Technology Transfer Univ. Workshops and Farm Visits/Interviews with Kazakhstan Livestock Farms

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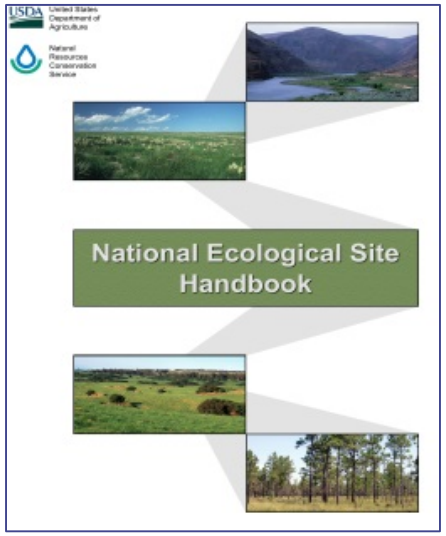
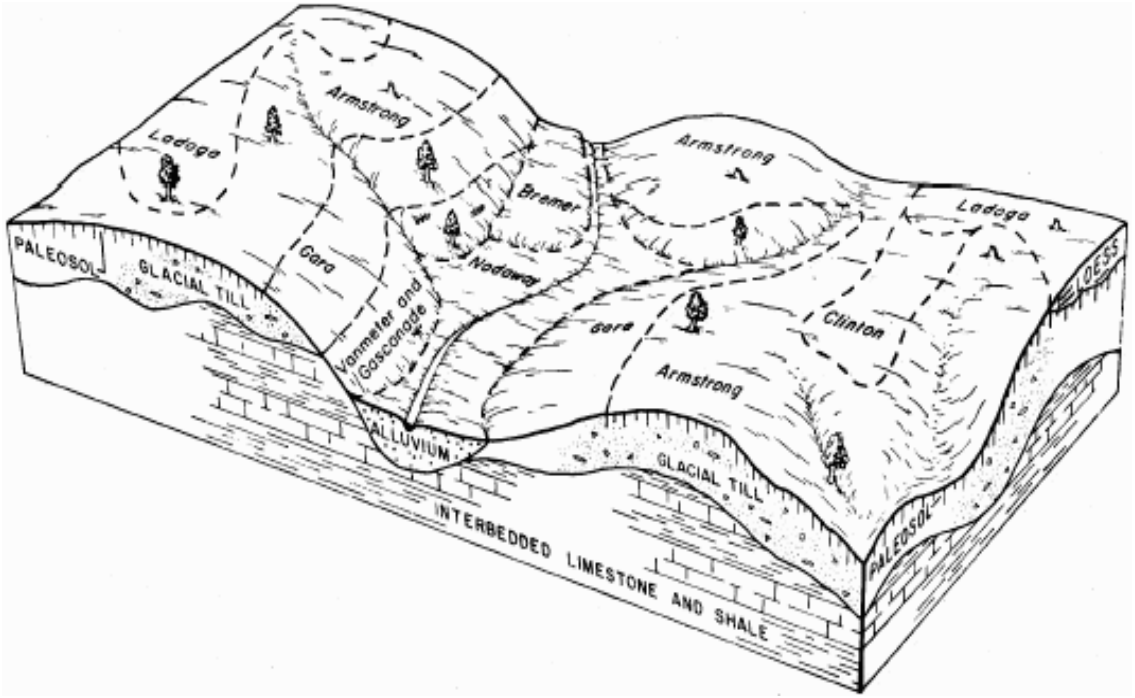
Ecological site concepts

- Soil survey interpretations
- Subdivisions of the landscape
- VEGETATION – production and dynamic behavior
- Soil map units and components delineate ecological sites

