"Q-Methodology applied to the Pike and San Isabel National Forests, Colorado"

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- Validation of Survey Method first used on Chugach National Forest, AK.

- Pike and San Isabel National Forests (PSI): third highest visitation rate in NFS, bordered by some of the fastest growing urban areas and counties in the US.

- Rural communities' socio-demographic and economic transitions from extractive to amenity economic income dependence – used Lake County to explore.

Multi-spatial Study of Values on the Pike and San Isabel National Forests (PSI)

People – R-Method

Discourses – Q-Method

Large Scale: PSI Survey
a. Values and intensity.
b. Place attachment of values on PSI landscape
c. Familiarity and use of Forest
d. Forest use preferences and attitudes
e. Demographics.

Small Scale: Lake County Q-Method

a. Quantitative: Survey and Q-sorts.
b. Qualitative: Interviews

PSI Research Objectives

- Survey Validation: residents' values, attitudes and preferences regarding the PSI.

- Q-Method: Prevailing values discourses in one rural county related to the PSI.

- Map Component: spatially explicit values and value characteristics.

Q-Study Methodology

- **General Comments' section of Survey provides Concourse/population of value statements reflecting all twelve Values - results in Q-sample.**

- **P-sample: Participant Sample - 39 Lake County participants, community members active in natural resource issues: Completed Survey, Q-sort and interview.**

- **Q-sort: arrangement by participants of value statements on cards according to strength of agreement or disagreement.**

Q-Study Procedure Overview

- Compile Q-Statements.
- Determine Participant Sample (P-Sample)
- Send letter, call later, set up appointment.
- Send/bring Survey.
- Conduct Q-Sort and Interview (consent letter).
- Enter Q-Sorts in PQMethod.
- Compile Interviews.
- Analysis in PQMethod.

Q-Sample

- Population of Statements: 71 Value statements from surveys (concourse) expressing an aspect of importance to survey respondents.

- After panel review and pretests, 36 Q-statements selected for Q-sample.

- All statements could be categorized using the values taxonomy.

Taxonomy of Forest/Wildland Values (Rolston, 1988, 1991; Reed and Brown 1998, 2002)

Aesthetic value (A) — I value these Forests because I enjoy the scenery, sights, sounds, smells, etc.

Biological diversity value (B) — I value these Forests because they provide a variety of fish, wildlife, plant life, etc.

Cultural value (C) — I value these Forests because they are a place for me to continue and pass down the wisdom and knowledge, traditions, and way of life of my ancestors.

Economic value (E) — I value these Forests because they provide timber, fisheries, minerals, and/or tourism opportunities such as outfitting and guiding.

Future value (F) — I value these Forests because they allow future generations to know and experience the Forests as they are now.

Historic value (H) — I value these Forests because they have places and things of natural and human history that matter to me, others, or the nation.

Taxonomy of Forest/Wildland Values

Intrinsic value (I) — I value these Forests in and of themselves, whether people are present or not.

Learning value (L) — I value these Forests because we can learn about the environment through scientific observation or experimentation.

Life Sustaining value (LS) — I value these Forests because they help produce, preserve, clean, and renew air, soil, and water.

Recreation value (R) — I value these Forests because they provide a place for my favorite outdoor recreation activities.

Spiritual value (S) — I value these Forests because they are a sacred, religious, or spiritually special place to me or because I feel reverence and respect for nature there.

Therapeutic value (T) — I value these Forests because they make me feel better, physically and/or mentally.
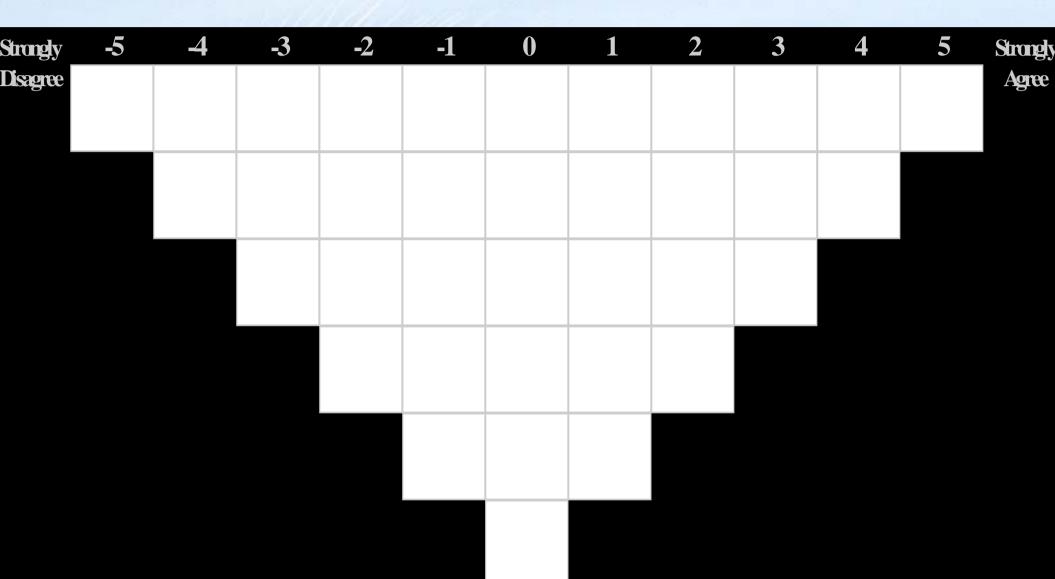
P-Sample: Non-random and relevant individuals, participants in the concourse.

