

Instructions for MT-ECS-3 Developing an Initial Rangeland Stocking Rate for EQIP Contracting

Data support and documentation are an integral part of conservation planning and contracting, but sometimes the opportunity does not exist to go to the field and collect data prior to contract development. Supporting documentation is still needed in a conservation plan, thus creating a need for a documentation procedure. The following instructions will guide the planner through the process of how to estimate initial stocking rates and AUMs for a landowner until actual field data can be collected. Please note that this method does not alleviate the potential for other resource concerns to be present that must be addressed in the conservation plan and EQIP contract.

This method serves as an INITIAL assessment and cannot be used as a stand-alone method for developing grazing system carrying capacities. The MT-ECS-3 does NOT replace the need to go to the field when conditions are suitable to conduct an actual grazing land inventory and then re-assess the initial stocking rate recommendation and grazing plan developed with the producer.

Step 1: Preliminary Information

The planner should have general information about the producer, such as location of grazing lands, current herd type and numbers, grazing rotation, length of grazing season, location of watering facilities, etc. This initial information will be needed later on in the process.

Step 2: Locating the ECS-3 Form for Your County

- a. Open Internet Explorer and navigate to:
<http://www.mt.nrcs.usda.gov/technical/ecs/range/forms.html>.
- b. Scroll down to the form titled "Summary of Initial Stocking Rates" and click "MT-ECS-3 Forms".
- c. Click on the MT-ECS-3 Excel file for your county of interest to open an active MT-ECS-3 document.
- d. Save the document to your computer.

Step 3: Using ArcGIS to Locate Rangeland Fields

- e. Verify with the Area Resource Soil Scientist that the most current soils data resides on your Field Office Server (F:geodata\soils).
- f. Open Toolkit.
- g. Add the soil layer if it is not in the project.
- h. Add existing Planned Land Unit (PLU) or create new PLU.
- i. You may wish to split polygons by fence lines for the range unit.
- j. Select all the range units, or an individual range unit to assess.
- k. Using the Soil Map and Inventory Tool, clip the soils map to the range units. In the Soils Inventory report Options, check only MU symbol and MU acres. Do not check any other options.
- l. Print and/or save the Soils Inventory Report.
- m. Keep the Soils Inventory Report window open.

Step 4: Creating Report from Area of Interest

- a. Select Soil Inventory Report window. Highlight Columns in Soil Inventory Report. Select copy.

- b. Open a blank Excel spreadsheet window. Paste selection from Soil Inventory Report into new Excel spreadsheet. Highlight the spreadsheet and sort by the map unit symbol in ascending order.
- c. Open the Excel MT-ECS-3 spreadsheet developed for your county that you saved to your computer.
- d. Highlight sorted data (values only, not column headings) from new Excel spreadsheet and paste into first two Columns of your county's MT-ECS-3 Excel spreadsheet. The data should be entered at Cell A:31 just under the "musym" heading in Part II: Rangeland Inventory section.
- e. The remainder of the Columns in Part II of the MT-ECS-3 spreadsheet will be automatically calculated.
- f. The other two spreadsheets, Soil Inventory Report and new excel spreadsheet can be closed at this point.

The "Adjusted lbs/ac" Column in Part II of the MT-ECS-3 form is provided to account for sites within the pasture that may be more or less productive than the key indicates. These must be field inventoried to make adjustments. For example: There is a 76-acre piece of pubescent wheatgrass in the 1,410-acre range unit. The AUM/acre may indicate 0.14, but due to the pubescent wheatgrass the site may be 0.21 AUM/acre. The "adjusted lbs/ac" would be changed to 1.5 times the AUM/acre instead of 1. Note: As a rule of thumb, standard rangeland AUM/acre figures derived from the county AUM tables can be multiplied by 1.5 to account for increased productivity on grazing lands that are seeded and managed as tame pasture.

Carrying capacity data is automatically calculated using the county profile shown on the right side of each specific county MT-ECS-3 spreadsheet. This data is available through the web site, <http://www.mt.nrcs.usda.gov/technical/ecs/range/aum/> and used to create these worksheets. The values for the "Range_AUM" are actual AUM/acre figures calculated using the low production value (lbs/ac) from soil survey data related to each soil type (musym = soil map unit symbol). The harvest efficiency used in the calculation was 25%. The forage consumption by 1 AUM was 915 lbs. For example: 1,000 lbs. production for a site would compute to 0.27 AUM/acre, i.e., $(1,000 \times .25)/915 = 0.27$.

Step 5: Recording Historical Grazing Information and Calculating Historical Stocking Rates

This section provides an area to document the current/most recent stocking situation for the grazing unit.

