

Crosswalk of Content in Native Prairie Adaptive Management Monitoring Protocols

Keith Hamilton and Marissa Edwards

This document shows where instructions for conducting the monitoring portion of the Native Prairie Adaptive Management (NPAM) projects in Regions 3 and 6 of the US Fish and Wildlife Service are located within the USGS sponsored document:

Gannon, J.J., Shaffer, T.L., Moore, C.T., 2013, Native Prairie Adaptive Management: A Multi Region Adaptive Approach to Invasive Plant Management on Fish and Wildlife Service Owned Native Prairies: U.S. Geological Survey [Open File Report 2013-1279](#), 184 p. with appendixes.

The structure of the US Fish and Wildlife Service protocol follows the National Wildlife Refuge System [Survey Protocol Handbook](#) and [Template](#). Cross referencing the content in the two documents is intended to aid the [Quick Review process](#) used by NWRS Inventory and Monitoring Staff and subsequently development of any required site-specific guidance for monitoring at a particular NWRS station.

Narrative

Element 1: Introduction

Gannon *et al.* 2013/Executive Summary/Pages 2-4
Gannon *et al.* 2013/4.1 Bounding the Problem/Pages 10-11
Gannon *et al.* 2013/ 8.0 Conclusions/Pages 78-79

Background

Gannon *et al.* 2013/1.0 Introduction/Pages 4-6
Gannon *et al.* 2013/3.0 Adaptive Management Decision Support Framework/Pages 9-10
NPAM Protocol Notebook/Appendix A, NPAM Project Record/Pages 41-44
NPAM Protocol Notebook/Appendix B, Treatment Motivations/Pages 45-49

Objectives

Gannon *et al.* 2013/4.2.1 General Statement/Page 11
“After thorough discussion, the group decided that the principal concern is to restore and maintain native cover and they developed the consensus management-objective statement to increase the composition of native grasses and forbs on native sod while minimizing cost (digital appendix 1).”

Gannon *et al.* 2013/4.2.2 Utility/Page 11-15 (Appendix 1a materials in Gannon *et al.* 2013/Page 82-84)

NPAM Protocol Notebook/Appendix B, Treatment Motivations/Pages 45-49

Element 2: Sampling Design

Sample design

Gannon *et al.* 2013/3.0 Adaptive Management Decision Support Framework/Pages 9-10

Sampling units, sample frame, and target universe

NPAM Protocol Notebook/1.1.3, General Design-Organization and Administration-Definitions/Pages 6-8

Sample selection and size

NPAM Protocol Notebook/1.1.5, General Design-Organization and Administration-Criteria for Participating/Withdrawing/Pages 11-13

NPAM Protocol Notebook/2.1.3, Setup Activities-Management Unit Description and Shapefile Development-Management Unit Questionnaire/Pages 19-20

Survey timing and schedule

NPAM Protocol Notebook/3.1, Recurrent Activities-Annual Timeline/Page 24

Sources of error

Element 3: Field Methods and Processing of Collected Materials

Pre-survey logistics and preparation

Grass Utilization Cheat Sheet//Table 1/Page 6

NPAM Protocol Notebook/2.1, Setup Activities-Management Unit Description and Shapefile Development/Page 17.

NPAM Protocol Notebook/2.1.1, Setup Activities-Management Unit Description and Shapefile Development-Entering a Management Unit in GIS/Pages 17-18.

NPAM Protocol Notebook/2.1.2, Setup Activities-Management Unit Description and Shapefile Development-Measuring and Recording Management Unit Characteristics/Pages 18-19.

NPAM Protocol Notebook/2.5, Setup Activities-Preparation/Consideration of a Management Unit for Treatment/ Page 23.

