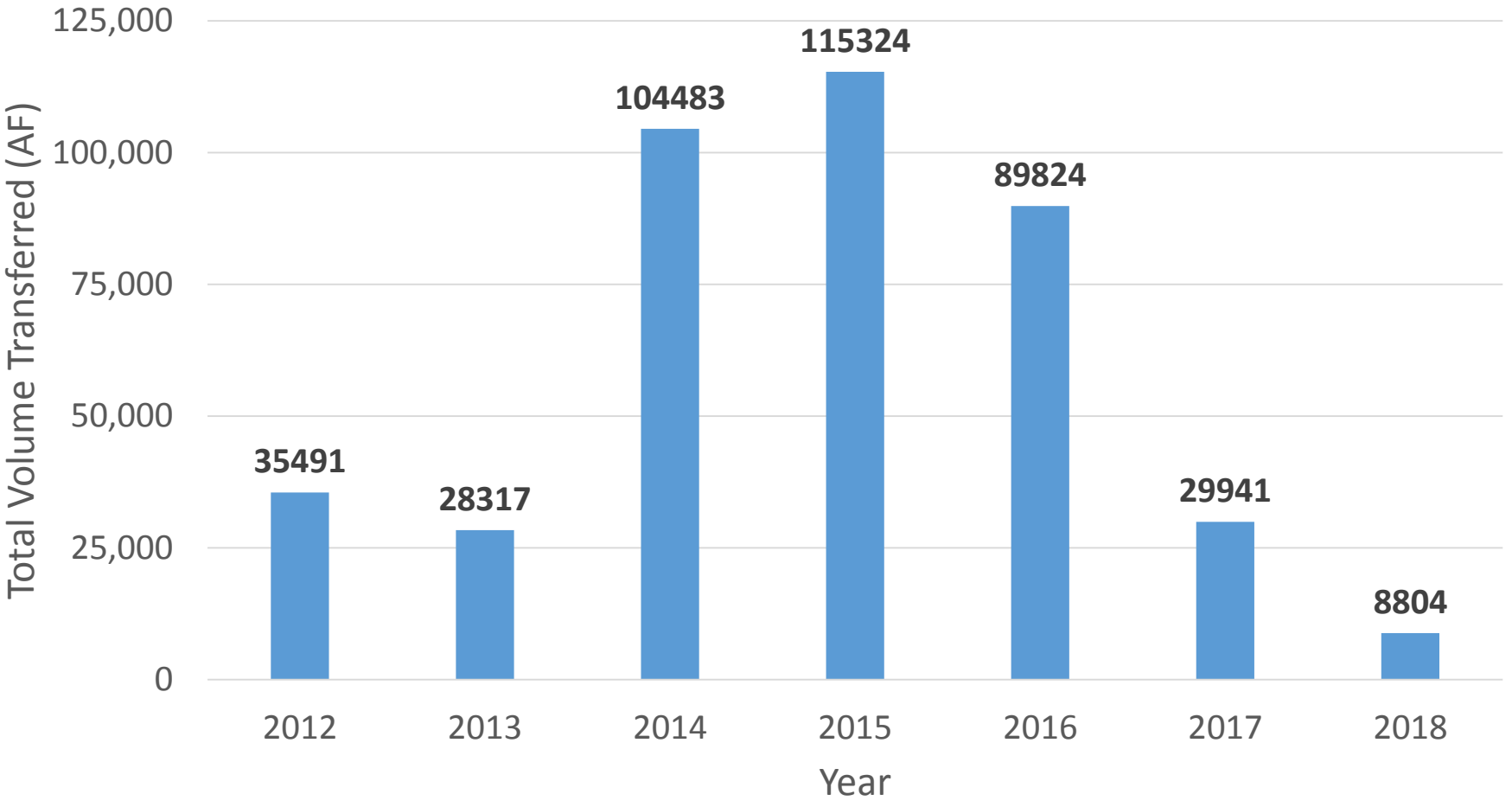


Transfer Distance

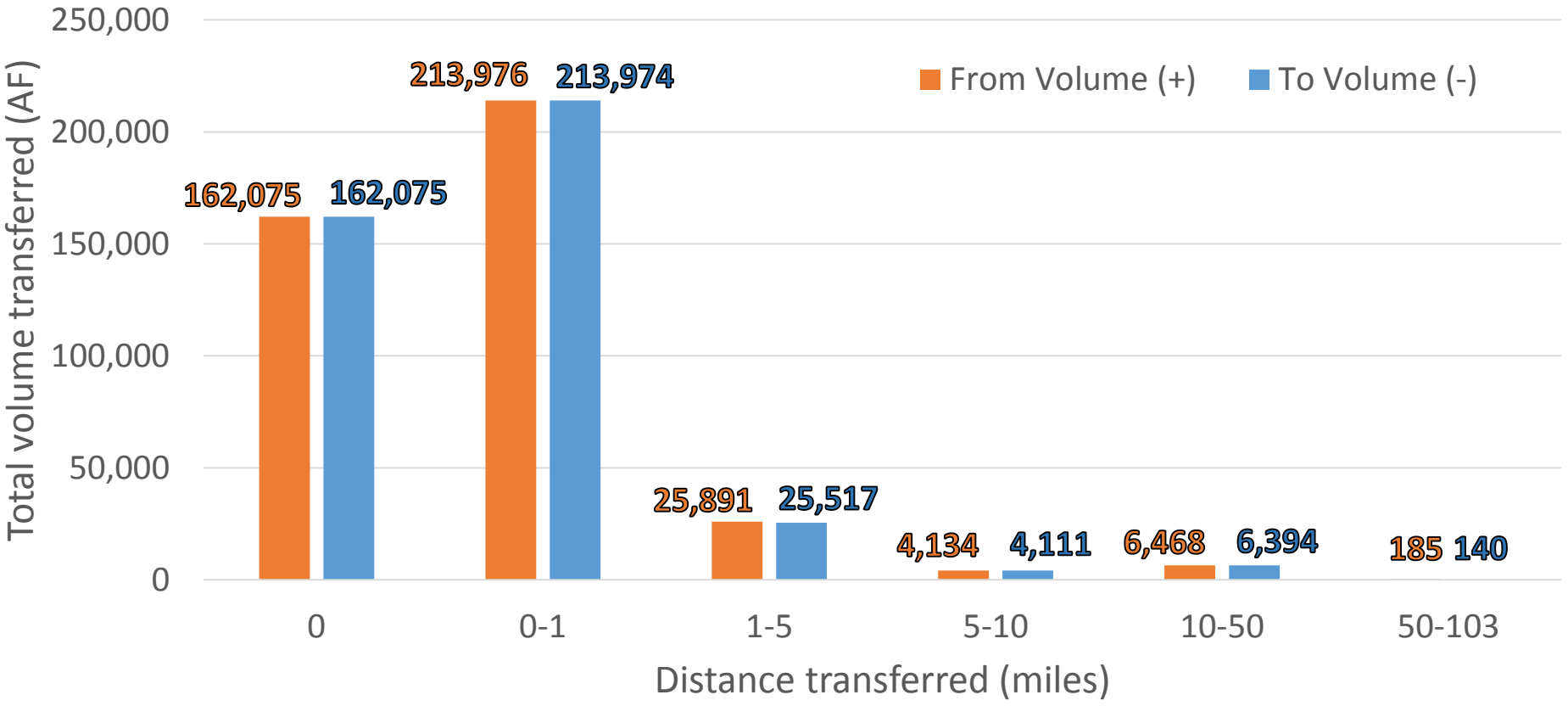
- Most transfers move short distances
- Approximately 75% of transfers move five miles away or less



