Great River Hydro

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August 13, 2018

VIA ELECTRONIC FILING
Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426

Re: Great River Hydro, LLC, ILP; Progress Report
Project Nos. P-1892-026, 1855-045, and 1904-073

Dear Secretary Bose:

Great River Hydro, LLC ("Great River Hydro") is the owner and licensee of the Wilder Hydroelectric Project (FERC No. 1892), the Bellows Falls Hydroelectric Project (FERC No. 1855), and the Vernon Hydroelectric Project (FERC No. 1904). On October 31, 2012, TransCanada (the previous licensee) initiated the Integrated Licensing Process ("ILP") by filing with the Federal Energy Regulatory Commission ("FERC" or "Commission") its Notice of Intent to seek new licenses for each project, along with a separate Pre-Application Document for each project. The current licenses for these projects each expire on April 30, 2019.

In accordance with the Commission's Revised Process Plan and Schedule for the Wilder, Bellows Falls, and Vernon Hydroelectric Projects dated February 15, 2018, Great River Hydro respectfully provides this progress report on the status of activities related to Studies 9 (Instream Flow), 24 (Dwarf Wedgemussel and Co-Occurring Mussel), and 33 (Cultural and Historic Resources) since the last progress report, filed May 15, 2018.

Great River Hydro held consultation meetings with stakeholder members of the Aquatics Working Group on June 8 and August 7, 2018. At the June 8 meeting Great River Hydro discussed output of a stakeholder requested model run of "*inflow at the dam equals outflow at the dam*" or stable water surface elevation (WSE) at each of the three dams. Stakeholders made it clear that the request was not based upon review of Instream Flow Study 9 data or habitat requirements but more to get a sense of the broader water budget or availability absent the effect of store-and-release mode of operation of the three projects. The modeled output demonstrated that a stable WSE at the dam can result in greater WSE fluctuation in significant portions of the reservoirs upstream of the dam with fluctuation increasing with increasing distance upstream of the dam. However, stakeholders indicated the output provided what they wanted to see – what flow there is to work with and the magnitude of effects for bookending a dual flow assessment. Stakeholders indicated that the meeting previously scheduled for July 3 would likely need to be pushed out or used for internal discussion of Study 9 results, with the intent of the next meeting to discuss preliminary review of Study 9 including the bypassed reach at Bellows Falls. A summary of the June 8, 2018 meeting was distributed on July 2, 2018. After the meeting, stakeholders were polled and the scheduled July 3 meeting was changed to August 7.

At the August 7 meeting Vermont Agency of Natural Resources (VANR) gave a presentation of how stakeholders were assessing data collected in support of Study 9 (instream flow). The presentation largely focused on the riverine section below the Wilder Dam as that tends to be the least influenced by intermediate inflow from the surrounding drainage area and purported to have the most frequent and dynamic peaking operation of the three projects under relicensing. Although much of the data analysis was performed by VANR staff, it was stated that prior to the meeting the analysis and presentation had been shared and discussed among various stakeholders including: New Hampshire Fish and Game Dept., US Fish and Wildlife Service, Vermont Dept. of Environmental Conservation, New Hampshire Dept. of Environmental Services, The Nature Conservancy and Connecticut River Conservancy. Representatives of the whitewater boating and paddling interests, consultants for FirstLight Energy and Great River Hydro attended the meeting also. The presentation also included an evaluation of steady state flow habitat response for noted species in the Bellows Falls bypassed reach. A copy of the stakeholder presentation is included as an attachment to this progress report. Meeting minutes have not been prepared at this time. Great River Hydro intends to review the information provided, potentially request additional information or analysis associated with the other riverine sections below the projects as needed prior to the next meeting.

Additional discussion centered on the topic of how alternative operating regimes might provide improvements in habitat or reduce habitat related impacts while at the same time allow for critical operational flexibility. Topics such as flexibility definitionregional electrical system importance, wholesale generation markets and system status conditions and action levels were discussed to point out that the operational flexibility of these projects is very important not only to the New England power system but to maintaining the economics of the projects. In order to attempt to illustrate how this sort of win-win arrangement might be possible, Great River Hydro will attempt to develop a hypothetical alternative and examine how certain components or operating changes would require various forms of flexibility and present this back to the stakeholder group. In addition, Great River Hydro will continue to investigate reasonable means of defining and or quantifying operational flexibility so as to provide a meaningful understanding to stakeholders less familiar with the power system needs and markets.

The continued direction of these consultation sessions is to seek a possible operating alternative that has significant improvement in habitat (identified through Study 9) compared to existing operations and quantified through time series analysis using the Operations model (Study 5) while providing system/market response flexibility when necessary. At this time, Great River Hydro does not have an estimated filing date for the Study 9 and 24 report addenda.

Great River Hydro is continuing efforts to complete our TCP as well as develop a Programmatic Agreement in consultation with the State SHPO's and tribal leaders during summer 2018.

If there are further questions regarding this matter, please contact me at 603-498-2851 or jragonese@greatriverhydro.com. Thank you for your consideration.

Sincerely,

John L. Ragonese
FERC License Manager

cc: Interested Parties List (distribution through email notification of availability and download from Great River Hydro's relicensing web site www.greatriverhydro-relicensing.com).

Attachment: Progress report from Vermont ANR on the review of Study 9 results

Vermont Department of Environmental Conservation *Agency of Natural Resources*
Watershed Management Division
1 National Life Drive [phone] 802-490-6180
Montpelier, Vermont 05620-3522 [fax] 802-828-1544
watershedmanagement.vt.gov

DISTRIBUTED ELECTRONICALLY

August 8, 2018

John Ragonese
FERC License Manager
Great River Hydro, LLC
One Harbour Place, Suite 330
Portsmouth, NH 03801

RE: Wilder, Bellows Falls, and Vernon Hydroelectric Projects (FERC Nos. 1892, 1855, & 1904)
Aquatics Working Group Presentation Materials

Dear John,

Please find enclosed the materials prepared by the Vermont Agency of Natural Resources and presented to Great River Hydro and the Aquatics Working Group on August 7, 2018. The presentation summarizes the Agency's ongoing review of Study 9 (Instream Flow) and related studies conducted in support of the relicensing of the Vernon, Bellows Falls, and Wilder hydroelectric projects. The goals of the presentation were to: (1) summarize key modeling results and other hydrological and biological factors that VANR is considering it its evaluation of the operations proposal including in the GRH's draft license application, and (2) facilitate discussion on key findings and possible next steps towards identifying operating conditions that are protective of riverine resources, aquatic habitat, and maintains a level of water quality that supports designated and existing uses.

Very truly yours,

Eric Davis
River Ecologist

Enc: Appendix A: Vermont ANR Study 9 Progress Report

c: Jennifer Griffin, Great River Hydro
Pete McHugh, Vermont FWD
Jeff Crocker, Vermont DEC

APPENDIX A

VERMONT ANR STUDY 9 PROGRESS REPORT

Progress report from Vermont ANR on the review of Study 9 results

August 7, 2018

Great River Hydro Operations Center

Wilder, Vermont

Overview of presentation

- Recap of tasks, work done to date, data sharing, etc.
- Context:
  - Hydrology and biology
  - Proposed operations
- Review of Study 9 (instream flow study) & key findings:
  - Evaluation of proposed operations (all projects, but Wilder as example)
    - Steady state (conservation flows)
    - Dual flow analysis (habitat in light of hydropeaking cycle)
  - Evaluation of Bellows Falls bypass reach (steady state)
- Concerns emerging from review of other studies
- Where to from here?

Study 9 Review Tasks

To evaluate whether the relicensing proposal has a reasonable assurance of satisfying state and federal laws, including State WQ standards, State & Federal ESAs, other relevant laws, in terms of:

a) Conservation flows
b) Hydropeaking operations
c) Impoundment considerations
d) [fish passage]

Work completed to date

- Studies largely complete, reports and relevant datasets have been shared by GRH
- The working group has convened several times in the last 14 months to:
  - Review flow and passage study results
  - Review supplemental studies
  - Discuss the ability of the relicensing proposal to provide necessary protections

Overview of presentation

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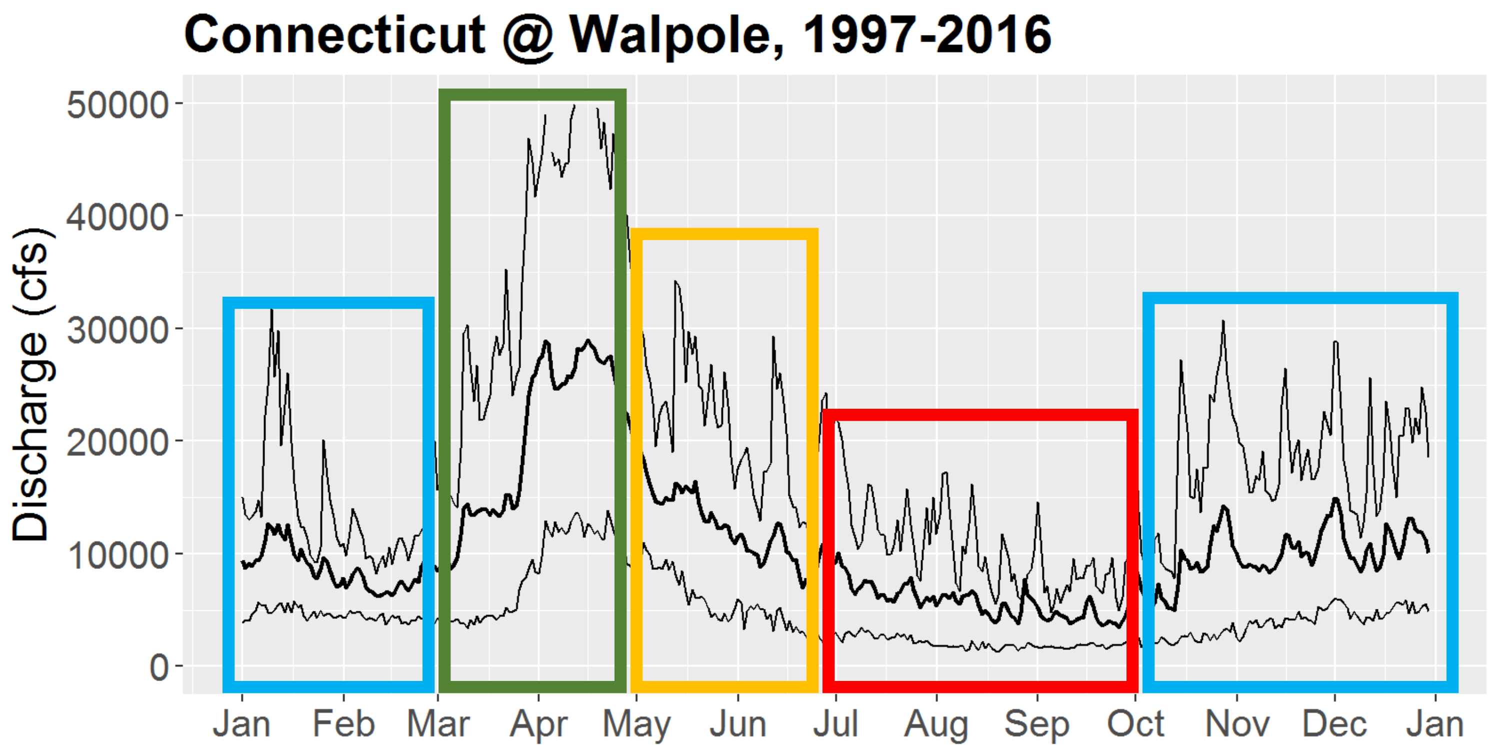
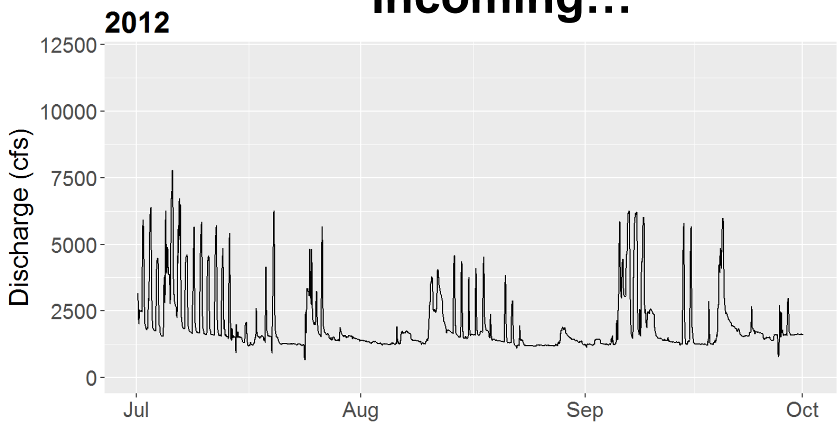
- Where to from here?



