

Rainwater Basin Wetland Complex



PrOACTS

- Problem
 - Objectives
 - Alternatives
 - Consequences
 - Tradeoffs & Optimization
 - Decide & Take Action
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Goal

- Provide sufficient wetland habitat in the Rainwater Basin Wetland Complex to meet North American Waterfowl Management Plan goals (NAWMP).

Problem Statement

- How to optimally manage publicly-owned wetland habitats with limited resources to meet bio-energetic needs of waterfowl during spring migration.
 - Lack of comprehensive management goals
 - site to regional scale
 - state/federal jurisdiction
 - Lack of explicit & standardized performance measures.
 - Impediments (cross-organizational) to implement management in the field.

Objectives

- **“Ends” Objectives:**
- **Provide 1/3 of energy (2.8 billion kilocalories) on public lands for spring migrating waterfowl.**
- Provide waterfowl hunting opportunities on public land.
- Provide sufficient habitat for migrating shorebirds.
- In the western Rainwater Basins, provide roosting habitat for migrating Whooping Cranes.

Objectives

➤ “Means” Objectives

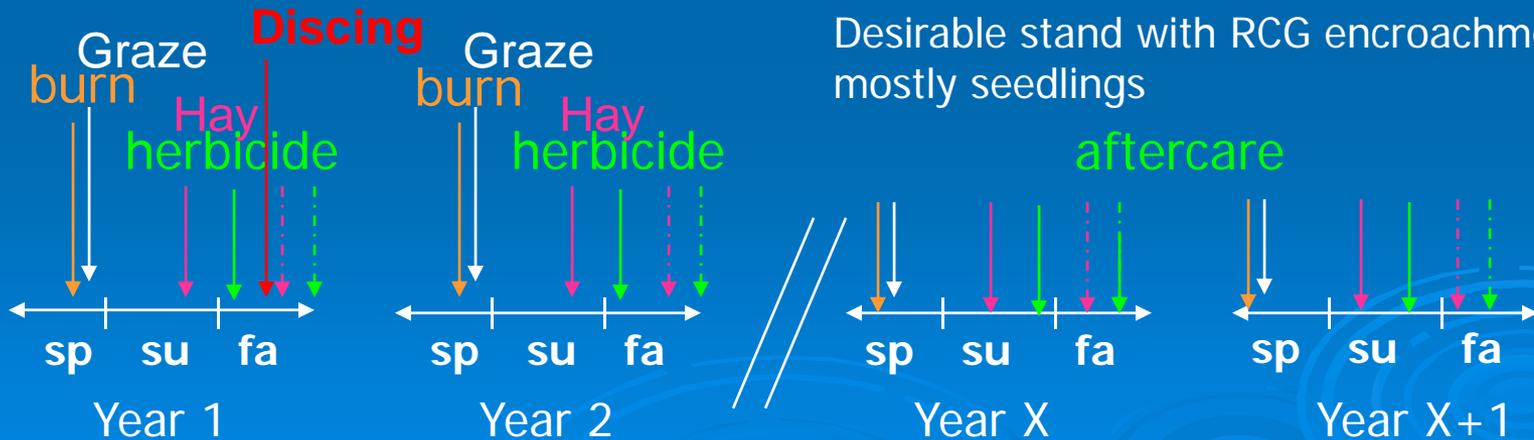
- Provide & maintain 11,800 flooded acres of waterfowl foraging habitat on public lands
- Maintain foraging habitat units at 75% of early successional vegetation
- Maintain 2,200 acres of roosting habitat
- Maintain a spatial distribution/configuration of habitats necessary to mitigate disease, snow goose/duck interactions, and spread out foraging areas
- Restore _ acres of non-functioning wetland habitat
- Acquire and restore _ acres of non-functioning high priority wetland habitat

Necessary shift in management practices to reduce Reed Canarygrass

current paradigm: 1 growing season



proposed paradigm: multiple growing seasons



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Alternatives / "Actions"





