Fish Passage at Hydropower Dams on the Penobscot & Kennebec Rivers

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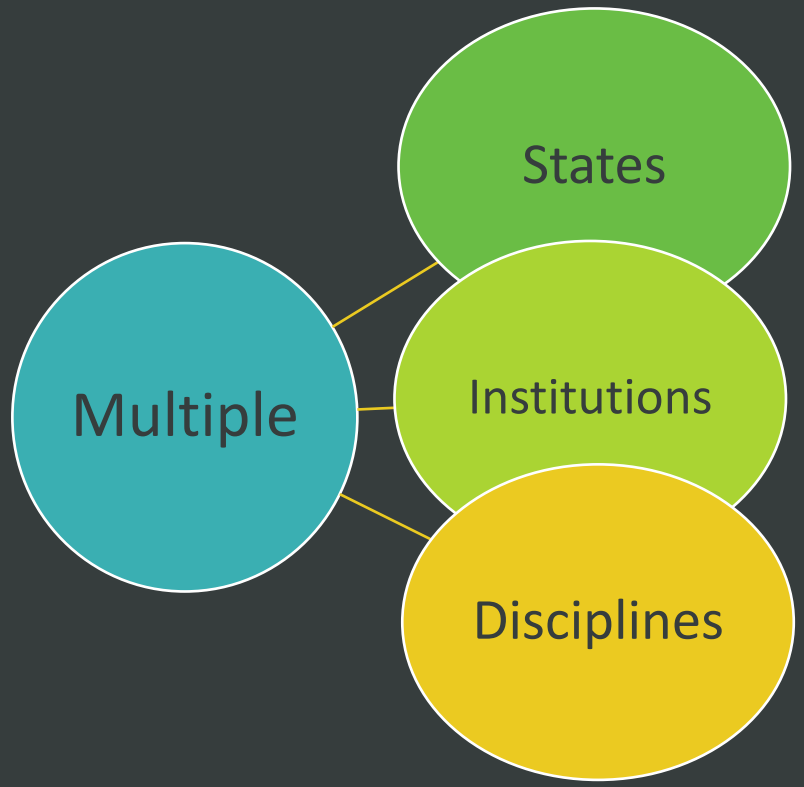
Future of Dams Project



