

# IEc

## Standard Oil Spill NRDA Methodology & Review of Historical Spill Data

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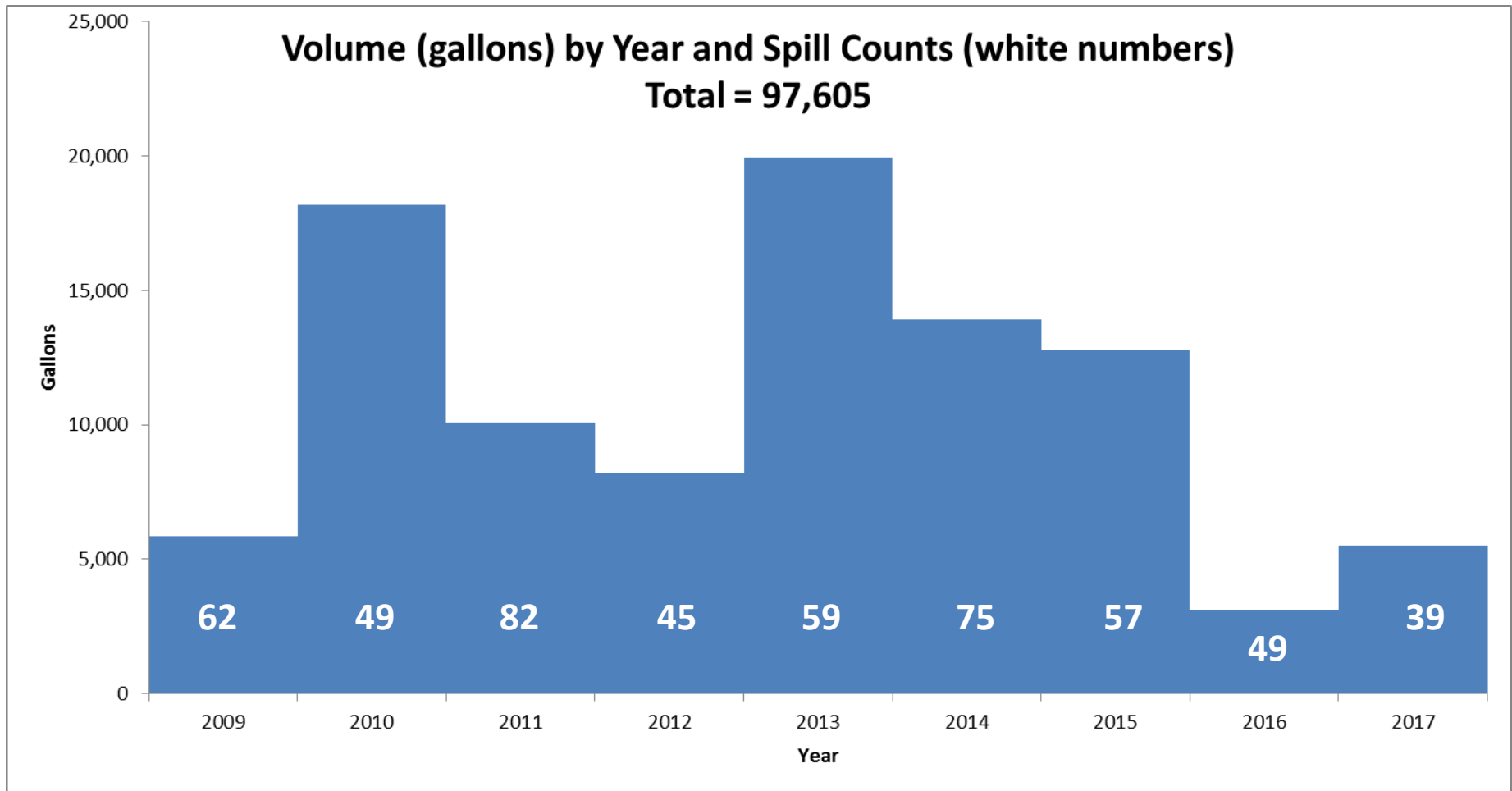
# Outline

- Present an overview of the Massachusetts Standard Oil Spill NRDA Approach.
- Present model results when applied to historical small to medium volume oil spill data from 2009-2017.
  - Small to medium volume spills: >10 gallons and <10,000 gallons.
  - Limited to closed spills (RAO or PSNC).
- Summarize historical (2009-2017) small to medium volume oil spill data.

# Goals

- Develop a standard approach for assessing damages from small to medium volume oil spills in Massachusetts (>10 to <10,000 gallons).
  - Increase efficiency and cost effectiveness of assessments.
  - Expedite restoration implementation.
  - Ensure citizens are compensated for damages.

# Background



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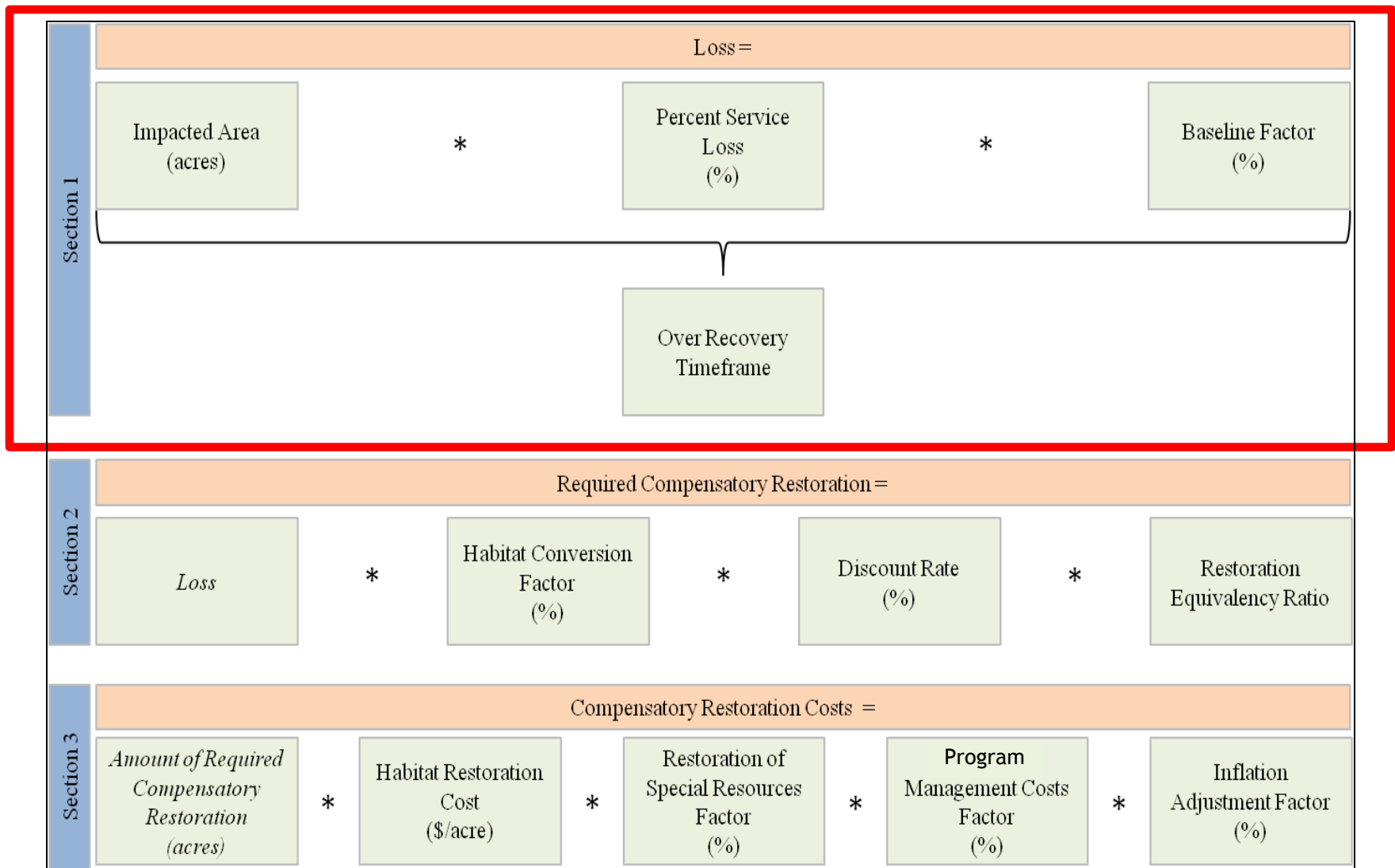
- 517 spills resulting ~97k gallons released from 2009 -2017
- Many do not impact natural resources.
- Many are small (<10 gallons).
- Many impact a limited spatial area (<0.1 acres).
- However, several spills result in quantifiable impacts to natural resources.
- The data, tools, and methods for developing a standard spill assessment approach exist.\*

