FINAL REPORT

FOREST SERVICE GRANT NO. WAUF-00-001

Period covered by this report: September 24, 2000 through January 1, 2004

NOTE: Please review the following information and revise complete as necessary.

Issued to: University of Washington

Address: Dept. of Landscape Architecture, Box 355734, Seattle, WA 98195-5734

Congressional District Number: 7

Project Name: Healing Nature: The Psychological, Social, and Spiritual Effects of Nature in the Hospice Care Environment

Contact Person/Principal Investigator:

Name: Daniel Winterbottom
Mailing Address: Same as above
Phone Number: (206) 616-1876
Fax Number: (206) 685-4486
E-Mail Address: nina@u.washington.edu

Your Organization's internet home page address:

Date of Award: September 24, 2000

Grant Modifications: Mod. 1 : No-cost time extension from January 1 , 2003 to January 1, 2004

Date of Expiration: January 1, 2004

Funding: Federal Share: $110,297 plus **Grantee Share:** $164,654 = **Total Project:** $274,951

FS Grant Manager: Barbara Hollenbeck, Cooperative Programs
Address: USDA Forest Service, P.O. Box 3623, Portland, OR 97208-3623
Phone Number: (503) 808-2351 **Fax Number:** (503) 808-2339 **E-mail: bhollenbeck@fs.fed.us**

Please provide an abstract on your project and its results. This abstract will be posted on the NUCFAC internet site. (approximately 200 words or less.)

Abstract: Work by Roger Ulrich, Sam Bass Warner, Clare Copper Marcus and others in the field of environmental psychology suggests a positive relationship between the experience of the natural landscape and human health and healing. There is surprisingly little actual research on the effects of nature and healing gardens on those they are intended to serve. While it appears to have been clearly demonstrated that nature can contribute to healing, what remains unexplored is how best to design settings for human contact with nature for healing purposes. What is the significance of the natural landscape, its quality, its forms, and organization? Can landscaped places improve the hospital experience, i.e.: visits with family members are more comfortable in naturalized places? What are the spiritual connections to nature in the healing process and can the healing effects of therapeutic gardens be quantified? We believe the landscape can, and often does, play a significant therapeutic role in the lives of those dealing with terminal or serious illnesses. Evidence has shown that exposure to nature can

reduce stress (Kaplan, Kaplan and Ryan, 1998) and other studies suggest that garden "sanctuaries" for terminally ill patients offer supportive environments, which help to alleviate some of the anxiety associated with the dying process (Marcus and Barnes 1995).

Objectives:

This study will explore how the design of and/or preservation of natural places can enhance the quality of life and the process of dying for those with, and those caring for persons diagnosed with, terminal illnesses. The study will specifically investigate how these environments accommodate the emotional, physical, social and spiritual needs of the users, and assist the survivors in the grieving process. This study will examine these impacts on three user groups, (1) the residents, (2) the staff (administrators and care providers) and (3) the survivors (family, partners **and loved ones).**

Objectives met to-date:

The design of the study and research methodologies. The development and pre testing of the surveys. Review and selection of the participating facilities. Review by he Office of Research and Human Subjects. The training of research assistants. The administration of surveys and interviews. Compilation and analysis of the survey data. The development and pre testing of the photo preference survey. Review and selection of the participating partners. Review by the Office of Research and Human Subjects. Dissemination of the photo preference survey. Data of analysis of the photo preference survey. Development of the on line survey. Analysis of the data and organization of the results.

Objectives not met:

Writing of journal articles for academic and professional **publication (in progress). Completing reports** for participants and partners (in progress).

List the major research or policy findings of your study:

The following findings are based on resident interviews, written surveys and a visual preference exercise

Findings:

Access to nature:

- People facing terminal illnesses place a great value on access to nature. Overall residents of long term care facilities and hospices indicated that having some outdoor nature at the facility where they live is quite important (mean = 4.55, S.D. = .89 on a 5-point scale). This view was shared by the staff care providers and those *visiting* the resident, often family members or relatives.