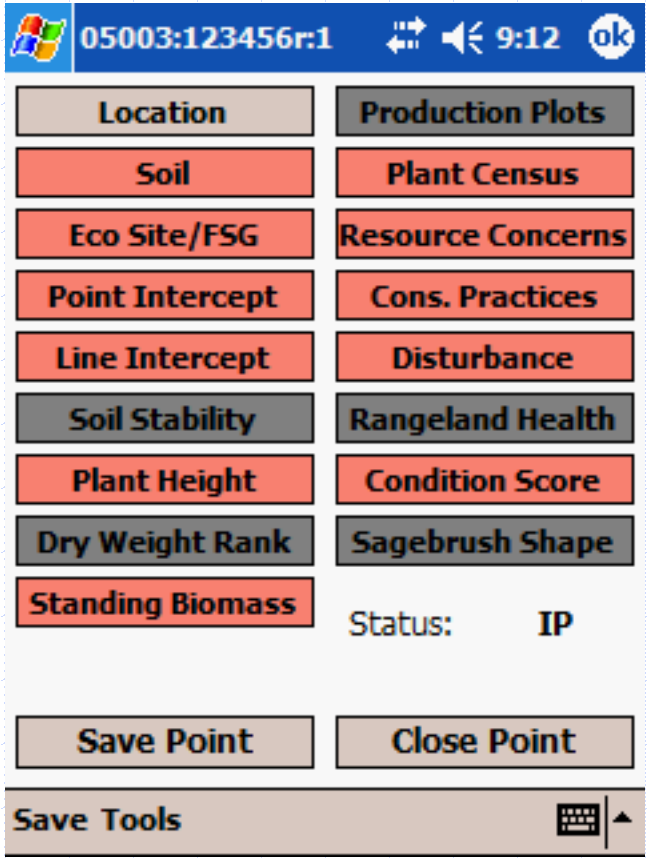


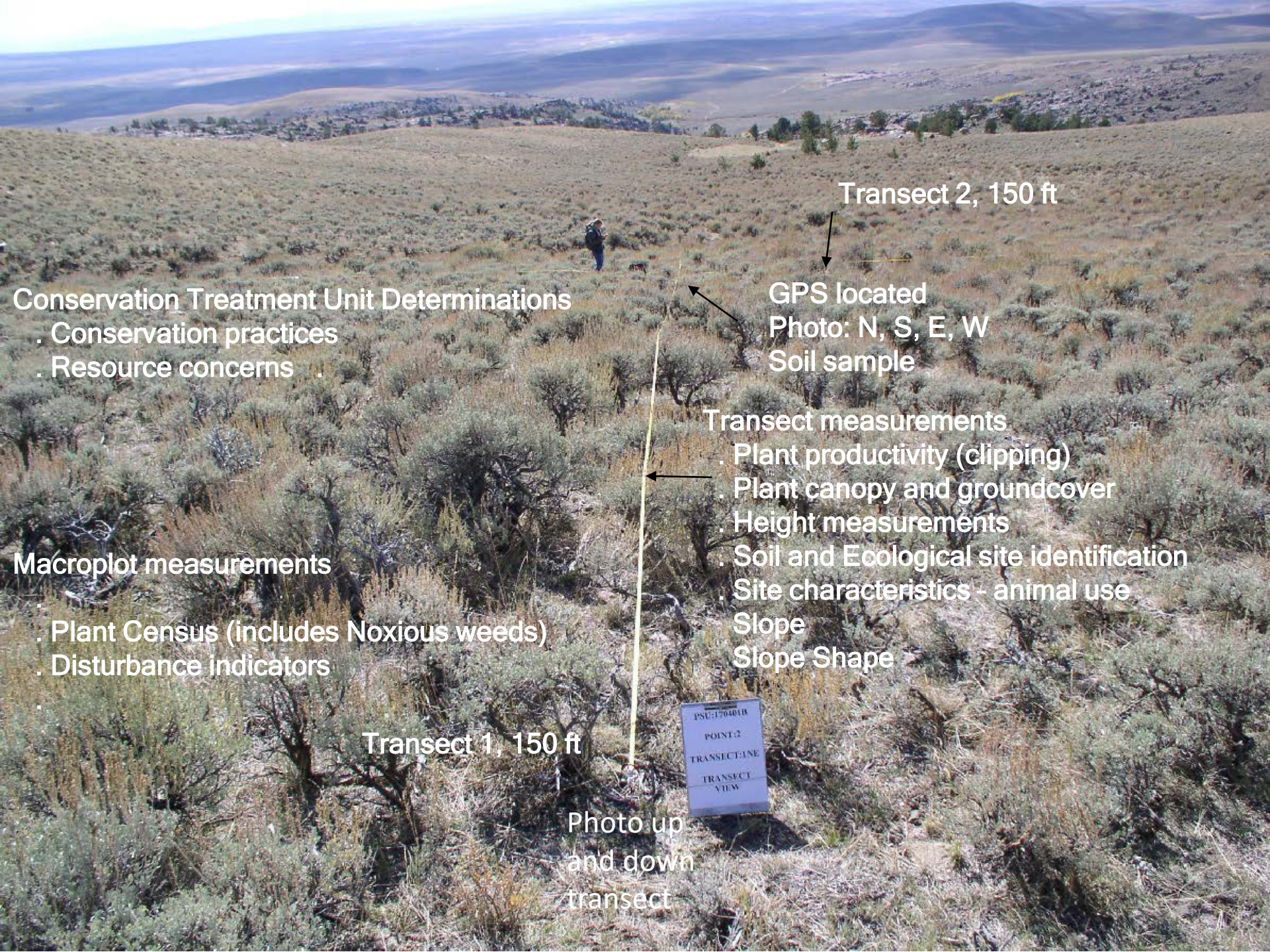


Ecological Sites: Definition

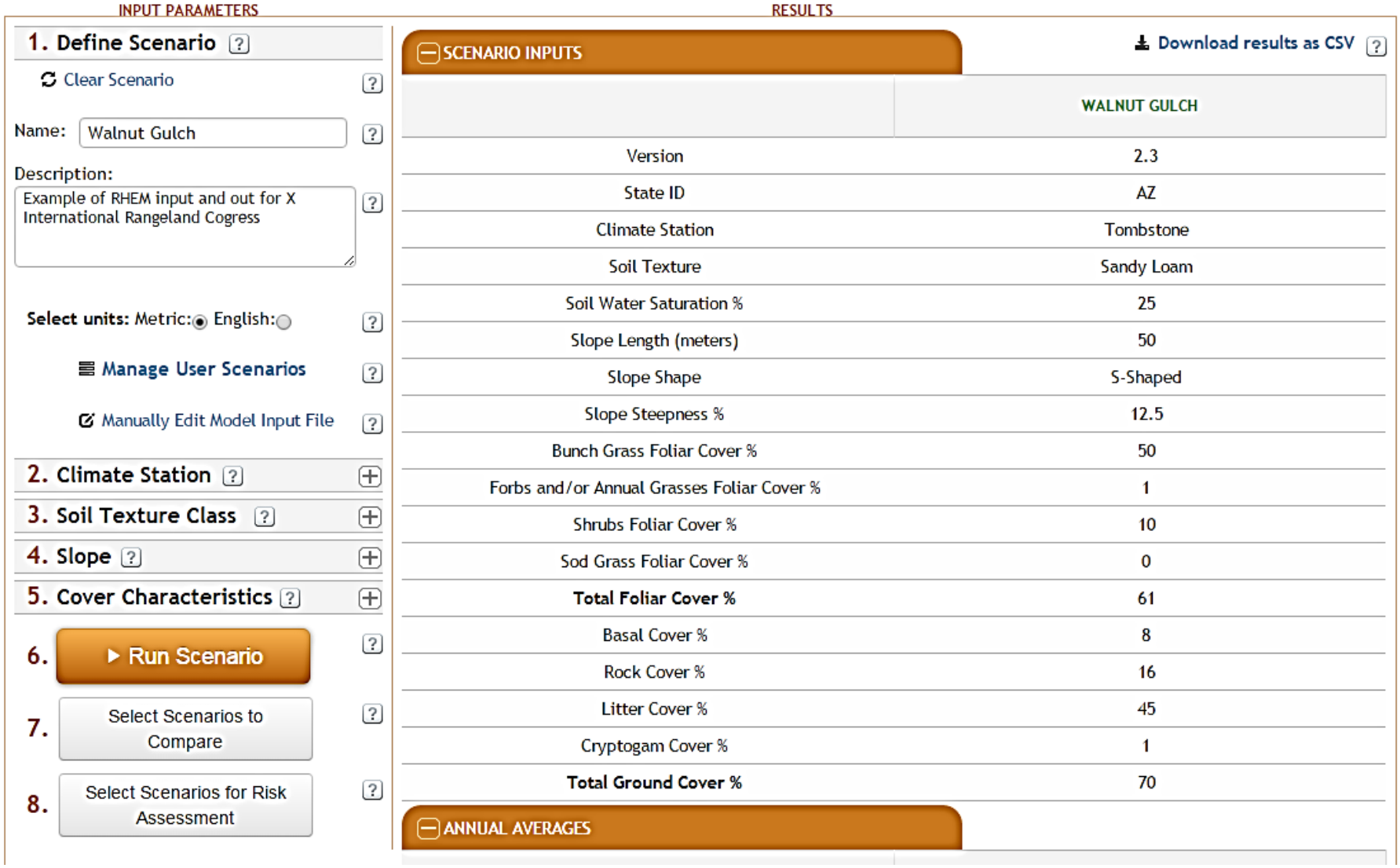
An ecological site is a conceptual classification of the landscape. It is a distinctive land type based on a recurring landform with distinct soils (chemical, physical, and biologic attributes), kinds and amounts of vegetation, hydrology, geology, climatic characteristics, ecological resistance and resiliency, successional dynamics and pathways, natural disturbance regimes, geologic and evolutionary history including herbivore and other animal impacts; and response to particular management actions. These discrete characteristics separate one ecological site from another and are inherent with respect to geological and evolutionary development.

