Blood, Sweat and Tiers:
Four years, Three Agencies, Two Funding Sources, and One Endangered Fish Change the World

Judy Gates, Director
MaineDOT Environmental Office
SCOE-SCOD 2017
The Winding Road

The Why
• Real tears
• Best laid plans

The Who, What, and Where
• Maine Atlantic Salmon Programmatic Consultation

The When
• Crafting predictability

The How
• By the numbers
WHY?

- “Capstone” performance measures: \( \geq 85\% \) on time & \( \geq 90\% \) on budget

- Approximately 50 stream projects per work plan year require consultation under ESA for Atlantic salmon

- Even with MaineDOT transportation liaison, only 7 consultations were completed by USFWS in 2015...averaging 185 days

- Directive to “push back” led to strained relationships inside and out
Inside...

This design will never work in the real world.

That design is already widely used in the real world.

I can come back later if you need time to concoct additional uninformed criticisms.

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Out...

WE COULD DO THE PROJECT RIGHT FOR $100,000 OR DO IT WRONG FOR $25,000.

I BELIEVE THAT THE WISE KING SALMON WOULD SAY TO SPLIT THE DIFFERENCE AND DO IT FOR $50,000.

FISH ARE STUPID.

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MaineDOT saw…

USFWS saw…
WHO?

- USFWS
- NMFS-NOAA
- Maine DMR
- USACE
Programmatic Biological Assessment for Transportation Projects for the Gulf of Maine Distinct Population Segment of Atlantic Salmon and Designated Critical Habitat

U.S. Fish and Wildlife Service Jurisdiction

June 2016
Submitted by:
Maine Department of Transportation
Federal Highway Administration
US Army Corps of Engineers

Approved January 2017
WHEN?

STUDIES SHOW IT TAKES TEN THOUSAND HOURS OF PRACTICE TO BE GREAT AT ANYTHING.

I WOULD THINK A WILLINGNESS TO PRACTICE THE SAME THING FOR TEN THOUSAND HOURS IS A MENTAL DISORDER.

THAT MAKES ME FEEL BETTER ABOUT MY MEDIOCRITY. YOU'RE WELCOME.
Stream Crossing Replacements
Bridge Removal
Culvert End Resets/Extensions
Bridge Scour Countermeasures
Bridge Maintenance: Grout Bag Installation and Concrete Repair
Temporary Work Access and Temporary Bridges
Invert Line and Slipline Culvert Rehabilitation
Pre-project Geotechnical Drilling
WHERE?
Tier 1 Habitat
Critical habitat or likelihood of presence

Tier 2 Habitat
DPS but presence unlikely

Tier 3
Not within DPS
**Tier 1**
1.2 x bank full width + habitat connectivity design + AMMs

NO invert or slip lining

**Tier 2**
1.0 x bank full width + mitigation + AMMs

**Tier 3**
BMPs
AMMs/BMPs

Hydro-acoustic monitoring

Habitat connectivity design
What **is** Habitat Connectivity Design?

- Natural stream dimensions
- Profiles
- Dynamics

- U.S. Forest Service guide (Forest Service Stream-Simulation Working Group 2008), augmented by…
- States of Washington (Barnard et al. 2013)
- Vermont (Bates and Kirn 2009)
- California (Love and Bates 2009)
WHO?

- IF sponsor can’t be a federal agency or applicant? Maine DMR!

- No head count? Transfer from MaineDOT! Appropriations Committee approval mid-stream!

- Not the right fit? Change job classification!

- Empty bank account? ....
We hear a Who!
A new question… how much?

<table>
<thead>
<tr>
<th>SHRU</th>
<th>Cost Per Habitat Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merrymeeting Bay</td>
<td>$4855.52</td>
</tr>
<tr>
<td>Penobscot</td>
<td>$3408.02</td>
</tr>
<tr>
<td>Down East</td>
<td>$6346.80</td>
</tr>
</tbody>
</table>

Legend:
- Gulf of Maine DPS
- SHRU Boundary
- NE States
- Canadian Provinces

Map prepared by:
NOAA, NMFS
Tara Trinko

Data Sources:
National Atlas of Canada
US Fish & Wildlife Service
05/04/10
The Math

Total lineal feet of crossing structures x cost per lineal foot to upgrade to 1.2 bfw number of blocked rearing habitat units