Volume Transferred by Year

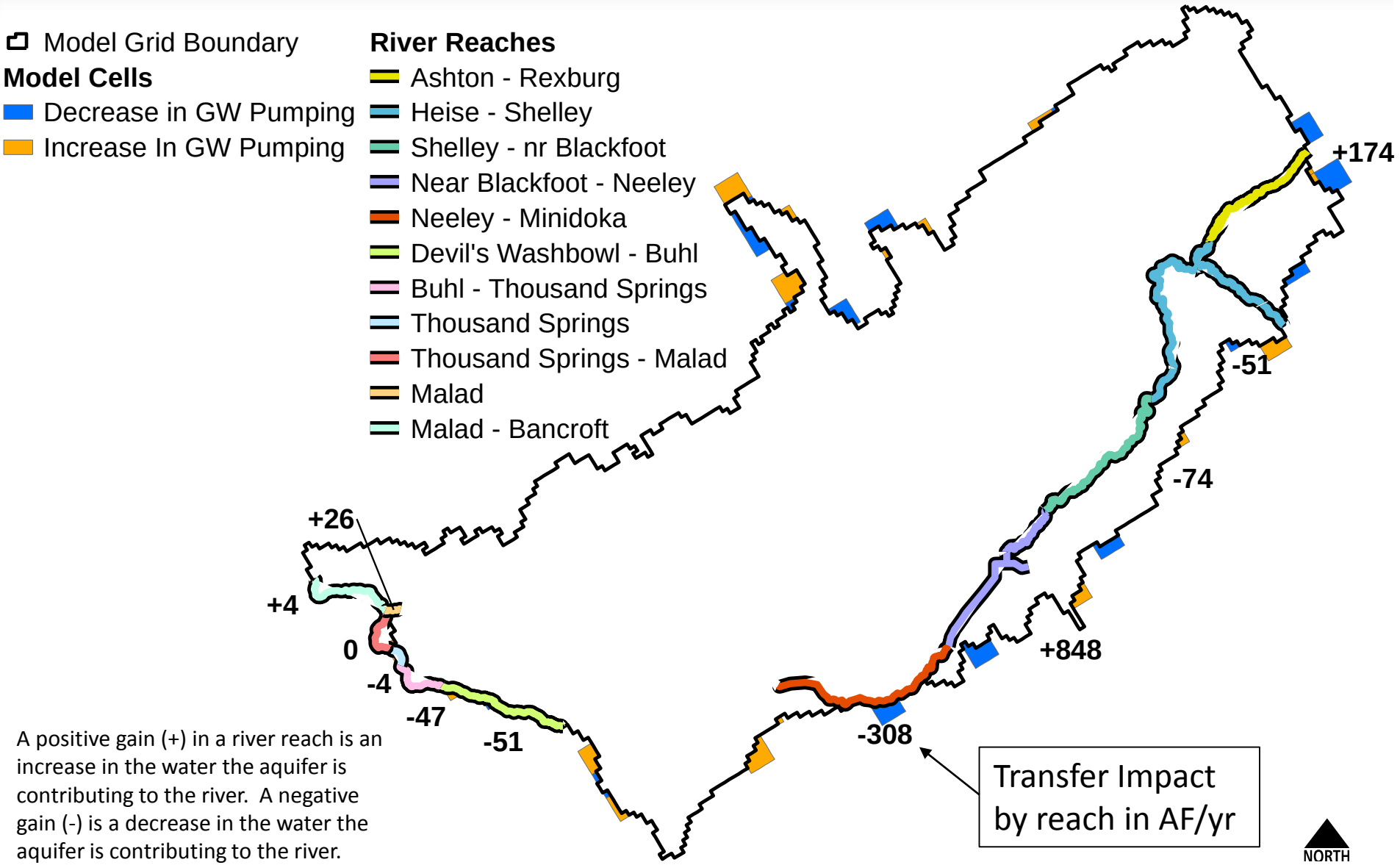


Volume Transferred by Distance 2012-2018



IDAHO Department of Water Resources

Cumulative change in acre feet of groundwater pumped between 2012 and 2018 due to transfers