Hydrology context

- ~4 hydro-biological periods
  - Winter (Oct-Feb)
  - Early spring (Mar-Apr)
  - Late Spr./Early Sum. (May-Jun)
  - Summer (Jul-Sep)
- Altered incoming hydrology
  - Storage reservoirs
  - Peak generation (~1,000 / 6,000 cfs cycle from McIndoes)

Incoming…



Within VBW reach…

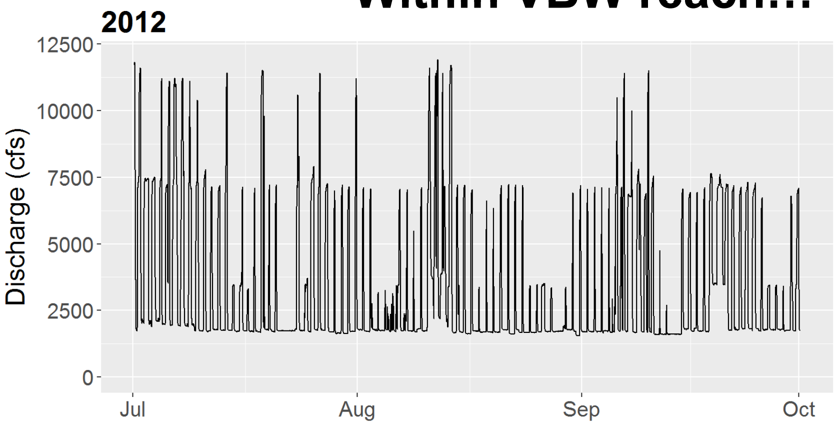


Table 2.1. Timing of key life history events, in full months; see Table 1.1 for sub-monthly life history details. The 1997-2016 daily median discharge at Walpole, rounded to the nearest 100 cfs, is provided below each month for considering linkages between life history and hydrology.

Species	Life stage	Jan 7,700	Feb 6,200	Mar 10,800	Apr 22,700	May 12,500	Jun 7,900	Jul 5,000	Aug 3,700	Sep 3,100	Oct 5,200	Nov 7,700	Dec 8,800
American Shad	Juvenile												
	Adult												
	Spawning												
Walleye	Fry												
	Juvenile												
	Adult												
	Spawning												
Fallfish	Fry												
	Juvenile												
	Adult												
	Spawning												
White Sucker	Fry												
	Juv/Ad												
	Spawning												
Longnose Dace	Juvenile												
	Adult												
	YOY												
Tessellated Darter	Adult												
Sea Lamprey	Spawning												
Smallmouth Bass	YOY												
	Juvenile												
	Adult												
	Spawning												
Macroinvertebrates	all aquatic												
Rainbow Trout	Adult												
Dwarf Wedgemussel[1]	Adult												
Co-occurring Mussels	Adult												

[1]Reproduction occurs summer/fall; glochidia release occurs in the following spring (March-June)

Biological context

- Native riverine & diadromous species
- Important sportfish
- Species of conservation concern:
  - DWM
  - Sea Lamprey
- Macroinvertebrates
- Seasonal presence/ significance

Current/proposed operations

Wilder Project: 675 cfs / 10,700 cfs

(conservation flow / max generation flow)

Bellows Falls Project: 1,083 cfs / 11,400 cfs

Bellows Falls bypass flow: leakage (100-300 cfs)

Vernon Project: 1,250 cfs / 17,100 cfs

(Note: other constraints also apply, e.g., drawdown rates, flood profile, etc.)

This is the operating regime included the draft license application; alternatives may be feasible, but this is what we have to work with currently.

Assessment of proposed operations

A proposed operating regime is assumed to offer adequate resource protection if it meets on of these conditions:

- If it has a minimal impact on the habitat of modeled species (assess using the **Study 9** steady state & dual flow/two flow results, other studies)

OR

- If it is executed in a way that's consistent with the river's natural flow regime, i.e., frequency, magnitude, rate of change, etc.

Overview of presentation

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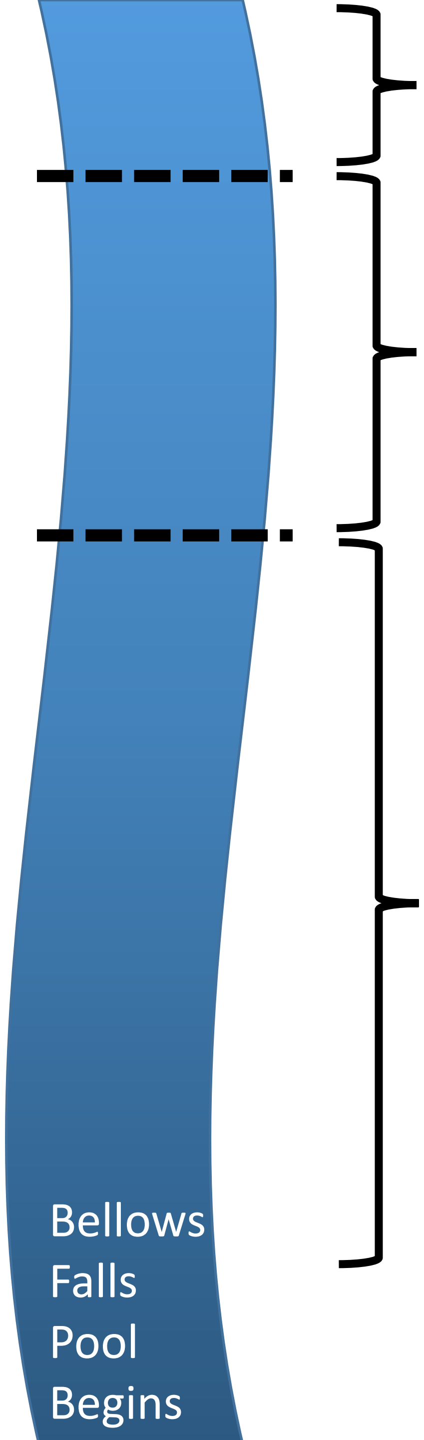
- Where to from here?

Insights from instream habitat modeling

- Steady state model results (flow vs. habitat relationships)
- Dual flow (immobile species), two flow (mobile species)
  - Evaluate base/peak pairs and assess habitat impacts
  - Problems/challenges:
    - Denominator in '% habitat remaining'…lots of options, habitat at base, ave Q, or FMF incoming? (not a determining factor ultimately…)
    - Setting a specific bar for what constitutes a 'minimal impact'
    - Hydrologic & storage constraints will eliminate some base-peak pairs
- Impoundment fluctuation not assessed here



Wilder 1: Wilder Dam to White River:

- 1.5 mi (8%), 12 x 1D transects; pool & run habitat
- Negligible flow accumulation (= Accretion), $Q_{Trans} = Q_{WD}$

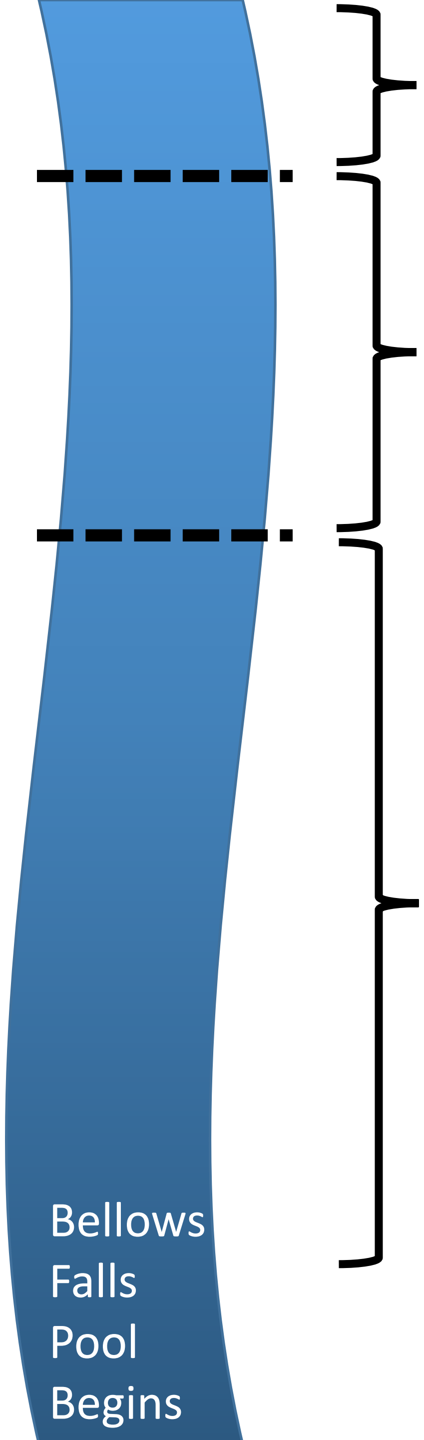
Wilder 2: White R to Ottauquechee R:

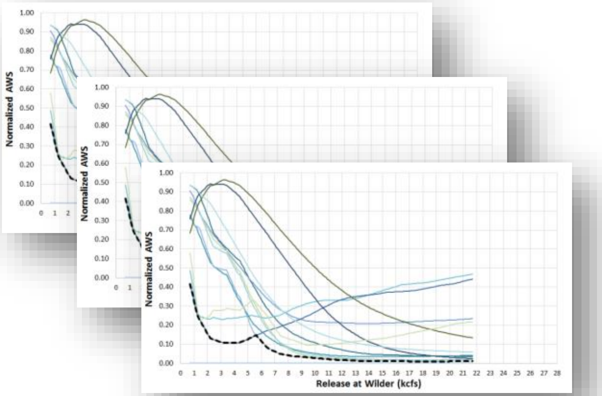
- 5.2 mi (29%), 16 x 1D transects; more habitat diversity & a 2D modeling site (Johnston Island)
- 600-2,500 cfs gained, depending on season, $Q_{Trans} = Q_{WD} + Q_{add1}$

Wilder 3: White to Ottauquechee segment:

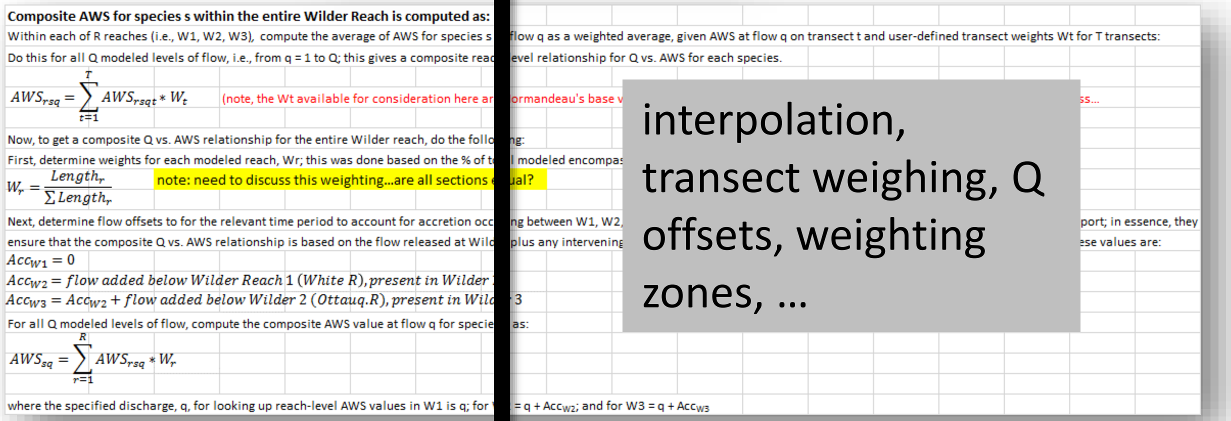
- 11 mi (63%), 16 x 1D transects; more habitat diversity & a 2D modeling site (Chase Island)
- Accretion: 800-3,300 cfs, depending on season , $Q_{Trans} = Q_{WD} + Q_{add1} + Q_{add2}$

26 flows (700-25,000 cfs) were modeled for 27 sp. on 44 transects, with 4 sets of weights…





Transect & zone relationships



Composite AWS for species s within the entire Wilder Reach is computed as:

Within each of R reaches (i.e., W1, W2, W3), compute the average of AWS for species s … flow q as a weighted average, given AWS at flow q on transect t and user-defined transect weights Wt for T transects:

Do this for all Q modeled levels of flow, i.e., from q = 1 to Q; this gives a composite reach-level relationship for Q vs. AWS for each species.

$$AWS_{rsq} = \sum_{t=1}^{T} AWS_{rsqt} * W_t$$ (note, the Wt available for consideration here ar… ormandeau's base v… …ss...

Now, to get a composite Q vs. AWS relationship for the entire Wilder reach, do the following:

First, determine weights for each modeled reach, Wr; this was done based on the % of t… modeled encompas…

$$W_r = \frac{Length_r}{\sum Length_r}$$ note: need to discuss this weighting...are all sections equal?