- When asked what residents do when they are in their favorite outdoor areas (43%) responded that they observe plants/nature and similarly (43%) responded that they sit on the grass. (27%) felt the there were social opportunities including watching and interacting with people, while a small percentage (8%) enjoyed looking at views and (6%) responded tending gardens. The physical output required to garden clear presents a limiting factor for many of the participants in the study. When compared with figures for the facilities that had younger patients, those with a younger population had higher percentages of those choosing observing nature, sifting on the grass and interacting with people all at (56%). Its clear and this may in part reflect the physical abilities of many of the respondents and that passive engagements such as observing nature ranked higher than active ones such as gardening because they either weren't able to garden or the physical effort to get to the gardening area was to difficult for them..

• While almost half the respondents enjoyed interactions with nature the time they actually spent outdoors in a natural setting was relatively low. Only (6%)responded that they actually go out into nature more than once a day. For those who go out once every few days the number increases substantially (20%) while the majority (43%) actually go outside less than once a week. It should be noted that the number of younger patients who desire to and do go out is almost four times the frequency of the older, less mobile respondents. Likewise those younger residents most were diagnosed with AIDS or cancer expressed a stronger desire to have interactions with nature than those of advanced age where both the physical and cognitive break down appeared to lessen the importance they placed on interactions with nature. This finding suggests that for many respondents interactions with nature may be more visual than physical.

• Access was one of the primary determinants for lack on interaction with nature. In 50% of the facilities the respondents physical condition/mobility prevented them from going outside, and 33% of the respondents noted that insufficient staff help prevented them from going outside. When asked what's keeping them from getting outside (29%) stated physical limitations, (18%) lack of protection from inclement weather. It should be noted that (51%) of the residents were in wheelchairs, (17%) used a walker and (4%) were bedridden.

• The most common reasons the respondents desired to go outside were to get fresh air, feel physically better and for enjoyment. Other reasons are listed below:

Fresh air	35%
To feel physically better	20%
For enjoyment/happiness	20%
For a change of scenery	16%
To get away from the facility	14%
Feel invigorated/stimulated	12%
Change in attitude or outlook	10%
Meet people	8%
Feeling of belonging/home	6%
Sun exposure	4%
Healing effect	4%
Excitement/satisfaction/relaxing	2%

• When asked if there were other things they would like to do or see outside but couldn't because it wasn't possible in the existing spaces the respondents they included gardening (6%) and walking or exercise (4%).

• In response to the question what was keeping them from going outside more residents cited:

Physical limitations	45%
Inclement weather or lack of protection from	18%
Lack of assistance	18%
Getting lost	2%

• When the respondents were asked what it was about their favorite places that caused them to be preferred "plant selection" was rated the highest at (31%). One interpretation of this response is that residents place a high value on the landscape design since the response to "natural

environment" was only (4%). It is further reinforced that respondents value being outdoors with fresh air as "not being indoors" was (20%) and "fresh air" (12%). "Relaxing" and "quiet" both received (10%) and "negotiable space" (6%). While there is much to still explore with this population, this data alone begins to indicate some design parameters or guidelines that could be employed when designing spaces that offer plant/human interactions for this population. It also reiterates the importance of designing open spaces to be both accessible and negotiable in these settings.

• As indicated above, residents were, in many cases limited by their physical mobility making access difficult and most did not go outside frequently. For these residents the interaction with nature more commonly takes place as a visually experience, not a physical one. Residents spend on an average a moderate amount of time looking out the window (in their room or elsewhere) (mean = 3.02, S.D. = 1.33 of a 5-point scale.)

• What do residents like about the view from their window?

Garden/plants	37%
Birds	27%
People	24%
Landscape/Scenery	20%
Weather exposure	10%
Wildlife/pets	8%

These responses are similar to those responding to the question what do you do in your favorite outdoor space. As in that question, here to nature is a highly valued component of a view from the window. As seen above, gardens and plants, birds and landscape scenery are highly desired. When asked what they disliked:.