THE UNIVERSITY OF MAINE 1865

USGS science for a changing world

NSF

MAINE EPSCoR

NEST New England SusTainability Consortium

EPSCoR NEW HAMPSHIRE

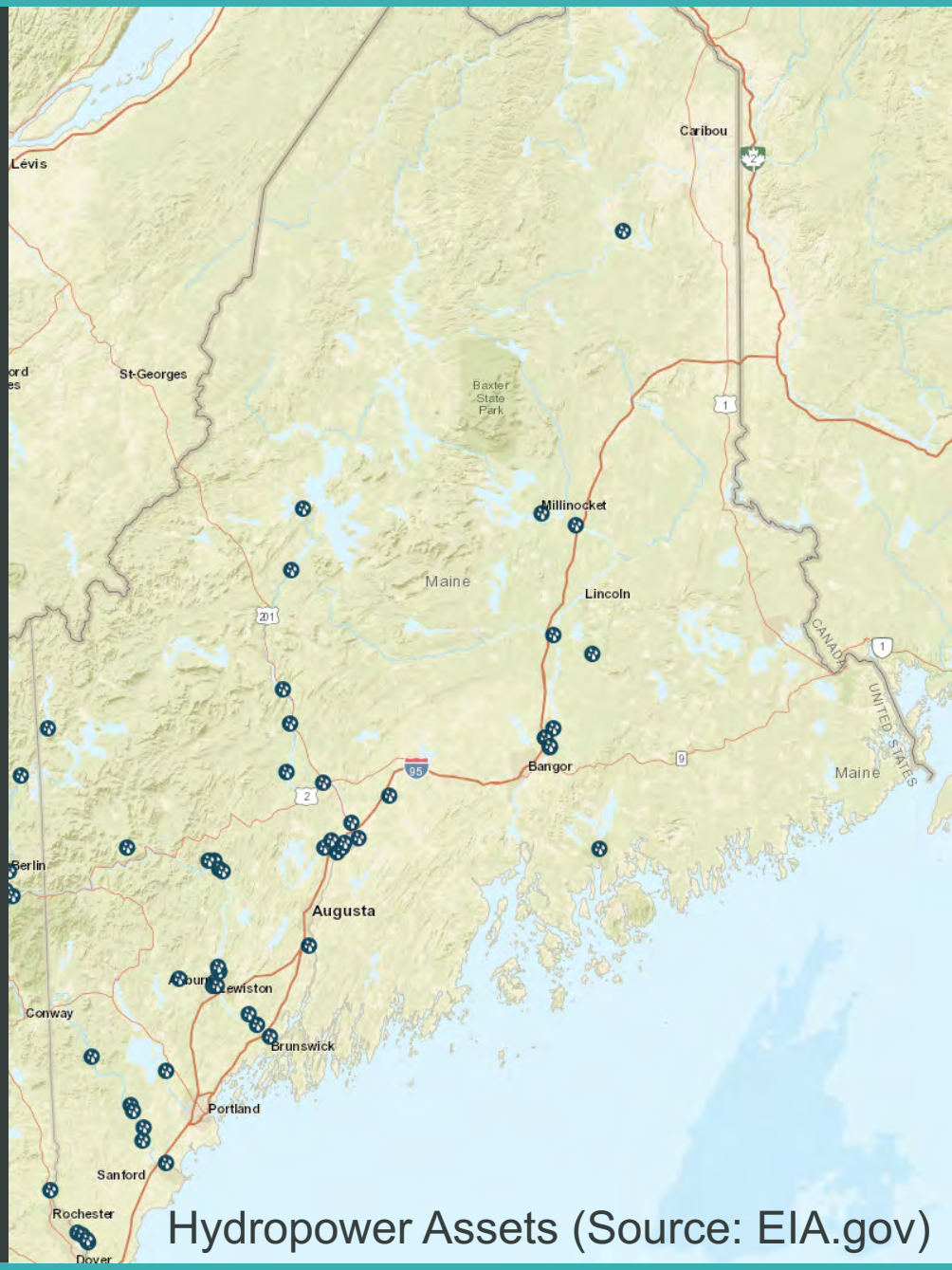
TALK OVERVIEW

- 1 Hydropower & Fish Passage
- 2 Hydropower Regulation
- 3 Study Focus & Approach
- 4 Content Analysis
- 5 Emergent Themes

Hydropower & Fish Passage

Maine Importance

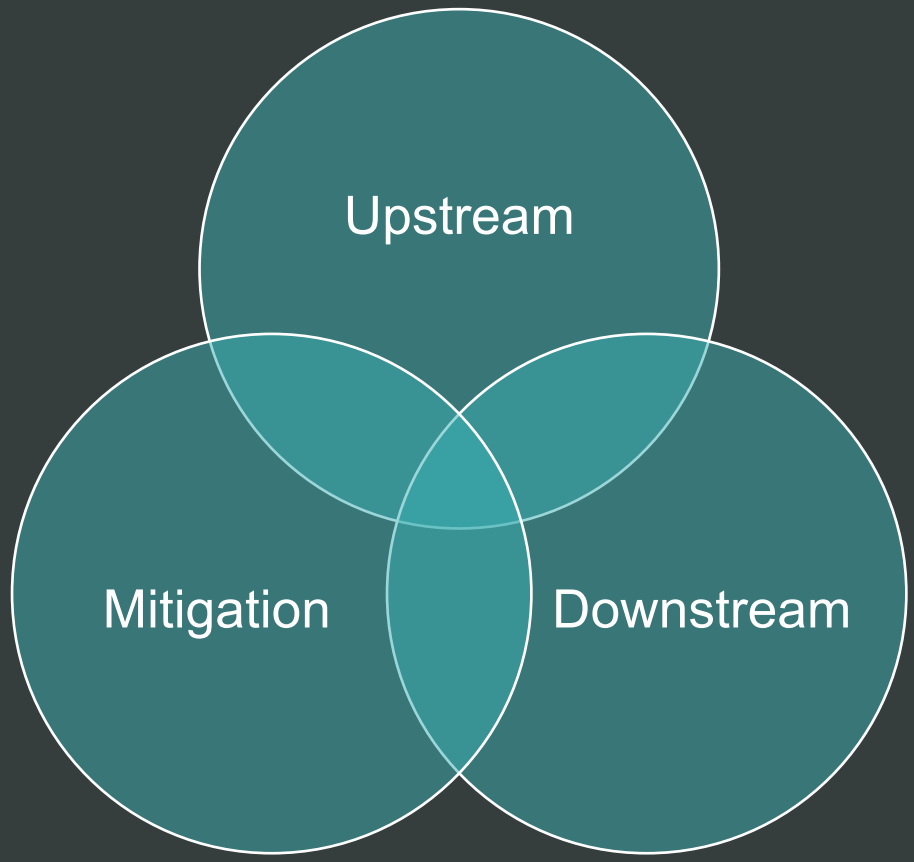
- Primary use of dams in Maine is hydropower
  - 25% electricity generation
- Major cause for declines of anadromous fish