Summary of Rangeland NRI Field Data Collection Pr




Transect 2, 150 ft
Conservation Treatment Unit Determinations
. Conservation practices
. Resource concerns .
GPS located
Photo: N, S, E, W
Soil sample
Transect measurements
. Plant productivity (clipping)
. Plant canopy and groundcover
. Height measurements
. Soil and Ecological site identification
. Site characteristics - animal use
Slope
Slope Shape
Macroplot measurements
.
. Plant Census (includes Noxious weeds)
. Disturbance indicators
.
Transect 1, 150 ft
PSU:170401B
POINT:2
TRANSECT:1NE
TRANSECT VIEW
Photo up and down transect

Rangeland Hydrology and Erosion Model (RHEM) Web Interface



INPUT PARAMETERS

1. Define Scenario
Clear Scenario
Name: Walnut Gulch
Description: Example of RHEM input and out for X International Rangeland Cogress
Select units: Metric: English:
Manage User Scenarios
Manually Edit Model Input File
2. Climate Station
3. Soil Texture Class
4. Slope
5. Cover Characteristics
6. Run Scenario
7. Select Scenarios to Compare
8. Select Scenarios for Risk Assessment

RESULTS

SCENARIO INPUTS

Download results as CSV

	WALNUT GULCH
Version	2.3
State ID	AZ
Climate Station	Tombstone
Soil Texture	Sandy Loam
Soil Water Saturation %	25
Slope Length (meters)	50
Slope Shape	S-Shaped
Slope Steepness %	12.5
Bunch Grass Foliar Cover %	50
Forbs and/or Annual Grasses Foliar Cover %	1
Shrubs Foliar Cover %	10
Sod Grass Foliar Cover %	0
Total Foliar Cover %	61
Basal Cover %	8
Rock Cover %	16
Litter Cover %	45
Cryptogam Cover %	1
Total Ground Cover %	70

ANNUAL AVERAGES

Farm Visits
September 2017

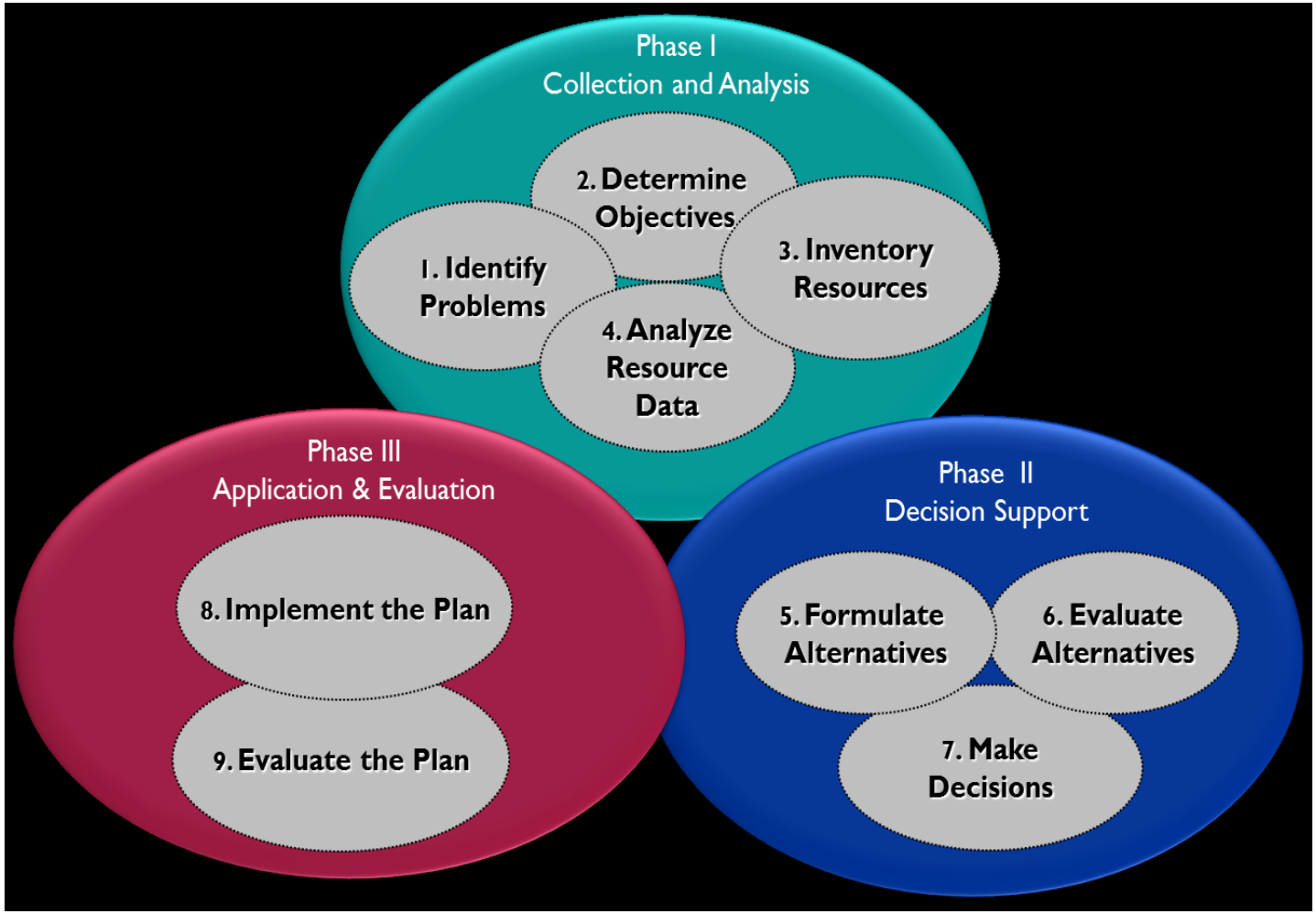
Farm Visit Objectives

- Introduce USDA scientists/land management specialists to the diverse landscape of Kazakhstan
- Provide training to Kazakh team on basic land inventory methods and collect some preliminary data to demonstrate some technologies used in farm conservation and resource management planning
- Interview livestock farms to identify resource needs
- Introduce farm planning ideas to livestock managers
- Prepare reports to interest farm producers to participate in further more detailed conservation and land management plans

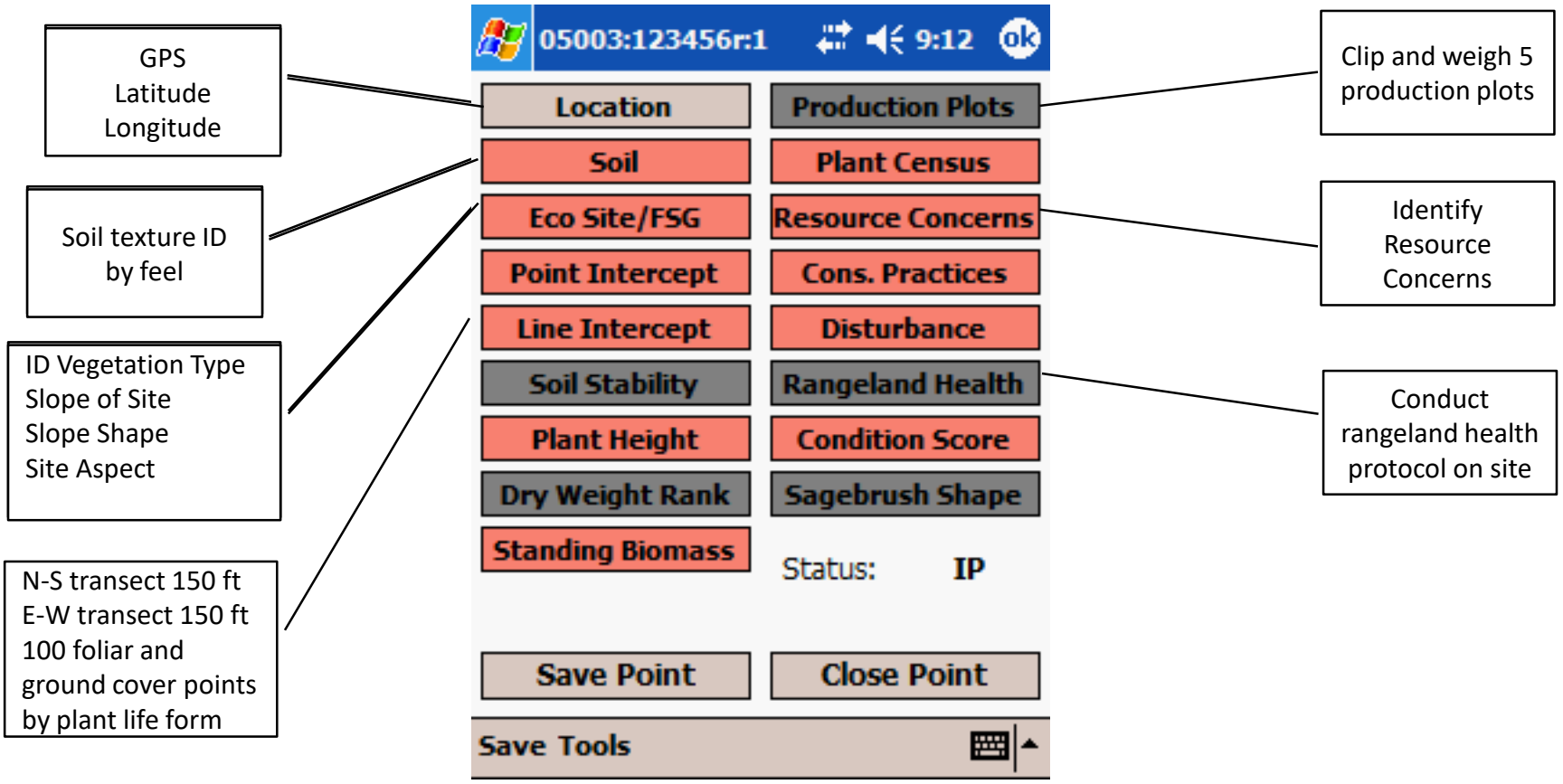
Farm Visit Objectives

The livestock farms have personal management and conservation objectives and goals. One of the Kazakh team objectives was to visit with land managers and share ideas and see if a more detailed conservation planning process used in USA was of interest with local farmers.

The Nine-Step USDA Natural Resources Conservation Service Planning Process



Summary of Field Data Protocols Used on Livestock Farms from USDA Rangeland NRI Field Data Collection Protocols



Use Rangeland Hydrology and Erosion Model to evaluate Hydrologic Function

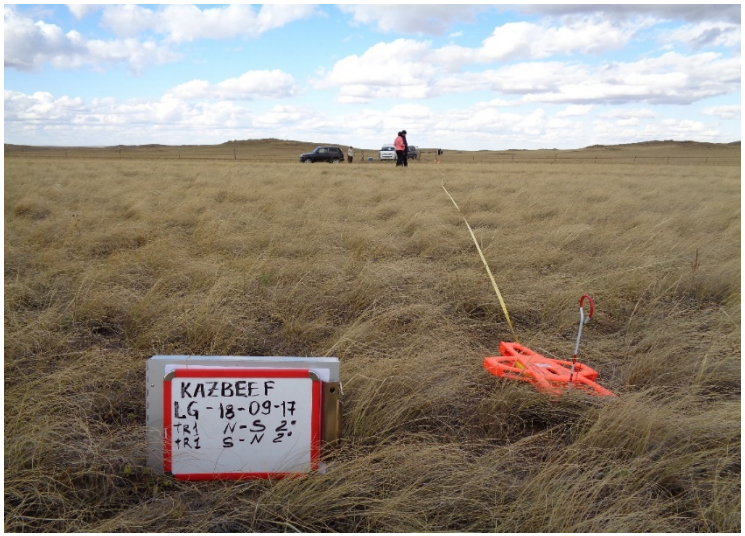
Resource Inventories can provide a baseline for National Conditions (NRI)

Develop comprehensive Farm plan with land operators

Identify Ecological Sites and Soils
Upland Clay Loam
Needlegrass Site
0-5% slopes

Conduct Rangeland Health Protocol
17 indicators as part of farm plan

Kaz Beef, Marmay Village, Akmola Region, 7,000 cattle, 120,000 ha



12/13/2018

Kaz Beef, Marmay Village, Akmola Region, 7,000 cattle, 120,000 ha

Kaz Beef, Marmay Village, Akmola Region, 7,000 cattle, 120,000 ha
Example of Rangeland Hydrology and Erosion Model Report

ANNUAL AVERAGES

	KAZ BEEF ungrazed
Avg. Precipitation (mm/year)	385.850
Avg. Runoff (mm/year)	42.604
Avg. Sediment Yield (tonne/ha/year)	0.652
Avg. Soil Loss (tonne/ha/year)	0.654

RETURN FREQUENCY RESULTS FOR YEARLY VALUES 2-100 yr storm events

Variable	2 yr	5 yr	10 yr	25 yr	50 yr	100 yr
Rain (mm)	33.600	45.200	54.400	68.500	74.200	81.500
Runoff (mm)	14.664	24.730	31.802	41.953	50.004	53.967
Soil Loss (tonne/ha)	0.243	0.438	0.566	0.745	0.969	1.071
Sediment Yield (tonne/ha)	0.242	0.438	0.565	0.745	0.969	1.069

Kaz Beef, Marmay Village, Akmola Region, 7,000 cattle, 120,000 ha
Example of hydrology writeup.

Hydrology and Erosion Notes: About 11% of the total annual precipitation (rainfall) is lost through runoff. This level is what is expected for a needlegrass plant community in good condition. Soil loss rates are sustainable; however, if soil loss was to increase above 0.6 tonne/ha/yr, soil loss rates would begin to exceed that which is sustainable and the site would degrade. Maintaining plant cover above 65% is necessary to protect the site from water erosion. Plant litter cover should also be maintained at levels 15-25%.

Maintain current grazing management at 50% of annual productivity of desirable species.

Aydarly (110,062 ha), Almaty Region, 9-21-2017,
52,000 sheep, 2162 cows, 1375 horses

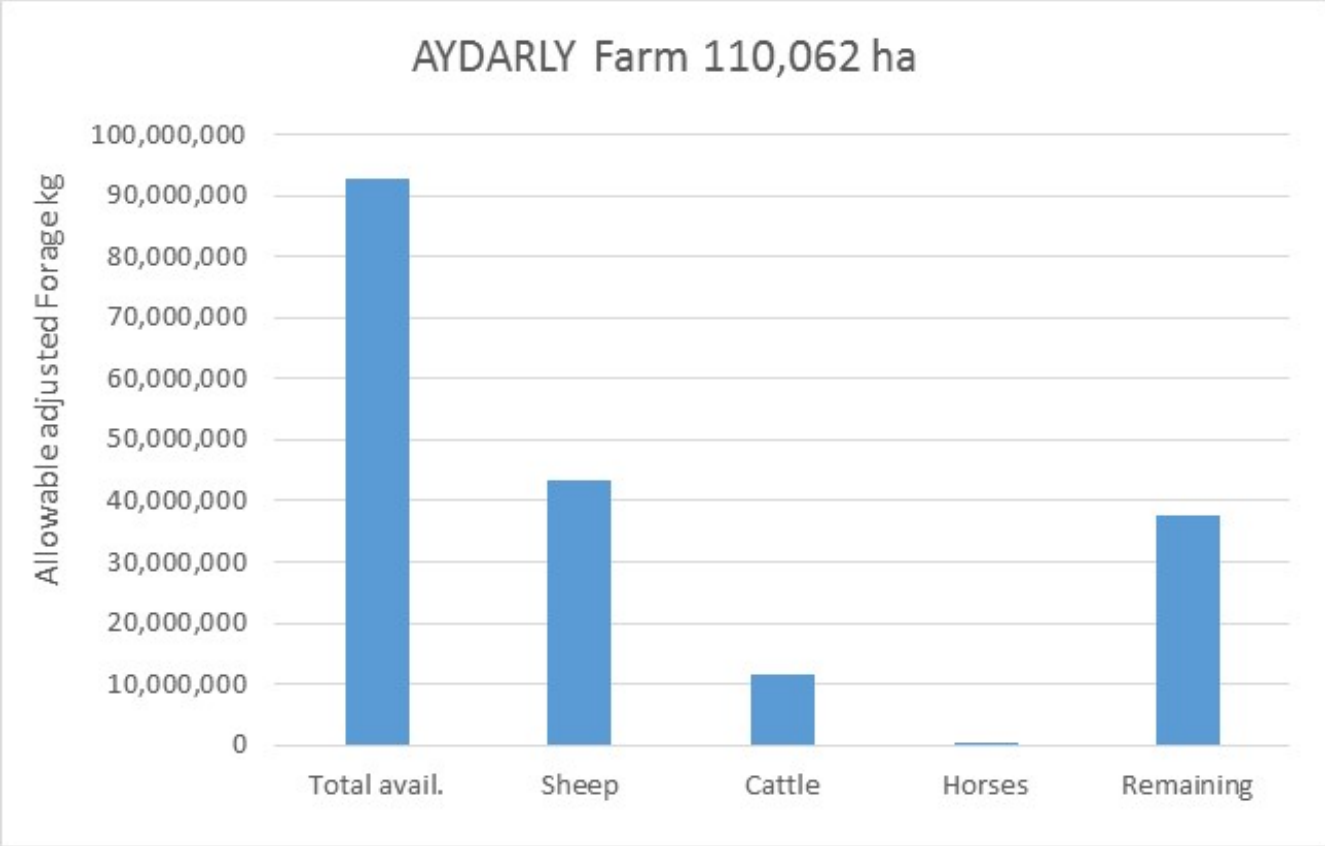
Aydarly (110,062 ha), Almaty Region, 9-21-2017, 52,000 sheep, 2162 cows, 1375 horses

Rangeland Hydrology and Erosion Model Estimates ANNUAL AVERAGES
No Appreciable Soil Loss and Water Runoff on this site

	AYDARLY
Avg. Precipitation (mm/year)	163.330
Avg. Runoff (mm/year)	1.016
Avg. Sediment Yield (tonne/ha/year)	0.016
Avg. Soil Loss (tonne/ha/year)	0.016

Aydarly (110,062 ha), Almaty Region, 9-21-2017, 52,000 sheep, 2162 cows, 1375 horses

Preliminary Forage Estimates for Farm with Existing Livestock



Visit to Shykurkol (AtamekenAgro)
(15,000 ha), North Kazakhstan Region, 3,000 ha, 09-17-2017, 1500 cattle

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Shukyrkol Farm		
	Ungrazed	**Moderately Grazed**
Variables		
Slope (%)	2-4%	2-4%
Slope Shape	Convex	Uniform
GPS LAT	53º 6’ 23”	53.106432
GPS LONG	67º 31’ 11	67.520253
Ann ppt.	350-375 mm/yr	350-375 mm/yr
Soil Texture	Clay loam	Clay loam
Bunchgrass (%)	76%	51%
Per. Forb (%)	0%	2%
Woody Shrub (%)	0%	0%
Ground Litter (%)	35%	35%
Bare Soil (%)	82%	28%
Rock (%)	0%	0%
Biomass kg/ha	1,209.6	896 remaining
Potential Use of Forage	50%	50%
Efficiency Factor	10%	10%
Recommended Bio to Graze kg/ha	544.3	About 26% grazed, could graze to 544.3 kg/ha (see ungrazed production estimate)
Forage Requirement Cow 498 kg/6 mo old calf kg/month and yr.	449.1 kg per month 5388.7 kg per yr	449.1 kg per month 5388.7 kg per yr.
Estimated ha needed for cow 498 kg/calf/month	0.8 ha per month or 1.2 cow Animal Units per month	0.8 ha per month or 1.2 cow Animal Units per month

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