\*Information and estimates presented herein are for the purposes of developing this standardized approach only.

# Conceptual Model

Compensatory Restoration Costs (\$)
=
Loss (discounted service acre-years - DSAYs)
*
Required Compensatory Restoration Factors (%)
*
Restoration Costs (\$/acre)

# Conceptual Model

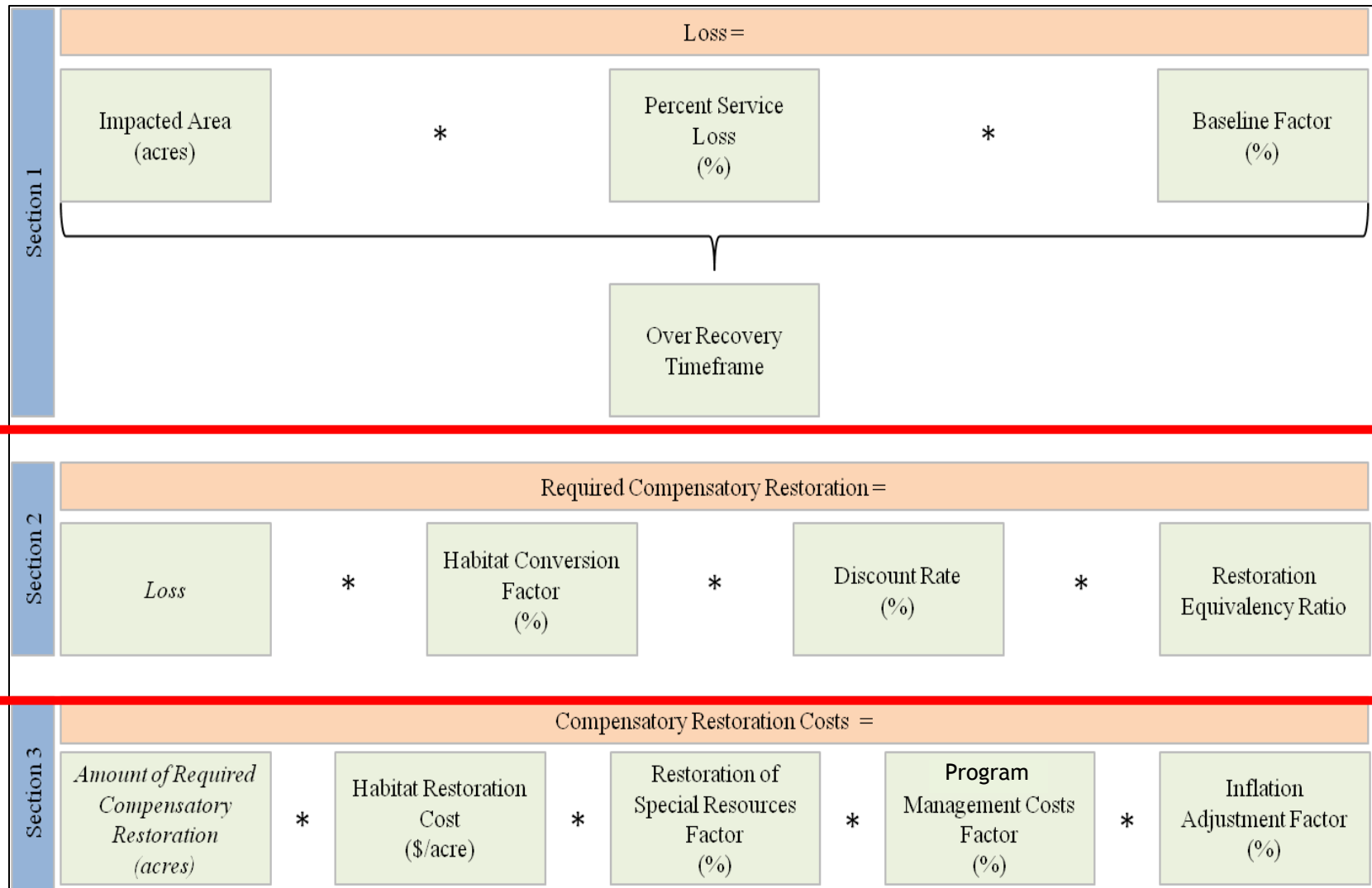


# Loss

- Impacted Area -
  - Areal extent (acres); Reported via MA BWSC Forms.
- % Loss -
  - Acute toxicity, mechanical injury, and persistence.
  - Estimates range from 25% (jet fuel) to 100% (heavy oils).
  - French-McCay et al., 2009.
- Baseline -
  - Condition that would have existed if the incident had not occurred.
  - Located in an urbanized setting.
  - Evidence of erosion or channelization.
  - Presence of invasive species.
- Impacts were assumed to last one year but can vary.



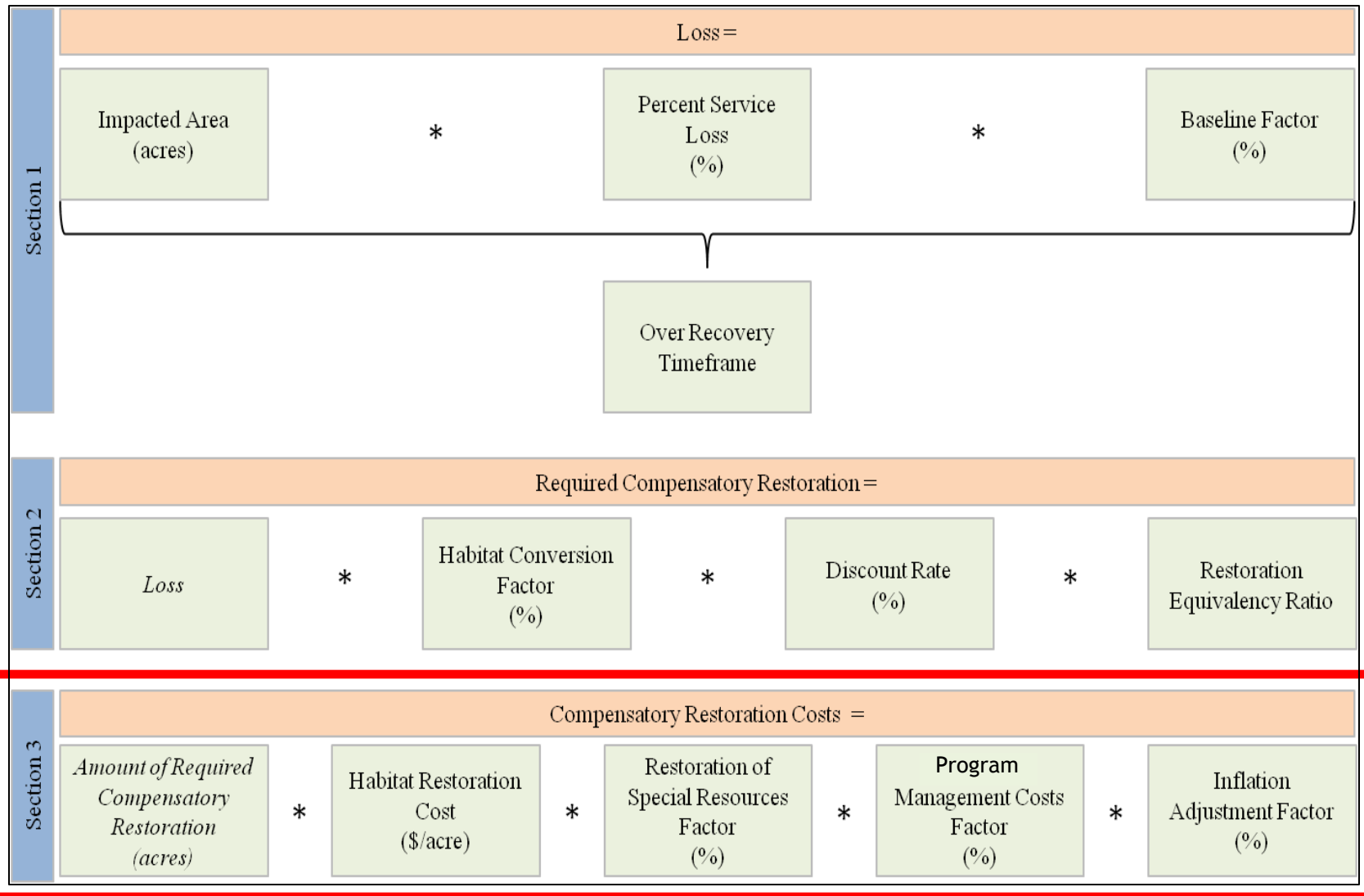
# Conceptual Model



# Required Restoration

- **Habitat Conversion Factor** -
  - Differences in habitats and the services they provide.
  - Primary productivity (Peterson et al., 2007).
  - E.g., Open fresh water habitat to wetlands habitat - 3:1 ratio.
- **Discount rate** - 3%
- **Restoration Equivalency Ratio** -
  - Amount of restored habitat that is functionally equivalent to natural habitat.
  - Estimates developed by MA Division of Marine Fisheries and MA Department of Environmental Protection.
  - 3:1 for wetlands and 4:1 for eelgrass.

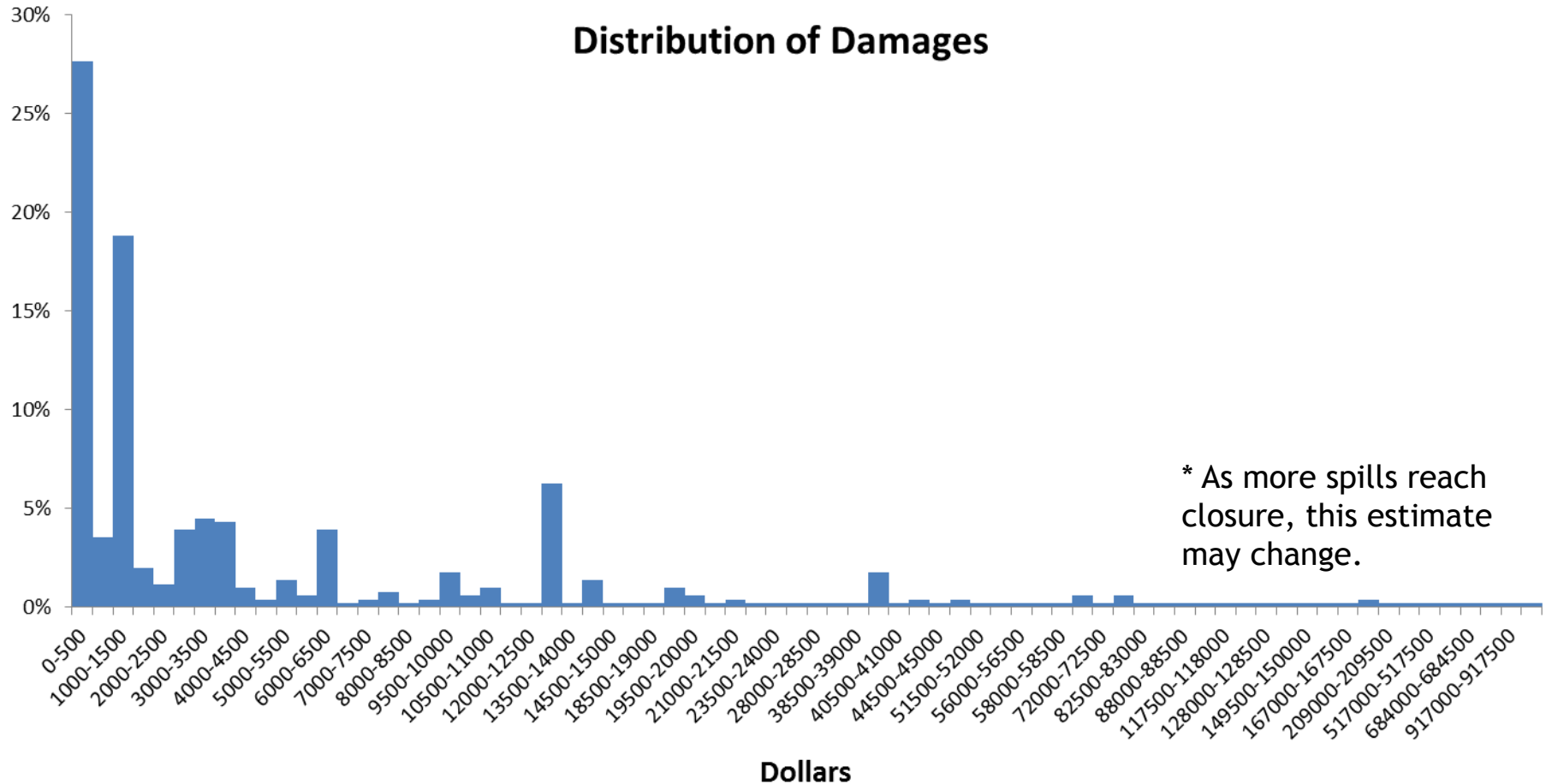
# Conceptual Model



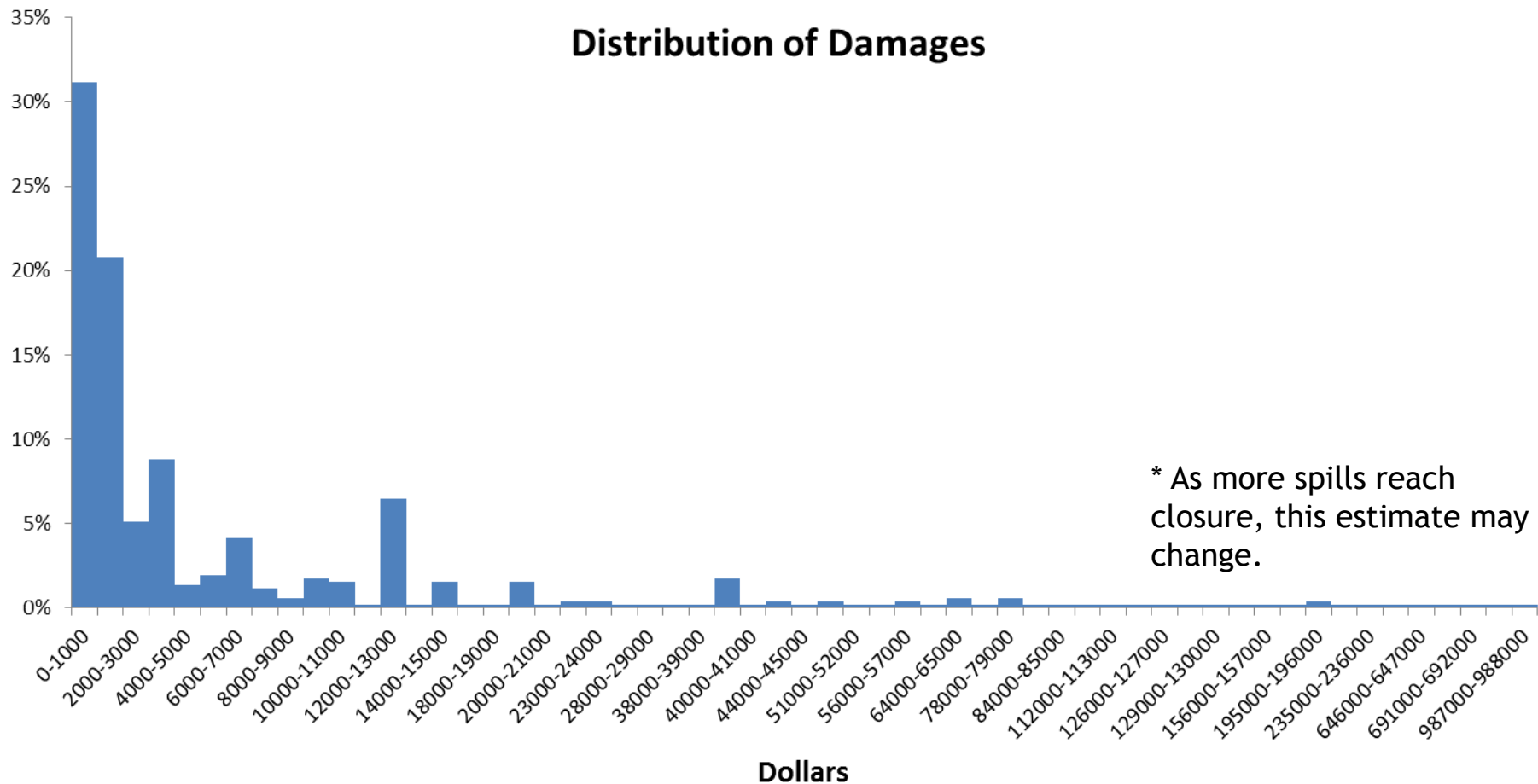
# Costs

- Habitat Restoration Costs -
  - \$603K per acre of wetlands restoration (Massachusetts In-Lieu Fee Program Fees, 2014).
- Special Natural Resources Factor -
  - Resources that require additional effort to manage and restore.
  - E.g., Outstanding Resource Waters, as designated by the Commonwealth.
  - 10% of overall project costs.
- Program Management / Administration -
  - 10% of construction costs.
- Inflation Adjustment Factor (Consumer Price Index)-
  - Converts the restoration cost estimate from 2018 dollars.

