

Become An Earth Doctor Game Resource Presentation

The resource presentation can be used with the Become An Earth Doctor game to introduce participants to land reclamation, the need for land reclamation, disturbance types, reclamation stages, and ultimately lead participants through the entire game. Speaker notes and participant prompts are included in the comments to guide presenters.

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Land Reclamation: Become An Earth Doctor





Introduce Yourself

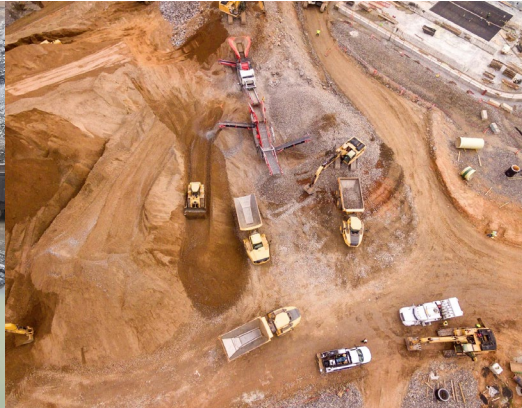


What Is Land Reclamation



Land Reclamation

- Returning disturbed or damaged land to its past condition and use or to another productive use
- Restoration returns the land to what was there before the disturbance





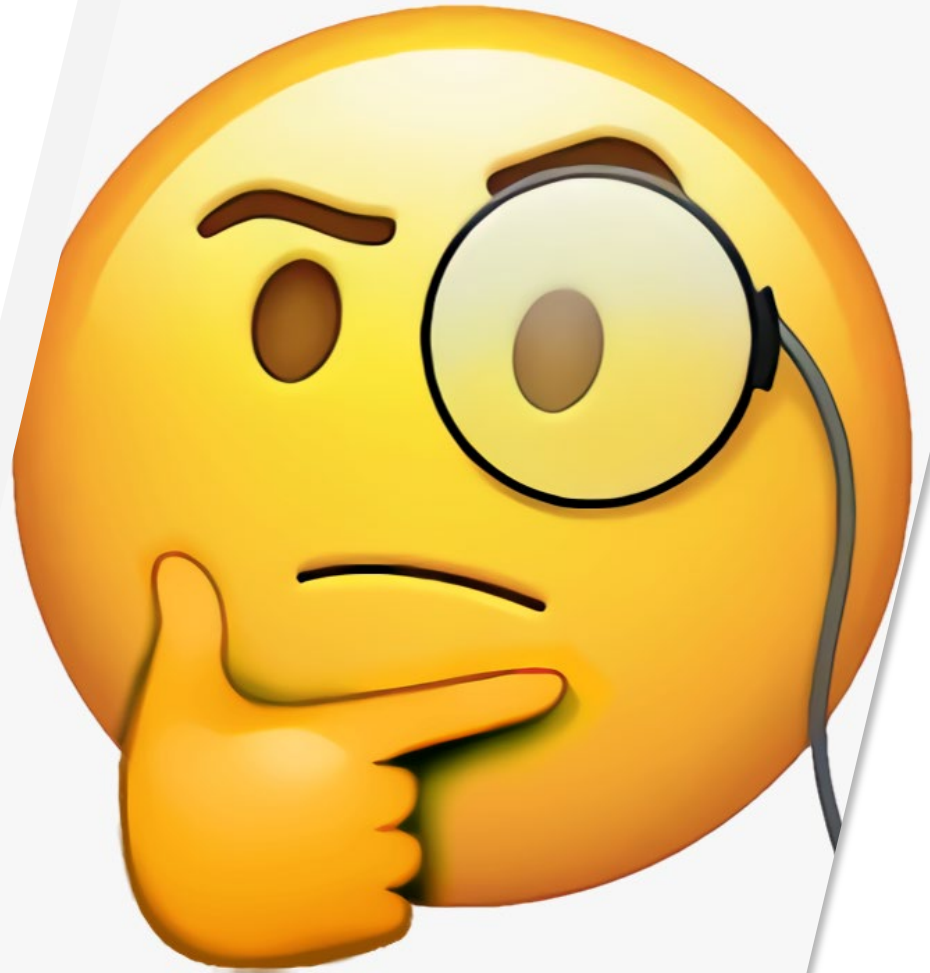
Need For Reclamation





What Is A Disturbance

- Disturbance = change to ecosystem
- Damage, degradation = negative change to ecosystem