Next, determine flow offsets to for the relevant time period to account for accretion occ…ng between W1, W2, … port; in essence, they ensure that the composite Q vs. AWS relationship is based on the flow released at Wild… plus any intervening … ese values are:

$Acc_{W1} = 0$

$Acc_{W2} = flow\ added\ below\ Wilder\ Reach\ 1\ (White\ R), present\ in\ Wilder$ …

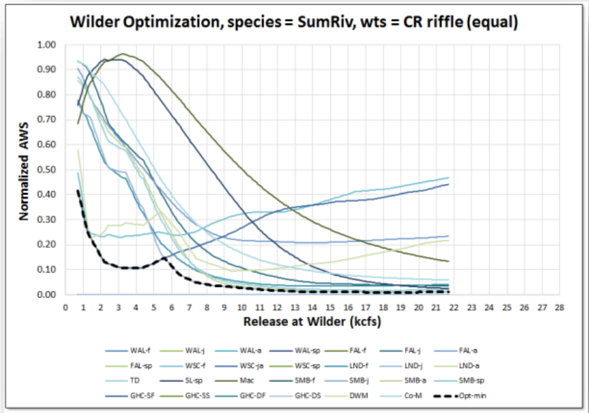
$Acc_{W3} = Acc_{W2} + flow\ added\ below\ Wilder\ 2\ (Ottauq.R), present\ in\ Wil$…3

For all Q modeled levels of flow, compute the composite AWS value at flow q for specie… as:

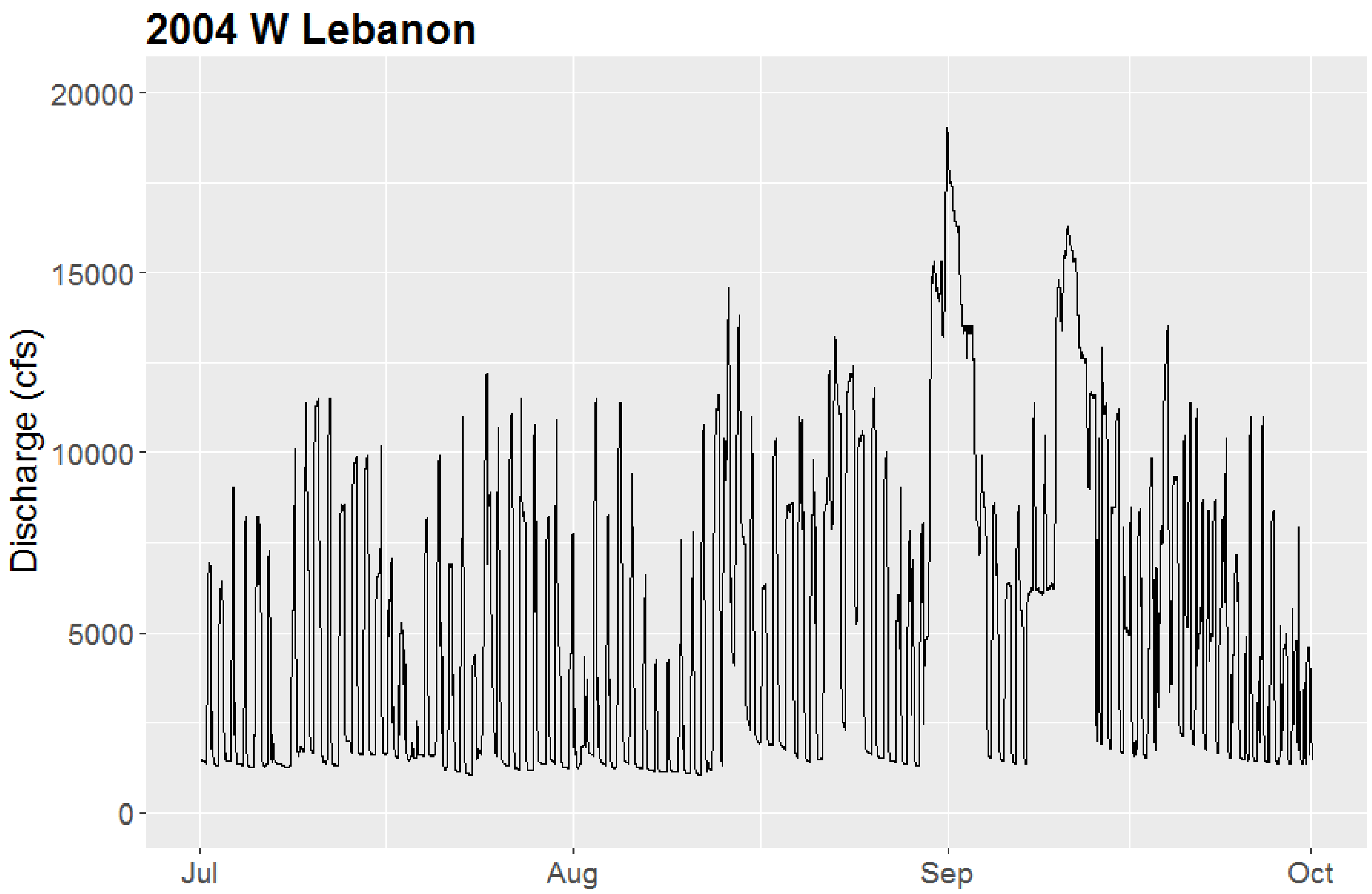
$$AWS_{sq} = \sum_{r=1}^{R} AWS_{rsq} * W_r$$

where the specified discharge, q, for looking up reach-level AWS values in W1 is q; for … = q + Acc_{W2}; and for W3 = q + Acc_{W3}

interpolation, transect weighing, Q offsets, weighting zones, …



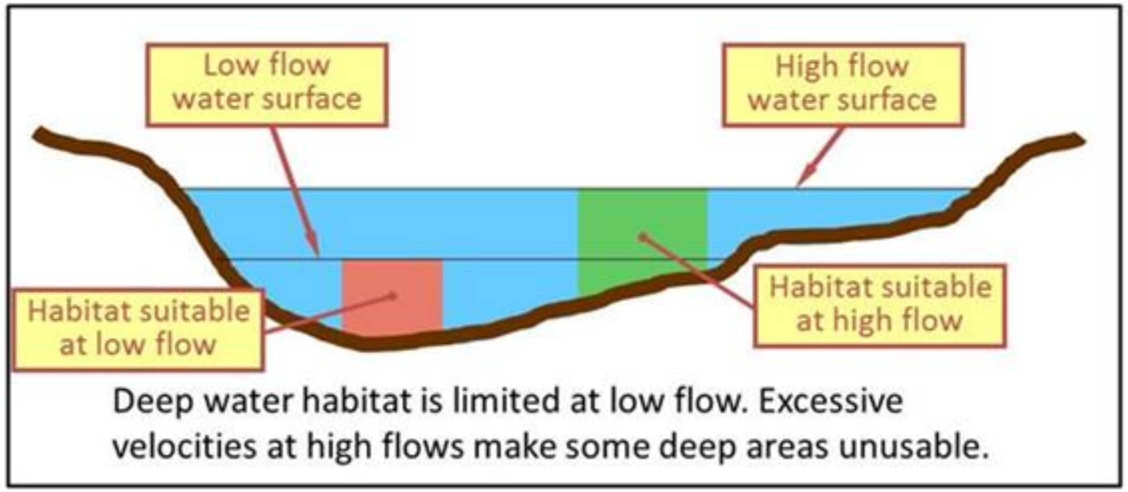
Composite Q vs. habitat relationship


2004 W Lebanon
Discharge (cfs)
20000
15000
10000
5000
0
Jul
Aug
Sep
Oct

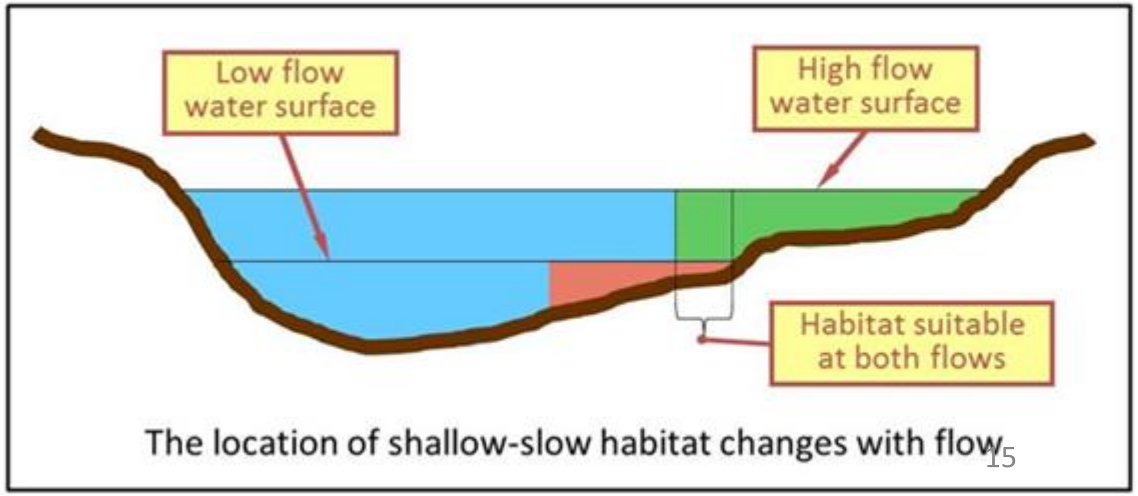
Dual flow & two flow assessments

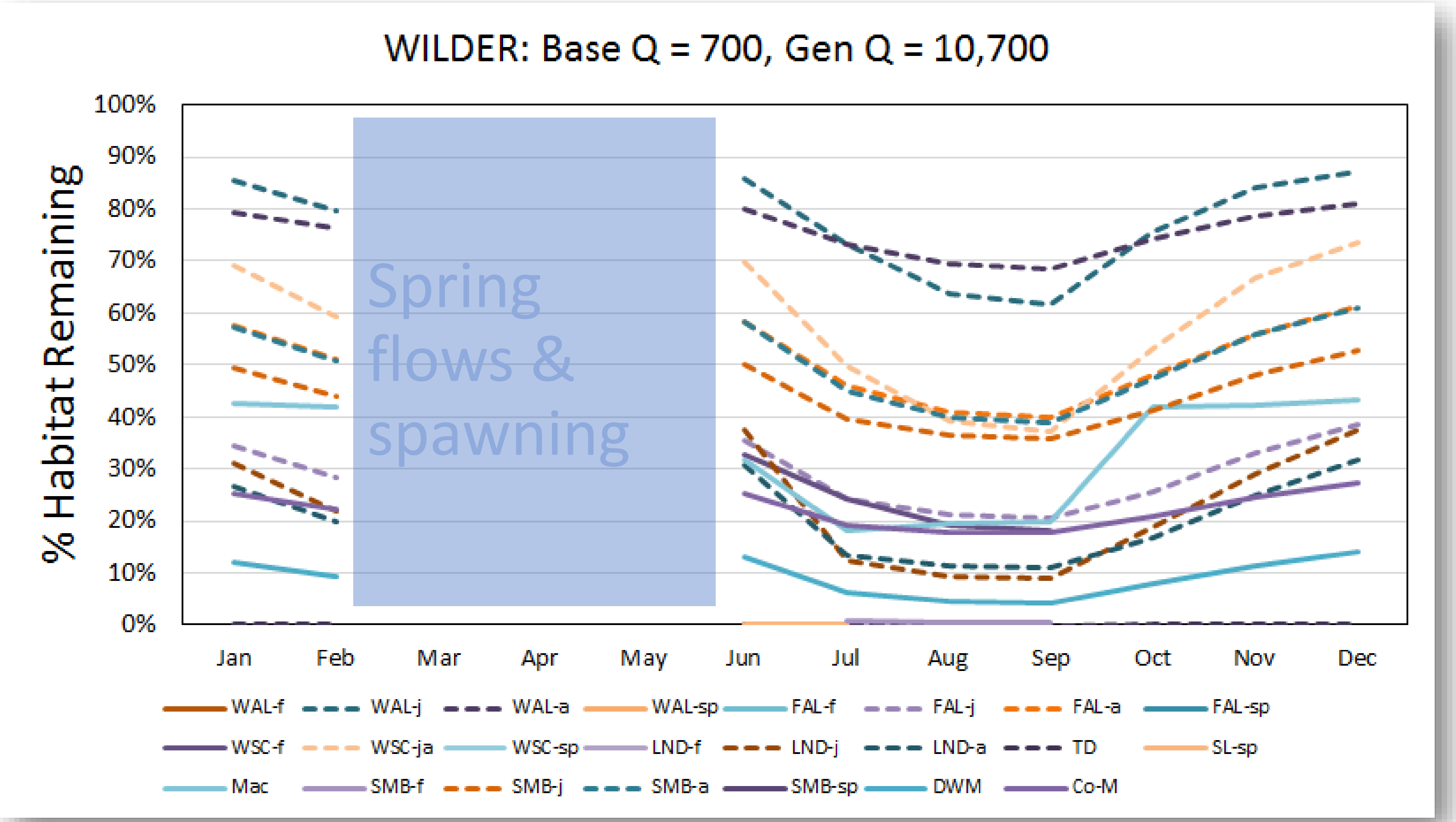
Base Flows	Base Flow AWS	Persistent AWS (ft2/ft) Peaking Flows									
		2500	3175	3850	4475	5400	6350	7025	7700	9525	11400
1300	118.0	np	np	np	59%	47%	36%	31%	27%	21%	16%
1500	115.7	np	np	np	63%	49%	38%	32%	28%	21%	17%
1750	113.3	np	np	np	68%	52%	40%	34%	30%	23%	18%
2000	110.5	np	np	np	72%	54%	41%	35%	31%	23%	19%
2250	106.0	np	np	np	75%	56%	43%	37%	32%	24%	20%
2500	100.8	np	np	np	78%	58%	44%	38%	33%	25%	20%
3000	90.8		np	np	82%	61%	47%	40%	35%	27%	21%
3500	82.9			np	85%	64%	49%	42%	37%	28%	23%
4000	75.6				88%	66%	50%	43%	38%	29%	24%
4500	67.3					67%	52%	44%	39%	30%	24%
5000	59.1					69%	53%	46%	40%	31%	25%
6000	45.6						55%	48%	42%	32%	26%

Mobile spp/stages, habitat = $\min(\Sigma H_{bi}, \Sigma H_{pi})$

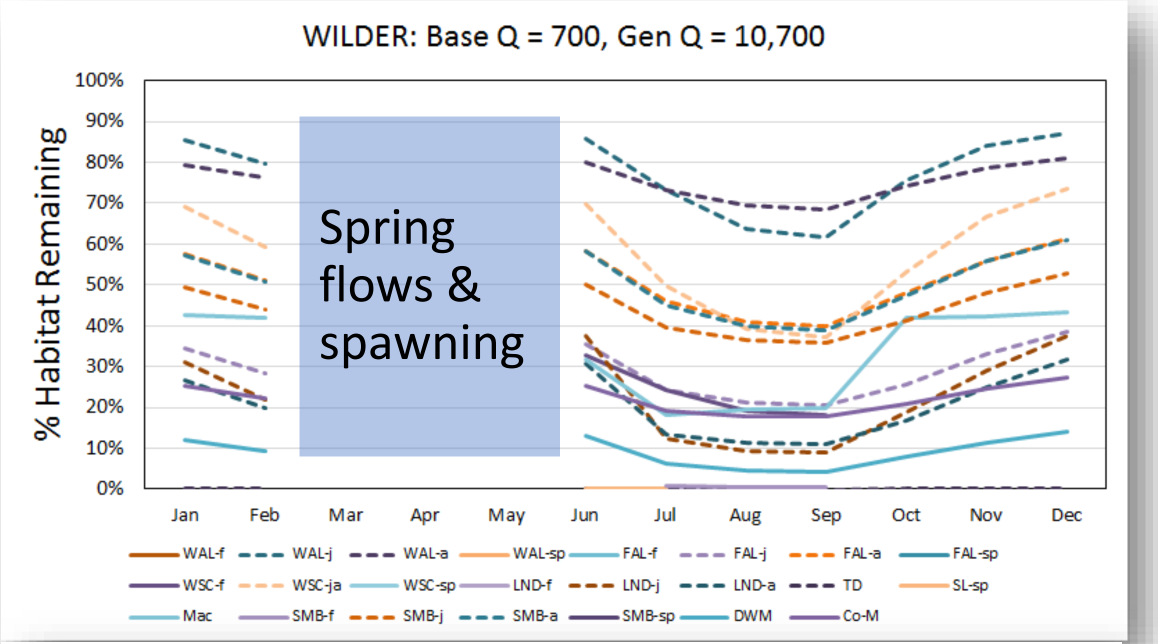


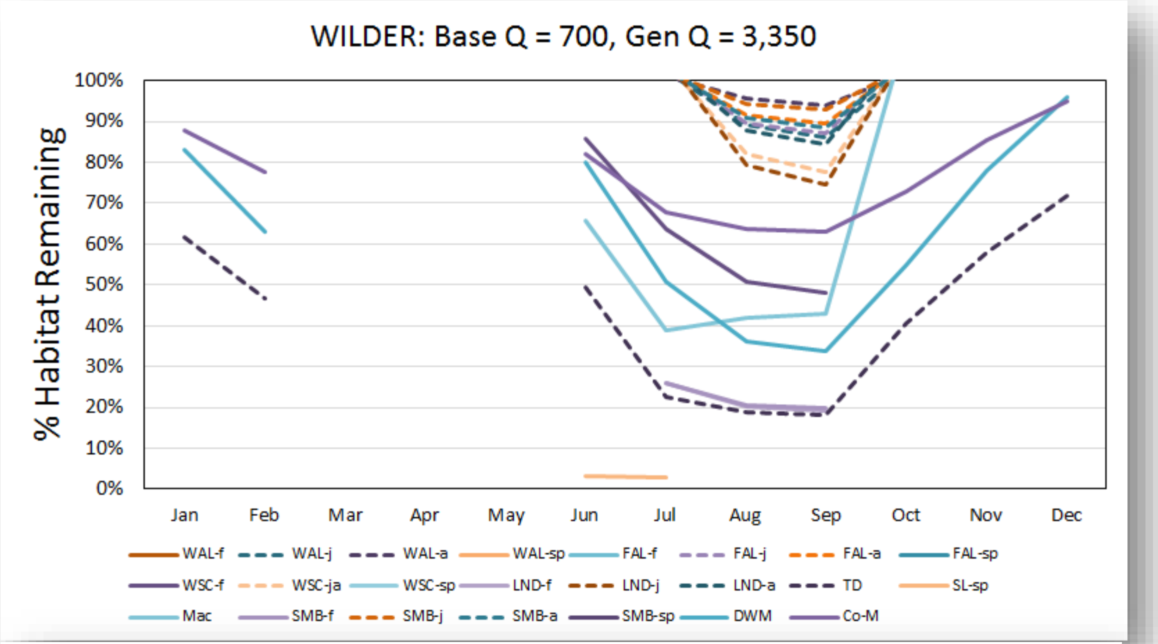
Immobile spp/stages, habitat = $\Sigma(\min(H_{bi}, H_{pi}))$

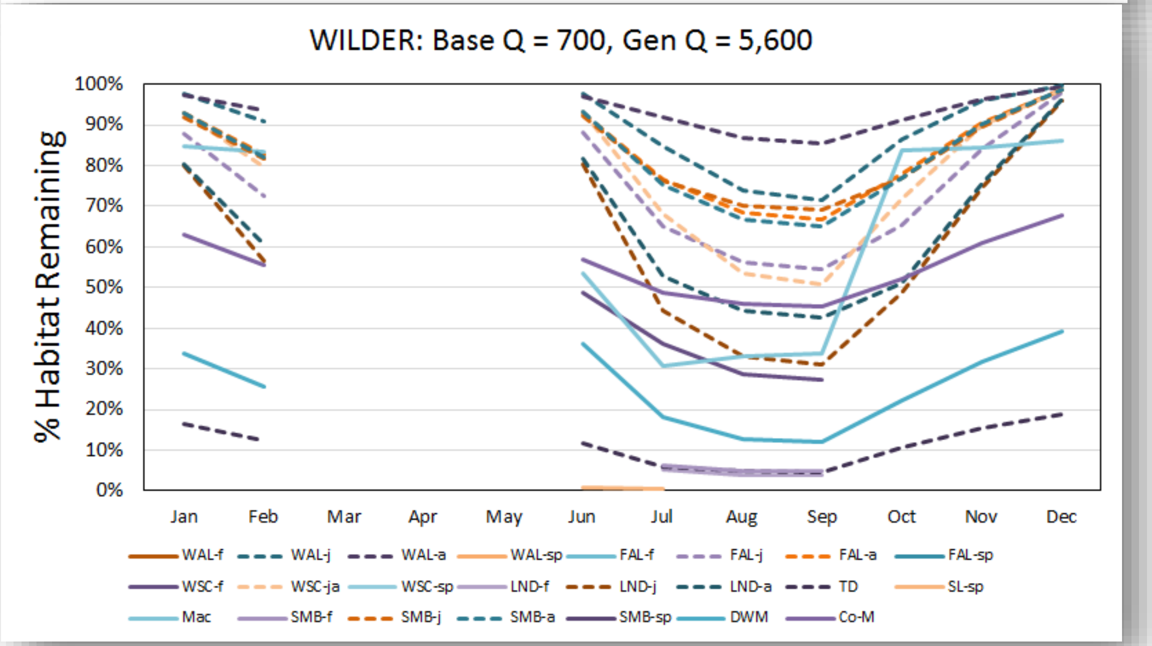


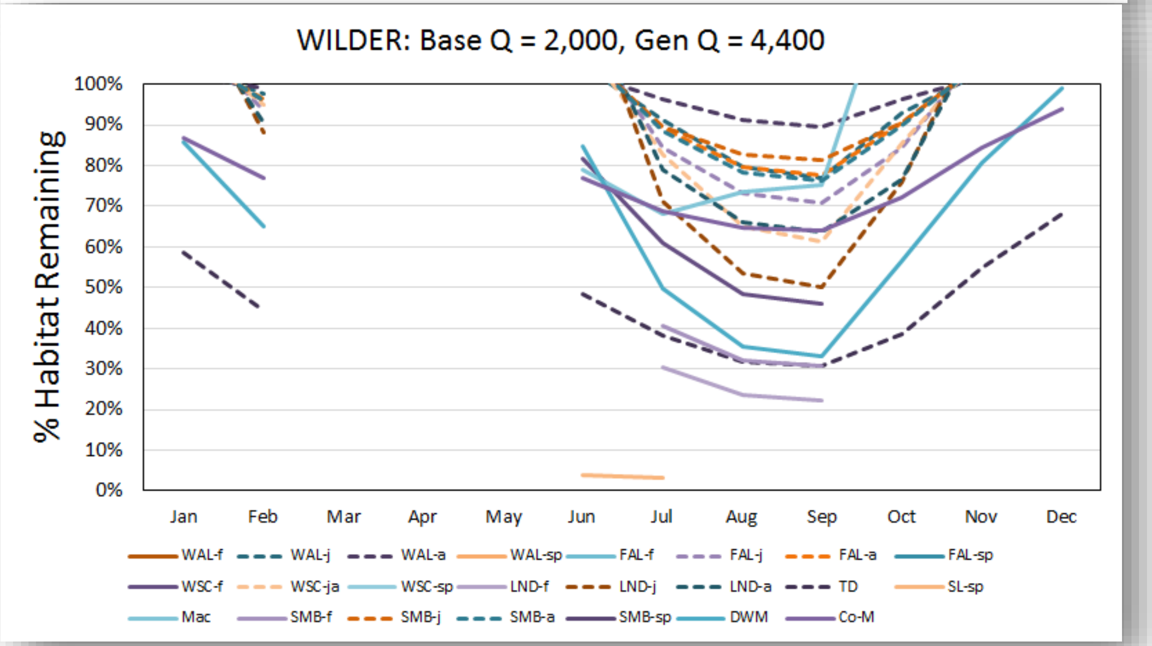

WILDER: Base Q = 700, Gen Q = 10,700
% Habitat Remaining
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Spring flows & spawning
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
WAL-f
WAL-j
WAL-a
WAL-sp
FAL-f
FAL-j
FAL-a
FAL-sp
WSC-f
WSC-ja
WSC-sp
LND-f
LND-j
LND-a
TD
SL-sp
Mac
SMB-f
SMB-j
SMB-a
SMB-sp
DWM
Co-M

