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V(A). Planned Program (Summary)

1. Name of the Planned Program

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V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
121	Management of Range Resources	0%		20%	
122	Management and Control of Forest and Range Fires	0%		20%	
123	Management and Sustainability of Forest Resources	0%		30%	
605	Natural Resource and Environmental Economics	0%		10%	
903	Communication, Education, and Information Delivery	0%		20%	
	Total	0%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.1	0.0
Actual	0.0	0.0	2.7	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	95740	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	63774	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	141347	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Correlating land-based information with remotely sensed images: Landscape Fire Interactions: The application of a ratio in creating a fire severity index such as the Normalized Burn Ratio (NBR) has been assumed to minimize the effect of topography on the spectral response. However, in Alaska the solar elevation during the fire season is typically less than 50 degrees and therefore the effect of topography on fire severity estimates from remote sensing may be substantial. Using a potential insolation model to model insolation for the time of satellite overpass in the Boundary Fire, the post-fire NBR was found to consistently vary due to topographic control of solar radiation. To minimize the spectral response due to topographic control of vegetation and fire severity, a differenced NBR was computed using two post-fire images (from August and September). There was a substantial negative bias in the remotely sensed fire severity estimate as potential insolation decreased due to topography. Thus fire severity would be underestimated for stands in valley bottoms or north-facing slopes. These are areas where highly flammable black spruce stands typically occur. The effect of changing solar elevation and plant phenology can also affect fire severity estimates independent of fire severity. Fire severity estimates varied considerably based on a differenced NBR approach using the same post-fire image and using different pre-fire images acquired at dates ranging from June through July. Using a later pre-fire image consistently resulted in higher fire severity estimates. The high fire severity class increased by over ten percent when a July pre-fire image was used instead of a June pre-fire image. •Spatially Modeling the Distribution of Beef Cattle and Reindeer:We continued observations of the beef cattle herd located at the Matanuska Experiment Farm outside of Palmer, Alaska. Spatial and activity data representing all time periods occurring during a twenty-four hour day were obtained. In all, we obtained data for seven 24-hour periods (one 24-hour period for each week of observations). Videotaped data is converted into digital format through on-screen digitizing using high resolution orthophotos as a backdrop. Low-cost GPS receivers were tested this summer to determine battery life and accuracy of the units using a static setup. The Seward Peninsula reindeer project is a Masters-level graduate student project to develop models to predict suitable habitat for calving females. He has made good progress and is currently writing up his results for publication. We have entered into a joint research project with Oregon State University and the USDA Agricultural Research Service out of Boise, Idaho to test prototype GPS collars using the reindeer on the Seward Peninsula. The major output associated with this project includes mentoring and teaching a Masters-level graduate student in proper research methods, analysis and modeling of data. Other outputs are the development of two types of low cost GPS collars for monitoring range animal behavior and distribution.

2. Brief description of the target audience

• Landscape Fire Interactions: Fire managers, fire ecologists, graduate and undergraduate students.

•Spatially Modeling the Distribution of Beef Cattle and Reindeer :Reindeer Herders Association. Research peer collaborations will be increased with new data management systems. The primary target audience for increased accessibility of data will be agencies and industry including forestry, livestock, and petroleum. Curricula are to be developed as 4 year academic programs in geography and natural resources management with applications in K-12. Graduate and undergraduate students.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	50	0	0	0
2007	60	500	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	2	2

V(F). State Defined Outputs

Output Target
Output #1

Output Measure

Number of databases developed.

Year	Target	Actual
2007	1	20

Output #2

Output Measure

Number of curricula developed.

Year	Target	Actual
2007	1	3

V(G). State Defined Outcomes

O No.	Outcome Name
1	Number of data sets successfully merged with GINA.
2	Number of curricula adopted.

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Outcome #1

1. Outcome Measures

Not reporting on this Outcome for this Annual Report

2. Associated Institution Types

3a. Outcome Type:

3b. Quantitative Outcome

Year	Quantitative Target	Actual

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area

V(H). Planned Program (External Factors)

External factors which affected outcomes

Natural Disasters (drought,weather extremes,etc.)
Economy
Appropriations changes
Public Policy changes
Government Regulations
Competing Public priorities

Brief Explanation

Remote sensing of fire severity from optical satellite data has some unique challenges in Alaska relative to the lower-48 United States. Some of these challenges include cloud cover and cloud shadows during and after the fire season, poor inventory of pre-fire imagery, low solar elevation, and substantial changes in spectral reflectance due to plant phenology and solar elevation changes during the fire season. Public priority and government regulations affect fire management. This determines our program direction. Curricula are developed to meet demand for information on changing fire management technologies.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

Before-After (before and after program)
During (during program)

Evaluation Results

Key Items of Evaluation