

1 McGREGOR W. SCOTT
2 United States Attorney
3 Eastern District of California

3 KIMBERLY GAAB
4 Assistant U.S. Attorney
5 2500 Tulare Street
6 Suite 4400
7 Fresno, California 93721
8 Telephone: (559) 497-4000
9 Facsimile: (559) 497-4099

7 SUE ELLEN WOOLDRIDGE
8 Assistant Attorney General
9 United States Department of Justice
10 Environment & Natural Resources Division

10 CHARLES R. SHOCKEY, Attorney
11 D.C. Bar #914879
12 United States Department of Justice
13 Environment and Natural Resources Division
14 501 "I" Street, Suite 9-700
15 Sacramento, CA 95814-2322
16 Telephone: (916) 930-2203
17 Facsimile: (916) 930-2210
18 Email: charles.shockey@usdoj.gov

15 Attorneys for Defendants

16 IN THE UNITED STATES DISTRICT COURT
17 FOR THE EASTERN DISTRICT OF CALIFORNIA
18 FRESNO DIVISION

19	FRIENDS OF YOSEMITE VALLEY,	)	Case No. CV-F-00-6191 AWI DLB
20	et al.,)	
		)	DECLARATION OF JAYNE
21	Plaintiffs,	)	BELNAP IN SUPPORT OF
		)	DEFENDANTS' OPPOSITION
22	v.	)	TO PLAINTIFFS' MOTION
		)	FOR RELIEF
23	DIRK KEMPTHORNE, in his)	
	official capacity as Secretary of)	
24	the Interior, et al.,	)	DATE: October 10, 2006
		)	TIME: 1:30 p.m.
25	Defendants.	)	PLACE: Courtroom 3
		)	JUDGE: Hon. Anthony W. Ishii

26 I, Jayne Belnap, do declare and if called as a witness would testify as follows:

27 1. I am a senior scientist with the U.S. Geological Survey, formerly with the National
28 Park Service (1987-93), and also serve as an Adjunct Professor at Brigham Young University

1 Botany and Range Department and Northern Arizona University Biology Department. I conduct
2 research on recreation in national parks, national monuments, US Forest Service Land, and
3 Bureau of Land Management lands. I have been a federal scientist in this capacity since 1987.

4 2. I earned two B.A. degrees from the University of California, Santa Cruz, an M.S.
5 degree from Stanford University in 1983 and a Ph.D. from Brigham Young University in 1991.
6 All were in ecology, botany, and related fields. I am currently the President of the International
7 Soil Ecology Society and on the Governing Board of the Ecological Society of America.

8 3. I conduct research on the impacts of recreational use on ecosystem components and
9 ecosystem function. Much of my research relates to providing managers with data by which to
10 decide how to manage visitor use in a given area. I have assisted many parks and many BLM
11 field offices in how to determine levels of use, how to monitor use, and ways they might mitigate
12 the effects of use. The results of my research have been reported in numerous presentations at
13 scientific conferences and published in professional and peer-reviewed literature.

14 4. I have published multiple papers related to the impact of visitor use and managing for
15 this use. These include:

16 Belnap, J. (In press). The potential roles of biological soil crusts in dryland hydrologic
17 cycles. *Hydrological Processes* (Special Issue)

18 Belnap, J., S. L. Phillips, J. E. Herrick and J. R. Johansen (In press). Wind erodibility of
19 soils at Ft. Irwin, CA (Mojave Desert) before and after trampling disturbance:
Implications for land management. *Earth Surface Processes and Landforms*.

20 Hartley, A. E., N. Barger, J. Belnap and G. S. Okin. In press. Nutrient cycling in dryland
21 ecosystems. in P. Marschner and Z. Rengel, editors. *Nutrient cycling in terrestrial
ecosystems*.

22 Herrick, J. E., J. W. Van Zee, J. Belnap and J. R. Johansen (In press). Disturbance
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Mojave Desert. *Journal of Arid Environments*.

24 Barger, N. N. J. E. Herrick, J. Van Zee and J. Belnap (2006). Impacts of biological soil
25 crust disturbance and composition on C and N loss from water erosion.
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26 Housman, D. C., H. H. Powers, A. D. Collins and J. Belnap (2006). Carbon and nitrogen
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12 O. L. Lange, editors. *Biological Soil Crusts: Structure, Function, and*
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14 Belnap, J. (2003). Biological soil crusts in deserts: A short review of their role in soil
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18 *Crusts: Structure, Function, and Management*. Springer-Verlag, Berlin.

19 Belnap, J. 2003. Microbes and microfauna associated with biological soil crusts. Pages
20 167-174 *in* J. Belnap and O. L. Lange, editors. *Biological Soil Crusts: Structure,*
21 *Function, and Management*. Springer-Verlag, Berlin.

22 Belnap, J., B. Büdel and O. L. Lange. 2003. Biological soil crusts: Characteristics and
23 distribution. Pages 3-30 *in* J. Belnap and O. L. Lange, editors. *Biological Soil*
24 *Crusts: Structure, Function, and Management*. Springer-Verlag, Berlin.