Presence of people	13%
Rooftop	8%
Houses or buildings	8%
Lack of view or obstruction	6%
Walls or windows	6%
Lack of color	4%
Lack of plants	4%

It is clear that these residents disliked the built environment and views lacking in natural features. While its clear from the percentage of people responding that they like viewing people from their window (24%), (13%) strongly dislike the presence of people in their views out the window

Visual preference:

In addition to responding to an interview, residents and some people using support facilities on a visiting basis, thus they are not residents were also asked to review some images the research team had selected. The images were organized around thematic differences and with six colored

images where grouped to a page for a total of six pages or 36 images. The various themes included water (still, active, natural and artifice), lush woodlands (glades, ferns and trees, lushly planted courtyards) , pastoral views (meadows, swaths of lawn) therapeutic/working landscapes (vegetable gardens, horticultural therapy gardens), urban oasis's (small courtyards, intimate spaces and meditative refuges) and heavily built gardens(urban spaces with minimal plantings, artwork and architectonic features). The images where quite different in each of the categories and the respondent was not told that each sheet had a theme. The respondents were asked to rank each photo as to how much time they would spend in the setting.

In most cases there was a clear preference for one as was the case in four of the six categories. In the others one had two preferred images and in the other three of the images all received a similar number of responses.

Category: Heavily built gardens: (images 1-6)

Ranking:

43 % image 3
16 % image 2
16 % image 5
14 % image 1
5.5% image 4
5.5% image 6

Category: Urban oasis's: (images 7-13)

Ranking:

31 % image 12
28 % image 11
19 % image 7
16 % image 8
6 % image 11

Category: Therapeutic/working landscapes: (images 13-18)

Ranking:

67 % image 13
24 % image 17
6 % image 16
3 % image 14
3 % image 15
3 % image 18

Category: Pastoral view: (images 19-24)

Ranking:

45 % image 23
21 % image 19
15 % image 21
14 % image 22
5 % image 24

Category: Lush woodlands: (images 25-30)

Ranking:

73 % image 25
18 % image 26
3 % image 27
3 % image 28
3 % image 30

Category: Water: (images 31-36)

Ranking:

31 % image 32
27 % image 36
27 % image 34
6 % image 33
6 % image 31
3 % image 35

When analyzing images that represent the most preferred places the respondents would most like to spend time, it is striking that one characteristic is common to all. In five of the images that were ranked highest vegetation is the dominant visual feature. The one that is not more than 50% vegetated *does include* other natural materials such as stone and water. Image 25, the *image* that received the highest ranking, 75%, depicts a river running through mossy forest composed of 80% vegetation and 20% water. The second highest rated image, number 13 at 67% is composed of raised vegetable beds that make up 75% of the image. This view differs from image 25. Here the vegetation represents a domestic landscape not a naturalistic scene as in image 25, possibly suggesting that the image of vegetation is very important to the respondent and is not necessarily dependent on vegetation type or character. Image 23 received 45% and is a pastoral image with water in the *foreground* (20% of the *image) and* a swath of lawn in the mid ground and a forested area making up the background which makes up the remaining 75% of the image. Image 3 receiving 43% contains 90% vegetation, lawn and shrubs with the remainder a natural stone stairway. Both images 32 and 12 received 31%. Image 12 contains a heavily vegetated garden (80%), a river rock patio (10%) and a rusticated arbor. Image 32 (50% water, 20% trees) is the least vegetated of the images although the waterfall is clearly a natural element. In the same category image 36 received a close 27% and is composed of a waterfall in a natural setting with 70% vegetation and 30% rock/water .

While photo preference may not be a purely scientific indicator of people's responses as perception, cultural background and other subjective influences can effect a response, it is significant that all of the preferred selections were dominated by vegetation or other natural elements. When taken in total the evidence indicates that nature plays a significant role in people facing end of life when asked which environment would they most like to spend their time.

These same respondents were also asked to answer several questions about the two images they ranked the highest such as: How would this place be beneficial to you in coping with your illness, what do you like about the scene and are there specific elements and activities that would be important to you *in* coping with your illness.