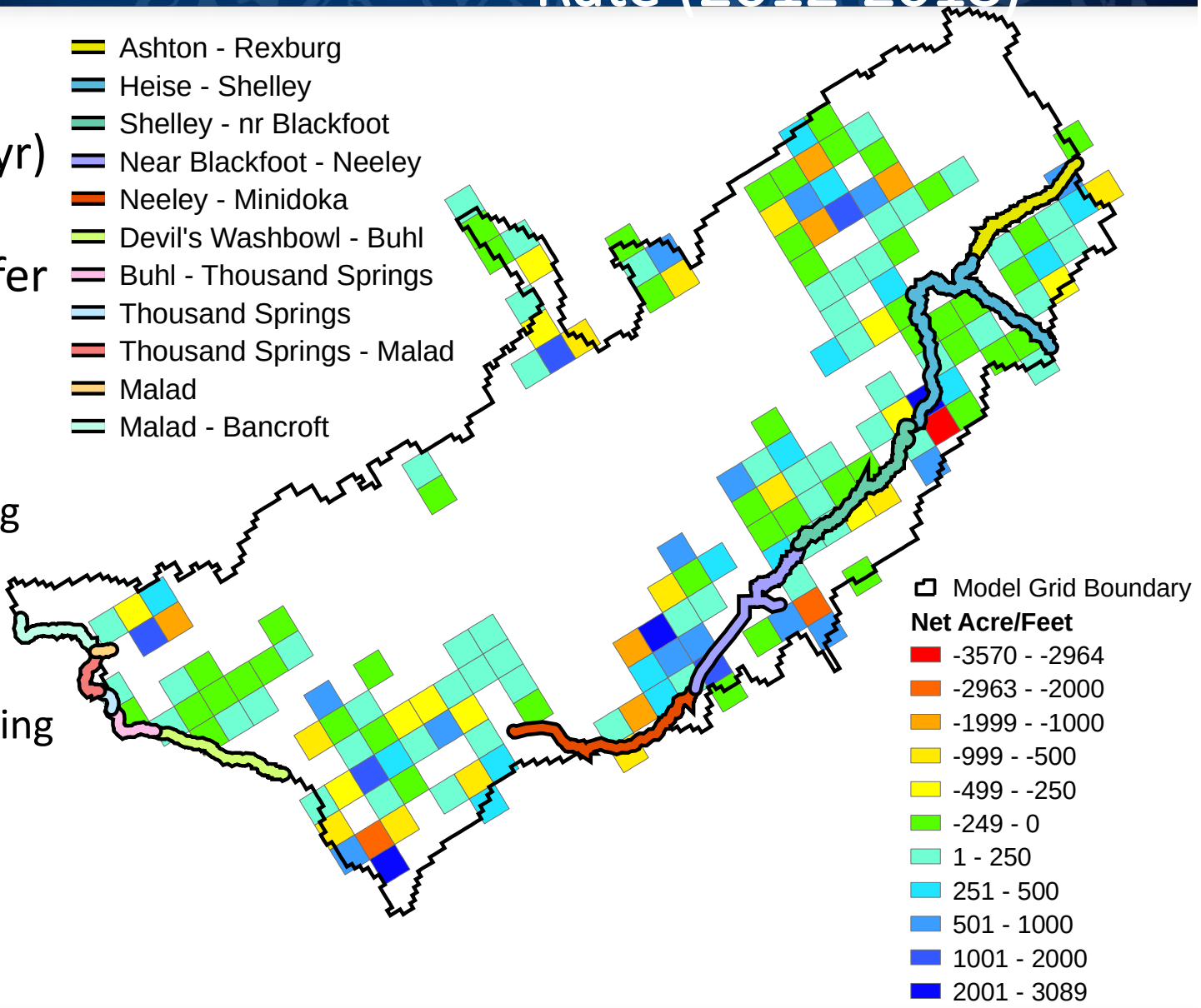
A positive gain (+) in a river reach is an increase in the water the aquifer is contributing to the river. A negative gain (-) is a decrease in the water the aquifer is contributing to the river.

IDAHO Department of Water Resources

Cumulative Annual Pumping Rate (2012-2018)

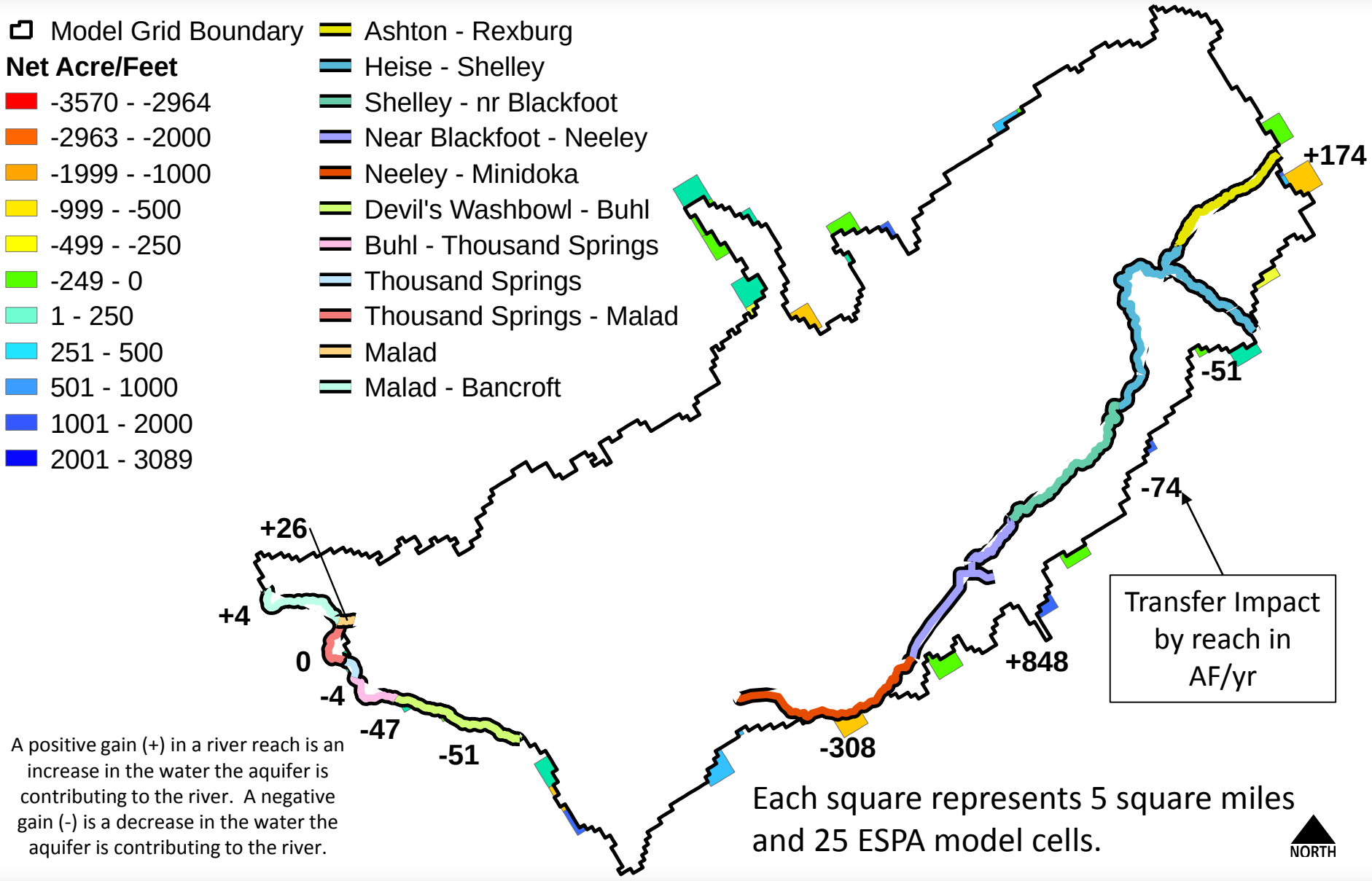
Cumulative annual pumping rate (AF/yr) for all model cells involved in a transfer (2012-2018)

- Red = Less Pumping
- Blue = More Pumping



IDAHO Department of Water Resources

Cumulative change in acre feet of groundwater pumped between 2012 and 2018 due to transfers.



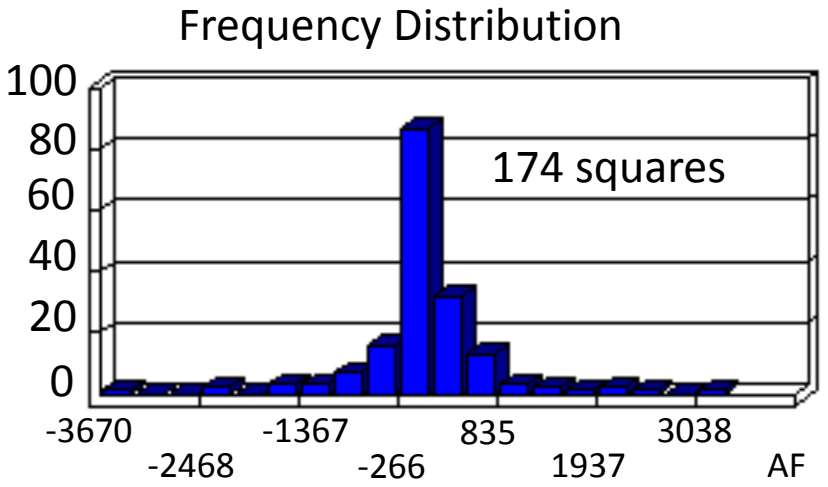
A positive gain (+) in a river reach is an increase in the water the aquifer is contributing to the river. A negative gain (-) is a decrease in the water the aquifer is contributing to the river.

Each square represents 5 square miles and 25 ESPA model cells.

NORTH

IDAHO Department of Water Resources

Cumulative change in acre feet of groundwater pumped between 2012 and 2018 due to transfers.



Model Grid Boundary

Net Acre/Feet

- -3570 - -2964
- -2963 - -2000
- -1999 - -1000
- -999 - -500
- -499 - -250
- -249 - 0
- 1 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2000
- 2001 - 3089

+174

-51

-74

+26

+4

0

-4

-47

-51

+848

-308

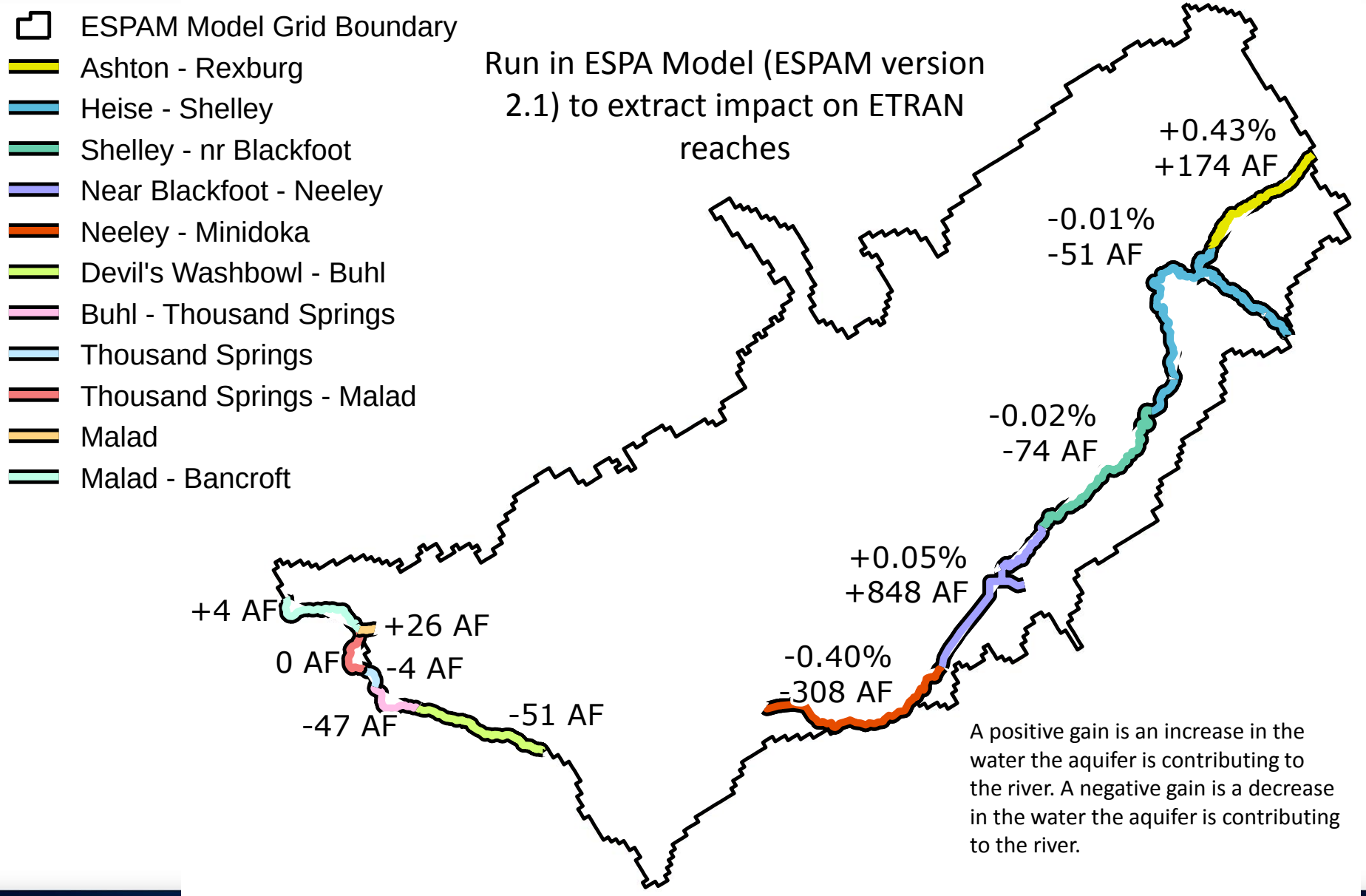
Transfer Impact by reach in AF/yr

Each square represents 5 square miles and 25 ESPA model cells.