Hydropower Assets (Source: EIA.gov)

Types of Passage

- Not all created equal
- Species specific
- Life stage specific
- No perfect option
- Most common: fishways



- “… items which may constitute a “fishway” under section 18 for the **safe** and **timely** upstream and downstream passage of fish shall be limited to physical structures, facilities, and devices necessary to maintain all life stages of such fish, and project operations and measures related to such structures, facilities, or devices which are necessary to ensure the **effective**ness of such structures, facilities, or devises for such fish.”

  - —16 U.S.C. 811 Clarification of Authority Regarding Fishways

General Passage Standards

- **Safe**

Movement through project that does not result in any unacceptable stress, delayed injury, or death of the fish

- **Timely**

Minimal delay of migration movements past the barrier to the extent needed to achieve restoration goals

- **Effective**

When most (if not all) fish pass to up/down-stream habitats without impact on their natural biological functions

Elements of a Fishway

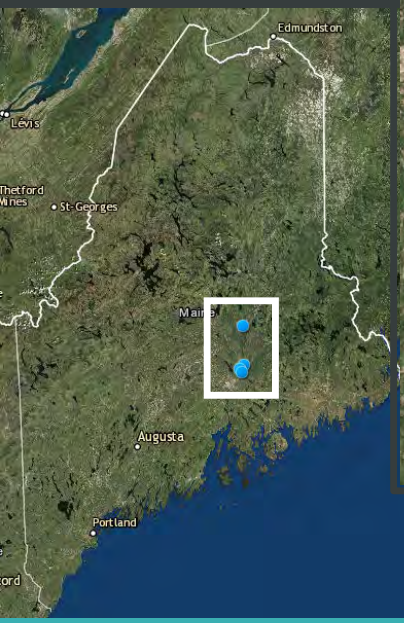
- Structures
- Facilities
- Devices
- Project operations
- Measures

ADDRESS

- Fish behavior
- Physiology
- Bio-mechanics
- Hydrology
- Engineering

“Installing a fish passage structure does not constitute providing satisfactory fish passage unless all of the above components are adequately factored into the design” –NOAA

Site & Species Specific Standards



- Downstream At. salmon smolts:
  - 96% survival (75% confidence)
  - Passage within 24 hours
- Upstream At. salmon adults:
  - 95% success
  - Passage within 48 hours
  - No passage Stillwater/Orono

Hydropower Regulation

FERC Hydropower Licensing

- Federal Energy Regulatory Commission (FERC)
- Responsible for regulating non-federal hydropower dams in US
- Issue 30-50 year licenses (40-year default) for projects
- Licenses outline project operations, including fish passage
- Process of relicensing = best chance to influence fish passage

Relicensing Timeline

Consults	NOI	Scoping	Study Plans	Study Reports	Draft License	License	Decision
-5+ Years	-5 Years	-5 Years			-2.5 Years	-2 Years	0 Years
Pre-filing consult with stakeholders	Notice of intent to file license documents submitted	FERC scoping meeting	Study plans submitted	Reasonable studies carried out & reported	Prelim license proposal submitted	License application submitted	FERC decision & appeal process if needed

← Stakeholder engagement invited through COMMENTS, PROTESTS, & MOTIONS TO INTERVENE →

