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Standard Oil Spill NRDA Methodology & Review of Historical Spill Data

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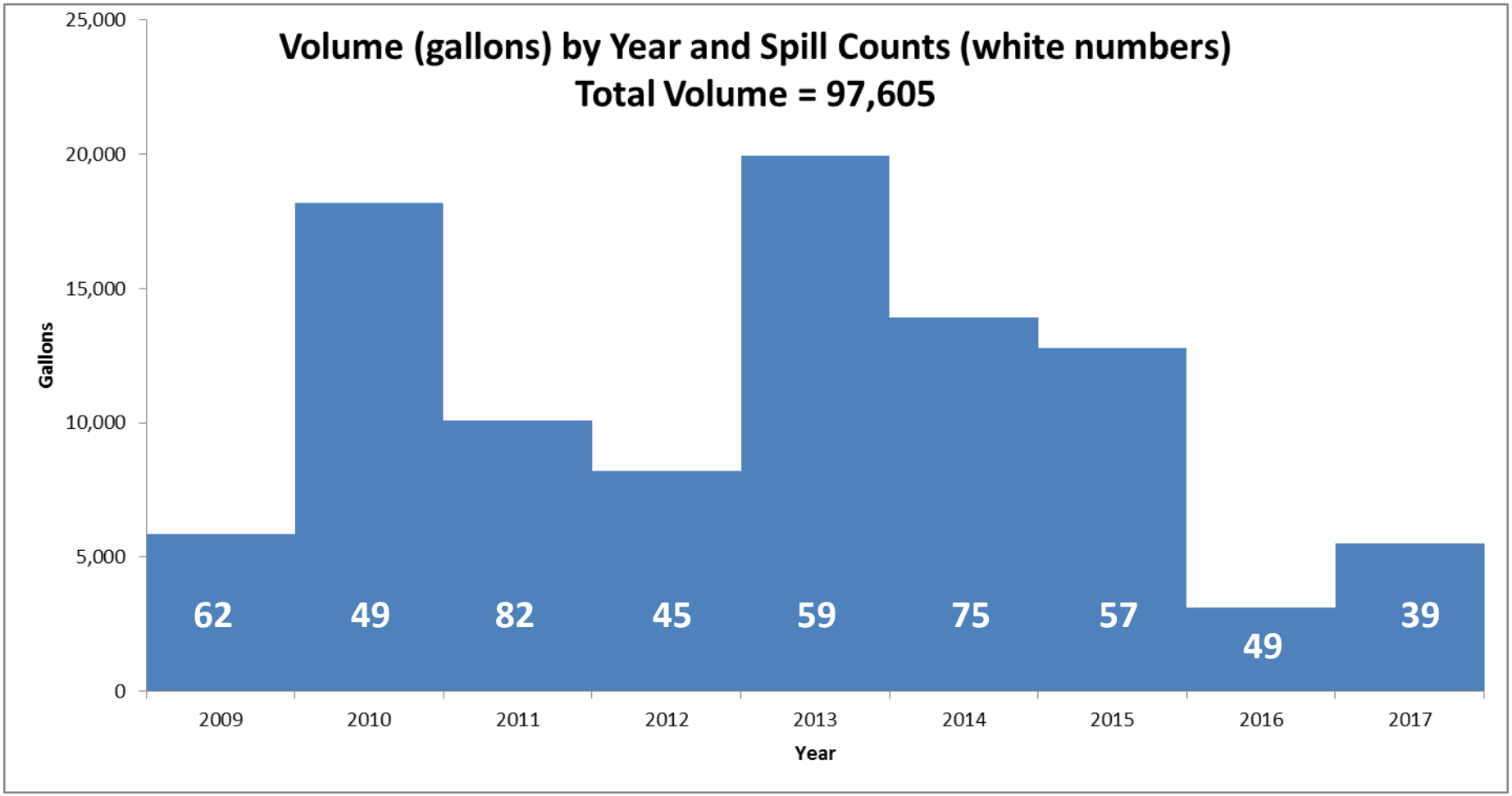
Outline