- a. Return to the top of your county's Excel spreadsheet and complete Part I.
- b. Total grazed acres: enter number for entire range unit (this figure should be the same as the number generated from Part II in Cell C27).
- c. Total number of grazing animals: enter number of animals currently scheduled to graze the grazing unit.
- d. Kind(s) of animal grazing: specify livestock class and age (i.e., cow/calf pairs, yearlings, mature bulls, ewes/lambs, etc.).
- e. Average weights of animal classes: enter the average weight of the livestock class(es).
- f. Animal unit equivalent: manually calculate and enter animal unit equivalent for grazing animals in grazing unit (Example: 1,000 lbs. cow+calf = 1.0 AU; 1,200 lbs. cow+calf = 1.2 AU; 1 ewe+lamb = 0.17 AU, etc.).
- g. Total days animals are grazing on all acres: enter how many days the above numbers of livestock are in the grazing unit.
- h. Total animal units: this will be automatically generated (number of animals X animal unit equivalent). (Ex: 300 cow/calf pairs weigh 1,200 lbs. = $300 \times 1.2 = 360$ AU.)

- i. Calculated AUM/acre based on historical information: this will be automatically generated after all information above is provided. This is calculated as:
(total animal units/total grazed acres) x (total days grazed/30).

Step 6: Interpret and Compare Results

The resulting AUM/acre figure based on historical information in Part I and calculated AUM/acre from the range inventory in Part II are compared on the “% Difference” line in Cell F29 of Part II. If this figure is 100%, the historical AUM/acre and calculated AUM/acre values are identical. Values above 100 indicate the % historical grazing use above the carrying capacity calculated by the range inventory in Part II.

In the example, it was estimated in Part II: Rangeland Inventory that 300 head of cow/calf pairs could graze the unit for 0.86 months, or 26 days. Since $300 \text{ head} \times 1.2 \text{ AUE} = 360 \text{ AU}$, then $308 \text{ AUMs} / 360 \text{ AU} = 0.86 \text{ months}$, and $0.86 \text{ months} \times 30 \text{ days} = 26 \text{ days}$. This is almost the same as the 25 days the pairs are currently in the grazing unit. The historical AUM/acre calculation arrives at 0.21 AUMs/acre, which is lower (under stocked) than the average estimated value of 0.22 AUMs/acre in the rangeland inventory. Currently, the example producer is grazing the pairs for a period similar to, but slightly shorter time, than what is estimated the grazing unit can handle for that number of cattle. This comparison of AUM/acre figures should indicate to the planner that current stocking rates are near the recommended level. Evaluations may need to be made to adjust numbers or length of days in the grazing plan. The planner should consider that in some cases, the producer may possibly be stocking low to account for steep slopes and inaccessibility. When the calculated rangeland inventory stocking rates are near the historical stocking rates (for instance, even within 0.05 AUM/acre) the planner should still be cautious in using this data for exact figures. That is why these figures should only be used as an initial guide, not treated as final numbers for the conservation plan or contract development without supporting information.

Further investigation and field work is required to complete resource inventories, evaluate existing resource conditions, develop accurate rangeland or pasture forage inventories, implement or continue monitoring, and collect any other pertinent information to develop the prescribed grazing plan.

Important for EQIP Planning Purposes: If the difference between historical AUM/acre figures and the AUM/acre value (“% Difference” calculation) calculated from the range inventory is greater than 120% (20% higher of the initial recommended stocking rate), further inventory, analysis, and documentation is needed before NRCS enters into an EQIP contract with the producer. The MT-ECS-3 only provides an initial way to document grazing situations in conservation planning and contract development until information can be collected from the field.

The following pages contain an example of a completed MT-ECS-3 form, and all the documentation (maps and tables) that accompany the completed MT-ECS-3. These items are required documentation and will be kept in the producer’s conservation plan case file and in Customer Service Toolkit. Only the first page of the MT-ECS-3 form needs to be printed and placed in the producer’s case file.

Example Worksheet: Summary of Initial Stocking Rates

Part I: Historical Stocking Rate Information:

This information is provided by the rancher and used as a comparison to NRCS initial stocking rate values.

Total grazed acres: Total number of grazing animals on acres:

Kind(s) of animal grazing: (cow/calf, stockers, sheep, etc.)

Average weights of animal classes: lbs

Animal Unit equivalents:
 (AU equivalent is 1,000 lb cow+calf = 1.0; 1200 lb cow+calf = 1.2; etc)
 (AU equivalent is 1 sheep+ lamb = 0.17; yearling cattle = 0.6; mature horse = 1.2)

Total days animals are grazing on all acres: days

Total Animal Units (# animals * AU equivalent): AU's

Calculated AUM/acre based on historical information: AUM/ac
 (total animal units / total grazed acres) x (total days grazed / 30)

Part II: Rangeland Inventory

Soil Map units 25, 39, and 40 were spot checked and found much less prod.