Key Stakeholders

NOAA Fisheries

U.S. Fish & Wildlife Service

Maine Dept. Environmental Protection

Maine Dept. of Marine Resources

Maine Dept. of Inland Fisheries & Wildlife

Penobscot Indian Nation

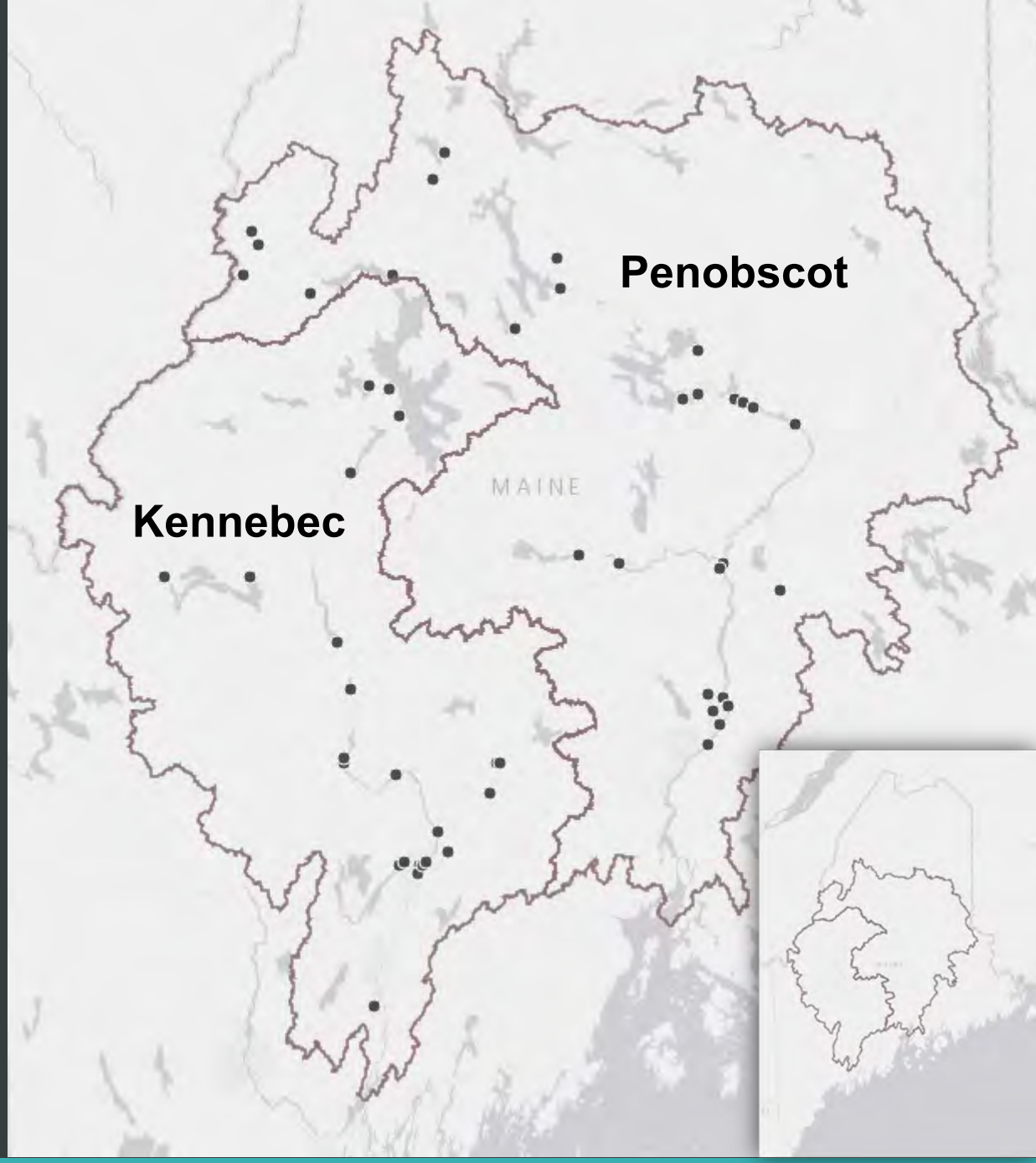
Legal Framework

- Federal Power Act
- Clean Water Act
- Endangered Species Act
- Magnuson-Stevens Fishery Conservation and Mgmt Act
- National Environmental Policy Act
- Fish and Wildlife Coordination Act

Study Focus & Approach

Kennebec & Penobscot River Watersheds

- 9 removed dams
- 10 exempt projects
- 28 active projects
  - 10 up for relicensing within next decade



Objectives

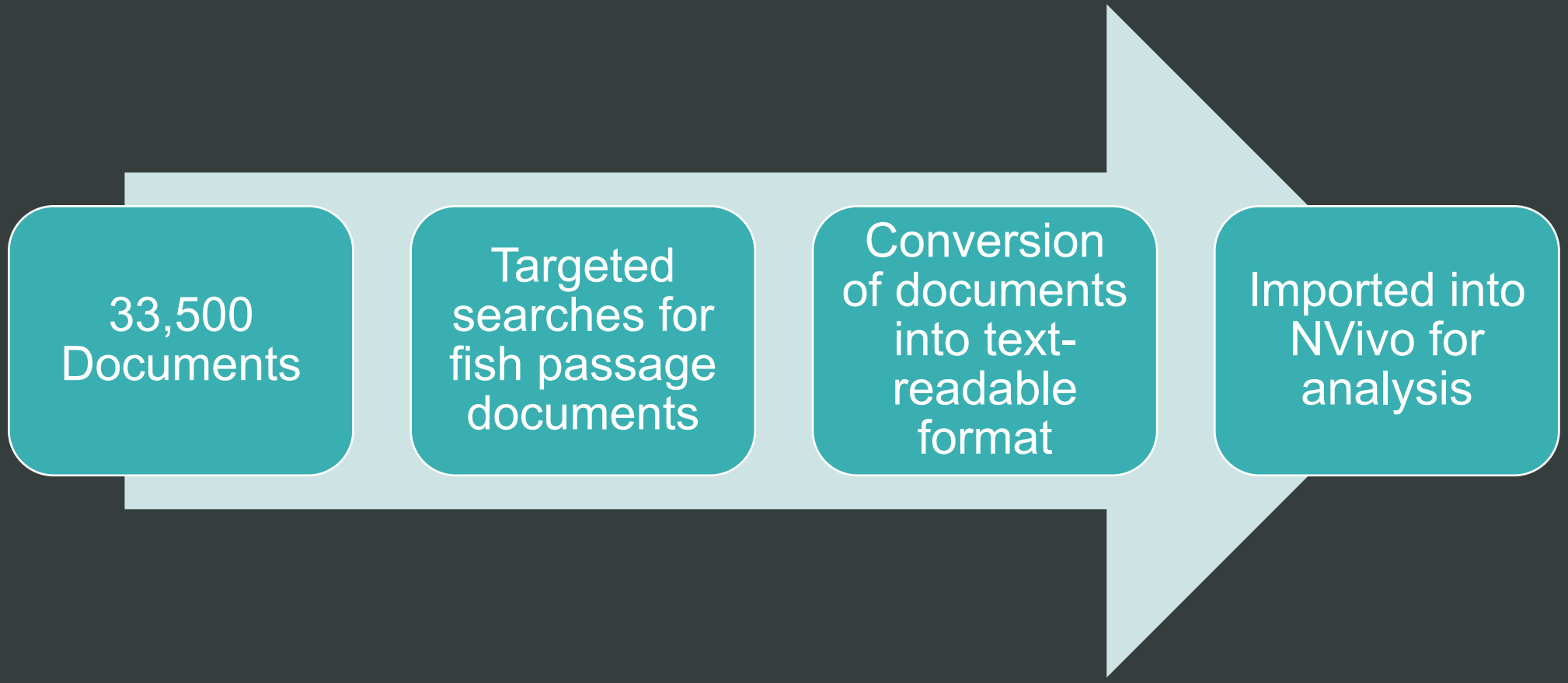
- Characterize the presence, authority, interactions, and decision processes of agencies/entities across sites
- Examine agency/entity perspectives of the relicensing process
- Identify significant factors which influence fish passage decisions

Approach

- Participant Observations
- Semi-structured Interviews
- Content Analysis
  - Source of Information: FERC eLibrary
    - Kennebec & Penobscot Hydro Projects = 33,500 Documents

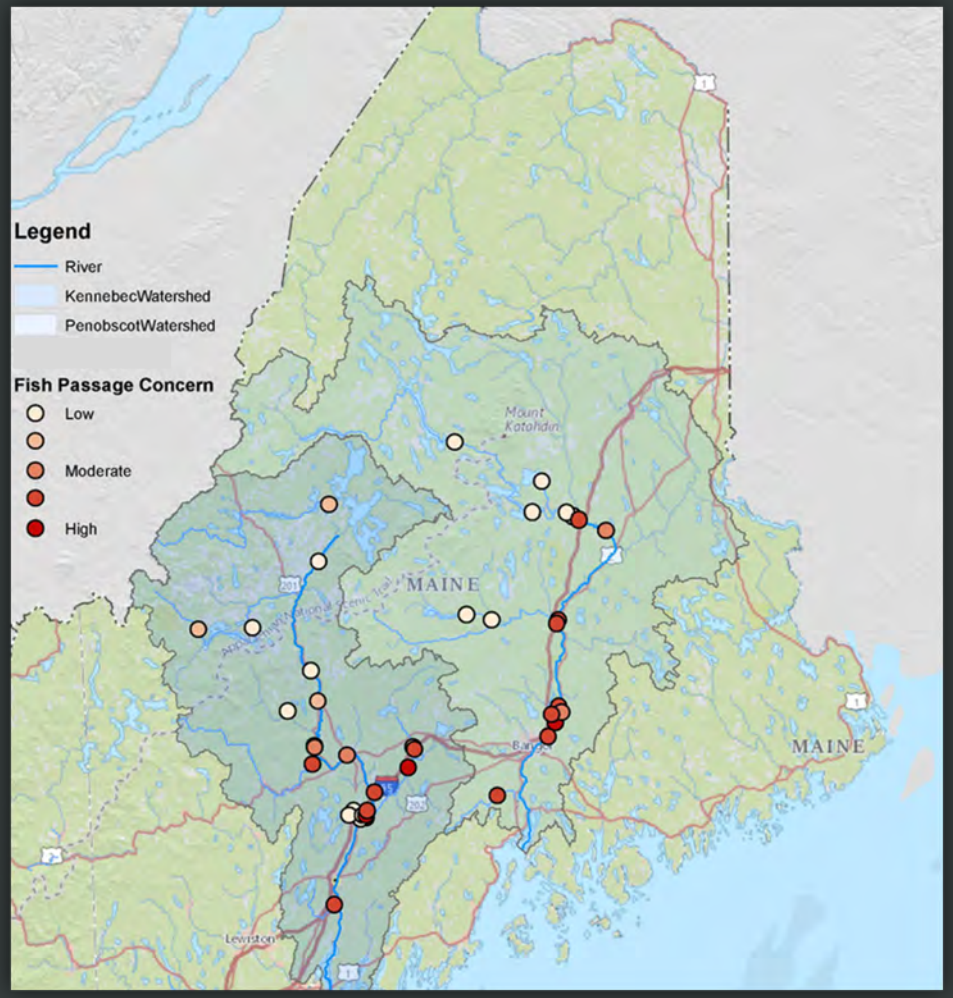
Content Analysis

Database Creation



Fish Passage Documents

- 8% of all documents addressed fish passage
- Ranged from 0-30% by project
- Highest proportion
  - Mainstem
  - Anadromous fish
  - NGO presence



