A Quick, Rough Look at Some of the Potential Economic Benefits to the Washoe County Population from Acquiring the Ballardini Ranch Area

To accompany the Excel worksheet "Ballardini Ranch"

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Abbreviations: BR = Ballardini Ranch

Disclaimer:

The estimates presented in this memo are at best very rough approximations, based on existing literature and statistics from other cases where open land has been permanently designated for public recreational use. They have been compiled in a few hours time in preparation for the April 11, 2006 Washoe County Commission meeting. More precise estimates of economic benefits would require primary studies in the Reno/Sparks area, including substantial survey work involving local households.

The memo focuses on the three streams of economic benefits that are likely to matter most in this case. Many other possible benefits have been omitted, such as all non-use benefits (which include benefits to future generations).

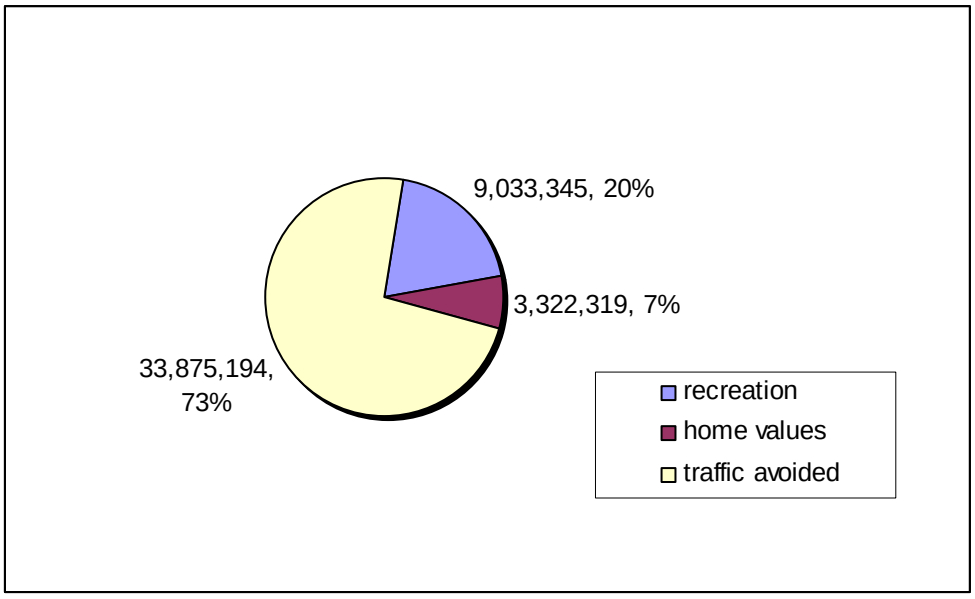
This is NOT an official research project funded or endorsed by the University of Nevada, Reno, nor has it been commissioned by any other private or public entity. The author is a resource economist specializing in the field of non-market valuation, i.e. the estimation of economic values associated with non-market resources, such as recreational opportunities on public lands, air and water quality, energy generation and provision, and other environmental amenities. He is also a resident of the Lakeridge Springs Home Owners Association located off Ridgeview Drive near the Ballardini Ranch area. Thus, the author has a direct stake in the outcome of the Ballardini Ranch land designation. However, the figures and techniques used in this memo have been objectively, if not conservatively, selected, and all are based on reputable academic or government research.

It is hoped that the reported figures and concepts will contribute useful information to facilitate the Commission's decision process regarding the Ballardini Ranch.

Summary of findings

The pie chart shows the *discounted present values* of three types of benefits over 30 years, using a discount rate of 5%. (For details please see the accompanying Excel sheet "Ballardini Ranch"). The time horizon of 30 years was chosen to facilitate the comparison with expected debt payments on the proposed bond, which are envisioned to continue for 30 years.

In reality, benefits to the public, especially through direct recreational use of the Ranch, would continue to be enjoyed past this 30 year horizon.



Total estimated discounted benefits: $ 46,230,859

Recreational Benefits:

These benefits would be enjoyed by the wider population of Reno / Sparks. We assume that the BR would be primarily used for hiking / nature walks, wildlife viewing, mountain biking, and picnicking. These activities can take place without major infrastructure improvements beyond improved access to the area. The estimated benefits from recreation may be larger than those derived in this document if additional amenities are added to the Park.

Quantity (= unit of measurement): Expected number of visitor days per year

- This figure would usually be estimated through direct observation (e.g. count vehicles at parking lot over an extended time period) or survey work (ask Reno/Sparks households how often they would visit the BR under different Park-infrastructure scenarios).

- For this discussion memo, we use visitation figures of other Washoe County Regional Parks for guidance. According to the Washoe County Department of Regional Parks and Open Space (personal communication), park areas of comparable magnitude and infrastructure with BR, such as Gallena Creek Regional Park, and Hidden Valley Regional Park receive 100,000 to 130,000 visitor-days per year. We conservatively halve the lower bound of these figures to control for deficiencies in infrastructure compared to these established facilities for our initial visitation estimate, but allow for an increase in visits over time, as captured in the spreadsheet.

Price (= dollar value per unit of measurement): Value of a visit to the average recreationist, measured in $ / visitor-day.

- This figure would usually be estimated based on intercept (on-site) or household surveys. One would ask questions in the spirit of "What is the most you'd be willing to pay for a day trip to the Ballardini Ranch Park". This figure likely varies by activities, so researchers would first decide on principal recreational activities the public would engage in at the BR. Then target each sub-group of users with a separate survey instrument.