Education	Gender	Mining Association	Years of Residence
No College: 8	12 Women	18 Mining	21: > 20 years
College Degree: 31	27 Men	21 Non-Mining	18: < 20 years

P-Sample

- Original list contained 183 names. Picked every fourth name, controlling proportionally for education, gender, mining association and years of residence.

- Final Result: 39 Interviews conducted with county commissioners, city council members, P&Z members for both city and county, heads of EMS, Fire Department and other county and city functions, Chamber of Commerce, Lake County Open Space Initiative and other non-profit members, and members of the public who regularly attend natural resource related meetings.

Q-Sort: Respondents place cards according to their level of agreement with a value statement.

| -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 |

Q-Study Interview Questions

1. While deciding what statements you agreed or disagreed with, were there any trade-offs that were particularly difficult?

2. Considering that these statements represent reasons why the PSI is important to people, do you feel your values are adequately represented? Is there anything missing?

3. What statements did you most agree with and why?

4. What statements did you most disagree with and why?

5. What statements wound up more in the middle section and why?

6. This part of our study is really concentrating on the connectivity between the PSI and Lake County. In what ways is the PSI important to Lake County in your opinion?

7. What would you like to see happen regarding the PSI in the next two decades? Are there any things you'd like to see changed regarding the PSI? Anything stay the same?

8. Are there any other aspects regarding the importance of the PSI that we haven't discussed? Anything you'd like to add?

Analysis

- PQ-Method provides correlation matrix, initial factor analysis, factor rotation by Varimax and/or manual method, final factor scores, difference scores, consensus statements, correlation among factors and reliability coefficients.

- PSI: conducted Varimax rotation AND slight manual. All because of Bernie.

Q-Method Results for PSI

Anthropocentric				Biocentric
Utilitarian Values		Amenity		Nature-Oriented
Discourse 2 Extractive Economic	Discourse 5 Amenity Economic	Discourse 4 Leadville	Discourse 1 Stewardship	Discourse 3 Preservation
Older, long-term residents. Agree with logging, grazing, energy extraction, motorized recreational, therapeutic values. Disagree with aesthetic, biodiversity, life sustaining, intrinsic and future values.	Business sector. Favors amenity economic, non-motorized recreation, outfitting and educational values. Opposed to biodiversity, extractive economic and motorized recreation.	County commissioners and other elected officials Aesthetic, amenity economic, intrinsic and historic values. Disagree with extractive economic values related to forests e.g. reservoirs, logging, energy (not minerals).	Cohort is most involved in local NRM issues. Favors amenity oriented economic, future, life sustaining and non-motorized recreation values. Disagree with extractive economic values related to forests e.g. energy, logging and motorized recreation values.	Ecocentric, frequently more protective of nature over human needs. Only discourse which rates biocentric statements positively. Intrinsic, biodiversity and life sustaining values score highest. Against all extractive economic and motorized uses. Conditionally favors non-motorized recreation.
% Variance				
5	10	15	12	21

Mean Value Intensity Rankings

	PSI	PSI Urban	PSI Rural	Lake Co.	Lake Q
Aesthetic	1	2	2	5	5
Biodiversity	5	4*	5*	4	2
Cultural	12	12	11	12	12
Economic	9	11	8	6	4
Future	4	5*	4*	3	6
Historic	8	8	9	9	9
Intrinsic	7	7	7	8	7
Learning	11	9	12	10	11
Life Sustaining	3	1	3	2	3
Recreation	2	3	1	1	1
Spiritual	10	10	10	11	10
Therapeutic	6	6	6	7	8

Conclusions

- Q-Methodology can provide the explanation for results in R-Methodology.

- Q-Methodology in Lake County provided valuable information to local natural resource management deliberations.

- Q-Methodology in combination with values mapping survey can provide valuable collaborative tools which in turn can contribute to both shared values and shared knowledge.

Sawatch Range, CO

Survey Results: Values of PSI Residents

Item	% in Favor		
	Urban	Rural	Total
Aesthetic	79	72	74
Biodiversity	73*	64	66
Cultural	29	35	32
Economic	31	27	33

* $p < 0.05$

Survey Results: Values of PSI Residents 2

Item	% in Favor		
	Urban	Rural	Total
Future	73*	69	71
Historic	41	42	41.5
Intrinsic	41	46	42
Learning	44	37	39

* $p < 0.05$

Survey Results: Values of PSI Residents 3

Item	% in Favor		
	Urban	Rural	Total
Life-sustaining	73	69	71
Recreation	68	64	66
Spiritual	30	35	32
Therapeutic	48	52	50