NORTH

IDAHO Department of Water Resources

Impact of all ESPA 2012-2018 transfers



Impact of all ESPA 2012-2018 Transfers by Reach

Reach	Transfer Impact		Average Reach Gain		% change in reach gain
	(AF/yr)	(cfs)	(AF/yr)	(cfs)	
Ashton-Rexburg	174	0.24	-40,100	-55	+0.43%
Heise-Shelley	-51	-0.07	-535,500	-739	-0.01%
Shelley-Near Blackfoot	-74	-0.10	-466,800	-644	-0.02%
Subtotal above Near Blackfoot	**49**	**0.07**	**-1,042,400**	**-1,439**	**+0.00%**
Near Blackfoot-Neeley	848	1.17	1,598,200	2,206	+0.05%
Neeley-Minidoka	-308	-0.43	77,600	107	-0.40%
Subtotal Near Blackfoot-Minidoka	**539**	**0.74**	**1,675,800**	**2,313**	**+0.03%**

Note: Increase in river reach gain is positive (+) and a decrease to river reach gain is negative (-)

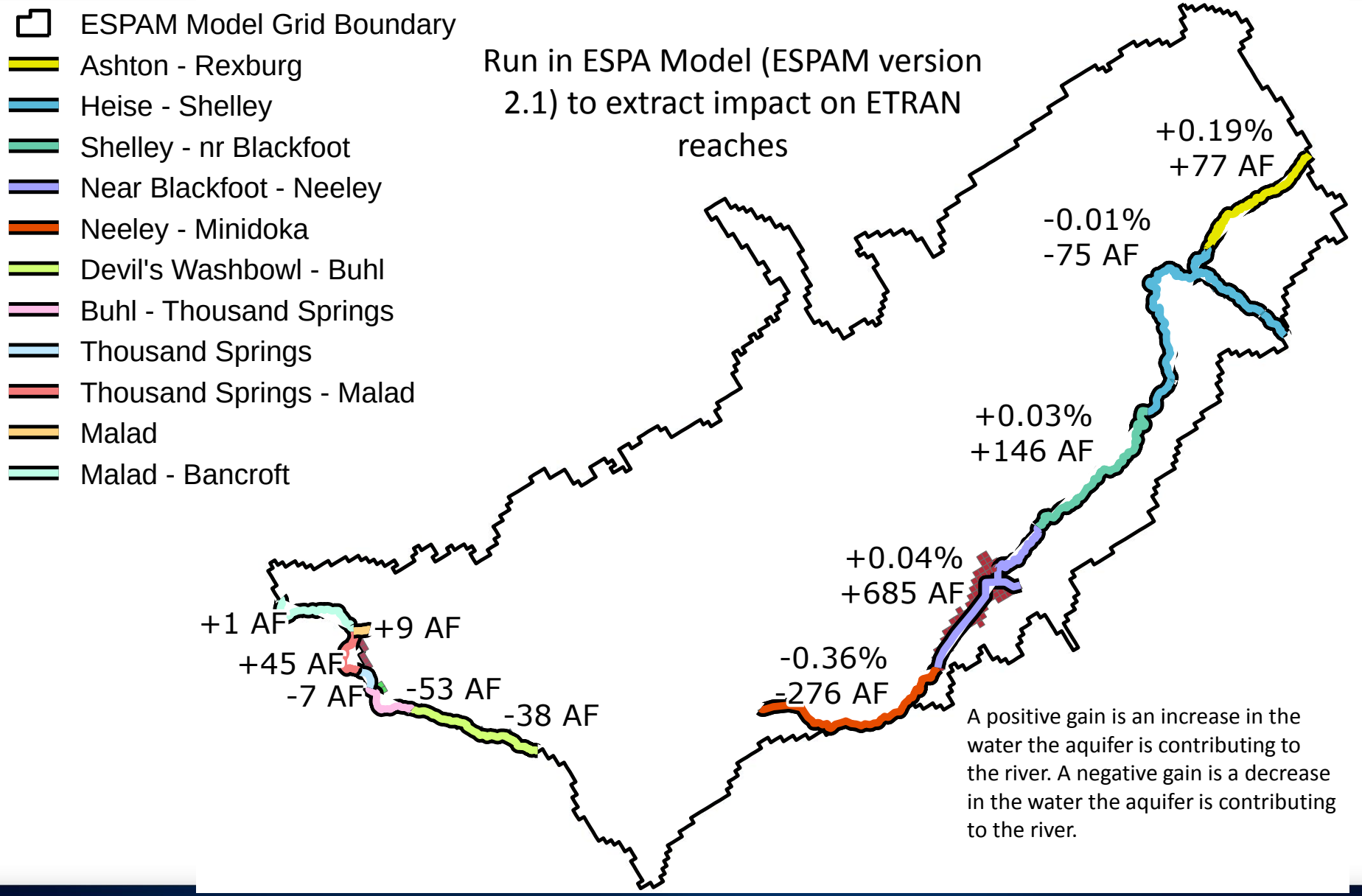
Impact of all ESPA 2012-2018 Transfers by Reach

Reach	Transfer Impact		Average Reach Gain		% change in reach gain
	(AF/yr)	(cfs)	(AF/yr)	(cfs)	
Devil's Washbowl -Buhl	-51	-0.07	1,121,400	1,548	0.00%
Buhl-Thousand Springs	-47	-0.06			
Thousand Springs	-4	-0.01			
Thousand Springs-Malad	0	0.00			
Malad	26	0.04			
Malad-Bancroft	4	0.01			
Subtotal Kimberly-King Hill	**-70**	**-0.10**	**4,088,500**	**5,644**	**0.00%**
Total for all reaches	**518**	**0.71**	**4,721,900**	**6,518**	**0.01%**

Note: Increase in river reach gain is positive (+) and a decrease to river reach gain is negative (-)

IDAHO Department of Water Resources

Impact of all ESPA 2012-2018 transfers > 1 mile



Impact of ESPA 2012-2018 Transfers by Reach Greater than 1 mile

Reach	Transfer Impact		Average Reach Gain		% change in reach gain
	(AF/yr)	(cfs)	(AF/yr)	(cfs)	
Ashton-Rexburg	77	0.11	-40,100	-55	0.19%
Heise-Shelley	-75	-0.10	-535,500	-739	-0.01%
Shelley-Near Blackfoot	146	0.20	-466,800	-644	0.03%
Subtotal above Near Blackfoot	***148***	***0.20***	**-1,042,400**	**-1,439**	***0.01%***
Near Blackfoot-Neeley	685	0.95	1,598,200	2,206	0.04%
Neeley-Minidoka	-276	-0.38	77,600	107	-0.36%
Subtotal Near Blackfoot-Minidoka	***409***	***0.56***	**1,675,800**	**2,313**	***0.02%***

Note: Increase in river reach gain is positive (+) and a decrease to river reach gain is negative (-)