Establishment sampling units

Gannon *et al.* 2013/2.0 Study Area/Pages 6-8
Grass Utilization Cheat Sheet//Table 1/Page 6
NPAM Protocol Notebook/2.2, Setup Activities-Generating Transects/Pages 20-21

Data collection procedures (field, lab)

NPAM Protocol Notebook/2.3, Setup Activities-Transect Characteristics/Pages 21-22
NPAM Protocol Notebook/3.3.1, Recurrent Activities-Monitoring-Vegetation/Pages 27-29
NPAM Protocol Notebook/3.3.3, Recurrent Activities-Monitoring-Station-Level Phenology/Pages 34-35
NPAM Protocol Notebook/Appendix K, Phenology User Guide/Pages 127-135
Slope & Aspect Data Collection- Native Prairie Adaptive Management Project/Page 1

Processing of collected materials

Gannon *et al.* 2013/4.4.1 Vegetation State/Pages 21-22 (Appendix 1a materials in Gannon *et al.* 2013/Page 82-84)
Gannon *et al.* 2013/4.4.2 Defoliation State/Page 22
Gannon *et al.* 2013/ 4.4.3 Full System State Structure/Page 30

End-of-season procedures

Element 4: Data Management and Analysis

Data entry, verification, and editing

Gannon *et al.* 2013/ 5.3 Annual Data Processing Steps/Pages 64-65
NPAM Database User Guide, Overview/ Page 3
NPAM Database User Guide, NPAM SharePoint Site/ Page 4
NPAM Protocol Notebook/2.4, Setup Activities-Database Population/Page 22
NPAM Protocol Notebook/3.4, Recurrent Activities-Data Entry and Checking/Pages 35-36
NPAM Protocol Notebook/Appendix C, Native Prairie Adaptive Management Monitoring/Pages 50-53

Metadata

NPAM Database User Guide, NPAM Main Menu/ Page 5.
NPAM Database User Guide, Enter/Edit Observers/ Pages 5-6.
NPAM Database User Guide, Enter/Edit Treatment Data/ Pages 6-15.
NPAM Database User Guide, Enter Additional Special Treatments/ Page 16.
NPAM Database User Guide, Enter/Edit Transect Monitoring Data/ Pages 16-19.
NPAM Database User Guide, Enter/Edit Response to Actions/ Page 19.

NPAM Database User Guide, Cooperator Summary Datasheets/ Page 20.
NPAM Protocol Notebook/ 3.3.2, Recurrent Activities-Monitoring-Management Actions/ Pages 29-34.
NPAM Protocol Notebook/3.5, Recurrent Activities-Database Close-out Processing/Pages 36-38.
NPAM Protocol Notebook/Appendix C, Native Prairie Adaptive Management Monitoring/Pages 54-66.

Data security and archiving

Gannon *et al.* 2013/4.12 Database/Pages 61-62

Analysis methods

Gannon *et al.* 2013/4.4.1 Vegetation State/Pages 21-22 (Appendix 1a materials in Gannon *et al.* 2013/Page 82-84)

Gannon *et al.* 2013/4.4.2 Defoliation State/Page 22

Gannon *et al.* 2013/ 4.4.3 Full System State Structure/Page 30

NPAM Protocol Notebook/3.5, Recurrent Activities-Database Close-out Processing/Pages 36-38

Software

Element 5: Reporting

Implications and application

Objectives and Methods—

Summary of Results—

NPAM Protocol Notebook/3.5, Recurrent Activities-Database Close-out Processing/Pages 36-38

Important Findings—

Reporting schedule

Report distribution

Element 6: Personnel Requirements and Training

Gannon *et al.* 2013/ 7.1 NPAM Advisory Team/Page 74-75

Roles and responsibilities

Gannon *et al.* 2013/4.11 Administration/Page 60-61
NPAM Protocol Notebook/1.1.2, General Design-Organization and Administration-Roles and Responsibilities/Pages 2-5

Qualifications

NPAM Protocol Notebook/3.2, Recurrent Activities-Planning Activities/Pages 25-26

Training

NPAM Protocol Notebook/3.2, Recurrent Activities-Planning Activities/Pages 25-26

Element 7: Operational Requirements

Budget

Staff time

Schedule

NPAM Protocol Notebook/3.1, Recurrent Activities-Annual Timeline/Page 24

Coordination

NPAM Protocol Notebook/1.1.2, General Design-Organization and Administration-Roles and Responsibilities/Pages 2-5

Element 8: References

Gannon *et al.* 2013/ 8.0 References Cited /Pages 79-80

Standard Operating Procedures (SOP)