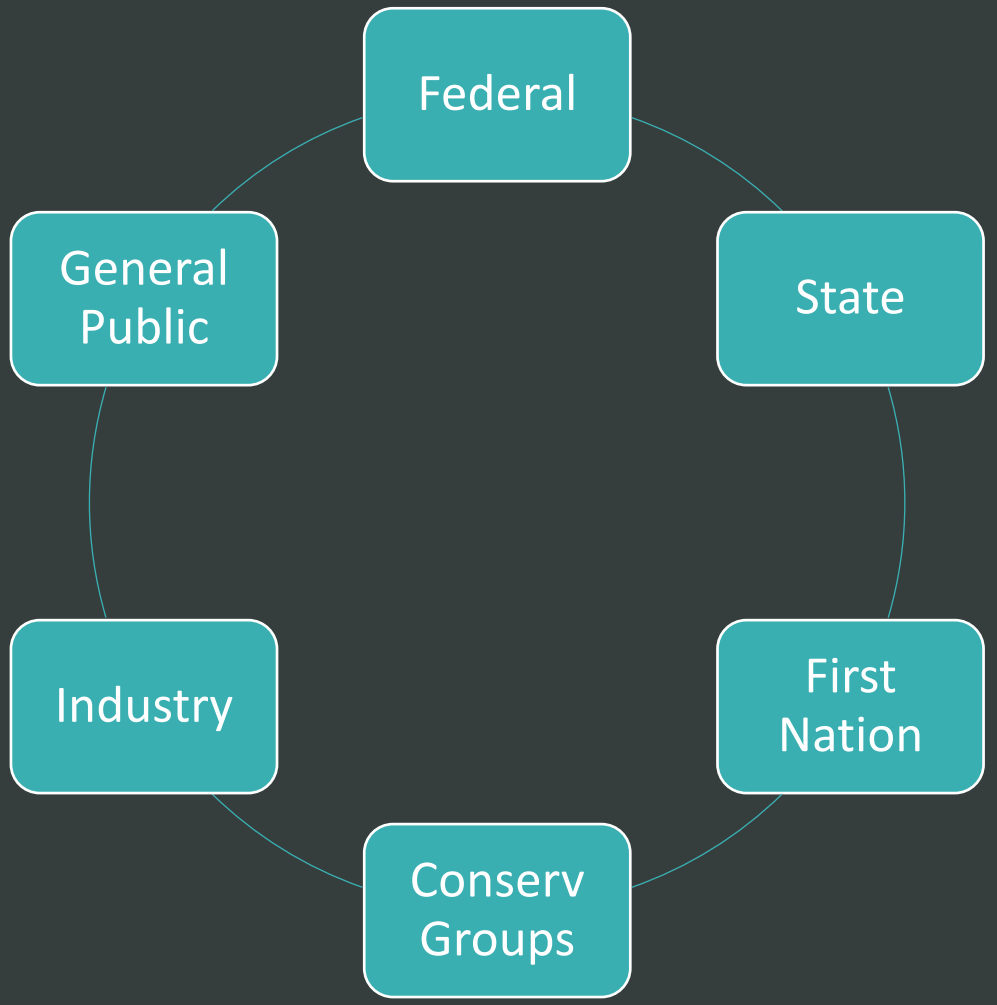
Official Comments

- Avenue for representation in the relicensing process
- Used by FERC and could conceivably effect license outcomes
- Ranged from 0-400 by project
- Majority of comments from the general public

Emerging Themes

Science in Decision-making

- Different types of knowledge
  - Peer reviewed research
  - Consultant research
  - Stakeholder observations
  - Traditional ecological knowledge
- Types of knowledge are valued differently by stakeholder groups



Ownership Patterns

- Affects relicensing efforts
  - Type of licensing process chosen
  - Relationships with stakeholders
  - Ability to reach settlements
- Changes to status quo
- Majority owned by one parent company

Brookfield
Renewable Energy Partners

Kruger
Energy

EAGLE CREEK
– RENEWABLE ENERGY –

Delayed Action

- Stakeholders entering late in the process
- Resource issues
- Too little, too late mentality
- Trouble gaining and maintaining interest

Project Classification

- Removed
  - Receive the most media attention
  - Comments high, especially from general public
- Exempt Projects
  - Few overall comments & fish passage concerns
- Active

Basin-scale Planning

- FERC basin planning status reports 1960s-80s
- Resurgent effort to coordinate existing projects
- Penobscot River Restoration, Maine
  - Collaboration necessary
  - Goal: restore 11 species of sea-run fish while maintaining energy production

Settlement Agreements

- Favored by FERC
  - Likely to accept settlement recommendations
- Alternative to litigation
- Examples:
  - Lower Penobscot River Multiparty Settlement Agreement
  - Lower Kennebec River Comprehensive Hydropower Settlement Accord

Use of Authority

IN FAVOR

- Use tools that are available
- Defer to authority
- Could lead to stronger passage prescriptions

AGAINST

- Negative image
- Limited resources (financial and human)
- Could lead to unknown challenges and legal battles

Going Forward

Thank You!

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