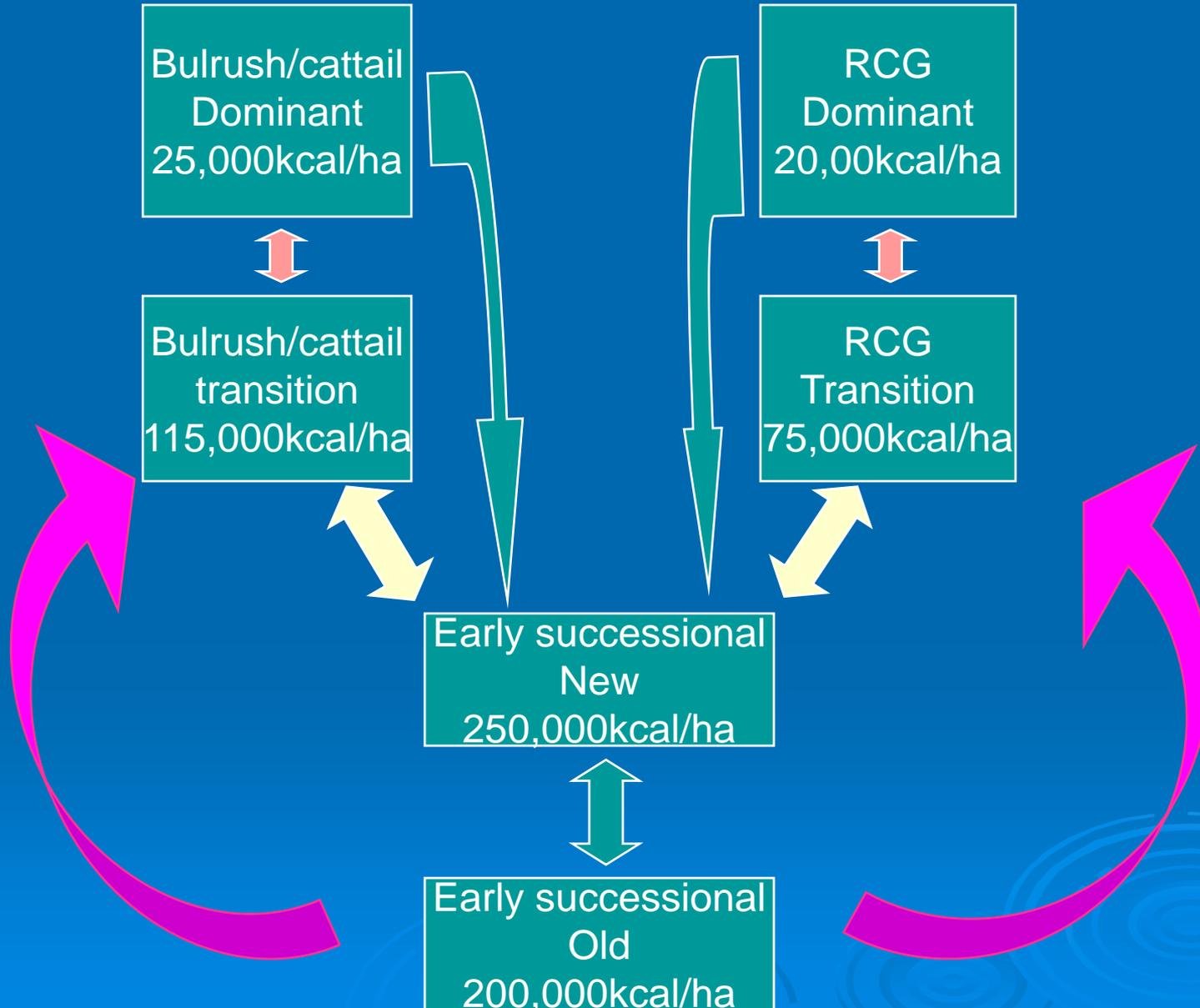
Grazed RCG

Ungrazed RCG

Defining a Framework

State Variables	Definition	Utility
Wetland Vegetative Condition	Percent vegetation composition	Kilo-Calories per Acre
Reed Canarygrass (Dominant)	>75%	20
Bulrush-cattail (Dominant)	>75%	30
Reed Canarygrass (Transitional)	25 – 75%	75
Bulrush-cattail (Transitional)	25 – 75%	115
Early Successional (New)	>75% Annuals	250
Early Successional (Old)	>75% Perennials	200

State Dynamics - RWB Vegetation Transition Model



Reed Canary (D)							Sum		
Action	RG (D)	BC (D)	RG (T)	BC (T)	ES (N)	ES (O)		E(Kcal)	Cost/acre
Grazing (H)	0.8	0	0.2	0	0	0	1	31	+ 90
Grazing (L)	1	0	0	0	0	0	1	20	+ 30
Discing	0	0	0.5	0	0.6	0	1	162.5	-20
Tilling	0	0	0.4	0	0.6	0	1	180	-40
Mowing	1	0	0	0	0	0	1	20	-15
Fire (SP)	1	0	0	0	0	0	1	20	-25
Fire (FA)	1	0	0	0	0	0	1	20	-25
Haying	1	0	0	0	0	0	1	20	+15
Herbicide (G)	0.2	0	0.8	0	0	0	1	64	-25
Herbicide (F)	0.95	0	0.05	0	0	0	1	22.75	-30
Water level mgmt.	1	0	0	0	0	0	1	20	-14
Rest	1	0	0	0	0	0	1	20	0
scraping	0	0	0.1	0	0.9	0	1	232.5	-1250
Fire (SP) / Grazing (H) / Herb (G)	0.1	0	0.8	0	0.1	0	1	87	40
Fire (SP) / Grazing (H)	0.9	0	0.05	0	0.05	0	1	34.25	65
Fire (SP) / Haying / Herb (G)	0.1	0	0.8	0	0.1	0	1	87	-15
Grazing (H) / Herb (G) / Discing	0	0	0.2	0	0.8	0	1	215	45
Grazing (H) / Herb (G)	0.2	0	0.7	0	0.1	0	1	81.5	65
Grazing (H) / Herb (G) / Tilling	0	0	0.1	0	0.9	0	1	232.5	25
Grazing (L) / Herb (G) / Discing	0	0	0.2	0	0.8	0	1	215	-15
Grazing (L) / Herb (G)	0.3	0	0.65	0	0.05	0	1	67.25	5
Grazing (L) / Herb (G) / Tilling	0	0	0.1	0	0.9	0	1	232.5	-35
Discing / Tilling	0	0	0.2	0	0.8	0	1	215	-60
Discing / Water	0	0	0.1	0	0.85	0.05	1	230	-34
Grazing (H) / Herb (G) Water	0	0	0.35	0	0.6	0.05	1	186.25	51

Consequences

Tradeoffs



Optimization

➤ To Be Continued...



Decide & Take Action

- Evaluate Kcal response vs. Cost of actions
- Determine which Alternatives are possible at specific sites or across the entire Rainwater Basin landscape
 - Weather / Environmental
 - Political
 - Legal
 - Staff
 - Money
 - Time
- We now have a comprehensive (across agencies) decision matrix to make the right decision at the right time.
 - We can prioritize actions to achieve desired results while recognizing potential constraints

Questions?



