Element 3: Stressors

2015 State of Maine Wildlife Action Plan

Element 3: ‘Stressors’

Action Plans must include descriptions of problems facing SGCN or their habitats

IUCN Classification System

- International Union for the Conservation of Nature
  - http://www.iucnredlist.org/technical-documents/classification-schemes/threats-classification-scheme
- Recommended by both the Northeast Lexicon & Best Practices Report
- Used by all states in the NE

IUCN Classification System

- Provides standard terminology
  - Promotes regional & national collaboration
- Hierarchical
  - Includes 3 tiers:
    - 12 first level
    - 47 second level
    - 73 third level
  - Each tier is expandable
  - 3rd tier open-ended

IUCN Classification System

- Developed for International Conservation Efforts
  - Many categories not relevant to Maine (e.g. nomadic grazing)
  - Some categories lack specificity (e.g. recreational activity)
- Does not describe the nature of the impact
  - Which life history traits are affected?
  - How severe is the impact?
  - Can the impact be mitigated in some way?
- Does not acknowledge positive impacts for other species

Refining Stressors

- Northeast Lexicon defines ‘Stressor Characteristics’
  - Helps determine the importance of the Stressor
  - Identify highest priority Stressors for Conservation Actions
- Six characteristics, 3 levels of Impact
  - Severity
  - Reversibility
  - Immediacy
  - Spatial Extent
  - Certainty
  - Likelihood

Stressor Characteristics

Stressor Characteristic	Low Impact	Moderate Impact	High Impact
Severity	**Slight Severity**: Degree of ecological change is minor	**Moderate Severity:** Degree of ecological change is substantial	**Severe:** Degree of ecological change is major
Reversibility (Consider the likelihood of reversing the impacts within 10 years)	**Reversible:** Effects of the threat can be reversed by proven actions	**Reversible with difficulty:** effects of the threat may be reversed but costs or logistics make action impractical	**Irreversible:** Effects of the threat are irreversible
Immediacy (This characteristic assesses the time scale over which impacts of the threat will be observable)	**Long-term:** Effects of the threat are expected in 10-100 years given known ecosystem interactions or compounding threats	**Near-term:** Effects of the threat are expected within the next 1-10 years	**Immediate:** Effects of the threat are immediately observable (current or existing)
Spatial Extent (Consider the impact of threat within 10 years)	**Localized:** (<10%) A small portion of the habitat or population is negatively impacted by the threat.	**Dispersed or Patchy:** (10-50%)	**Pervasive:** (>50%) A large portion of the habitat or population is negatively impacted by the threat.
Certainty (This characteristic is used to assess the certainty surrounding the threat and its impacts)	**Low Certainty:** threat is poorly understood, data are insufficient, or the response to threat is poorly understood	**Moderate Certainty:** some information describing the threat and ecological responses to it is available, but many questions remain	**High Certainty:** Sufficient information about the threat and ecological responses to it is available
Likelihood (Consider impact of the threat within 10 years.)	**Unlikely:** Effects of the threat are unlikely to occur (less than 30% chance)	**Likely:** effects of threat are likely to occur (30-99% chance)	**Occurring:** effects of the threat are already observable (100% chance)

Assigning Stressors

Coarse Filter: Habitats

Fine Filter: SGCN

Habitat Stressors

Approach

- Assigned to Macrogroup Level*
- Assigned all Stressors for each Macrogroup
- 2nd level of IUCN Hierarchy
- Comment field to describe specific impact
- Characteristics: All 6, plus 'Actionability'