Impact of ESPA 2012-2018 Transfers by Reach Greater than 1 mile

Reach	Transfer Impact		Average Reach Gain		% change in reach gain
	(AF/yr)	(cfs)	(AF/yr)	(cfs)	
Devil's Washbowl -Buhl	-38	-0.05	1,121,400	1,548	0.00%
Buhl-Thousand Springs	-53	-0.07			
Thousand Springs	-7	-0.01			
Thousand Springs-Malad	1	-0.01			
Malad	45	0.06			
Malad-Bancroft	9	0.01			
Subtotal Kimberly-King Hill	***-42***	***0***			
Total for all reaches	**516**	**0.69**			

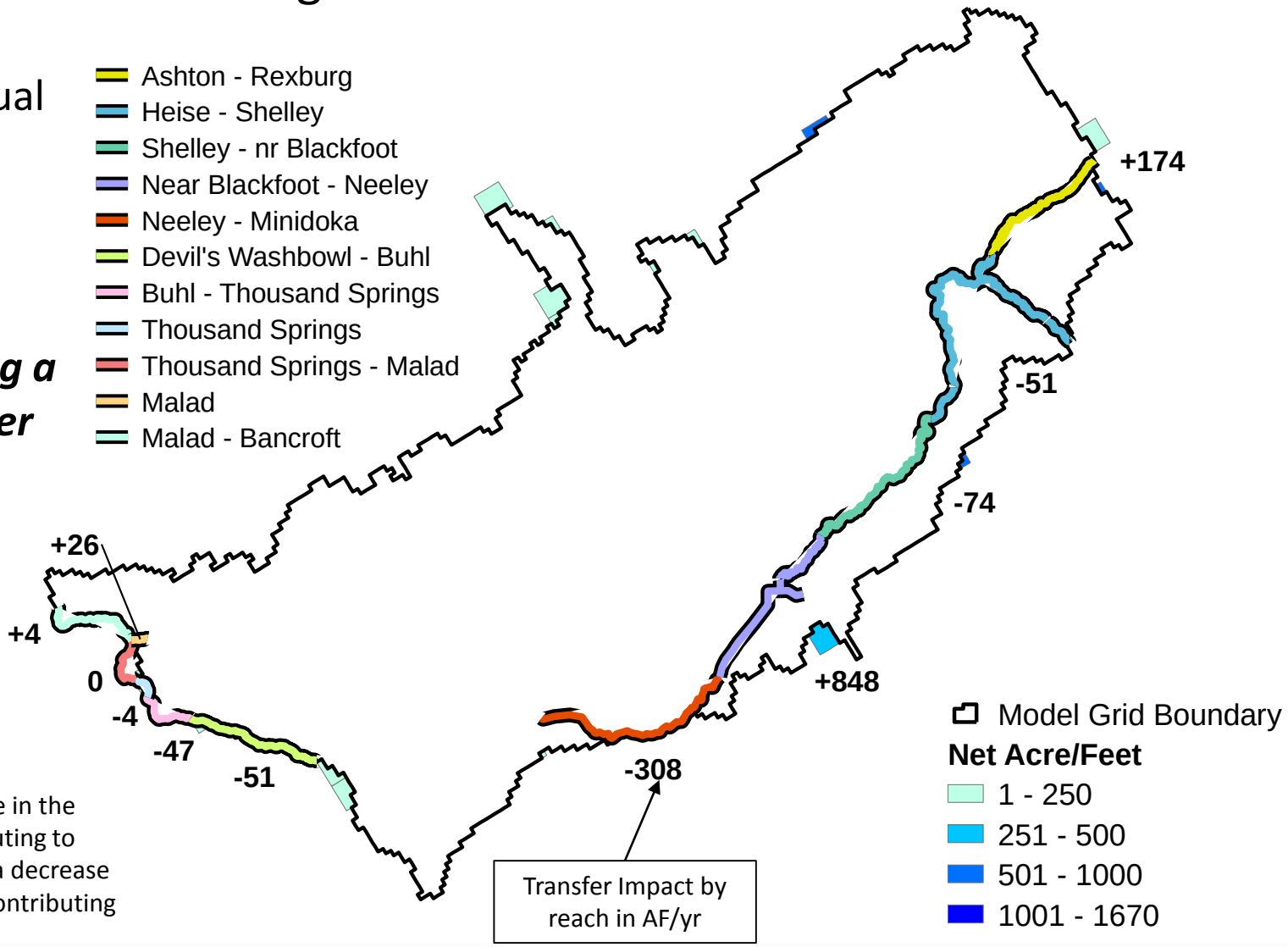
Note: Increase in river reach gain is positive (+) and a decrease to river reach gain is negative (-)

IDAHO Department of Water Resources

Increased Net Annual Pumping Rate (2012-2018)

Transfers Moving a Distance Greater than 1 mile

- **Increased** annual pumping rate (AF/yr) for all model cells involved in a transfer ***moving a distance greater than 1 mile***



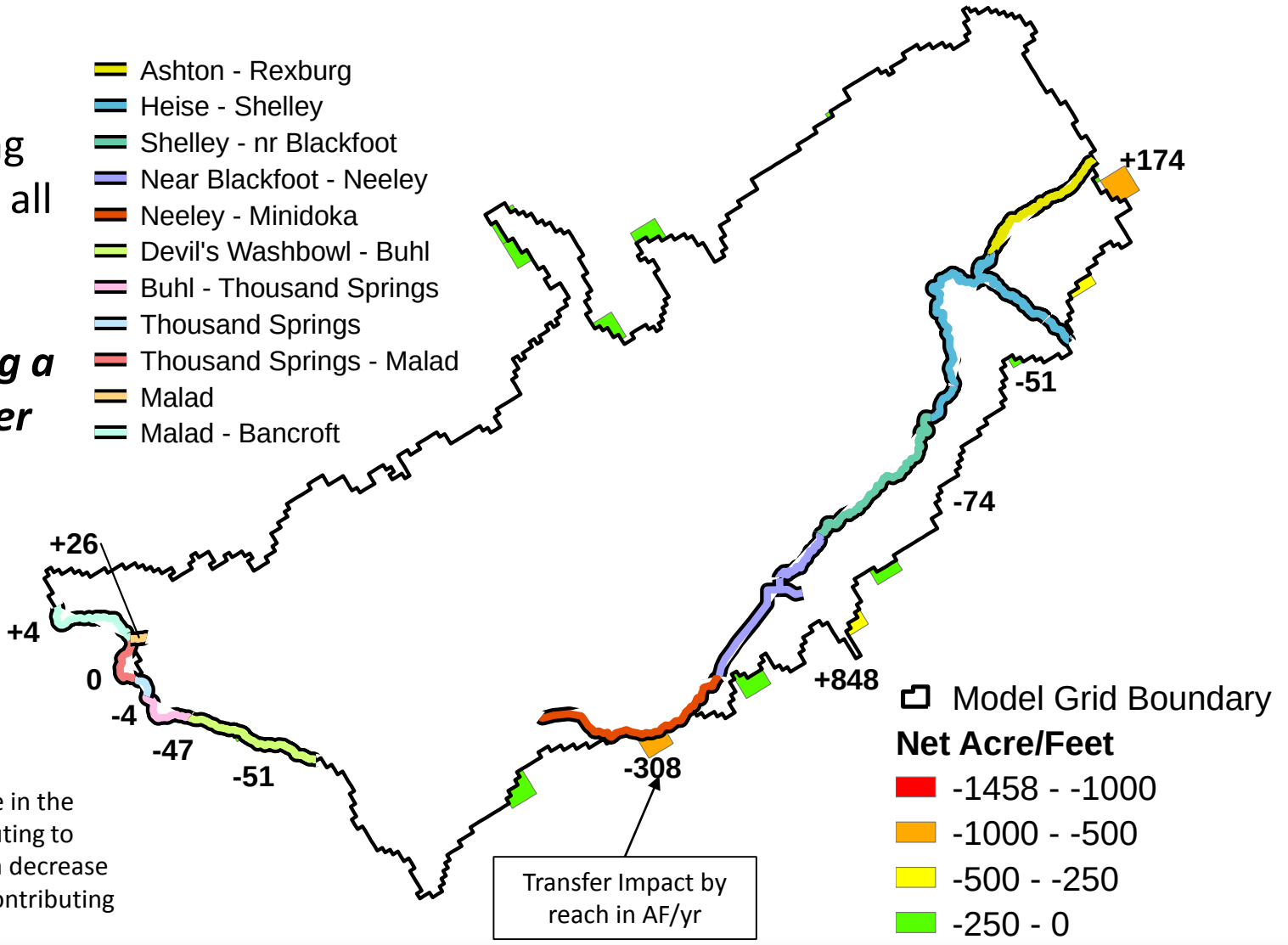
A positive gain is an increase in the water the aquifer is contributing to the river. A negative gain is a decrease in the water the aquifer is contributing to the river.

IDAHO Department of Water Resources

Decreased Net Annual Pumping Rate (2012-2018)

Transfers Moving a Distance Greater than 1 mile

- **Decreased** annual pumping rate (AF/yr) for all model cells involved in a transfer ***moving a distance greater than 1 mile***



A positive gain is an increase in the water the aquifer is contributing to the river. A negative gain is a decrease in the water the aquifer is contributing to the river.

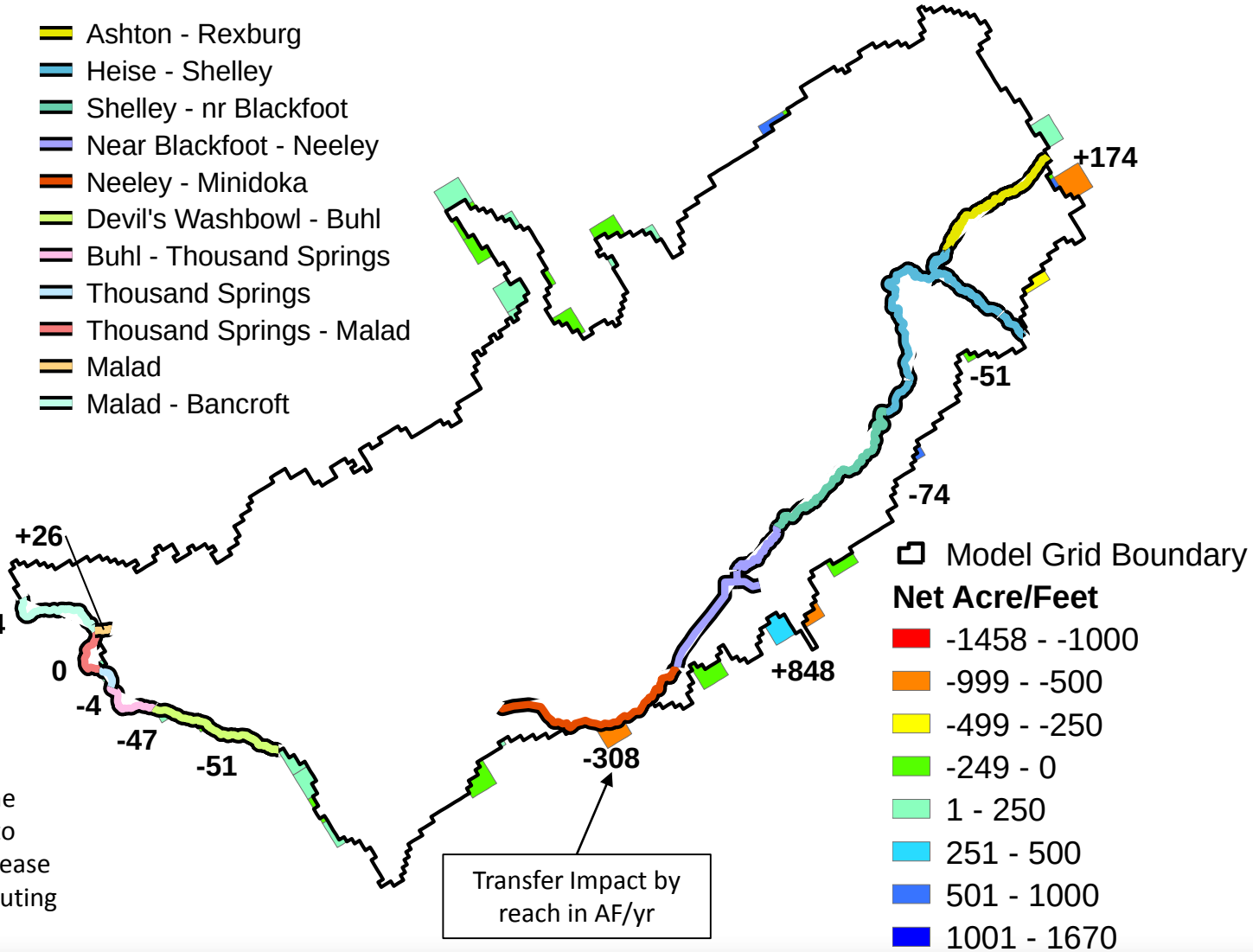
IDAHO Department of Water Resources

Cumulative Net Annual Pumping Rate (2012-2018)