Disturbances





Any Questions



Time To Explore Land Reclamation And Play Become An Earth Doctor

Designed by members of the Land
Reclamation International Graduate
School (University of Alberta)





Rules Of The Game

1. The goal of this game is successfully reclaim a site on time and on budget, while keeping people happy
2. Supplies needed
 - A dice or a number generator (<https://www.random.org/>)
 - 6 items (anything you want) for each player and/or team
 - Score sheet
 - Pen or pencil
 - Set of risk cards
 - Set of game cards



Method



Biopiling



Round of the game

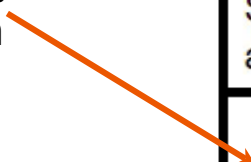


Description



Soil dug up, piled, amended, and assessed for improvement

Cost - how many cost points each roll will cost



Likelihood of effectiveness - you need to continue to roll until you are successful



Stakeholders - the method you chose will gain, lose, or not impact stakeholders



Gain
Impact Lose No

Time - amount of time you need to subtract with each roll





Rules Of The Game

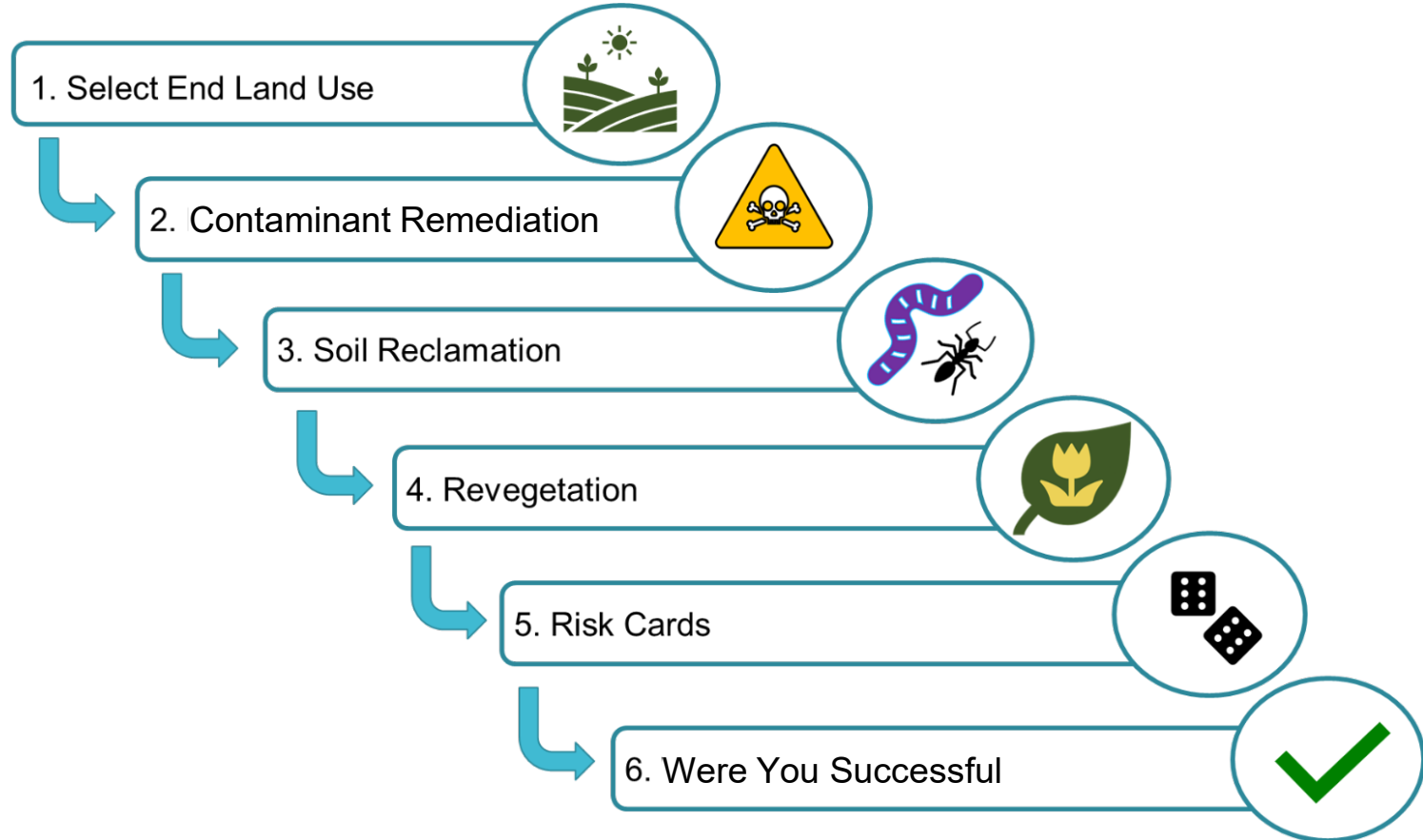
3. Set 3 of the 6 random items in front of you and 3 off to the side; these items represent your communities
You need at least 1 left by the end of the game, but you can earn more
As you go through each step of the game, you pick options that make your stakeholders
 - Angry → Lose an item in front of you
 - Happy → Add an item from off to the side
 - Moderate → Nothing changes

If you have to play multiple rounds in a step because your method wasn't successful, you may lose or gain multiple items

4. Complete each step of reclamation

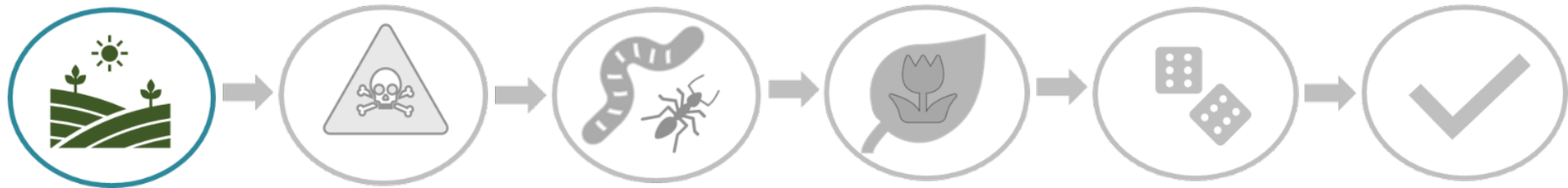


Game Steps





Step 1: Select An End Land Use





End Land Use


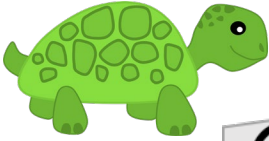



- Reclamation needs to be based on what we are going to do with the area after reclamation
- Forest, park, wetland, etc
- Consider climate, surrounding environment, what is there before disturbance
- Influenced by people












End Land Use

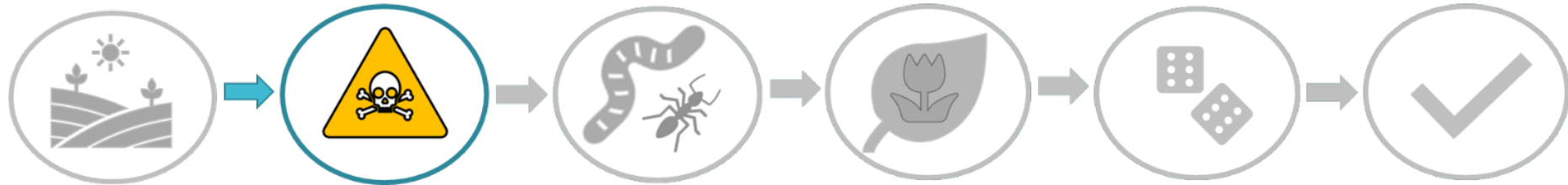
Consider your budget and timeline
You need to meet the time and cost points

Option One 
 
Slow and steady wins the reclamation race! This end land use is not expensive, but it takes a long time.
 

Option Two 
 
Money, money, money, money...money! This end land use is expensive, but it doesn't take much time.
 

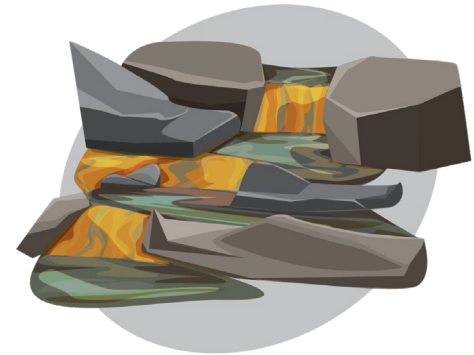
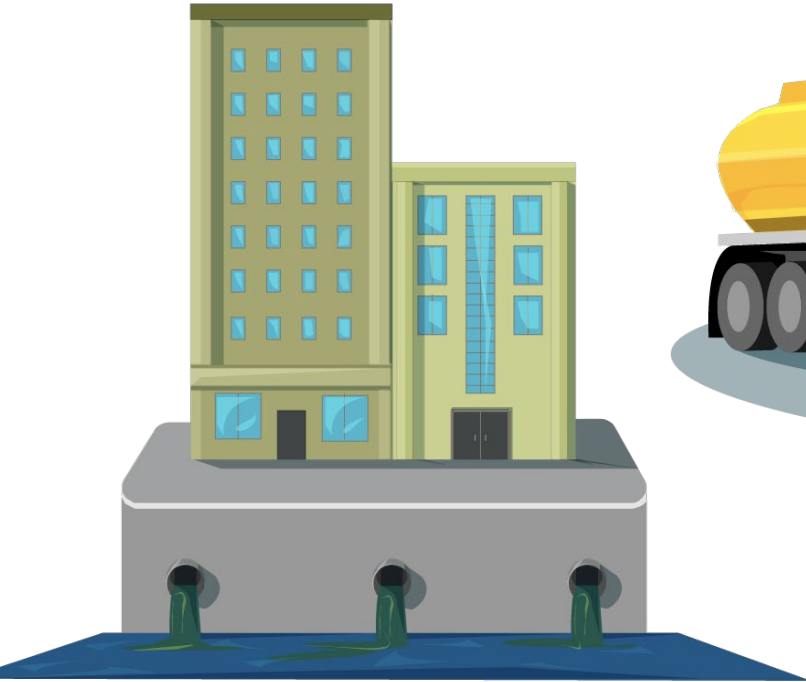
Option Three 
 
A little of this, and a little of that! This end land use could be a safe decision, or it could limit your options.
 

Step 2: Select Your Contaminant Remediation Method





What's Wrong Here



Contaminant Remediation

- Removal or reduction of contaminant or unwanted substance
- Taking away things you don't want in the soil or water





Step 2: Select Your Contaminant Remediation Method


Consider your budget and timeline, and the likelihood of success
Once you select, roll the dice or number generator (set to a number between 1 and 6)


If successful, go to the next step

If not successful, you can try again or select a different method



Consider if stakeholders are happy (add an item), angry (lose an item) or moderate (nothing happens)





Contaminant Remediation


Natural Attenuation 




Contaminants removed by microorganisms in the soil



5  25 




    5 6


Biopiling 




Soil dug up, piled, amended, and assessed for improvement



15  15 


   4 5 6


Thermal Desorption 




Soil heated to $>150\text{ }^{\circ}\text{C}$ to reduce contaminants, aka a soil oven



25  10 


 2 3 4 5 6

Dig And Dump 



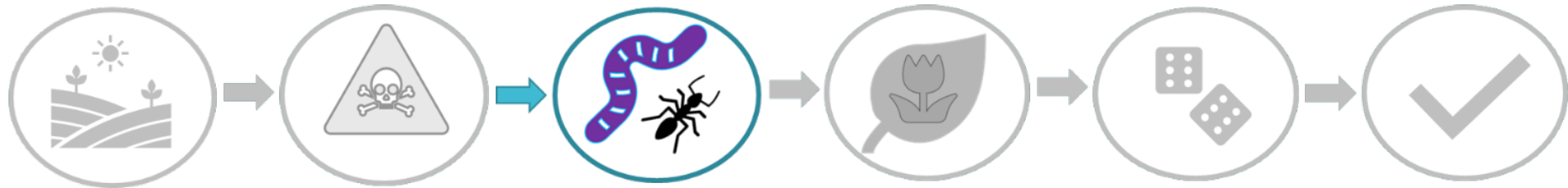
Soil dug up, discarded in a landfill, new soil is added

30  5 

 2 3 4 5 6



Step 3: Select Your Amendment For Soil Reclamation





Where Would You Rather Grow

A



B

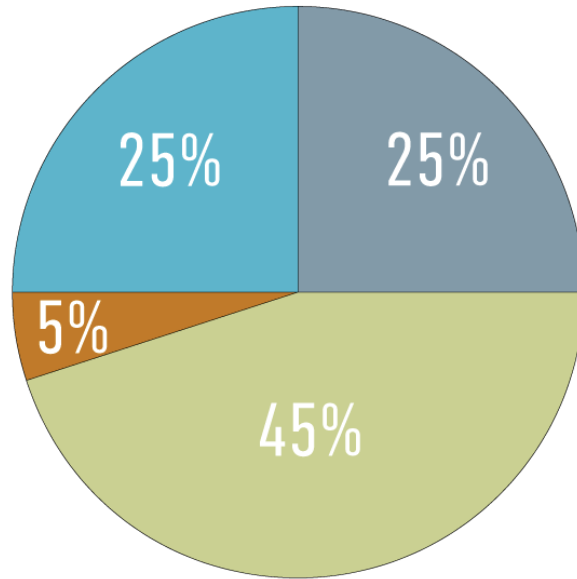


C





Soil Is Made Of



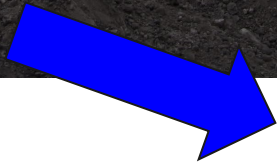
Soil Is Made Of





Soil Reclamation

Challenge



Goal



- Takes 1000s of years to build soil naturally
- Soil often stockpiled prior to disturbances
- May need to add materials to make soil healthy
- May need to build soil



Step 3: Select Your Amendment For Soil Reclamation

Consider your budget and timeline, and the likelihood of success
Once you select, roll the dice or number generator (set to a number between 1 and 6)


If successful, go to the next step


If not successful you can try again or select a different method

Consider if stakeholders are happy (add an item), angry (lose an item) or moderate (nothing happens)








Soil Reclamation


Manure 





Animal wastes increase carbon nutrients, water holding capacity




  




   4 5 6


Fertilizer 





Inorganic nutrients are added to increase fertility




  


   4 5 6

Salvaged Materials 



Salvaged soil, peat, LFH, etc are taken from another site or onsite

 2 3 4 5 6

Nothing 



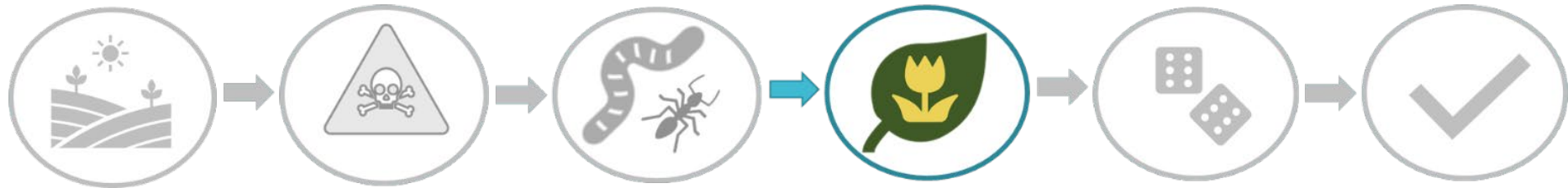
Soil is not reclaimed and left for nature to recover

     6



Step 4: Select Your Revegetation Method





Revegetation

- To add plants to disturbed land
- Revegetate with
 - Native species - species that evolved in an area
 - Non-native species - species that did not evolve in an area



Step 4: Select Your Revegetation Method


Consider your budget and timeline, and the likelihood of success
Once you select, roll the dice or number generator (set to a number
between 1 and 6)



If successful, go to the next step

If not successful you can try again or select a different method




Consider if stakeholders are happy (add an item), angry (lose an
item) or moderate (nothing happens)


Revegetation


Native Plants 





Native plants and seeds are planted on the site




  




 2 3 4 5 6


Non-Native Plants 





Non-native plants and seeds are planted on the site




  



   4 5 6


Mixed Planting 





Native and non-native plants and seeds are planted




  






  3 4 5 6

Nothing 



Nothing is planted

     6

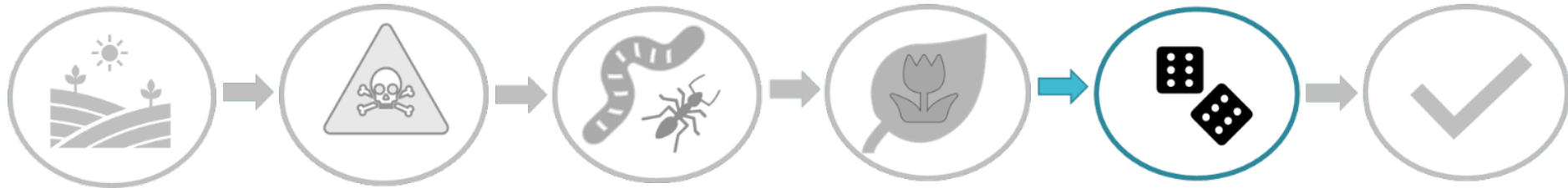


Step 5: Time To Risk It All

Many factors can negatively or positively affect your reclamation

Select three numbers between 1 and 24

Find the corresponding card and add or subtract those points



1



2



3



4



5



6



7



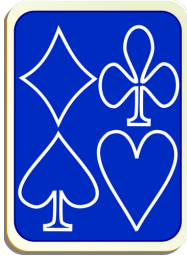
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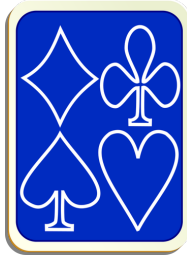
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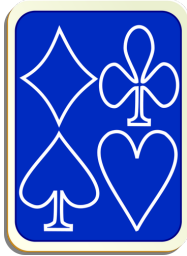
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12



13



14



15



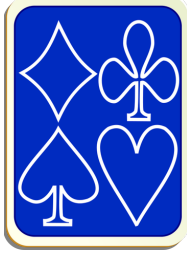
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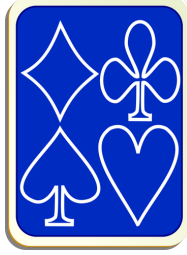
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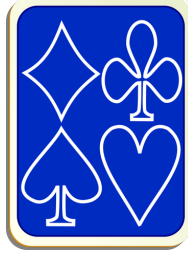
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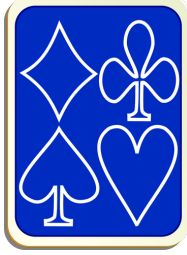
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20



21



22



23

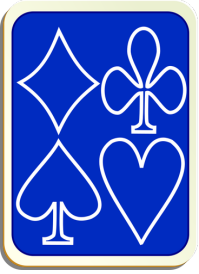



24




The End


1



1 **When It Rains** 



A heavy rainstorm hits your site and washes away all your plants



2



2 **Snow Big Deal** 





Skiers cause an avalanche that blocks the road to your site




3



3 **Research Rules** 



Scientists develop an inexpensive all-in-one soil amendment



4



4 Bluetooth Shovel 



A company tests their state-of-the-art equipment on your site



5



5 **Invaders** 



An invasive species establishes that requires herbicide and weeding



6



6 Turn It Off Or On 



Call a mechanic, your equipment breaks down



7



7 For The Gram 



A community group gets involved and helps with planting



8



8 **Don't Badger Me** 



An endangered female badger makes itself at home and has babies



9



9	First Job	
		
<p>During monitoring, you spill diesel filling your truck, better clean it up</p>		
		

