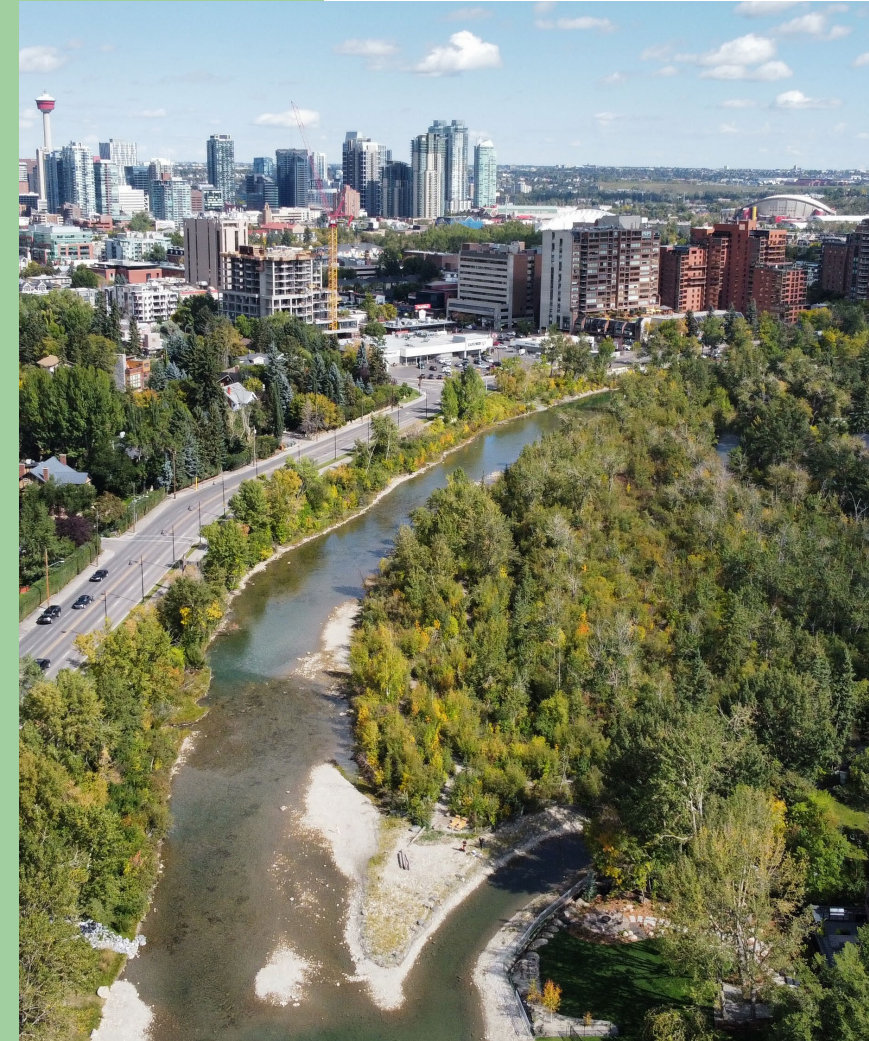




KERR WOOD LEIDAL  
consulting engineers

# HOW TO IMPROVE YOUR BIOENGINEERING PROJECT SEEDING

November 21, 2024



# TOPICS

- Background
- Methods
- Results
- Recommendations



# BACKGROUND

- Herbs = graminoids + forbs
- Herbs provide early ground cover, soil stability, and biodiversity, and help to reduce soil erosion
- Different application methods



# METHODS

- Five years of data collection (2018-2022)
- 69 bioengineering sites
- 85 transects analyzed
- 54 different herbaceous species



# RESULTS

## ESTABLISHMENT SUCCESS (TOP PERFORMERS)

SPECIES	# TRANSECTS	SUCCESS RATE (%)	MEAN COVER (%)
Slender wheat grass ( <i>Elymus trachycarpus</i> )	34	91	38
Fowl bluegrass ( <i>Poa palustris</i> )	40	70	21
Canada wild rye ( <i>Elymus canadensis</i> )	20	65	15
Northern wheat grass ( <i>Elymus lanceolatus</i> )	47	57	14
Western wheat grass ( <i>Pascopyrum smithii</i> )	69	49	11
Green needle grass ( <i>Nassella viridula</i> )	51	47	10
Tufted hair grass ( <i>Deschampsia cespitosa</i> )	47	38	18

# RESULTS

## ESTABLISHMENT SUCCESS (UNDERPERFORMERS)

SPECIES	# TRANSECTS	SUCCESS RATE (%)	MEAN COVER (%)
Rough fescue ( <i>Festuca campestris</i> )	21	0	0
Fowl manna grass ( <i>Glyceria striata</i> )	15	0	0
Wire rush ( <i>Juncus balticus</i> )	13	0	0
Bluejoint ( <i>Calamagrostis canadensis</i> )	12	0	0
Indian rice grass ( <i>Eriocoma hymenoides</i> )	7	0	0
Sandberg bluegrass ( <i>Poa secunda</i> )	7	0	0
June grass ( <i>Koeleria macrantha</i> )	45	9	4

# RESULTS

## ESTABLISHMENT SUCCESS

SPECIES	# TRANSECTS	SUCCESS RATE (%)	MEAN COVER
Wild blue flax ( <i>Linum lewisii</i> )	25	62	8
Wild vetch ( <i>Vicia americana</i> )	7	29	No data
Canada milk vetch ( <i>Astragalus canadensis</i> )	8	13	No data
Purple prairie clover ( <i>Dalea purpurea</i> )	16	6	No data
Gaillardia ( <i>Gaillardia aristida</i> )	9	0	No data

# RESULTS

## ESTABLISHMENT SUCCESS BY SEEDING METHOD

	Broadcast Seeding	Hydrseeding	Drill Seeding
Success Rate ( <i>i.e.</i> , percentage of species seeded that were observed in Year 1)	36% (n=46 transects)	31% (n=32 transects)	42% (n=4 transects)



## GENERAL OBSERVATIONS



- Some sites had thick herbaceous cover that was competing with plantings and cover
- Damaged shrubs and trees from maintenance activities
- Seeding application rates that were too high
- Poor success of herbaceous seed mix
- Non-native species seeded instead of native species



## RECOMMENDATIONS

### Do's



- Avoid seeding species that have poor success rates
- ~~Decompact~~ soils prior to seeding and planting
- Apply seed under erosion control matting
- Ensure the prescribed application rate is being used
- Avoid mowing seeded species
- Remove herbaceous vegetation competing with plantings and cuttings
- Use seed treatments to improve germination success



## RECOMMENDATIONS

### Do's



- Follow seeding BMPs:
  - Obtain and review seed certificates
  - Seed in spring or fall only
  - Select appropriate species
  - Select appropriate application rate for site conditions
  - Fence off seeded area until established
  - Irrigate if possible

# ACKNOWLEDGEMENTS

## CITY OF CALGARY TEAM

Norma Posada,  
Harpreet Sandhu,  
Pam Duncan,  
Rene Letourneau,  
Tim Walls,  
Jonathan Slaney,  
Narayan Pokhrel,  
Maggie Nelson

[Calgary.ca/riparian](http://Calgary.ca/riparian)

## KWL TEAM

KWL: Craig Kipkie, Mike Gallant,  
Deighen Blakely, Dave Murray

Terra Erosion Control: Pierre  
Raymond

Cows and Fish: Kathryn Hull

Longview Ecological: Alan Dodd

INRAE: Andre Evette, Delphine  
Jaymond, Marie-Anne Dusz

Ausenco: Kirsten Norris