Current/proposed regime



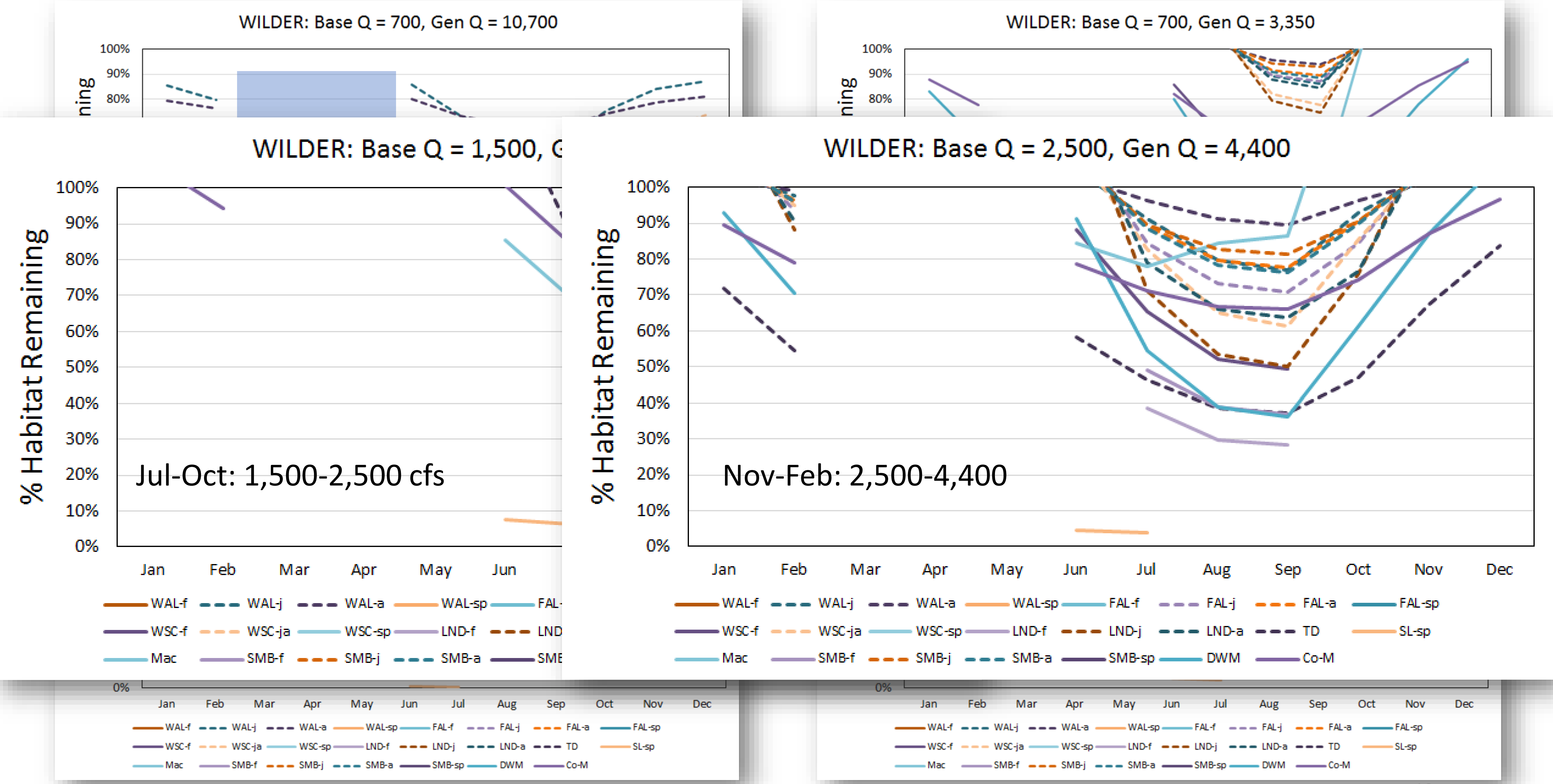


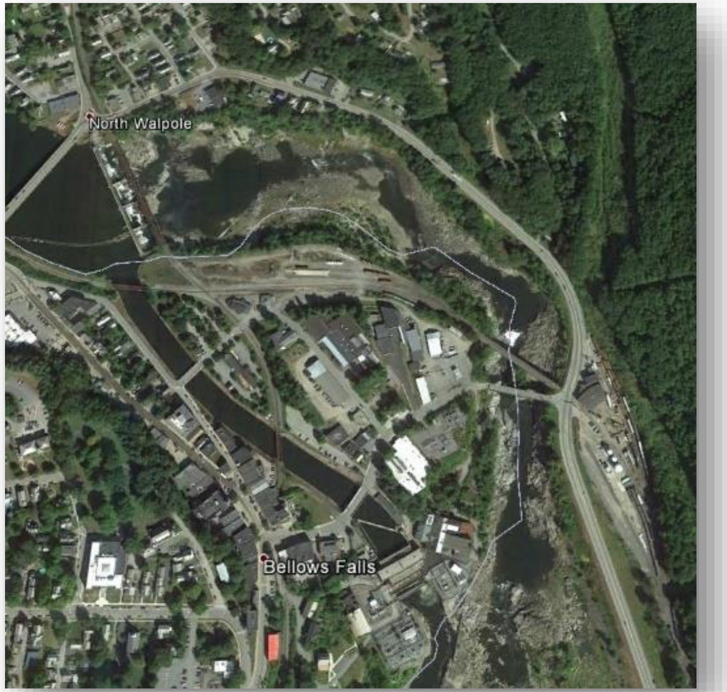


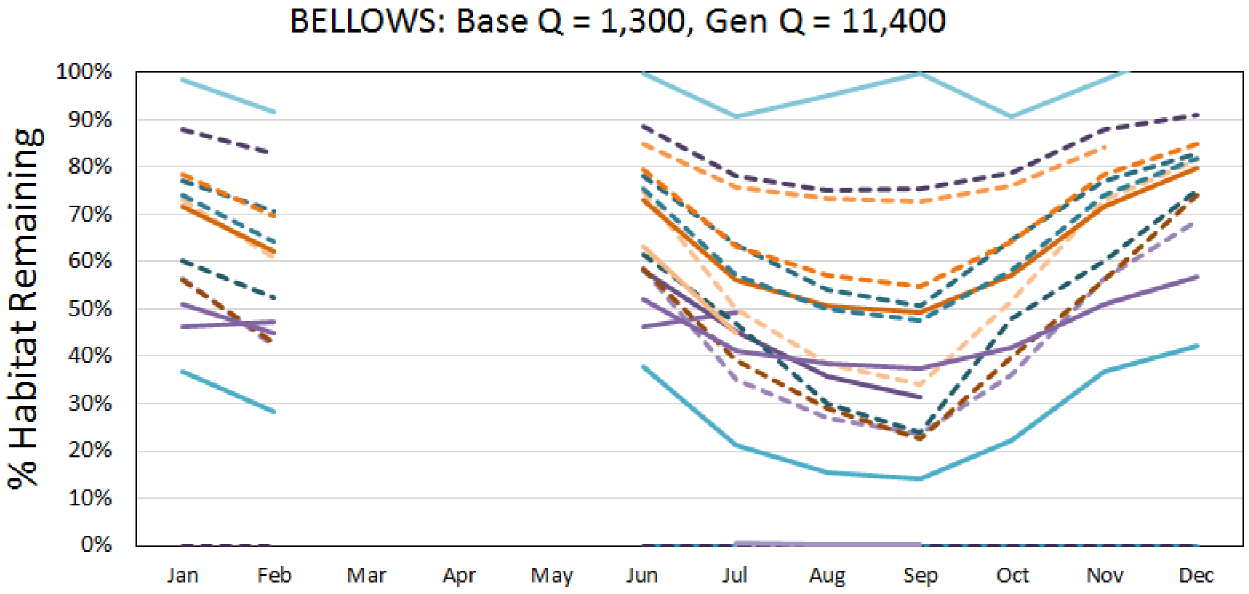


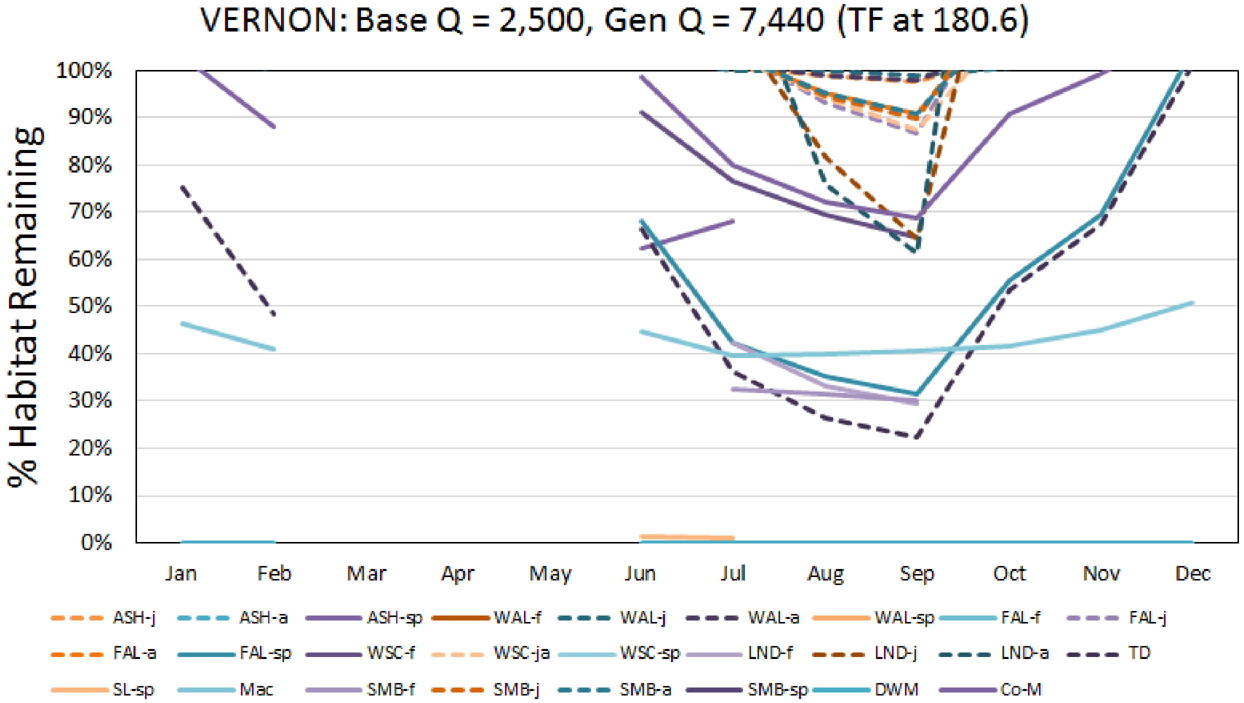
Current/proposed regime

Current/proposed regime




North Walpole
Bellows Falls


BELLOWS: Base Q = 1,300, Gen Q = 11,400
% Habitat Remaining
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec


VERNON: Base Q = 2,500, Gen Q = 7,440 (TF at 180.6)
% Habitat Remaining
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
ASH-j
ASH-a
ASH-sp
WAL-f
WAL-j
WAL-a
WAL-sp
FAL-f
FAL-j
FAL-a
FAL-sp
WSC-f
WSC-ja
WSC-sp
LND-f
LND-j
LND-a
TD
SL-sp
Mac
SMB-f
SMB-j
SMB-a
SMB-sp
DWM
Co-M

Assessment of proposed operations

A proposed operating regime is assumed to offer adequate resource protection if it meets on of these conditions:

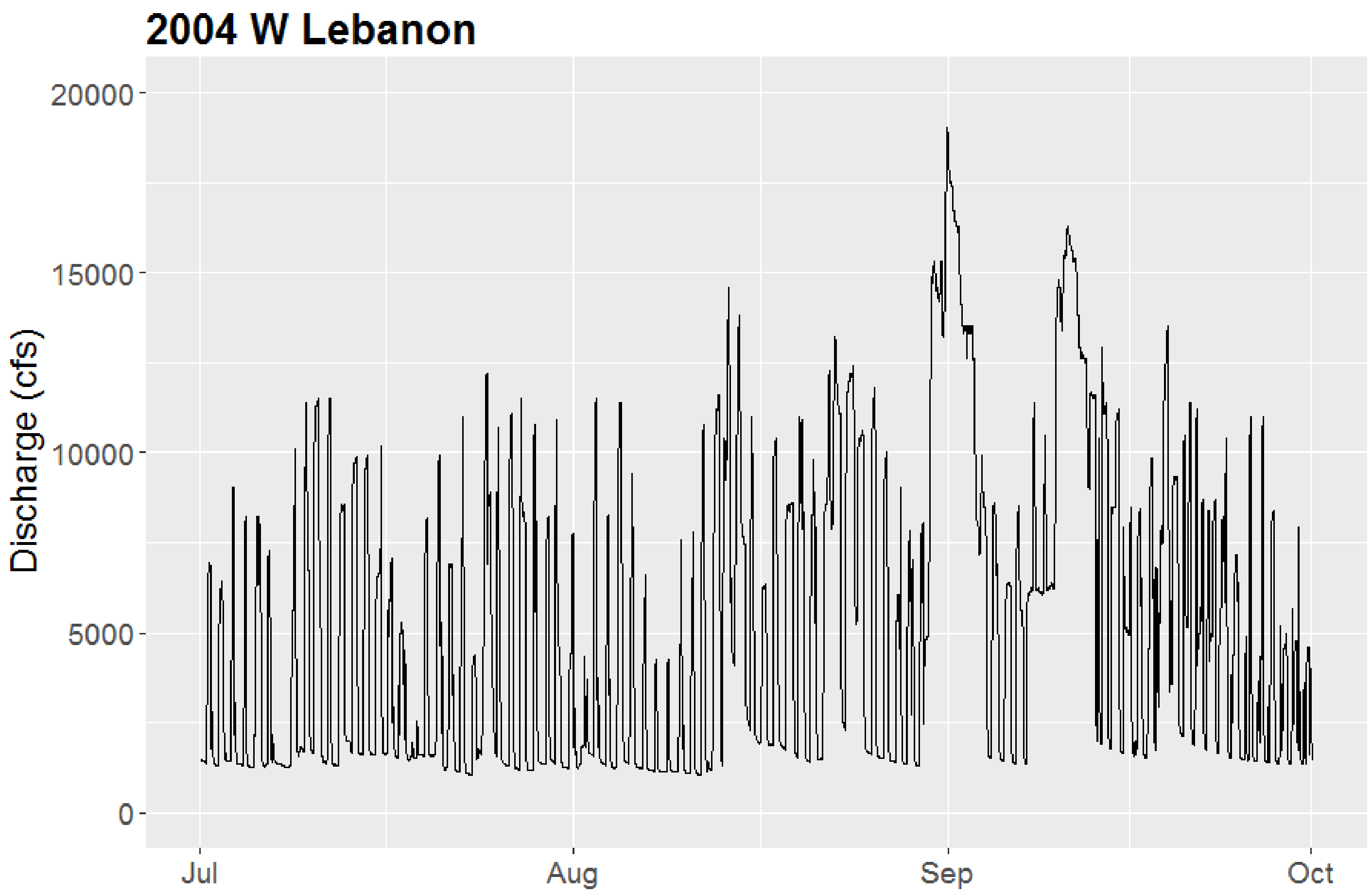
- If it has a minimal impact on the habitat of modeled species (assess using the **Study 9** steady state & dual flow/two flow results, other studies)

OR

- If it is executed in a way that's consistent with the river's natural flow regime, i.e., frequency, magnitude, rate of change, etc.

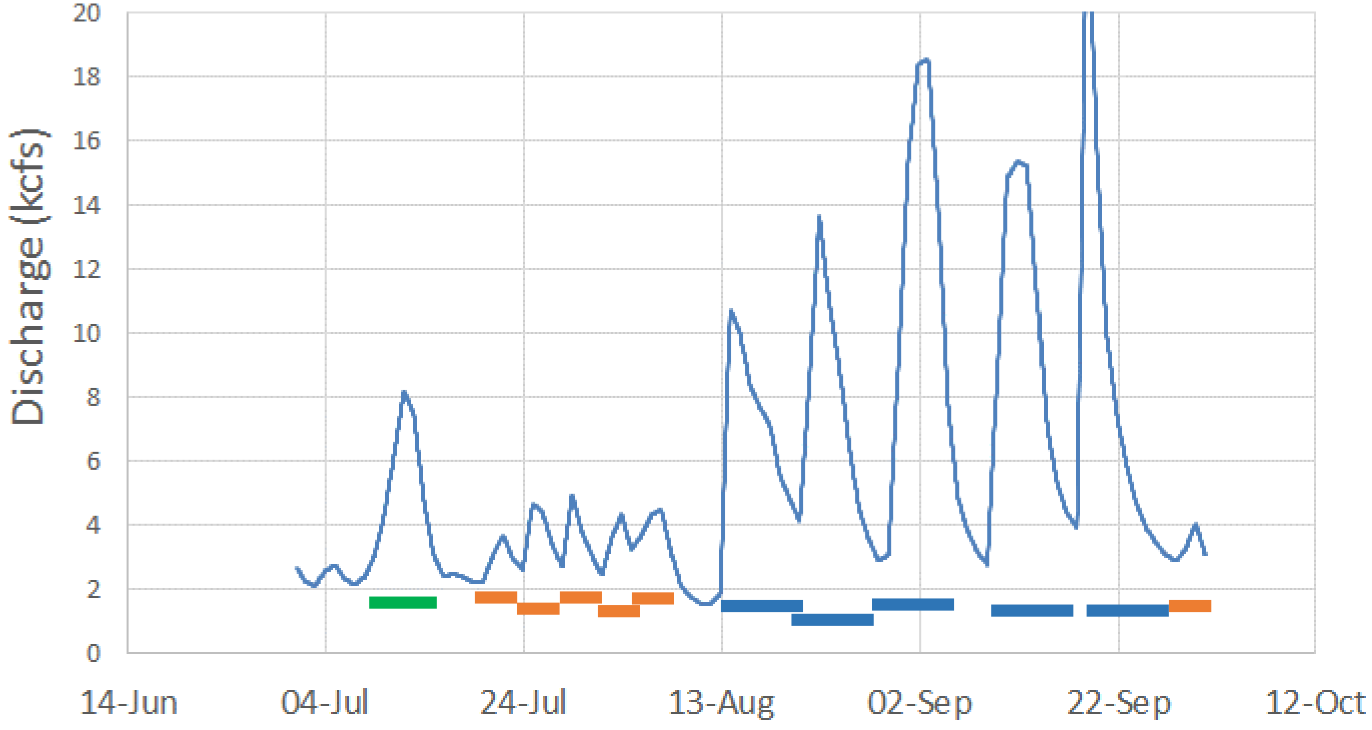
Insights from a natural flow perspective

- Quantify relevant statistics of background hydrology (freq, mag, etc.)
- Use these to identify potential bounds for operation
- Problems/challenges:
  - What is the right hydrologic baseline for evaluation?
  - How to implement without increasing flow variability overall?
  - Practical constraints to implementation?
  - Requires usable storage and does not address impoundment fluctuation



2004 W Lebanon
Discharge (cfs)
20000
15000
10000
5000
0
Jul
Aug
Sep
Oct

Frequency & Magnitude



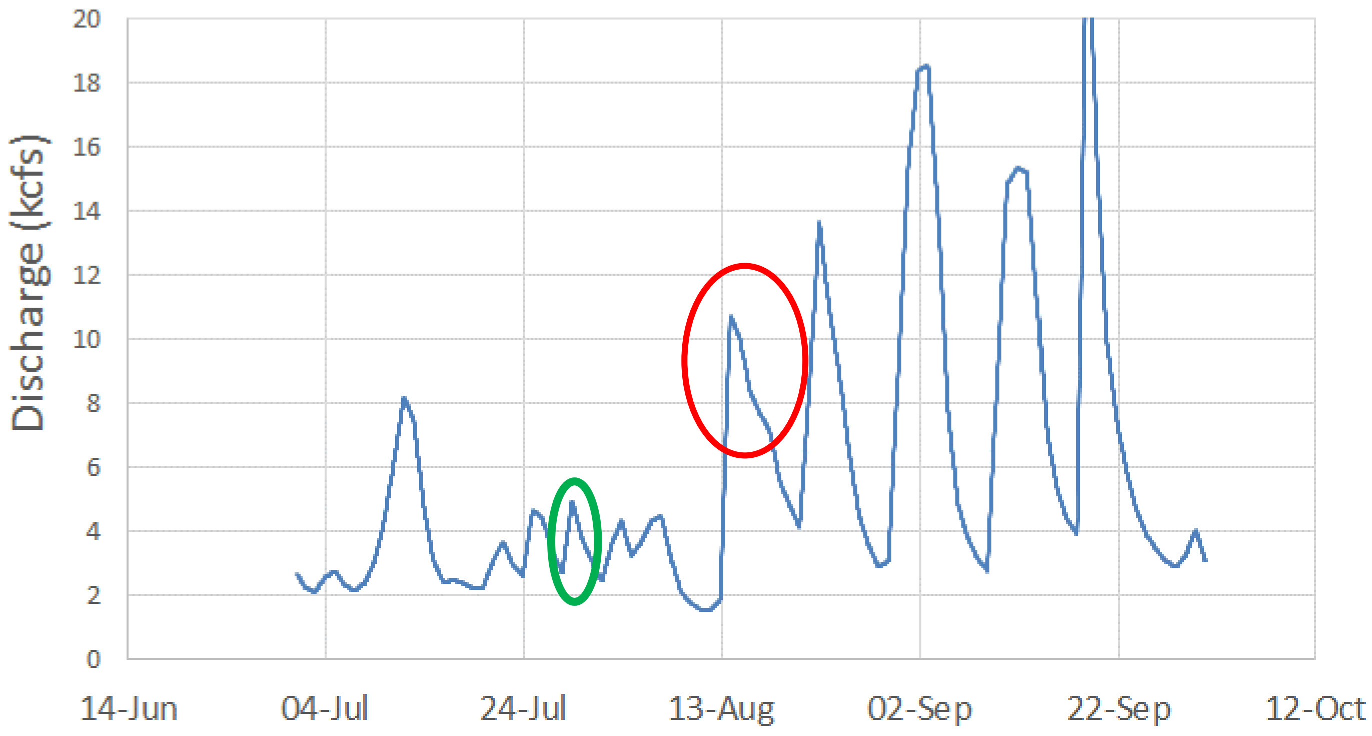
Approx. 2-3 kcfs to 4-5 kcfs, n = 6

Approx. 2-3 kcfs to 8 kcfs, n = 1

Approx. 2-3 kcfs to 10+ kcfs, n = 5

(i.e., 12 events vs. 80-90 ~1 kcfs to 8-10 kcfs per summer currently)

dQ/dt & Duration



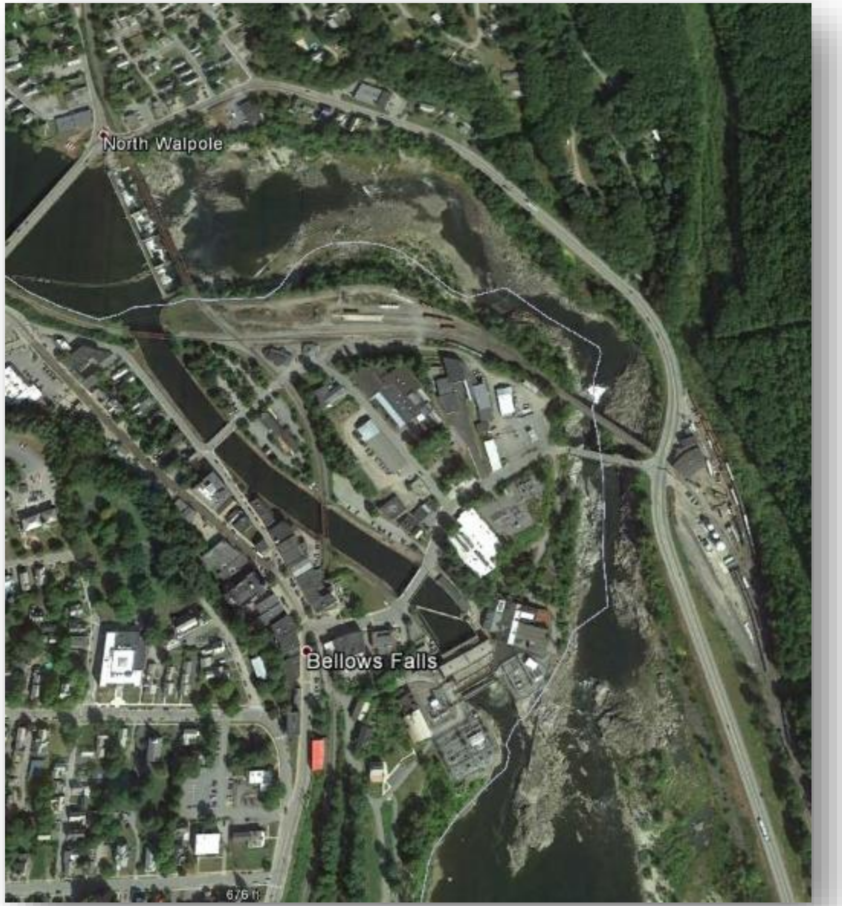
Event 1, 27-31 July:
2.7 to 4.9 kcfs
Duration: 4 d (96 h)
dQ/dt: +87 & -34 cfs/h

Event 2, 11-20 Aug:
1.5 to 10.7 kcfs
Duration: 9.2 d (221 h)
dQ/dt: +173 & -39 cfs/h

Current Operations:
~1 to 11 kcfs
Duration: 1 d (24 h)
dQ/dt: 600-700 cfs/h

The Bellows Falls bypass reach

- ~0.7 mi long, pool-dom'd (73%)
- Fish dam at bottom
- Several species present, likely spawning hab. ltd.
- Current flow 100-300 cfs; 7Q10 is ~1500 cfs
- Habitat survey incl. 7 transects (2 pool, 5 run/riff/gld)



The Bellows Falls bypass reach

- What species & life stages to include?

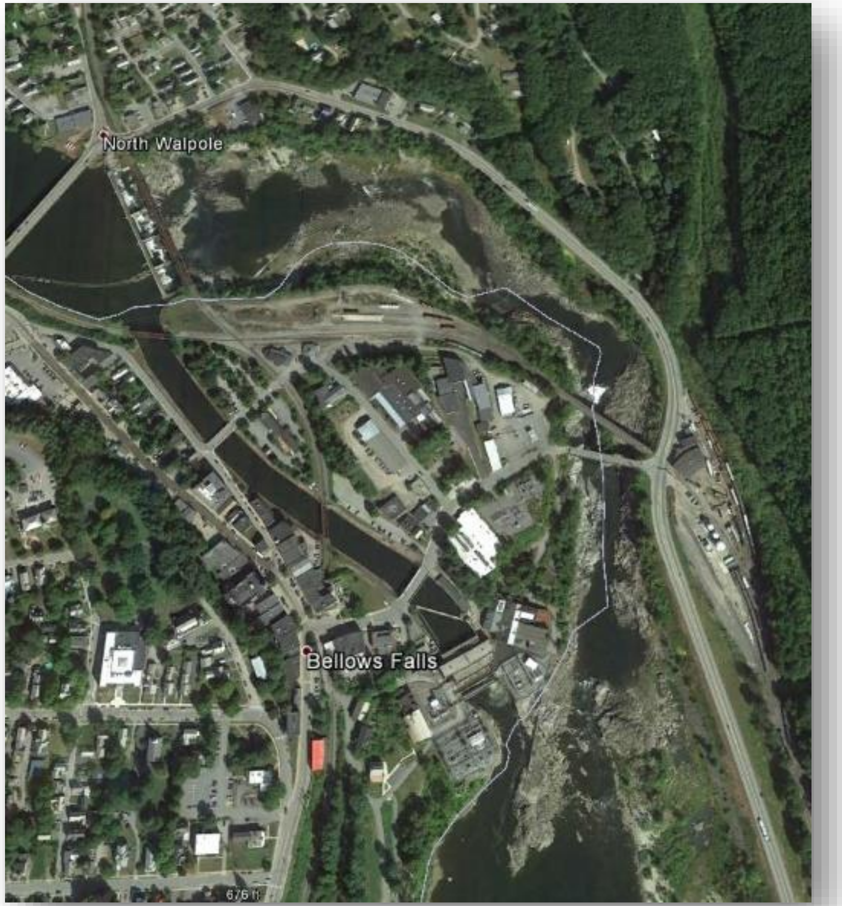


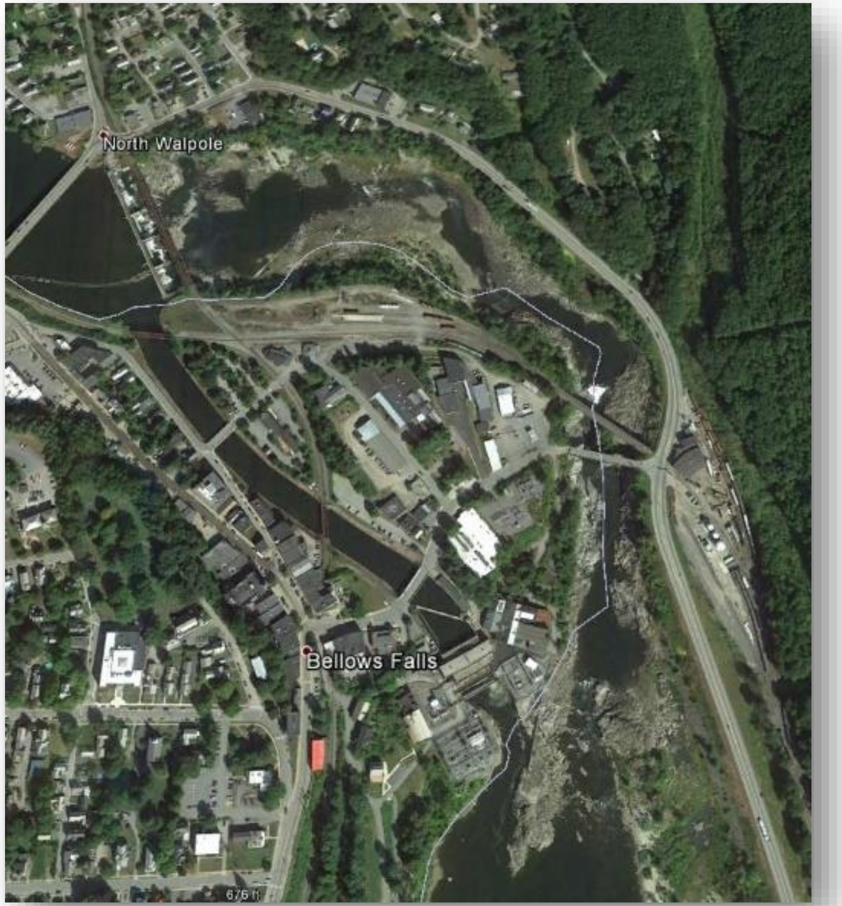
Table 2.1. Timing of key life history events, in full months; see Table 1.1 for sub-monthly life history details. The 1997-2016 daily median discharge at Walpole, rounded to the nearest 100 cfs, is provided below each month for considering linkages between life history and hydrology.

Species	**Life stage**	**Jan** 7,700	**Feb** 6,200	**Mar** 10,800	**Apr** 22,700	**May** 12,500	**Jun** 7,900	**Jul** 5,000	**Aug** 3,700	**Sep** 3,100	**Oct** 5,200	**Nov** 7,700	**Dec** 8,800
American Shad	Juvenile						■	■	■	■	■	■	
	Adult					■	■						
	Spawning					■	■	■					
Walleye	Fry					■	■						
	Juvenile	■	■	■	■	■	■	■	■	■	■	■	■
	Adult	■	■	■	■	■	■	■	■	■	■	■	■
	Spawning				■	■							
Fallfish	Fry						■						
	Juvenile	■	■	■	■	■	■	■	■	■	■	■	■
	Adult	■	■	■	■	■	■	■	■	■	■	■	■
	Spawning					■	■						
White Sucker	Fry						■	■	■	■			
	Juv/Ad	■	■	■	■	■	■	■	■	■	■	■	■
	Spawning				■	■	■						
Longnose Dace	Juvenile	■	■	■	■	■	■	■	■	■	■	■	■
	Adult	■	■	■	■	■	■	■	■	■	■	■	■
	YOY							■	■	■			
Tessellated Darter	Adult	■	■	■	■	■	■	■	■	■	■	■	■
Sea Lamprey	Spawning					■	■	■					
Smallmouth Bass	YOY							■	■	■			
	Juvenile	■	■	■	■	■	■	■	■	■	■	■	■
	Adult	■	■	■	■	■	■	■	■	■	■	■	■
	Spawning					■	■						
Macroinvertebrates	all aquatic	■	■	■	■	■	■	■	■	■	■	■	■
Rainbow Trout	Adult	■	■	■	■						■	■	■
Dwarf Wedgemussel[1]	Adult	■	■	■	■	■	■	■	■	■	■	■	■
Co-occurring Mussels	Adult	■	■	■	■	■	■	■	■	■	■	■	■

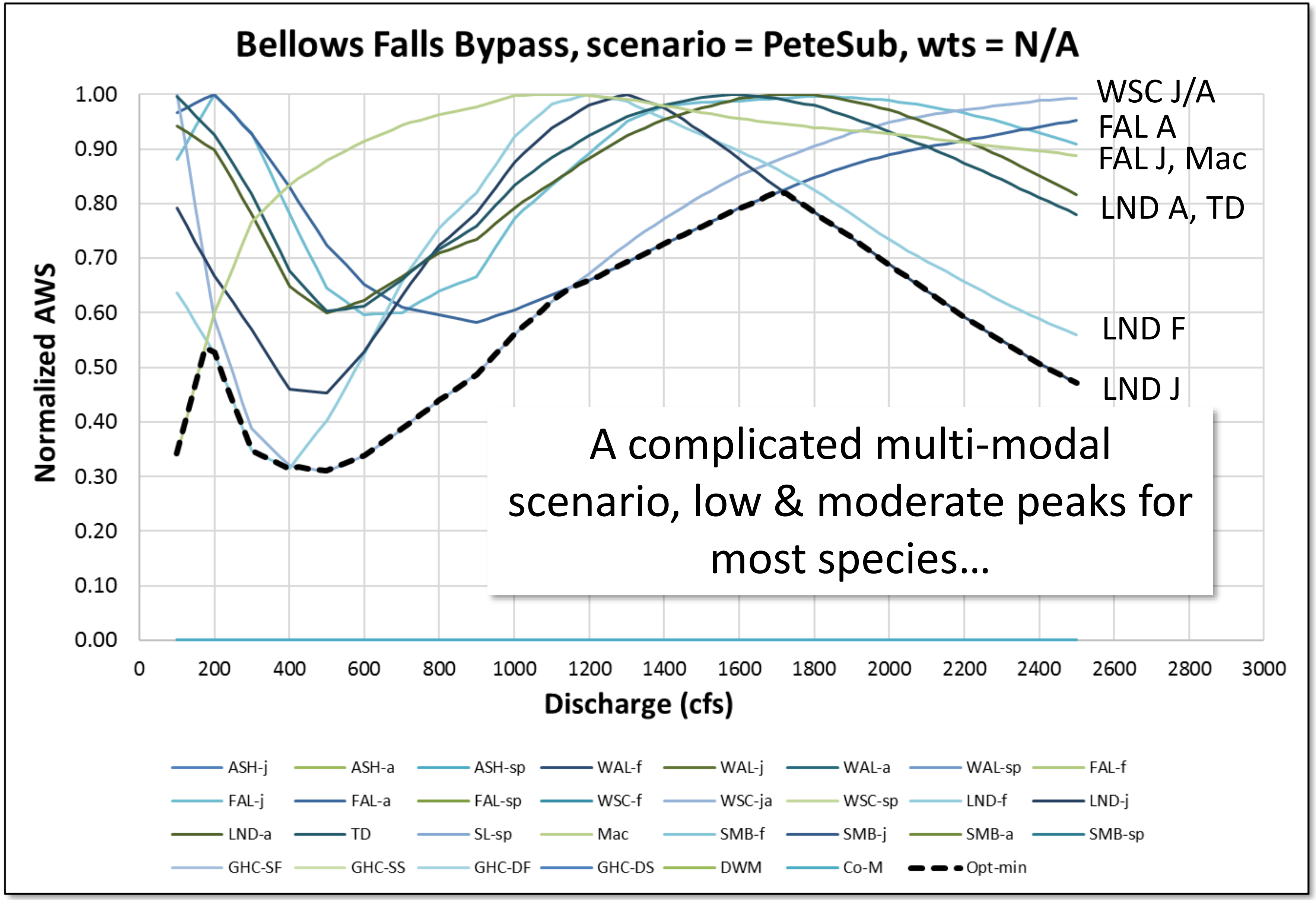
[1]Reproduction occurs summer/fall; glochidia release occurs in the following spring (March-June)

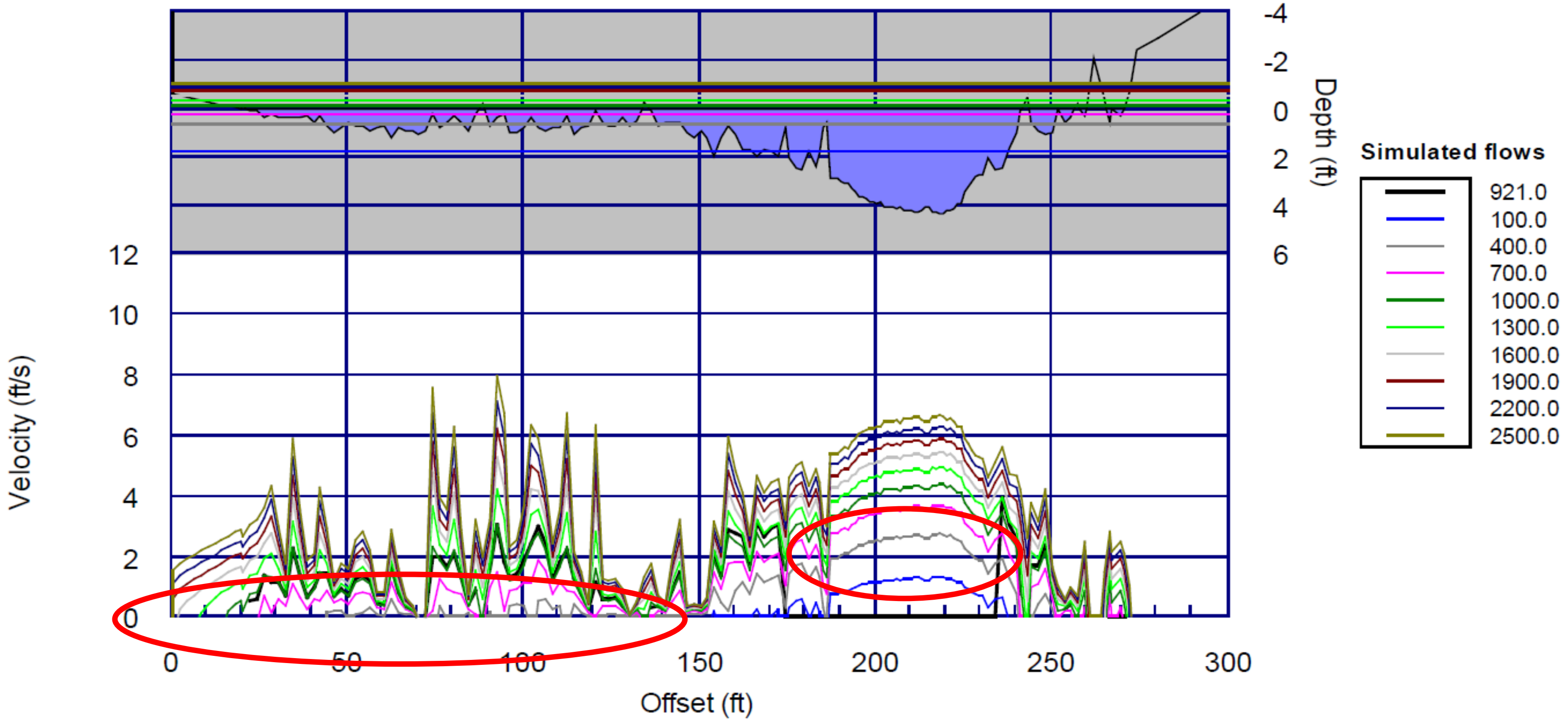
The Bellows Falls bypass reach

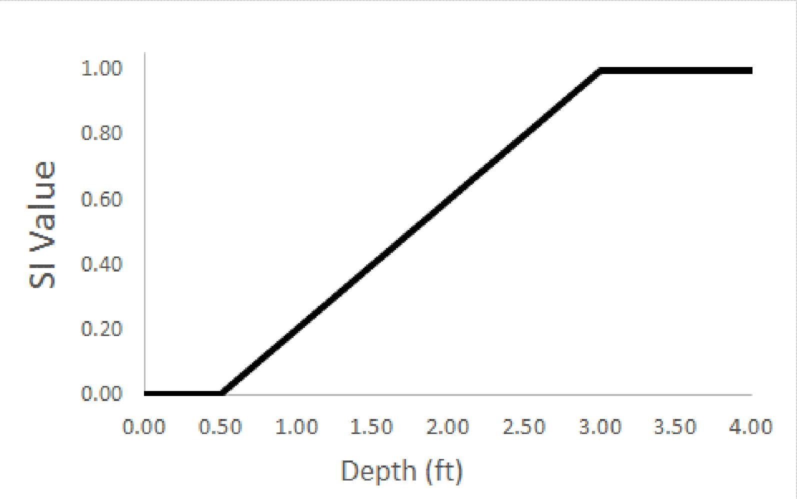
- What species & life stages to include?
- Focus on fast-water, riverine species, non-spawning stages; non-pool habs
- Draft list:
    - Fallfish J/A
    - Longnose Dace F/J/A
    - Tessellated Darter
    - White Sucker J/A
    - Macroinverts