25 Belnap, J. and D. Eldridge. 2003. Disturbance and recovery of biological soil crusts.
26 Pages 363-383 *in* J. Belnap and O. L. Lange, editors. *Biological Soil Crusts:*
27 *Structure, Function, and Management*. Springer-Verlag, Berlin.

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disturbance on nutrient inputs and losses. Pages 245-252 *in* A. S. Alsharhan, W.
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Belnap, J., R. Prasse and K. T. Harper. 2003. Influence of biological soil crusts on soil
environments and vascular plants. Pages 281-300 *in* J. Belnap and O. L. Lange,
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21 Evans, R. D. and J. Belnap (1999). Long-term consequences of disturbance on nitrogen
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24 Arches National Park, Utah, USA. *Environmental Management* 22(4): 635-642.

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26 erosion: The influences of crust development, soil texture, and disturbance.
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28 Belnap, J. and D. A. Gillette (1997). Disturbance of biological soil crusts: Impacts on
potential wind erodibility of sandy desert soils in southeastern Utah. *Land*
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Belnap, J. 1996. Impact of soil surface disturbance on cyanobacterial-lichen soil crusts in
deserts of the southwest United States. Pages 42-43 *in* B. Bartholomew, editor.
Desert Tortoise Council: Proceedings of the Twenty-first Annual Symposium,
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2 B. Bartholomew, editor. Desert Tortoise Council: Proceedings of the Twenty-first
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Park. Park Science 4(1): 11-13.

11 5. I have been invited by many parks and other land use offices to discuss with them how
12 to measure and assess impacts of visitor use. I have given many presentations on this topic to
13 various audiences.

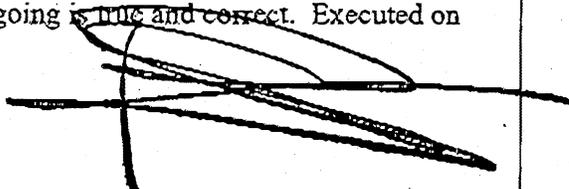
14 6. I have read the declaration of Dr. Glenn Hass in support of the plaintiffs' request for
15 relief. My viewpoint is in direct contrast to his, as I believe that setting absolute numbers is an
16 outdated scientific notion. It is well known that the impact of visitors on a given resource
17 depends on their behavior: a well-informed and compliant group will have far less impact on an
18 area than a less-informed or non-compliant group will have. Setting of absolute numbers means,
19 in a sense, that a manager is abdicating his responsibility to ensure that visitor use does not
20 impair the resources the manager is mandated to protect. In contrast, the designation of
21 indicators and setting of standards allows the manager to directly measure the effects of visitor
22 use and therefore directly know if he/she is fulfilling their mandate. This statement is derived
23 from my professional experience and the peer-reviewed scientific and land management
24 literature.

25 7. I have reviewed the Declarations made by Dr. Robert Manning, Dr. Jeffery Marion,
26 and Dr. David Cole and I am in full agreement with them. I do not think that their points need to
27 be restated, but I would like to emphasize that their views reflect the current thoughts by leading
28 scientists on the best way to approach the issue of carrying capacity decision making. I believe

1 that the viewpoint expressed by Dr. Haas, in contrast, represents a view that has been in disuse
2 for many years, as it did not accomplish or fulfill the needs of land management agencies.

3 8. The LAC and VERP frameworks incorporate the idea that people act differently, and
4 that resource condition is the factor that is being managed. As I stated above, this is much more
5 effective than setting absolute numbers, which allows for no flexibility when impacts exceed
6 desired conditions. Setting absolute numerical limits is not an approach that allows any
7 consideration for changing conditions, whether it be an environmental change or behavioral
8 change in people. I was on the original team that developed VERP at Arches National Park, and
9 I have been part of the monitoring effort of VERP in Arches since its inception. VERP is an
10 extremely effective way to assess the impacts of visitor use on both social and natural resources.
11 When standards have been exceeded (an exceedence does not equate to degradation. Rather, an
12 exceedence simply means that a condition has fallen below a pre-determined, measurable level)
13 management action has been taken, whether it be greater visitor education, implementing ranger-
14 led walks or other techniques that have reduced visitor impact without reducing visitor numbers.
15 Use of such tools has been very successful in bringing conditions back within the set standards.
16 That is the beauty of the LAC and VERP approach: there are many techniques to reduce
17 impacts. While reducing numbers of visitors is one tool available to managers under VERP and
18 LAC, there are many other tools available and it is incumbent on the manager to select the tool
19 that is most responsive to the issue at hand. In many cases, imposing a quota on visitor use does
20 not address the underlying cause for why desired conditions are not being met. In conclusion,
21 LAC and VERP have been successfully applied to many different situations, and it is difficult to
22 imagine why Dr. Haas, or anyone, frankly, would want to replace a system that is working so
23 well under so many different conditions with one that has been repeatedly shown to be fraught
24 with problems.

25 I declare under penalty of perjury that the foregoing is true and correct. Executed on
26 September 19, 2006, at Moab, Utah.

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Dr. Jayne Belnap