Soil Map unit was dominated by Pubescent wheatgrass and adjusted by 1.5

Calculated acres Total AUM's

Calculated AUM/ac from range inventory

% DIFFERENCE

musym	acres	lbs/ac	AUMs/ac	Adjusted lbs/ac	AUMs_calc	AUMs_calc adj. for yr
14	0.2	1610	0.44	1	0.09	0.09
16	65.9	1318	0.36	1	23.72	23.72
25	39.8	695	0.19	0.85	7.56	6.43
26	22.8	366	0.10	1	2.28	2.28
29	28	842	0.23	1	6.44	6.44
37	87.6	988	0.27	1	23.65	23.65
39	111.1	878	0.24	0.65	26.66	17.33
40	159.5	915	0.25	0.5	39.88	19.94
44	8.2	1318	0.36	1	2.95	2.95
45	49.5	1501	0.41	1	20.30	20.30
50	32.6	805	0.22	1	7.17	7.17
51	82.7	659	0.18	1	14.89	14.89
68	76.5	512	0.14	1.5	10.71	16.07
70	63.1	439	0.12	1	7.57	7.57
112	6.4	1098	0.30	1	1.92	1.92
123	21.2	915	0.25	1	5.30	5.30
124	9.3	1208	0.33	1	3.07	3.07
126	30.6	988	0.27	1	8.26	8.26
127	50	1098	0.30	1	15.00	15.00
141	6.9	988	0.27	1	1.86	1.86
144	92.1	732	0.20	1	18.42	18.42
146	63.3	732	0.20	1	12.66	12.66
149	10.3	805	0.22	1	2.27	2.27
150	3.3	805	0.22	1	0.73	0.73
151	126.6	878	0.24	1	30.38	30.38
168	0	988	0.27	1	0.00	0.00
169	8.4	988	0.27	1	2.27	2.27
172	154.7	878	0.24	1	37.13	37.13

MT055-McCone County		
mukey	musym	Range_AUM
344293	1	0.11
344380	2	0.11
344391	3	0.11
344402	4	0.30
344413	5	0.22
344424	6	0.55
344435	7	0.02
344446	8	0.33
344457	9	0.25
344294	10	0.25
344305	11	0.19
344316	12	0.05
344327	13	0.52
344338	14	0.44
344349	15	0.44
344360	16	0.36
344371	17	0.55
344378	18	0.33
344379	19	0.33
344381	20	0.19
344382	21	0.32
344383	22	0.28
344384	23	0.20
344385	24	0.38
344386	25	0.19
344387	26	0.10
344388	27	0.18
344389	28	0.17

Example:

1. Record Historical Data

- Historical data gathered from operator needs to be recorded.
- Data will automatically be generated for AU's and AUM/acre.
- Results for AUM needed = 1,410 acres at 0.21 AUM/acre or, 300 AUM's.

2. Record Rangeland Inventory

- Data input from Soil Inventory Report.
- Data will be automatically generated for acres, AUM's, and AUM/acre.
- Results for AUM needed = 1,410 acres at .22 AUM/acre or, 308 AUM's.

3. Compare Results and Make Determinations

- Compare Available (308 AUM or .22AUM/acre) to Needed (300 AUM or .21 AUM/acre).
- The "% Difference" figure calculated is 97.4%. Estimated forage supplied is very close to the amount needed.
- How much forage is available for what the rancher's needs are?
- If the difference between historical AUMs/acre and estimated available AUMs/acre is greater than 20% ("% Difference" value is greater than 120%), concerns of overstocking, reduction of days grazing, or other factors should be addressed with the applicant before submitting the EQIP application.

Example of Soils Map Generated to Determine Soil Mapping Units and Acres

Soils Map

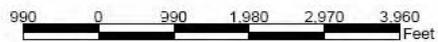


Legend

dataviewr	362D	470D	860D
data	407A	512D	860E
<all other values>	452E	52C	870E
musym	46C	52D	970F
163C	48D	770F	988F



Image: ortho1-1_mf031.sid



**Example of Soils Inventory Report Created to Obtain Soil Map Units and Acres of
Each Map Unit within Grazing Units**

Soils Inventory Report Page 1 of 1

Soils Inventory Report

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Map Unit Symbol	Acres	Percent
163C	20.8	1%
362D	54.5	3%
407A	0.2	0%
452E	15.4	1%
46C	4.7	0%
46D	24.8	1%
470D	723	35%
512D	5.6	0%
52C	35.6	2%
52D	170	8%
770F	178.2	9%
860D	1.7	0%
860E	1.1	0%
870E	674.6	32%
970F	139.5	7%
988F	34.3	2%
Total:	2084	