Actionability

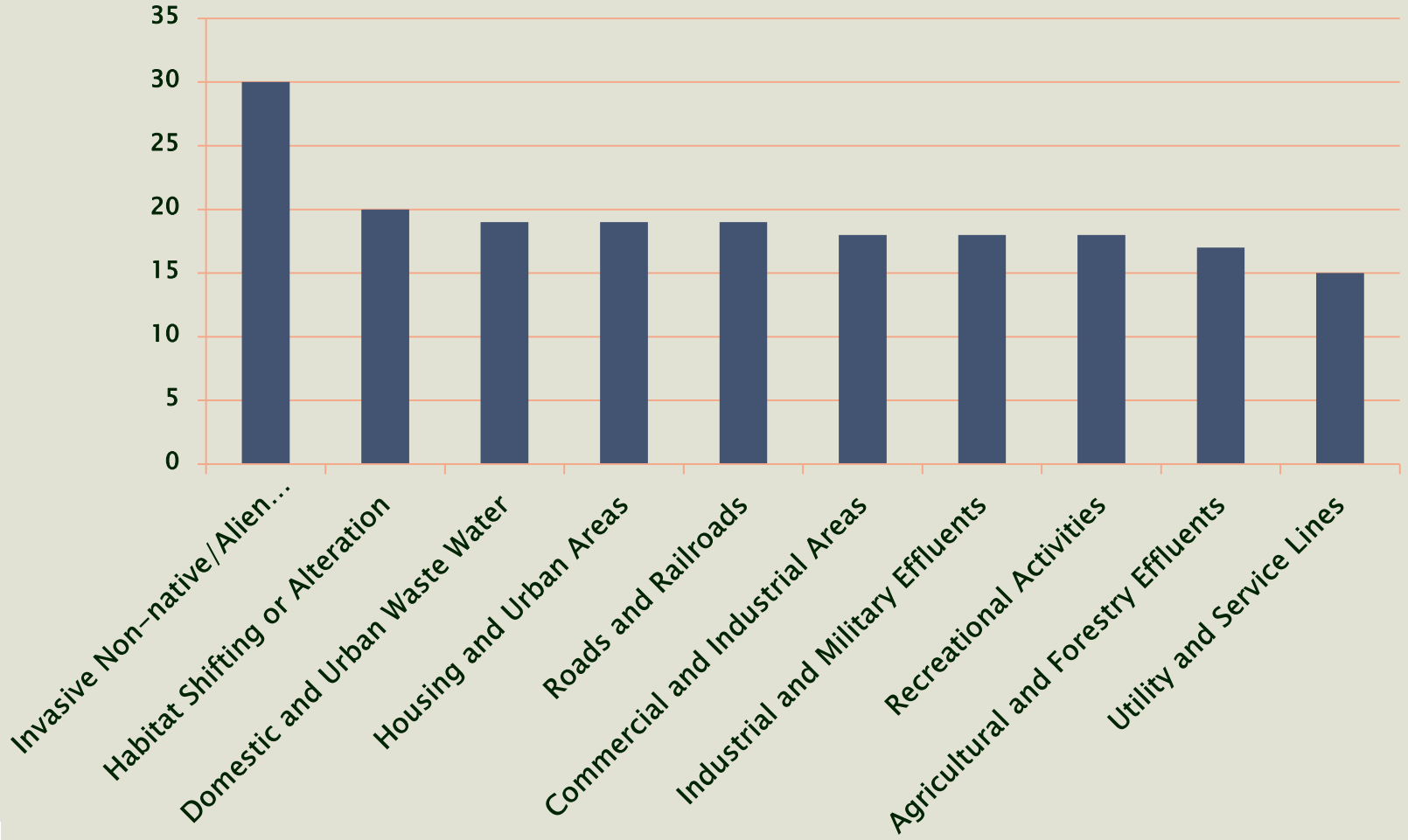
Replaces 'Reversibility' from previous work

Describes relative ease to prevent, restore, or mitigate Impact of Stressor or Stressor itself.

Stressor Characteristic	Level of Impact		
	Low	**Moderate**	**High**
Actionability (Consider the likelihood of implementing Conservation Actions to begin reducing the impact of the Stressor within the next 10 years)	**Actionable with Difficulty:** Impacts of a Stressor can only be minimally reversed, prevented, or mitigated, and cost or logistics make solutions difficult to implement	**Moderately Actionable:** Impacts of a Stressor can be reversed, prevented, or mitigated, however solutions are only partially effective or may be difficult to implement	**Highly Actionable:** Impacts of the Stressor can be reversed, prevented, or mitigated with proven strategies, at relatively low costs and with few logistical difficulties

Habitat Stressors

Results:



Habitat Stressors – Ranking Priority

- Which Habitats are the 'most stressed'?
- Within a Habitat, which Stressors are most important?