Transfers Moving a Distance Greater than 1 mile

- **Cumulative** annual pumping rate (AF/yr) for all model cells involved in a transfer ***moving a distance greater than 1 mile***

- Red = Less Pumping
- Blue = More Pumping

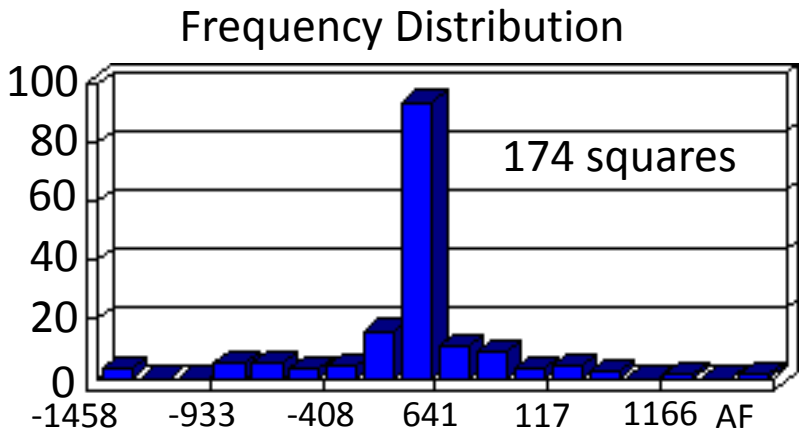


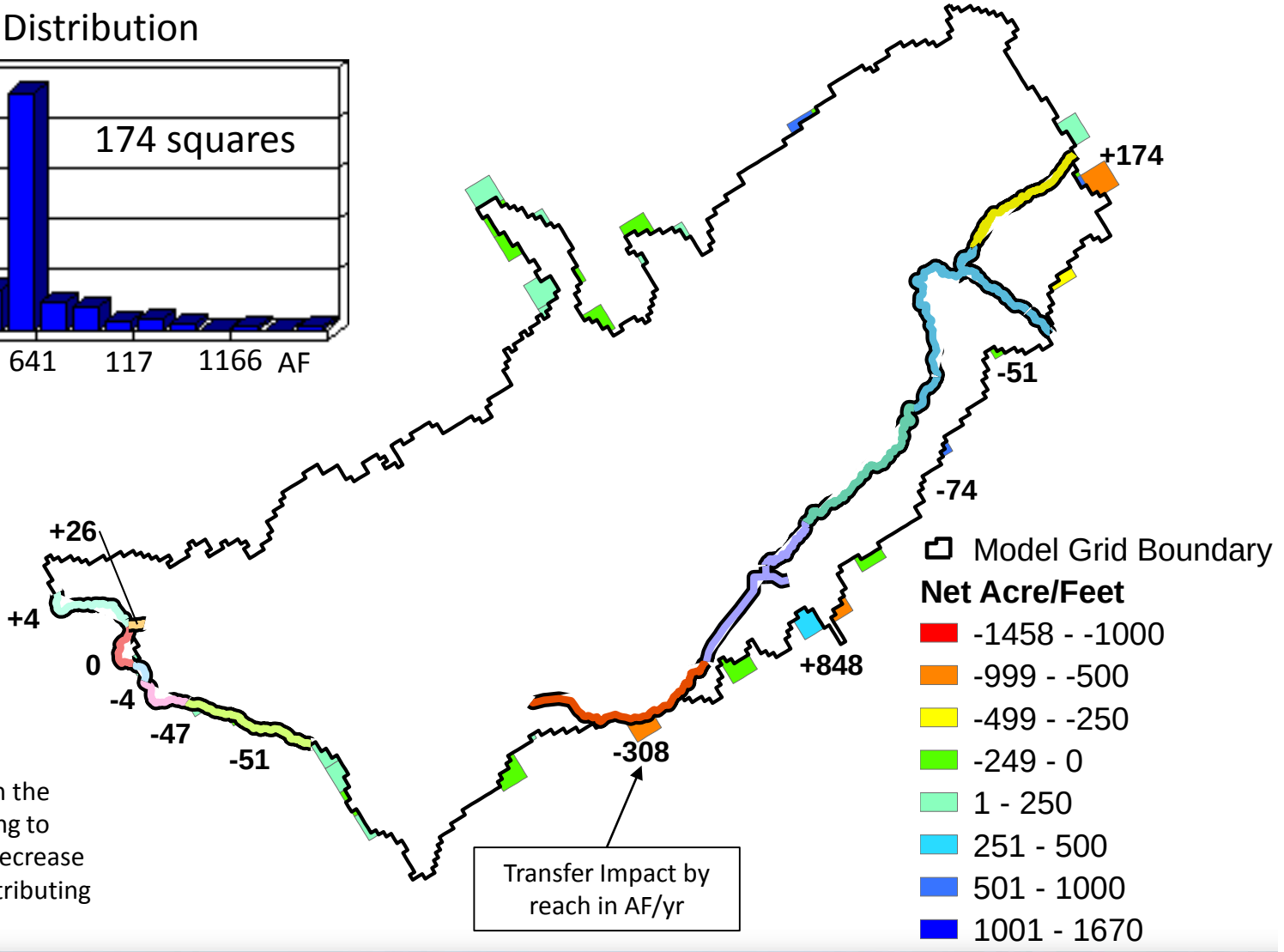
A positive gain is an increase in the water the aquifer is contributing to the river. A negative gain is a decrease in the water the aquifer is contributing to the river.

IDAHO Department of Water Resources

Cumulative Annual Pumping Rate (2012-2018)

Transfers Moving a Distance Greater than 1 mile





A positive gain is an increase in the water the aquifer is contributing to the river. A negative gain is a decrease in the water the aquifer is contributing to the river.

IDWR's Commitment to Updating this ESPA Cumulative Transfer Analysis

1. State office will maintain and update a record of ESPA transfers as they are approved by regional staff
2. Model will be processed and analyzed once a year, during mid to late November when field season has concluded

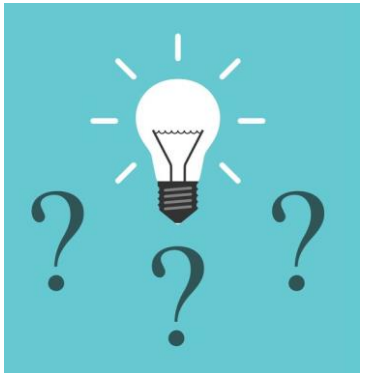
Where do we go from here?

- Does the current policy protect senior surface water users while allowing transfers for economic development?

- Do adjustments need to be made:

  To enable transfers to be completed more easily?

  To better protect senior water users?




Questions?