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### 2017-2018-2019 Work Plan

<table>
<thead>
<tr>
<th>SHRU</th>
<th>Estimated In Lieu Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merrymeeting</td>
<td>$111,677</td>
</tr>
<tr>
<td>Penobscot</td>
<td>$112,464</td>
</tr>
<tr>
<td>Merrymeeting</td>
<td>0</td>
</tr>
<tr>
<td>Merrymeeting</td>
<td>$3,046,839</td>
</tr>
<tr>
<td>Penobscot</td>
<td>$6,816</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$3,277,796</strong></td>
</tr>
</tbody>
</table>
Still on the table…

- Can in lieu fees be prorated?  
  \[(\text{SHRUs accessible post-project} – \text{SHRUs accessible pre-project}) \times Z \text{ habitat unit cost}\]

- Will projects be re-scoped rather than pay in lieu fees?

- Does Habitat Connectivity Design function as intended?

- Will ability to deliver offset increased costs?

….Stay tuned!!
Adaptive Asset Management meets Adaptive Resource Management

- Inter-agency De-brief
- Work plan candidates screened by resource agencies
- Mitigation costs incorporated into project estimate
- Design & construction requirements confirmed at project kick off
- Submit notification that project will be constructed according to MAP requirements
- Construction oversight and compliance verification
### Costs By the Numbers

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHRP2 lead adopter grant award</td>
<td>$250,000</td>
</tr>
<tr>
<td>Maine state highway funding</td>
<td>$120,000</td>
</tr>
<tr>
<td>Overall time investment</td>
<td>Four years</td>
</tr>
<tr>
<td>Direct time investment</td>
<td>1.68 years</td>
</tr>
<tr>
<td>Design changes</td>
<td>1.2bfw ~3X cost of in kind replacement</td>
</tr>
<tr>
<td>Adaptive management</td>
<td>$5-10,000 per project</td>
</tr>
<tr>
<td>Crossing design training</td>
<td>$30,000+</td>
</tr>
<tr>
<td>Mitigation</td>
<td>&gt;$700,000 per year</td>
</tr>
</tbody>
</table>
## Benefits By the Numbers

<table>
<thead>
<tr>
<th>Activity</th>
<th>Before MAP/ILF</th>
<th>After MAP/ILF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document length</td>
<td>50-100 pages</td>
<td>1 page</td>
</tr>
<tr>
<td>Biologist preparation</td>
<td>40 hours</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>USFWS Review</td>
<td>26 weeks average</td>
<td>1-2 weeks</td>
</tr>
<tr>
<td>Consultations completed ‘on time’</td>
<td>8%</td>
<td>100%</td>
</tr>
<tr>
<td>Design changes</td>
<td>Minimal</td>
<td>None</td>
</tr>
<tr>
<td>BMPs</td>
<td>Added cost/hours</td>
<td>Incorporated in estimate</td>
</tr>
<tr>
<td>Mitigation</td>
<td>Unpredictable</td>
<td>Incorporated in estimate</td>
</tr>
<tr>
<td>Habitat Units ‘benefited’</td>
<td>0</td>
<td>~685 per 3-yr work plan</td>
</tr>
<tr>
<td>Number of large culverts</td>
<td>X</td>
<td>2X</td>
</tr>
</tbody>
</table>
What moved the mountain?

- A shift at MaineDOT
- An engaged resource agency
- Several benevolent experts
- Quantified tradeoffs
- Endless patience
- Reasonably positive attitudes
- A committed advocate
2016 USFWS Recovery Champions
Region 5

Missing:
Kristen Chamberlain
David Gardner
Peter Lamothe
Paul Pfifer
Glenn Smith
Cheryl Martin...

Cindy Callahan, FHWA biologist
Patrick Dockens, USFWS liaison
Judy Gates, MaineDOT ENV Director
Cassie Chase, FHWA Env Engineer
David Bernhardt, MaineDOT Commissioner
Joyce Taylor, MaineDOT Chief Engineer
Anna Harris, USFWS Field Office Director
Christopher DeVore, USFWS liaison
Eric Ham, MaineDOT biologist

Integrity - Competence - Service
Thank you!

Signed
Maine’s Salmon & Traveling Public