- In absence of primary studies, we need to seek guidance from the existing literature on per-day values for visits to a regional park, ideally under comparable settings. Some examples:

Based on an extensive review of 131 studies on outdoor recreation in the U.S. Rosenberger and Loomis (2000) estimated the per visitor-day economic benefits of some outdoor activities as follows (in 2000 dollars):

Hiking	$45
Wildlife viewing	$27
General recreation (shorter walks, jogging, picnics, etc)	$15

Loomis et al. (2001), in turn, estimate a per-visitor day economic benefit of $30-$60 for mountain biking in Colorado National Forests.

Since some of these estimates were taken at well known regional and national destinations, they are probably a bit too large for use in the BR case. We therefore conservatively use a per-visitor day economic benefit value of $10 for the BR. This can be interpreted as a weighted average over all user groups and activities.

References:

Rosenberger, R., and J. B. Loomis, (2000) "Using meta-analysis for benefit transfer: In-sample convergent validity tests of an outdoor recreation database", *Water Resources Research*, 36(4), p. 1097-1107.

Loomis, J., A. Gonzalez-Caban, J. Englin, (2001) "Effect of forest fires on hiking and mountain biking", *Journal of Agricultural and Resource Economics*, 26(2), p. 508-522.

Increased Home Values due to the Proximity of the Park

This benefit would accrue to home owners within a specific distance of the Park.

Quantity: Number of existing (and possibly new future) homes in the vicinity of the proposed Park.

- We use a rough estimate of 2000 homes located within a 5-10 minute travel distance from the BR for this figure. More thorough research would be needed to determine the exact number of properties within this radius.

Price: The expected gain in value of the average home that would experience such a gain.

- These figures can be estimated by looking at the observed effects of similar policy interventions in other housing markets (ideally "similar" to our local market), or through *hedonic property value studies*. Such studies would relate the observed sales price of homes in the Reno/ Sparks area to home and neighborhood features, including distances to Parks or related measures. This would allow for the computation of an estimate of both (i) How many homes would likely experience an increase in value for the BR case, and (ii) the expected magnitude of the value gain.

Here are a few examples from the literature:

- Irwin, 2002 reports an estimated increase in home values of 1.17% to 2.6% in reaction to permanently converting developable pastureland into conserved open space in the Washington D.C. and Baltimore, MD, area. Breffle, et al., 1998, estimate an average one-time payment of $1200 (in 1997 dollars) that households within 0.1 mile of a disputed 5.5 acre parcel of open land in Boulder, CO, would be willing to pay to

permanently preserve the land as open space. In contrast, this figure decreases to $50 for households that live ten times further from the disputed property.

(Irwin, E. G. "The effects of Open Space on Residential Property Values." *Land Economics* 78, no. 4(2002): 465-480.

Breffle, W. S., E. R. Morey, and T. S. Lodder. "Using Contingent Valuation to Estimate a Neighborhood's Willingness to Pay to Preserve Undeveloped Urban Land " *Urban Studies* 35(1998): 715-727.)

- While similar value gradients with distance from the BR can be expected in our case, we will use an average per-home figure for all homes within 10 minutes driving distance from the BR. Based on the figures cited above, we use a conservative, one-time increase in property values of 0.5% per home. While the average home value in neighborhoods surrounding the BR area is likely higher than the wider Reno median value of $384,500 (RGJ, http://news.rgj.com/apps/pbcs.dll/article?AID=/20060407/BIZ12/604070369), we will use the latter figure for our benefits analysis.

  So the estimated one-time increase in home values per home from permanently designating the BR as public park is 384,500*0.005=$1922.5.

Avoided Increase in Traffic Flows

We assume that the main beneficiaries of not developing the BR and thus increasing local traffic flows are again the 2000 households residing in the vicinity of the BR.

Quantity: Avoided increase in traffic, measured in avoided vehicles per year.

- According to the Bureau of Transportation Statistics, the average U.S. household owns 1.2 vehicles. (Source: http://www.bts.gov/publications/national_transportation_statistics/)

- Assuming a planned community of 900 homes at BR, this implies that development would entail the addition of 1080 vehicles to local traffic flows.

- As shown in the spreadsheet, we assume this new fleet will be added incrementally over a period of three years.

Price: Avoided loss in home values that would result from increased traffic flows around BR.

- These values include economic losses due to increased trip durations for daily errands, air pollution, and noise. One possible way to capture these costs is through very detailed hedonic property value studies that relate the value of a home to local traffic patterns. This is based on the assumption that prospective home buyers figure expected daily trip

costs and the disamenities of local traffic patterns into their overall willingness to pay for a given property.

- To date, there exist only a few studies on this topic. However, there is one good example for the city of Raleigh, NC. Raleigh has approximately 500,000 inhabitants and is rapidly growing, so in this sense the area is at least somewhat similar to Reno. Also, the overall cost of living is comparable for the two cities with a difference of approximately 14%.

  The study is: Davis, Alison. "*Accessibility, Congestion, and Choice: Non-market consequences of the urban/suburban infrastructure*" presented at the North American Regional Science Meeting, Philadelphia, Pennsylvania 2003. Currently under review at *Land Economics*.

- Davis estimates the loss in property value to a home located in an area that currently experiences mild to moderate congestion from the insertion of an **additional vehicle** to the traffic flow at $30 – $50 per home and year. These one-time adjustments to property values are understood to capture the net present value of all future streams of disamenities caused by the additional vehicle.

  We will use Davis' more conservative estimate of $30, and subtract 1/3 of this figure to control for the smaller size of Reno / Sparks compared to Raleigh. So our local estimate is $20 per home and year.

- Assuming a linear relationship between the added number of cars and losses in home value (this is also a very conservative assumption!), we can derive a rough estimate for the annual avoided loss per added car to local homeowners as:

  20*2000=40,000, assuming there are 2000 homes that would be affected by the increase in traffic volume.