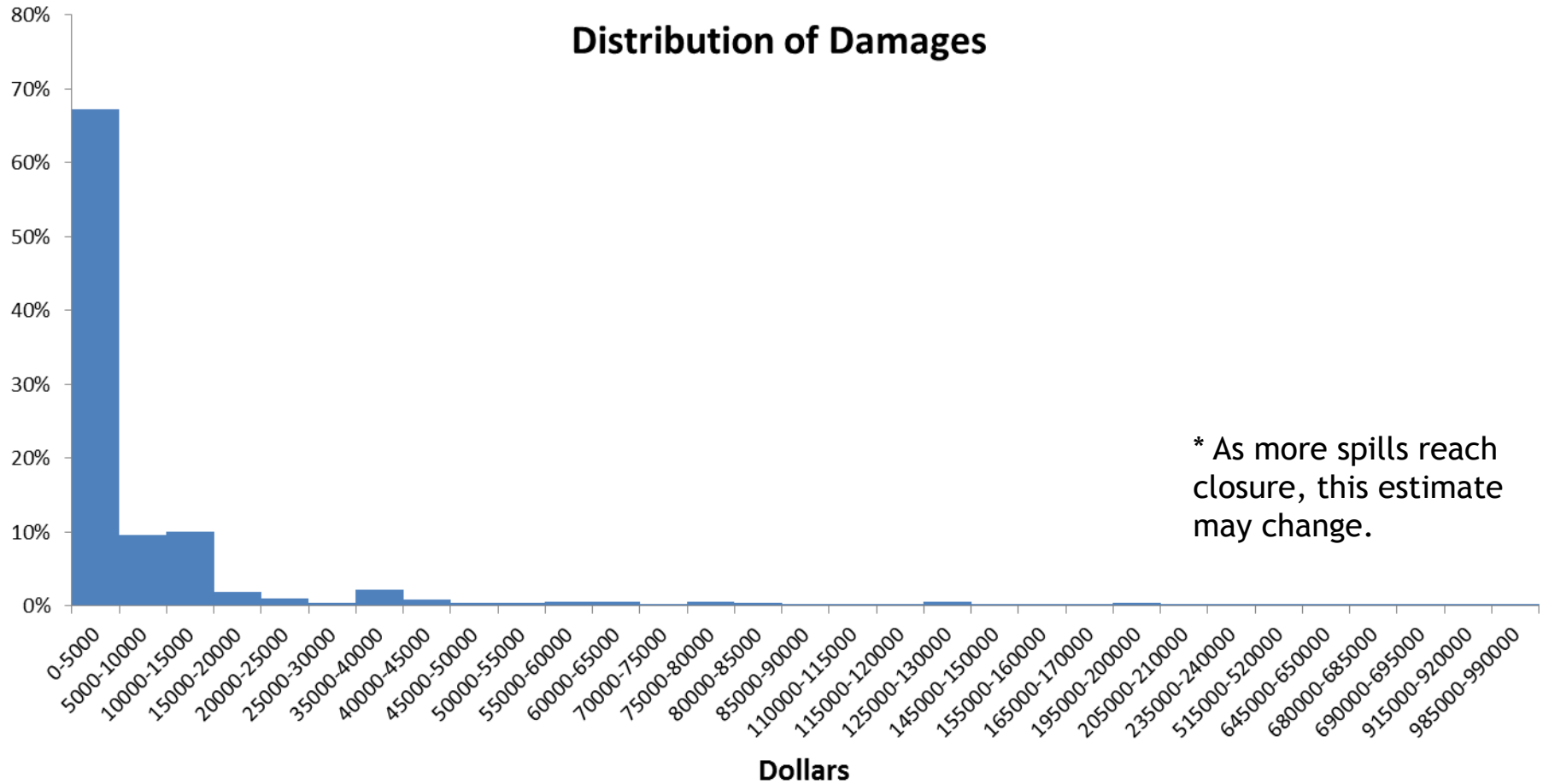
~28% of spills resulted in <\$500 in damages\*



~31% of spills resulted in <\$1,000 in damages\*



# ~67% of spills resulted in <\$5,000 in damages\*



\* As more spills reach closure, this estimate may change.

# Conclusion

- <500 spills resulting in >97k gallons being released.
- For each individual spill, multiple factors determine the amount (acres) of required restoration. Primarily:
  - Fuel type
  - Location/Habitat Type
  - Baseline
- Spills of <10k gallons typically impact from <0.01 to 70 acres
- Required restoration for these spills ranges from 0 to 2.7 acres (i.e., not a one-to-one ratio)



# Questions?





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