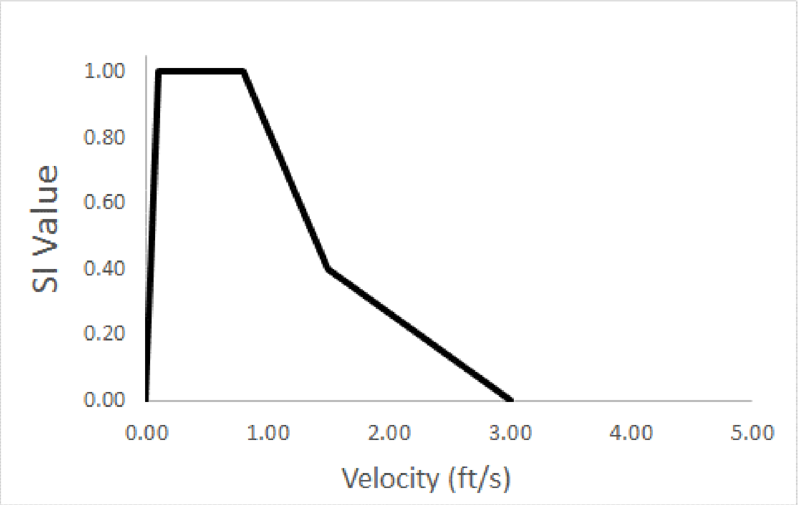


Habitat modeling results

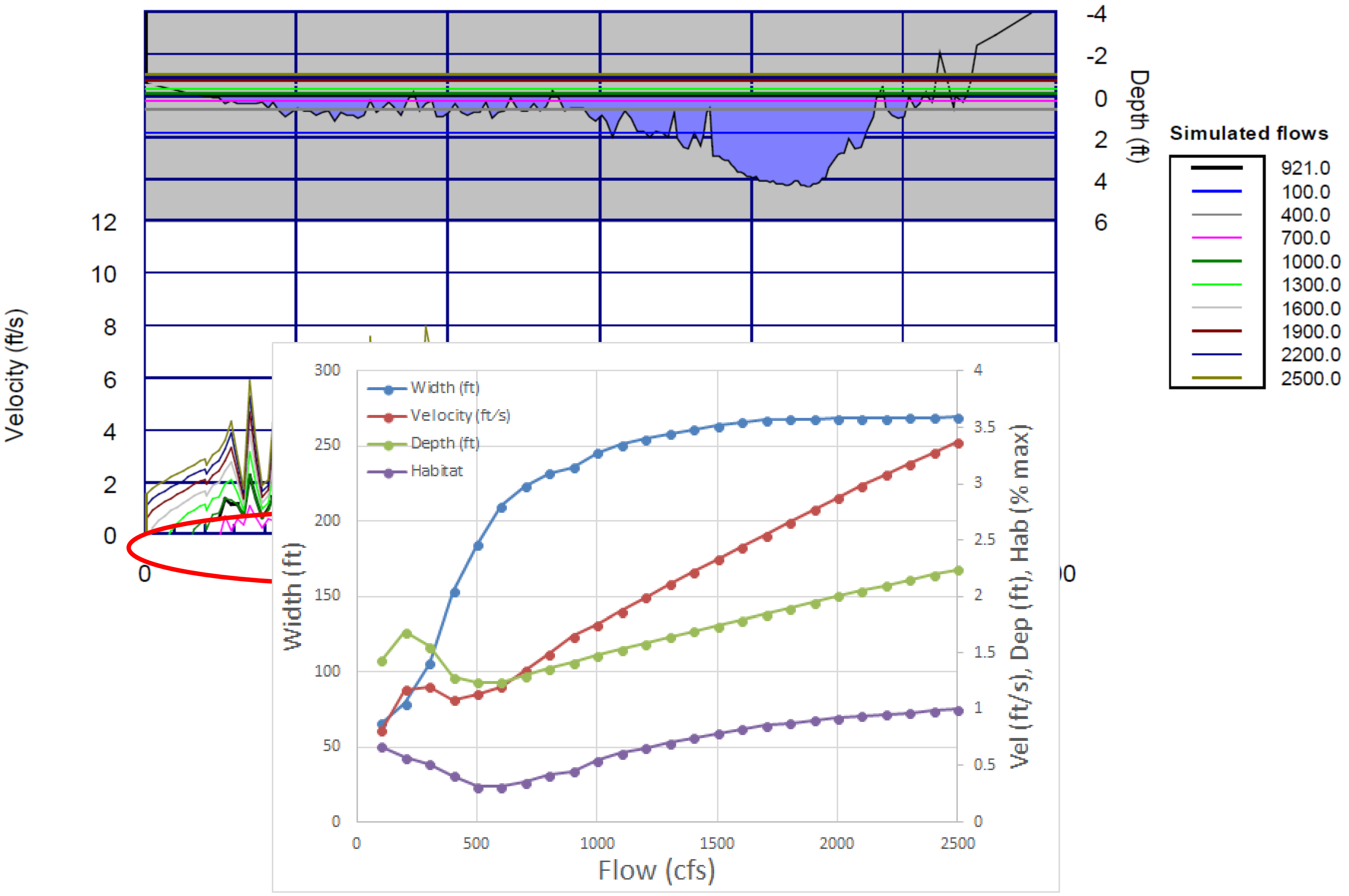



Velocity (ft/s)
Depth (ft)
Offset (ft)
Simulated flows
921.0
100.0
400.0
700.0
1000.0
1300.0
1600.0
1900.0
2200.0
2500.0

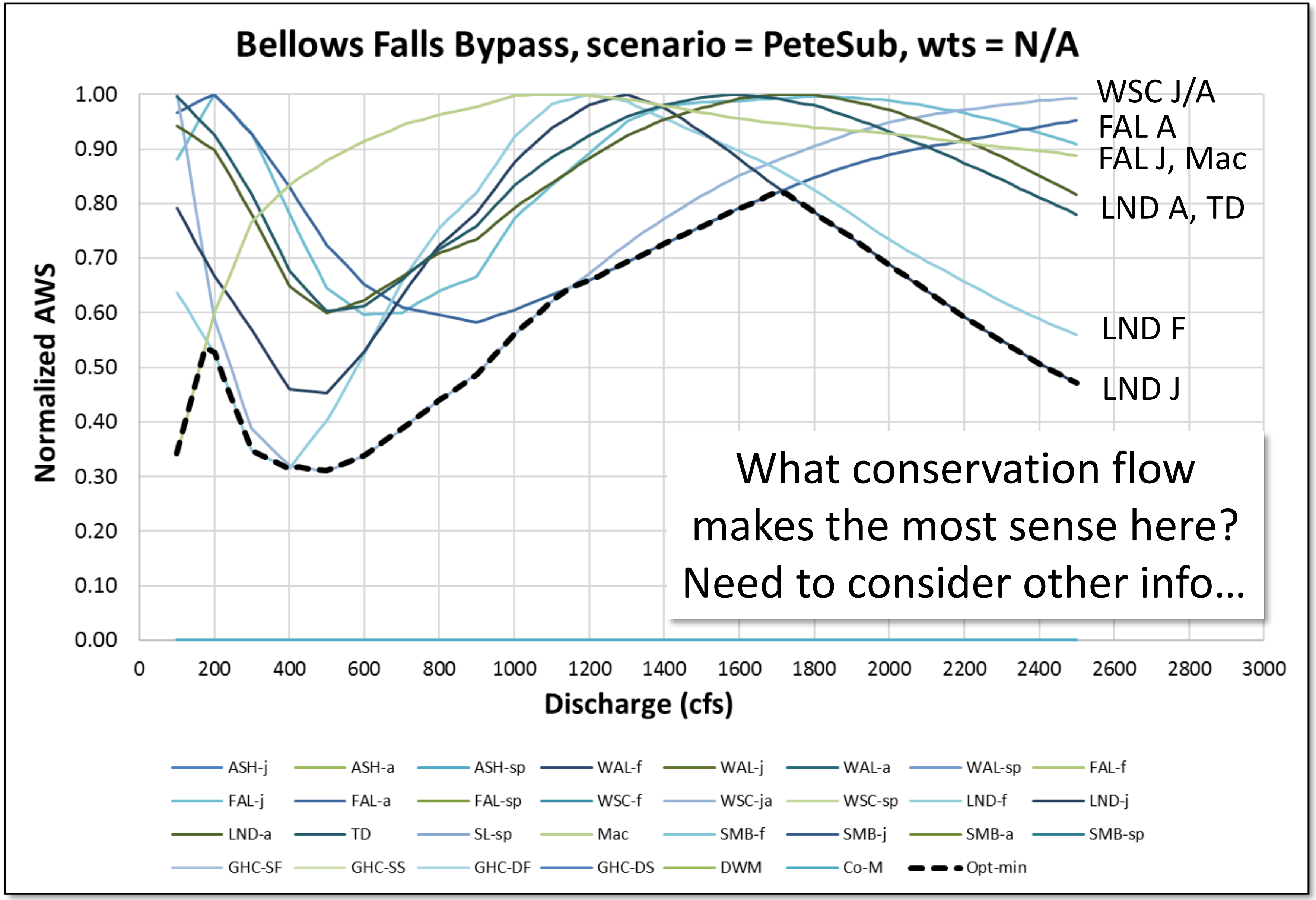

SI Value
Depth (ft)

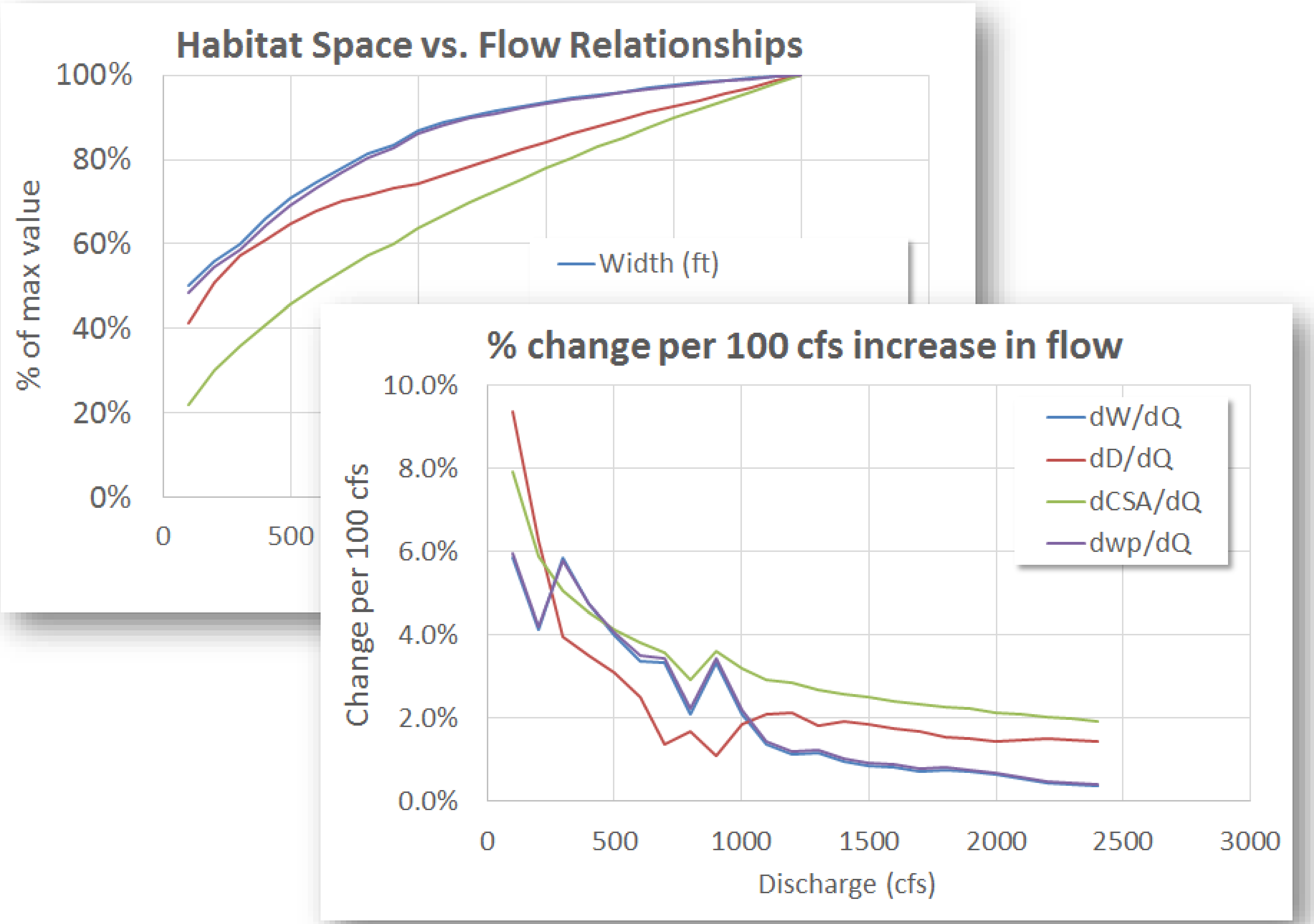

SI Value
Velocity (ft/s)

BFB4: Mid Velocities



Habitat modeling results





Habitat Space vs. Flow Relationships
100%
80%
60%
40%
20%
0%
% of max value
0
500
Width (ft)
% change per 100 cfs increase in flow
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
Change per 100 cfs
0
500
1000
1500
2000
2500
3000
Discharge (cfs)
dW/dQ
dD/dQ
dCSA/dQ
dwp/dQ

Overview of presentation

- Recap of tasks, work done to date, data sharing, etc.
- Context:
  - Hydrology and biology
  - Proposed operations
- Review of Study 9 (instream flow study) & key findings:
  - Evaluation of proposed operations (all projects, but Wilder as example)
    - Steady state (conservation flows)
    - Dual flow analysis (habitat in light of hydropeaking cycle)
  - Evaluation of Bellows Falls bypass reach (steady state)
- Concerns emerging from review of other studies
- Where to from here?

RT&E Species Studies

1. Study 28: Fowler's Toad rearing habitats vulnerable to washout (tadpoles, eggs) from project-related flow increases
2. Study 26: routine inundation of adult habitat and larval burrows, sometimes completely so; only Cobblestone found, no Puritans
3. Study 25: Impacts of rapid water level fluctuation to SGCN taxa (Riverine Clubtail) during eclosion window
4. Study 24: Dwarf wedgemussel and Co-occurring mussels…?

Effects of operations on spawning (Studies 14-16)

1. Early spawning fish species:
   - Yellow Perch egg masses highly susceptible
2. Late spawning fish species:
   - Dewatering & sedimentation at ~1/3 Smallmouth Bass nests (riverine sites)
   - Dewatering of ~1/3 Fallfish nests (riverine)
   - Shallow or dewatered LMB and sunfish nests
   - 26% of Sea Lamprey redds dewatered at least once; sedimentation evident (project effect?)
3. Info on esoscids, Walleye, suckers, other cyprinids insufficient to determine impacts

Non-biological Studies

1. Studies 2-3: Erosion study, many comments submitted and results are in dispute (?)
2. Study 30: Recreation study, 43% of interviewed users identified a desire for lower flow fluctuation
3. Study 31: Desirable flows for whitewater paddling at Sumner Falls (4.7 and 13 kcfs) and Bellows Falls Bypass (2.0-4.4 kcfs) identified
4. Study 32: Bellows Falls aesthetics study suggests flows 1,600-2,400 cfs most desirable

Overview of presentation

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Where to from here?

Considerations for identifying a protective operating regime:

- Hydraulic habitat conditions (Study 9)
- Hydrologic considerations:
  - Seasonality of operations
  - Frequency of generation cycles
  - Magnitude (min/max)
  - Rate of change on front/back of a generation cycle
  - Duration
  - Incoming flows
- Other studies and considerations
- Compatibility with desire for operational flexibility?
- Potential priority areas?