- 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 temporary and permanent solutions.
- 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

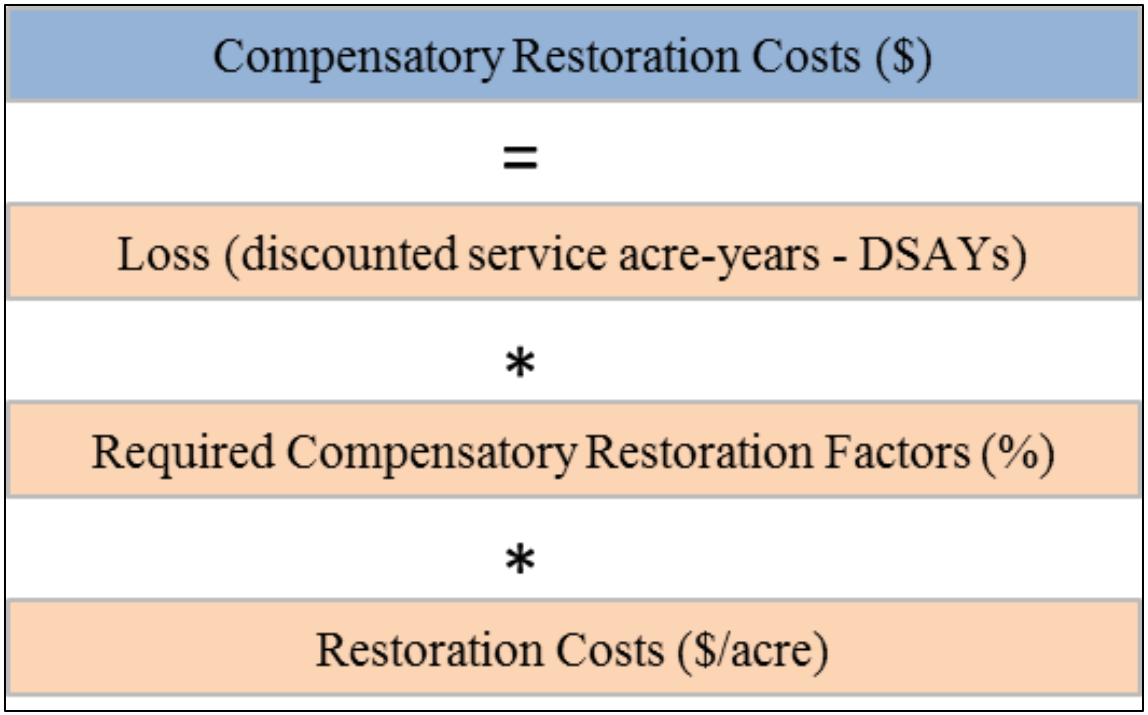

Volume (gallons) by Year and Spill Counts (white numbers)
Total Volume = 97,605
Gallons
25,000
20,000
15,000
10,000
5,000
0
62
49
82
45
59
75
57
49
39
2009
2010
2011
2012
2013
2014
2015
2016
2017
Year

Background

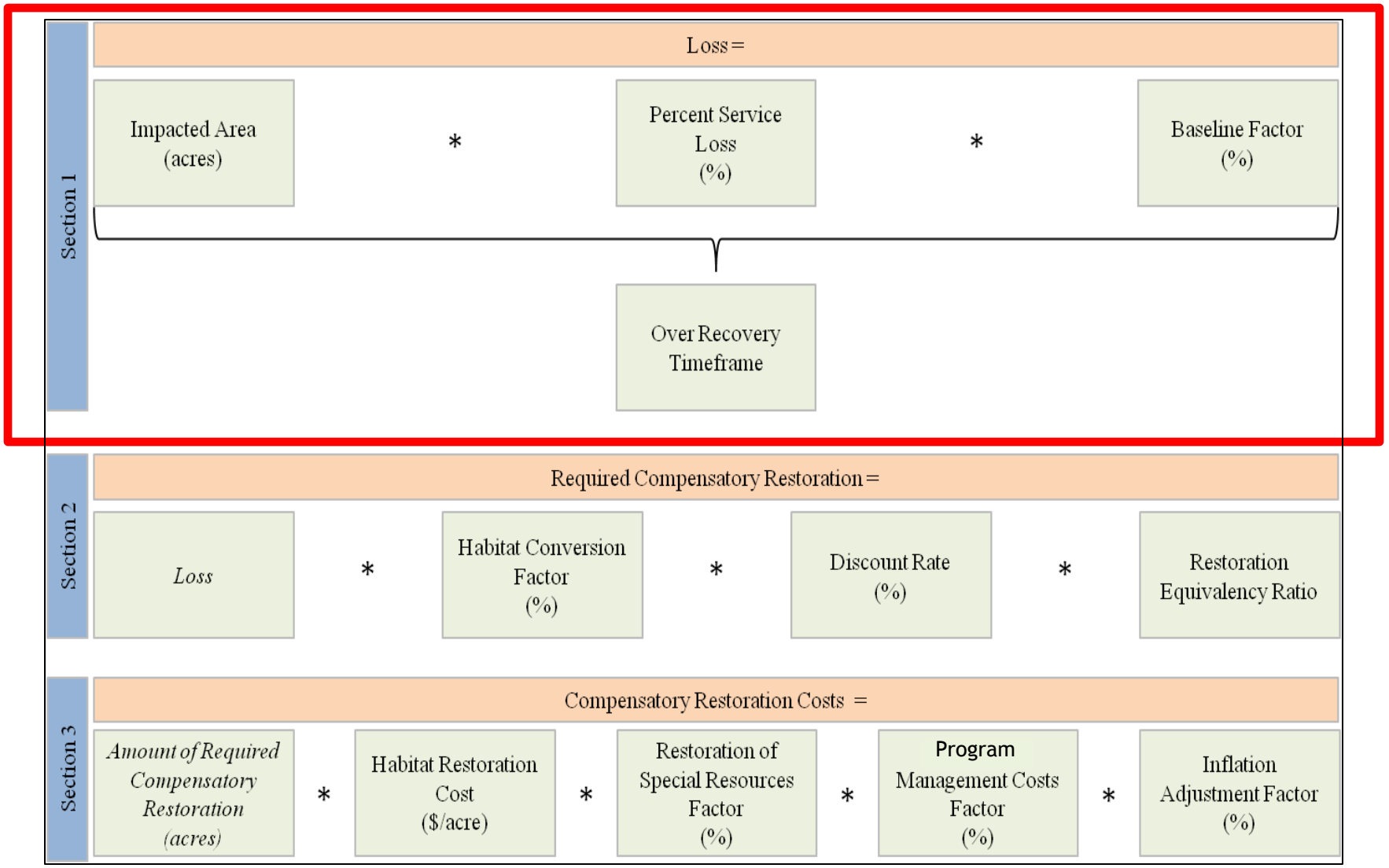
- 517 spills resulting ~97k gallons released from 2009 -2017
- Many do not impact natural resources.
- Many are small (<10 gallons).
- Many impact a limited spatial area (<0.1 acres).
- However, several spills result in quantifiable impacts to natural resources.
- The data, tools, and methods for developing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

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

Conceptual Model



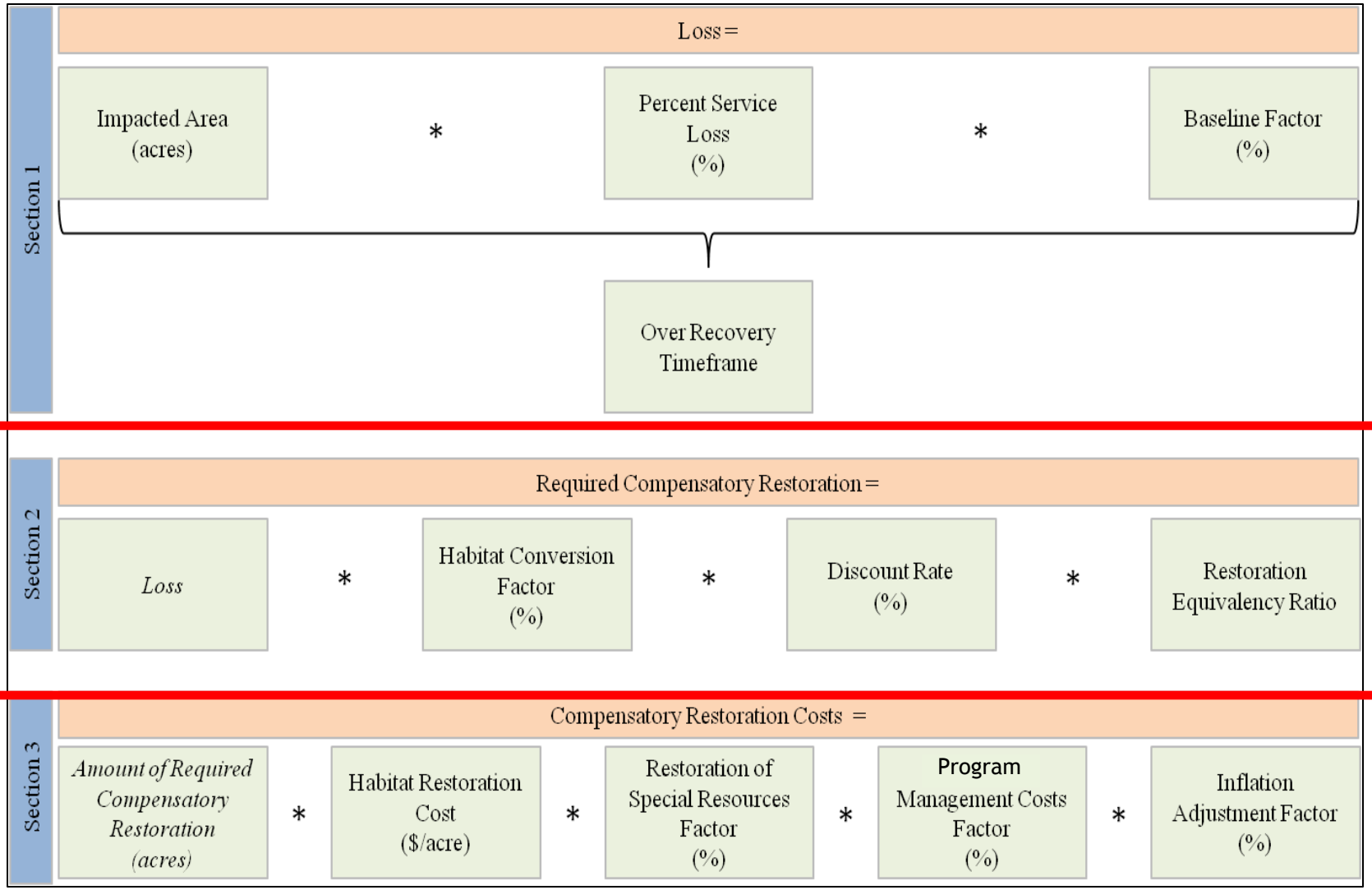
Conceptual Model



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.

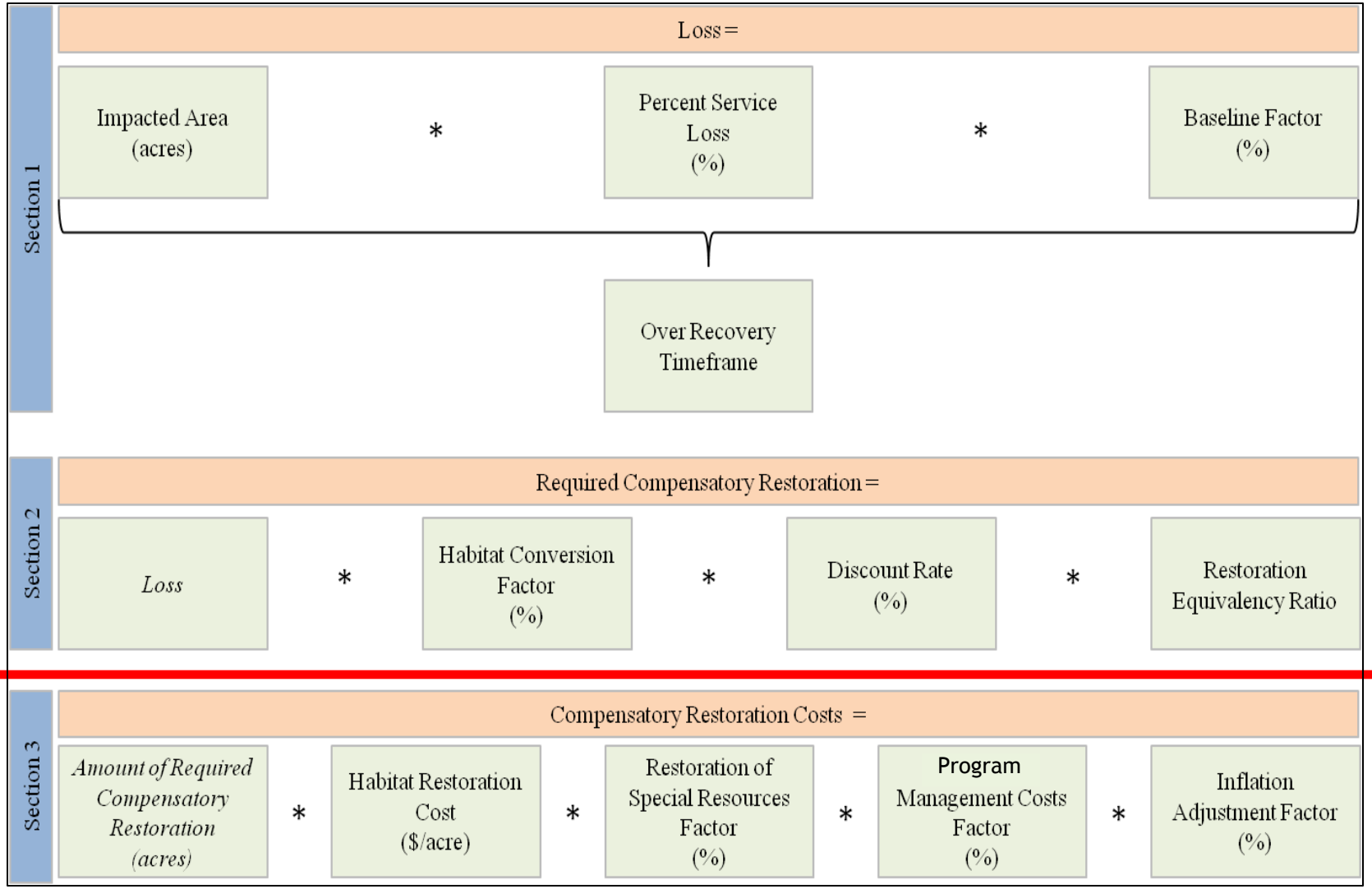
Conceptual Model



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.

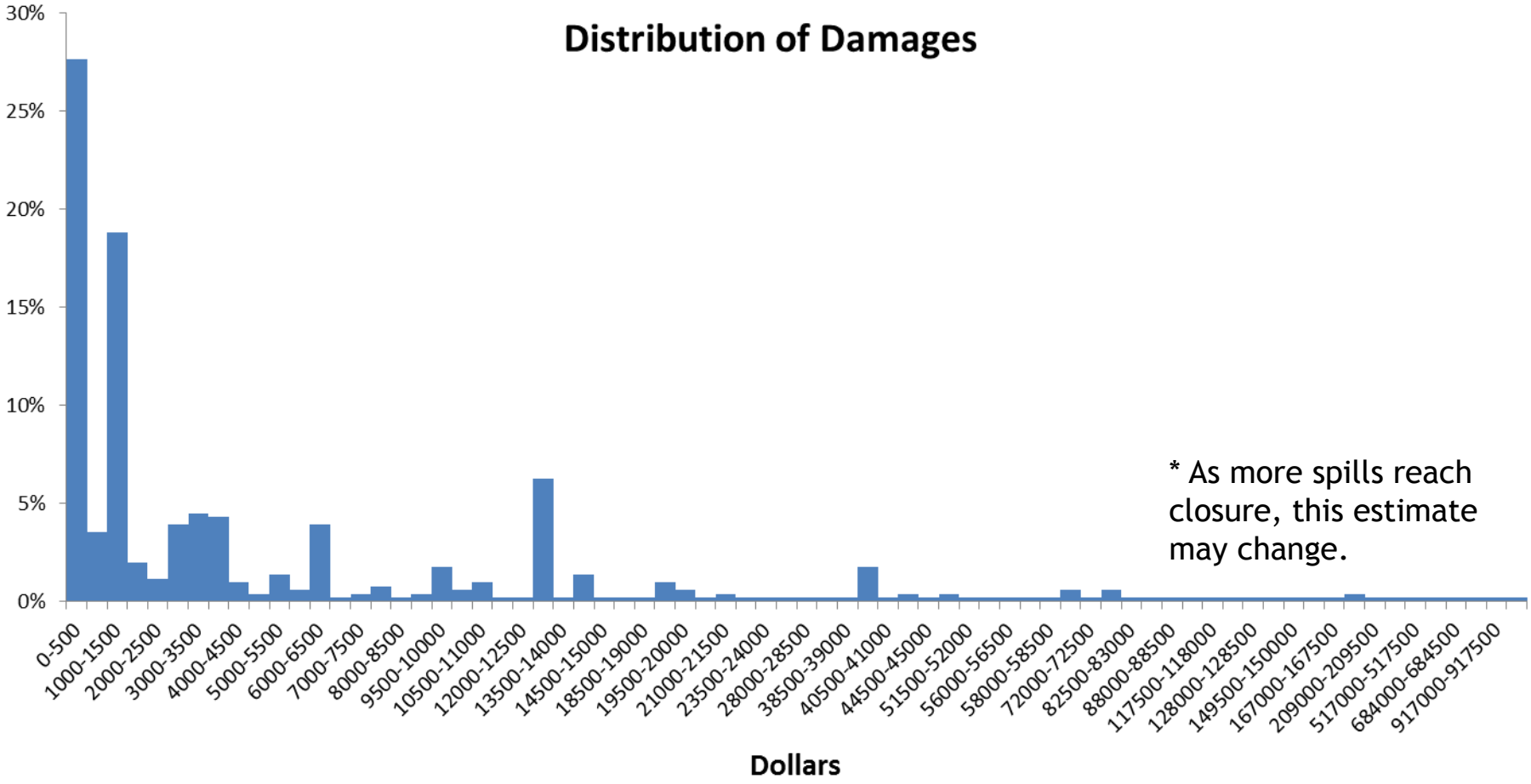
Conceptual Model



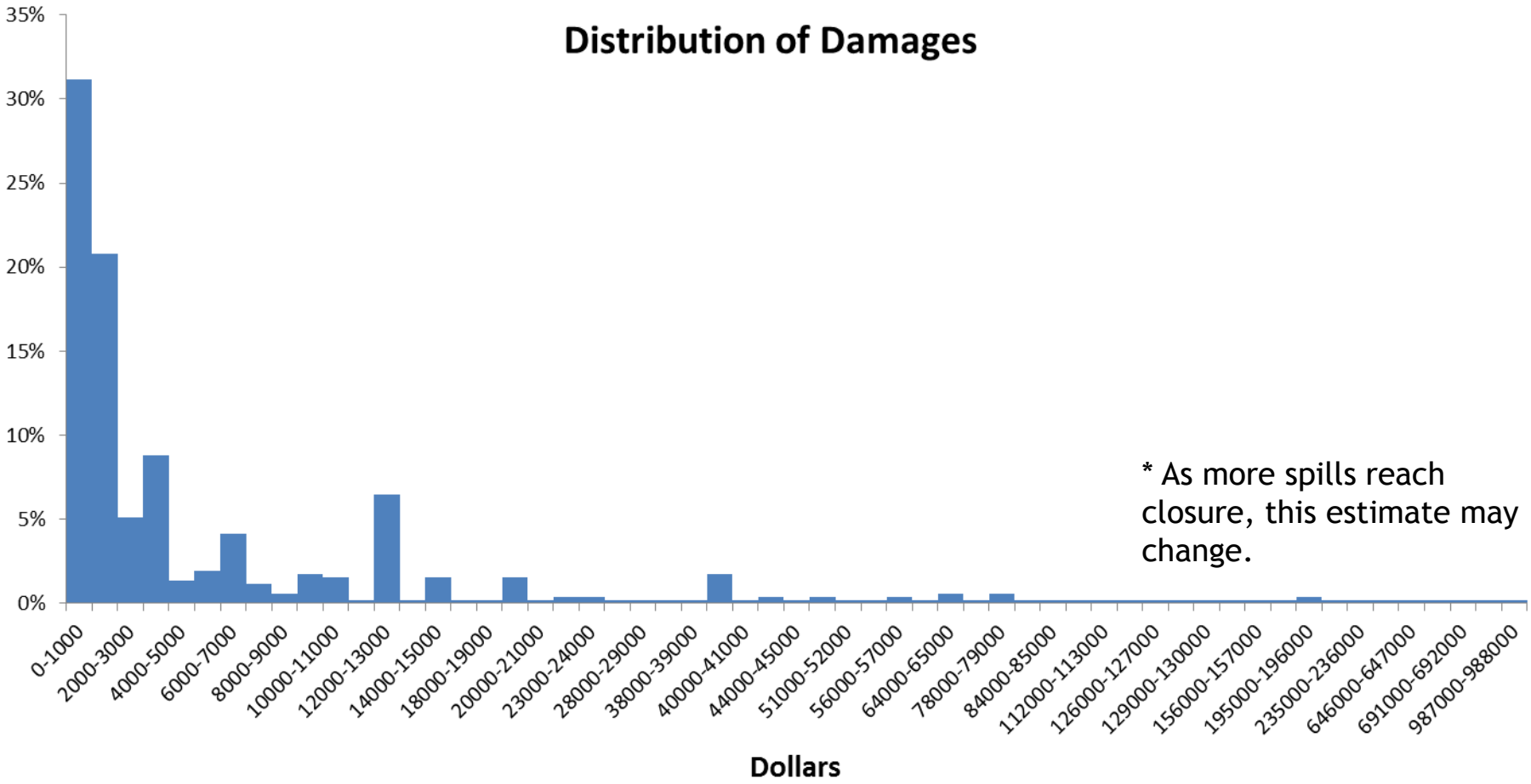
Costs

- 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*

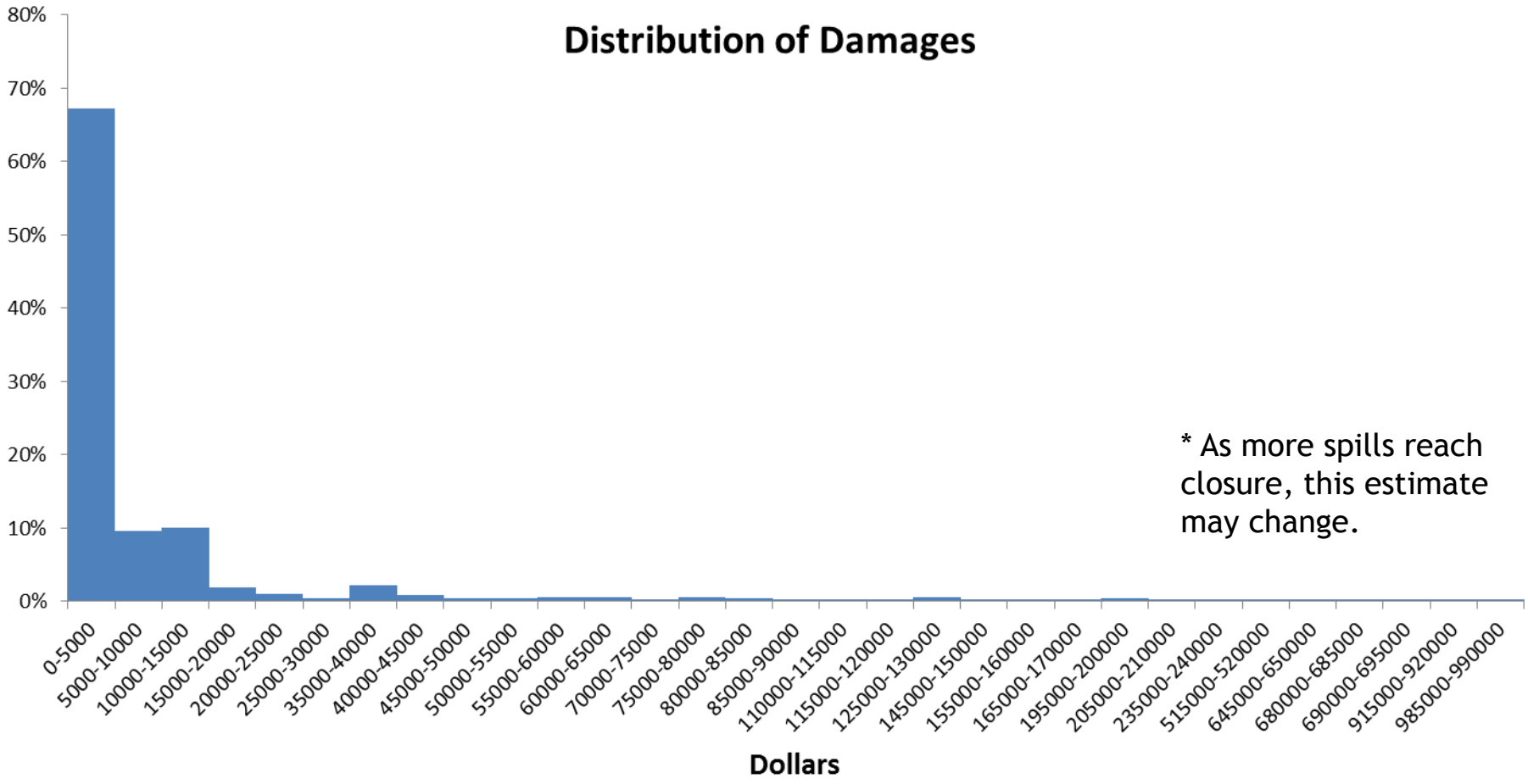


~31% of spills resulted in <$1,000 in damages*



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

~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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