SOP : Utility: Calculating/Quantifying and Interpreting

Gannon, J.J., et al/4.2.2 Utility/Pages 11-15 (Appendix 1a materials in Gannon *et al.* 2013/Page 82-84)

Gannon, J.J., et al/4.2.3 Objective Function/Pages 15-16

SOP: Additional Background Information

Gannon *et al.* 2013/ 4.3.2 Final Prototype: Alternative Management Actions by Grass Type/Pages 16-21

SOP: Defoliation Index

Gannon *et al.* 2013/ 4.4.2.1 Years Since Last Defoliation/ Pages 22-23

Gannon *et al.* 2013/ 4.4.2.2 Defoliation Index/ Pages 23-29

Gannon *et al.* 2013/ 4.4.2.3 Combination of Classified Years Since Defoliation and Defoliation Index Level/Page 29

SOP: Transition Probability Model (*Necessary? Element 4 material? Useful for analyzing survey results/data; purpose of conducting surveys*)

Gannon *et al.* 2013/4.5.1 Vegetation Model/Page 30

Gannon *et al.* 2013/ 4.5.1.1 General Structure/Page 30-33

Gannon *et al.* 2013/ 4.5.1.2 Model Parameterization /Page 33-36

Gannon *et al.* 2013/ 4.5.1.3 Model Prediction/Page 36

Gannon *et al.* 2013/ 4.5.2 Defoliation Model/Page 36-37

Gannon *et al.* 2013/ 4.5.3 Synthesis of the Vegetation and Defoliation Models/Page 38

SOP: Management Units

NPAM Protocol Notebook/2.1.2, Setup Activities-Management Unit Description and Shapefile Development-Measuring and Recording Management Unit Characteristics/Pages 18-19

NPAM Protocol Notebook/2.1.3, Setup Activities-Management Unit Description and Shapefile Development-Management Unit Questionnaire/Pages 19-20

NPAM Protocol Notebook/Appendix D, Management Unit Questionnaire/Pages 75-77

SOP: Data Collection Procedures

NPAM Protocol Notebook/3.3.1, Recurrent Activities-Monitoring-Vegetation/Pages 27-29

NPAM Protocol Notebook/3.3.3, Recurrent Activities-Monitoring-Station-Level Phenology/Pages 34-35

SOP: Data Management and Analysis

NPAM Database User Guide, Enter/Edit Observers/ Pages 5-6

NPAM Database User Guide, Enter/Edit Treatment Data/ Pages 6-15

NPAM Database User Guide, Enter Additional Special Treatments/ Page 16

NPAM Database User Guide, Enter/Edit Transect Monitoring Data/ Pages 16-19

NPAM Database User Guide, Enter/Edit Response to Actions/ Page 19

NPAM Database User Guide, Cooperator Summary Datasheets/ Page 20

NPAM Protocol Notebook/ 3.3.2, Recurrent Activities-Monitoring-Management Actions/ Pages 29-34

Supplemental Materials (SM)

SM: Supporting Documents

NPAM Protocol Notebook/Appendix E, Belt Transect Method/Pages 78-84

NPAM Protocol Notebook/Appendix F, ND and SD Plant Lists/Pages 85-86

NPAM Protocol Notebook/Appendix G, ND and SD Plant Classification Tree/Pages 87-89

NPAM Protocol Notebook/Appendix J, Grass Utilization Guide/Pages 95-126

SM: Data Sheets

NPAM Protocol Notebook/Appendix H, Vegetation Field Monitoring Datasheet/Page 90

NPAM Protocol Notebook/Appendix I, NPAM Management Actions Data Sheet/Pages 91-94

NPAM Protocol Notebook/Appendix D, Management Unit Questionnaire/Pages 75-77

NPAM Protocol Notebook/Appendix K, Phenology User Guide/Pages 136-141

USFWS Grazing Calculator/Page 1

NPAM Management Actions Data Sheet/Pages 1-4

Station-Level Phenology – Fall Data/Pages 1-2

SM: NPAM Vegetation Monitoring Data Sheet/Page 1

SM: Station-Level Phenology/Pages 1-2

SM: Trimble Handheld GPS Help Guide/Pages 1-11