Each response for the third question was sorted and grouped based on its specific reference. The results were distributed into the following groups:

Group	Example response	Number of responses
Meditation	Peaceful (50), calming (32))	414
Activities	Walking (53), gardening (25)	238
Plants	Flowers (53), plants/foliage (38), trees (22)	229
Water	Water (99), waterfall/active water (48)	222
Form	Openess (21), circle/round form (17)	116
Aesthetics	Beauty (31), variety/diversity (21)	107
Elements	Seating/chairs (59), path/walkway (20)	98
Nature	Natural/naturalness (62)	87
Light	Sun (28), shade (11)	55
Views	Height (33), view (10)	43
Colors	Colors (37)	42
Materials	Rocks/stones (26)	39
Solitude	Private (15)	32

Social	Friends to be with (15)	20
Accessibility	Convenient location (6)	14
Sensory	Fragrance/smells (12)	13
Safety	Safety/security (9)	9
Other	Home (5), freedom (3)	39

As the responses indicate nature, its character and effects were ranked quite high. While one can't directly link meditation to nature, some of the effects that were mentioned calming, peaceful, quiet, restful, relaxed, serene have been repeatedly associated with being in nature by researchers, writers and physiologists. Many of the activities *such* as gardening, observing/watching nature and wildlife viewing are again associated with natural environments. Plants, water and nature were all ranked in the top 50%. We clearly approached this project from the viewpoint of designers, and this data as with the data previously discussed suggest that design guidelines can be created from this and other researchers data that may better address the needs of this population and give others such as community and urban foresters a clearer direction when making decisions on what kind, and where to locate trees and plants in our urban environs

Recommendations:

• Views from the resident or patients room should be oriented towards views of nature. As the data indicates, many of those facing an end of life illness have limited mobility or stamina and their interactions with nature may often be limited to a view from the window. These can be borrowed views of existing landscapes or created views thought the addition of courtyards, additional tree plantings or at a minimum planter boxes.

• Access to nature should be provided in a manner that accommodates the range of patient's physical and cognitive abilities. Instead of one access point that may be far from patients rooms, multiple access opportunities should be created so that patients won't feel the physical effort is to great, lose their stamina just getting there or get disorientated in the process of seeking a physical interaction with nature.

• As important as access is to open space ability to negotiate within the space is of equal importance

• Increased awareness among staff of the importance to the patient to gain access and increased staff to assist patient to gain access would help patients achieve increased interactions with nature.

• As indicated above many people facing life threatening or and of life situations desire meditative, calming, restful experiences. Water, plants, flowing/open forms and nurturing activities such as gardening and walking are desired.
Gardening was listed not only as a desirable activity in the visual preference study but in the survey and interviews is came up as a favorite activity and one that residents missed in their outdoor experiences.

• As much as respondents perffered views out the window of plants, birds, landscape scenery, wildlife natural phenomena (weather) and people, views of buildings, rooftops, walls and other built urban elements should be screened with vegetation

• Finally it is striking that of the favorite activities mentioned observing plants/nature, sitting on the grass, social opportunities including watching and interacting with people, looking at views

and tending gardens, all of these are activities found in many urban parks, conservation lands and community gardens. While access to these places is clearly an issue, providing the transportation and support on a weekly or bi weekly basis would provide a great benefit for those residing in these facility with terminal illnesses. Linkages with community service projects at local schools, with park rangers and interns may be a viable means to link those residents with natural places.

As the academic papers are written, the report completed and presentations developed we expect further findings and recommendations will emerge. These will then be disseminated and posted on the web.

If not apparent in the above, or if your project did not involve research, how did the project increase the knowledge
we have about urban forestry? How will the public benefit:

This study will assess the effects *of* urban forestry both visually and experientially, and how it *impacts* the lives of those facing terminal illnesses. Many of the sites are close to parks, street trees and other types of urban vegetation, there value on the quality of life for these populations has yet to be evaluated and the preliminary results indicate that urban forests have a positive effect of the viewers. Almost all individuals will have to face the care for and placing of a loved one or friend in a care facility. The quality of life issues and level of care will be important criteria in selecting a facility. The results of this study will demonstrate the importance or lack of views of/and access to natural places for those facing death. In addition this *study* will access the *preferences for what kind of nature* is desired, how it is used and *the* level of access desired. This information will clearly benefit the public both as care providers, users and designers.