<u>Ranking Priority</u>

- Which Characteristics need to be considered?
- Are some more important than others?

Habitat Stressors – Ranking Priority

Stressor Characteristic	Low Impact	Moderate Impact	High Impact
Severity	**Slight Severity**: Degree of ecological change is minor	**Moderate Severity:** Degree of ecological change is substantial	**Severe:** Degree of ecological change is major
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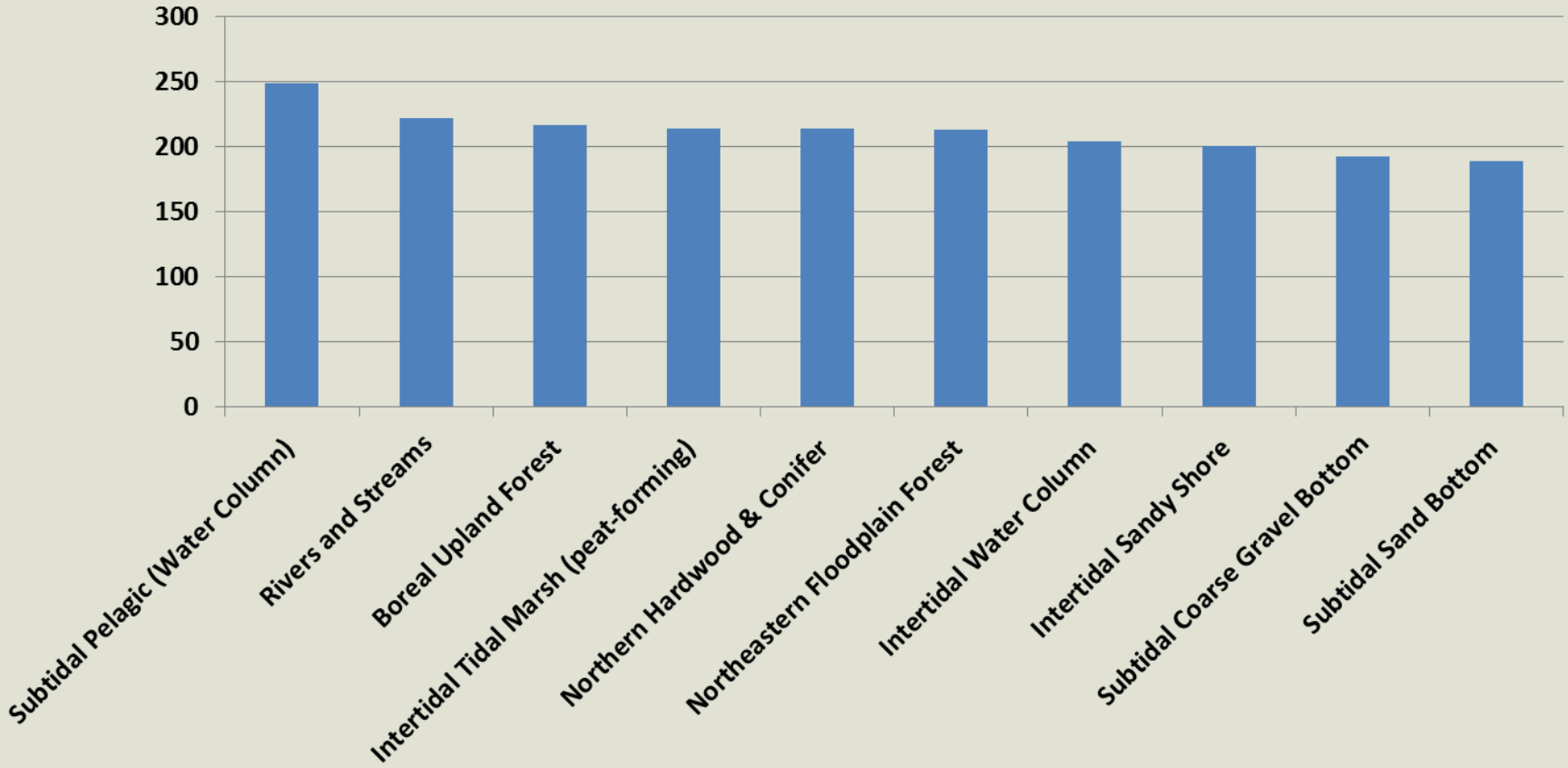
Habitat Stressors – No Weighting

Stressor Characteristic	Low Impact	Moderate Impact	High Impact
Severity	1	2	3
Actionability	1	2	3
Reversibility	1	2	3
Immediacy	1	2	3
Spatial Extent	1	2	3
Certainty	1	2	3
Likelihood	1	2	3

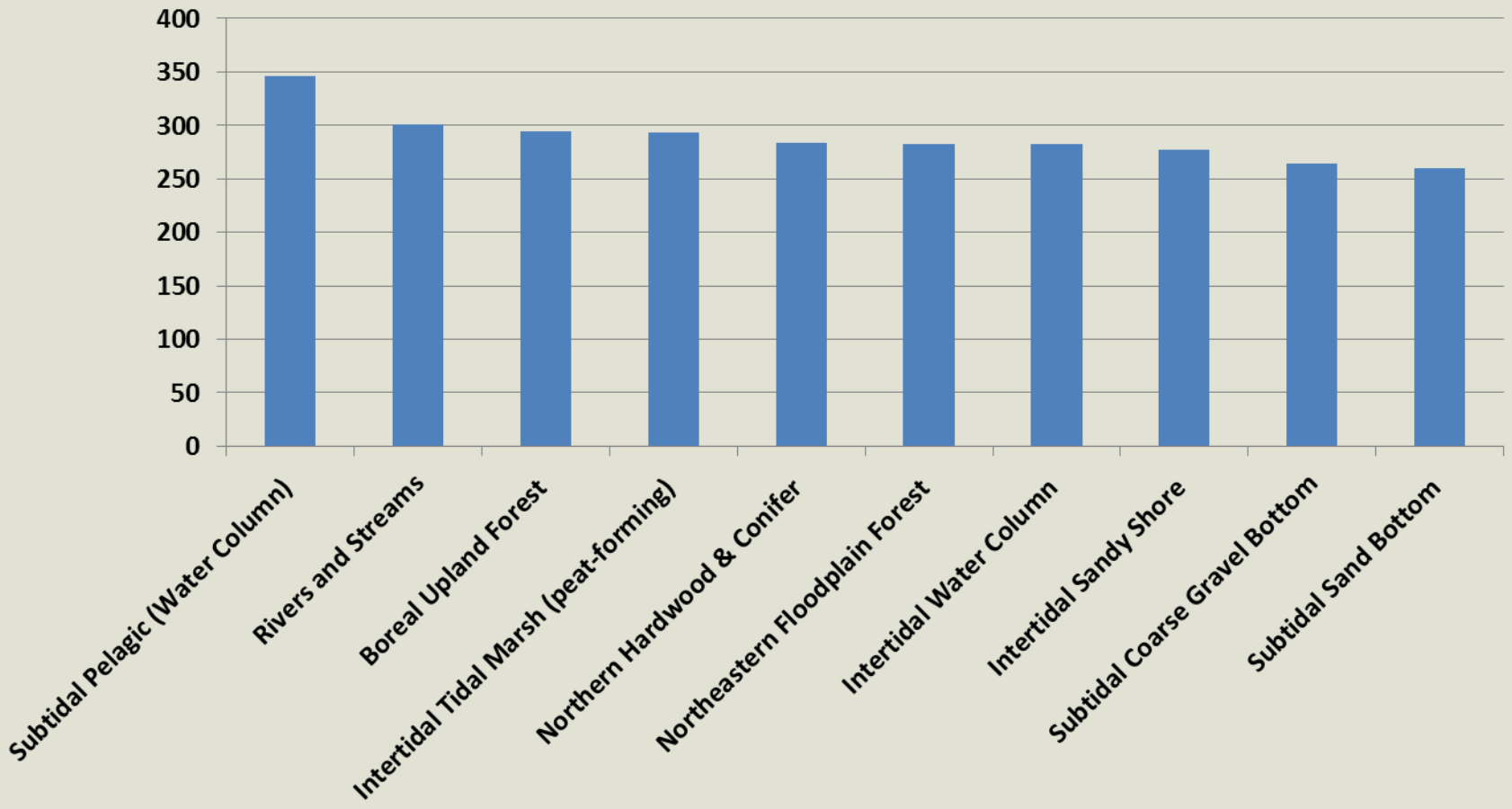
Habitat Stressors – No Weighting



Habitat Stressors – Weak Weighting

Stressor Characteristic	Low Impact	Moderate Impact	High Impact
Severity	2	4	6
Actionability	2	4	6
Reversibility	1	2	3
Immediacy	1	2	3
Spatial Extent	2	4	6
Certainty	1	2	3
Likelihood	1	2	3

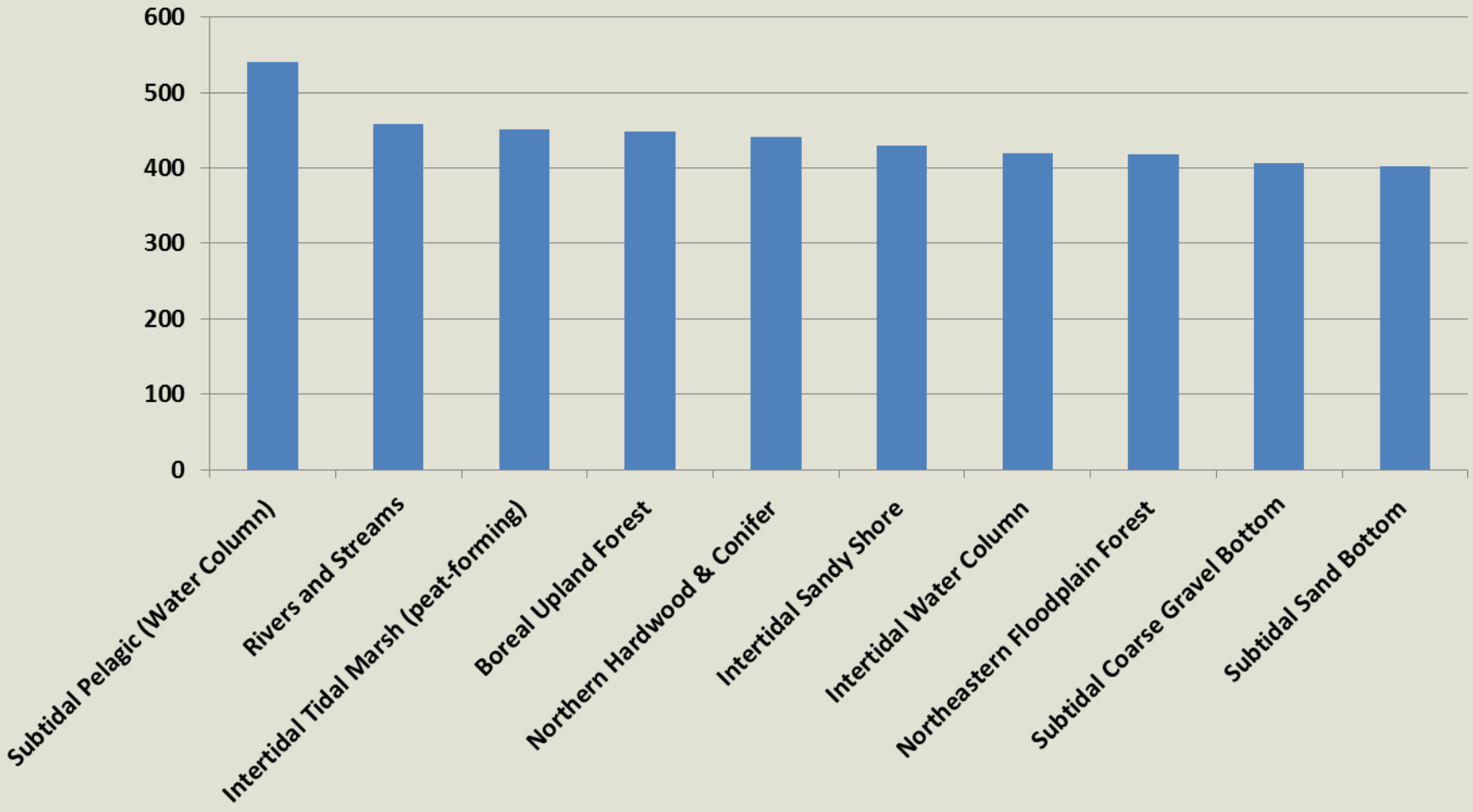
Habitat Stressors – Weak Weighting



Habitat Stressors – Strong Weighting

Stressor Characteristic	Low Impact	Moderate Impact	High Impact
Severity	4	8	12
Actionability	4	8	12
Reversibility	1	2	3
Immediacy	1	2	3
Spatial Extent	4	8	12
Certainty	1	2	3
Likelihood	1	2	3

Habitat Stressors – Strong Weighting



Habitat Stressors – Weighting

Macrogroup	Unweighted	Weak Weighting	Strong Weighting
Subtidal Pelagic (Water Column)	1	1	1
Rivers and Streams	2	2	2
Boreal Upland Forest	3	3	4
Intertidal Tidal Marsh (peat-forming)	4	4	3
Northern Hardwood & Conifer	5	6	8
Northeastern Floodplain Forest	6	7	7
Intertidal Water Column	7	5	5
Intertidal Sandy Shore	8	8	6
Subtidal Coarse Gravel Bottom	9	9	9
Subtidal Sand Bottom	10	10	10

Habitat Stressors – Ranking Priority

Results:

- Weighting has little effect
- Habitat Stressor ranking driven by # of Stressors
  - Is this what we want?
  - Or should we prioritize habitats based on SGCN, then look at Stressors?

Other ideas:

- Consider Actionability Separately?
  - Should Stressors with Low Actionability be ignored?
  - Focus for research and innovation?

Assigning Stressors – SGCN

Approach

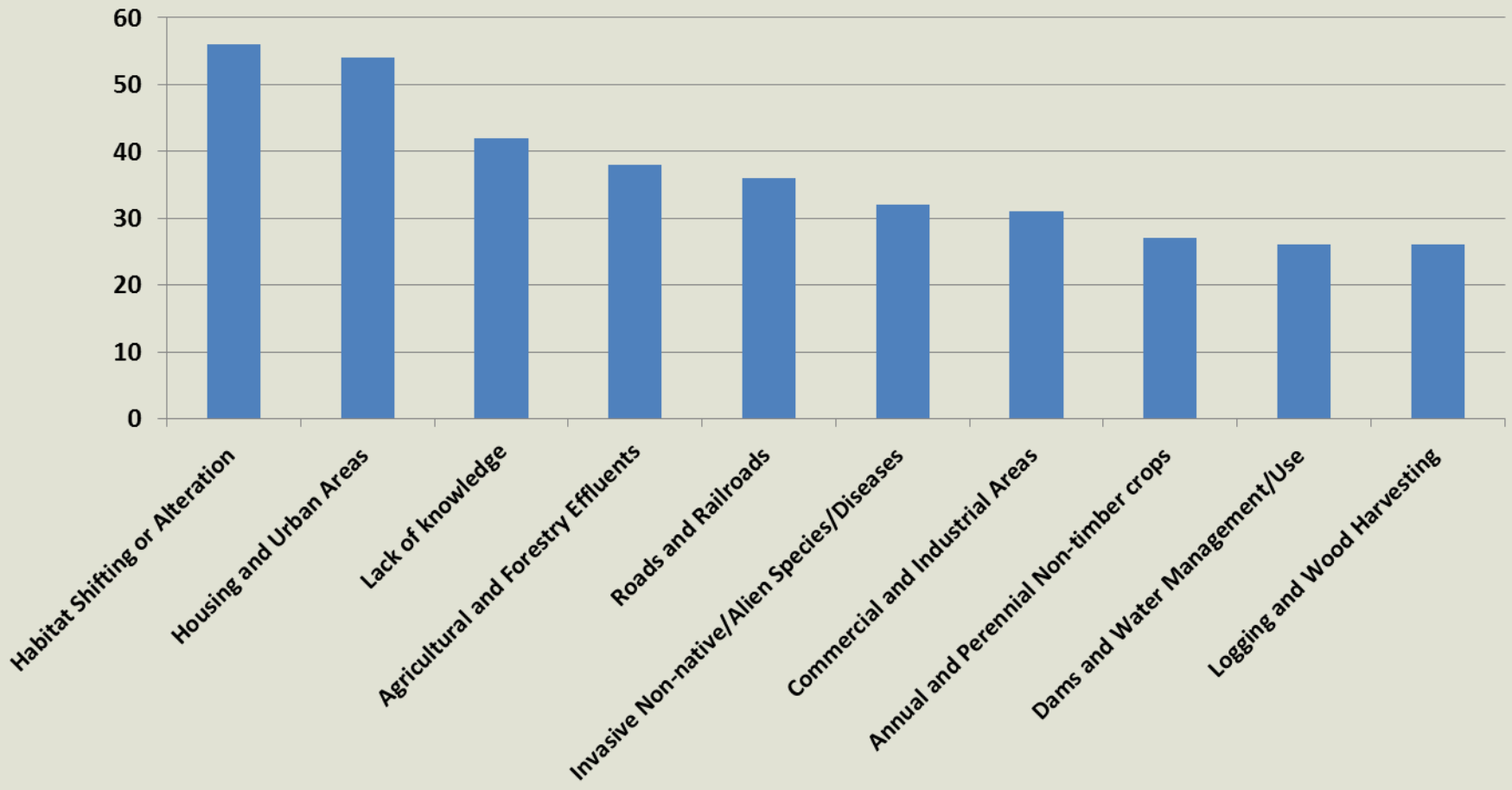
- P1 and P2 SGCN only
- 2nd level of IUCN hierarchy
- Comments field
- Characteristics: Severity & Actionability
  - Not assigned if low Likelihood or Certainty
  - Considered Immediacy & Spatial Extent when determining Severity
  - Assigned if Moderate or High Severity

Results – SGCN

Results:

- 611 SGCN Stressor Assignments
- 34 Level 2 Stressors
- Range: 1 – 13 Stressors/SGCN
- Mean: 4.6 Stressors/SGCN
- Reams of comments!

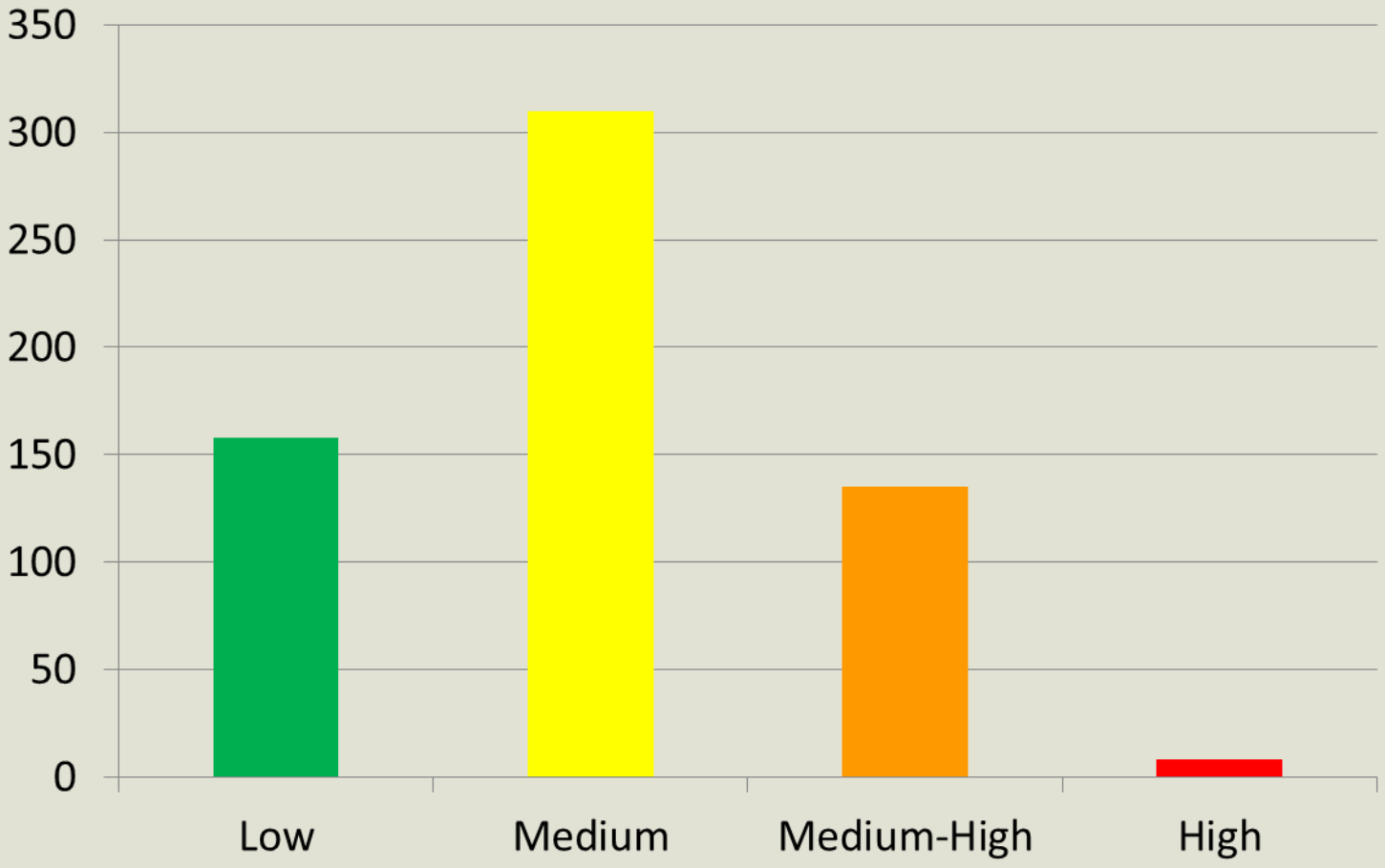
Results – SGCN



Prioritizing SGCN Stressors

Actionability	Severity: Moderate	Severity: Severe
Highly Actionable	Medium - High	High
Moderately Actionable	Medium	Medium - High
Actionable with Difficulty	Low	Low

Prioritizing SGCN Stressors



SGCN Stressors – High Priority

- New England Cottontail: Lack of regenerating forest
- Arctic Tern, Atlantic Puffin, Razorbill: Predation by large gulls
- Atlantic Salmon: Aquaculture

SGCN Stressors – Low Priority

- Numerous Species: Sea level rise (Moderate Severity, Actionable with Difficulty)
- Atlantic Salmon: Ocean Temperature rise (Severe, Actionable with Difficulty)
- Boreal Chickadee: Climate Change (Moderate Severity, Actionable with Difficulty)

Feedback

- Given the approach used, do assignments appear on target?
- Other approaches to Stressor Prioritization?