10



10	Hooligans	
		
<p>Teenagers trespass on your site, quick, install some fences</p>		
		

11



11

Elon Musk-eg




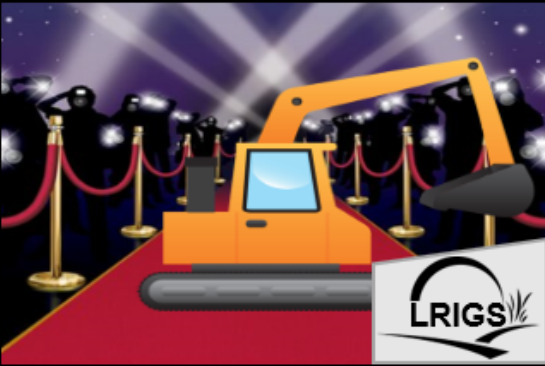
A nature loving billionaire
donates to your
reclamation project





12



12 Improved Access 



The road to your site is paved, making it easier to reach your site

13



13 Screamer 





A photograph of a landscape with a green funnel superimposed over it. The funnel is sucking up green leaves. In the foreground, there is a road sign that says "Saskatchewan 163 km". The LRIGS logo is in the bottom right corner.

A tornado hits your site and removes all your vegetation



 



14 **Summer Scorch** 



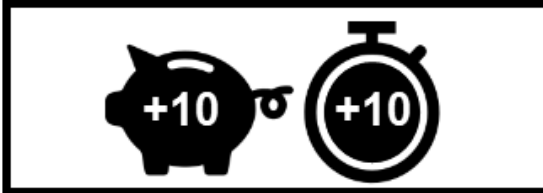


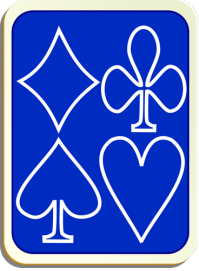
A wildfire reaches your site, 50 % of vegetation re-establishes





15




15	Nature Giveth	
		
Optimal growing conditions speed up your revegetation		
		



16 **Get A Bryologist** 



Monitoring finds a target moss species on your site



17



17 **Need Moisturizer** 





Climate change induced super drought kills some of your vegetation





18



18 **Mudslide** 



Rapid spring thaw results in a mudslide washing away your topsoil



19



19 **Black Gold** 



Soil quality was better than expected, requiring fewer amendments





20 Stakeholder Win 



A community partnership results in volunteers to help with monitoring





21 **Salad Bar** 




Who, me?


LRIGS

Wildlife snacks on some of your newly planted vegetation






22 Summer Job 



You hired inexperienced tree planters, most trees don't survive year 1





23 **Bearly Monitored** 



A bear takes up residence on site and stalls monitoring plans





24 **Remedi-Gate** 



Public consultation with nearby First Nation was insufficient, do better





Step 6: The End

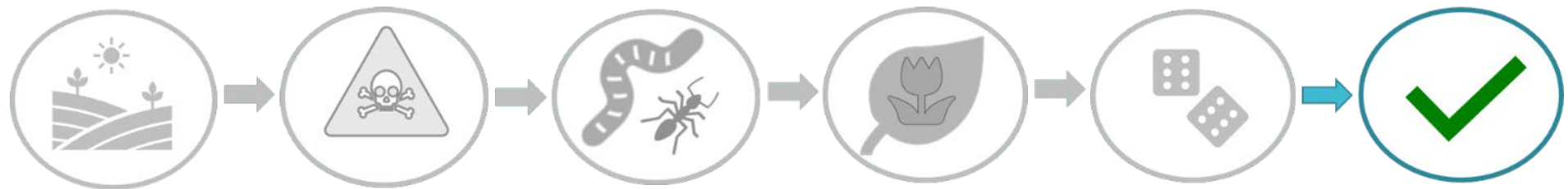
Were You Successful

Time to assess your final cost and time points

Did you reclaim your landscape **within budget** and **on time**

Do you have any communities supporting your project

If you were within budget, on time, and have communities, you were successful, if not, try again





Time To Design Your Own Reclaimed Ecosystem

Thank you

**Learn more at
<https://lrigs.ualberta.ca/>**

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