What recommendations might you make for community foresters or others who might benefit from your project?:

For many individuals facing a terminal illness the experience can heighten the quality of both interactions with people and animals and with inanimate objects such as rocks and trees *(nature).* For many an experience with nature provides many important qualities and experiences including:

- A refuge
- An escape
- A place for focus and meditation
- A place for relaxation and stress reduction
- A place for stimulation and reconnection

There was a strong preference for green spaces that were heavily vegetated. In the visual preference survey, those with a lot of vegetation consistently scorer higher than those that appeared more built and with less vegetation. This also was replicated when patients were surveyed as to what is most important and the answer again was *consistently* vegetation and *green* spaces. Thus *when community foresters* are making master planning decisions or accessing where to implement community greening projects, when looking at use, any facilities housing people with end of life illnesses should be identifies and if possible green spaces be developed within close physical proximity and offing visual access.

For many inner city facilities where open space maybe limited and often physically and visually removed from the patients, the public landscape can serve as a valuable resource these individuals. Several of the facilities used street walks as a means of providing patients and experience with the natural world, thus

the median landscape provided their nature interaction. Parks were also sited as destinations for patients ambulatory patients, thus access open spaces into and diversity of experience within these spaces should be considered. Many of the respondents mentioned their interest in seeing wildlife outside their windows. Again in the inner city many of the windows overlook streets, thus the use of trees that would attract wildlife would help to address this need. There was a strong preference for green spaces

How were your results be disseminated to the public?

The results of this study will be disseminated to a number of groups through several channels including:
(1) Reports to the participants and partners. These reports are being finalized and will be sent once completed.

(2) Academic and professional publications. Papers are currently being developed and will be submitted for publication once completed.

(3) *Presentations.* The project and emerging results have been presented at several conferences to date and we expect that to continue as the papers are published and specific conference opportunities arise. To date Associate Professor Daniel Winterbottom has made presentations at the American Society of Landscape Architects *Annual Conference,* San Jose, CA 2002, The University or Oregon. *Eugene* Or. 2003, and at the Imagining America Annual Conference, Champaign- Urban. 2003 where the project was discussed.

A web site is being developed where the results and papers will be disseminated.

List the active partners(key individuals or organizations) involved in the project to-date:

To date, partners include the following individuals and organizations:

- *Frances Marcus Lewis„* R.N.,Ph.D. , Elizabeth Sterling Soule Distinguished Professor of Health Promotion and Nursing, University of Washington
- *Dr. Stu Fraber.* Clinical Assistant Professor of Family Medicine, University of Washington and Practitioner at Tacoma Family Health
- *Nancy Gerlach-Spriggs,* Author of *Restorative Gardens,* Yale University Press, 1998; Director, Meristem Foundation
- *Project on Death in America* (Dr. Susan Block, Director, Faculty Scholars Program, and Faculty member at Harvard University and Dana Farber Cancer Research Facility)
- *American Landscape Architecture Association* (Mark Epstein, subcommittee Chair, ASLA professional Interest Group on Therapeutic garden Design)
- *National Hospice and Palliative Care Organization* (NHPCO) (Stephen Connor, Vice *President)*
- *Baily-Boushay House,* Seattle WA **(Ed** Lorah, Unit Care Manager, Tom Allsop, Chaplin)
- *Columbia Lutheran Home,* Seattle, WA (Beth Hartman, Director Support Services)
- *Franciscan Health Care at Bothell,* Bothell, WA (Ken Bloomstine, Director)
- *Horizon House,* Seattle WA (Amy Hayes, Director Health Services)
- *Hopewell House,* Spokane, WA (Jackie Van Gundy, Director)
- *Evergreen Hospice,* Kirkland, WA (David Bruchard, Supervisor)
- *Cancer Lifeline* (Barbara Frederick, Director)

- *Nancy Orr-Rainey* (former director of Washington State Hospice in Long Term Care Interest Group)
- *Volunteers.* Study participants will *include* long-term care facility residents, staff, and residents' family members. Participants will be asked to respond to structured surveys and photo-questionnaires and to participate in the Phase Two experiment.

Photo or illustration: If possible, please provide a photo or illustration for our use that summarizes or represents the project. Indicate how this should be credited:

If a no-cost extension has been requested for this project, why is (was) it needed?
Yes. The University of Washington Human Subjects review took much longer than anticipated to grant its permission to pursue the interviews, which set the target goals back. The extension allowed us to administer the surveys *and visual preference* study components *during* the appropriate seasons, spring and summer.

Comments considered of importance but not covered: