

Addendum to

Economic Impacts of Critical Habitat Designation for the Coastal California Gnatcatcher:

A Review of the USFWS' Final Draft Report: Economic Analysis of Critical Habitat Designation for the California Gnatcatcher

David Sunding

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This addendum reviews the *Final Draft Report: Economic Analysis of Critical Habitat Designation for the California Gnatcatcher* prepared by Economic & Planning Systems, Inc. (EPS) under subcontract to Industrial Economics, Inc. (IE) for the U.S. Fish & Wildlife Service's Division of Economics.

Method

The focus of the EPS/IE report is on Section 7 of the ESA that requires Federal agencies to ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of CH. Federal agencies are required to consult with the Service whenever they propose an action that may affect a listed species or its designated CH.

Most of the costs described in the EPS/IE report result from additional regulation imposed on private landowners and developers. The bulk these costs result from additional regulation of the housing industry. The Service's consultants proceed from the assumption, discussed below, that the designation of CH "is not expected to significantly affect housing or other markets." As a result, they focus on direct compliance costs as a reasonable measure of impacts.

The general steps followed in the EPS/IE report include the following:

- Describe projected development within proposed CH areas. The timeframe for the analysis is from the present to 2025.
- Identify activities with a Federal nexus.
- For these activities, determine likelihood that they will require a Section 7 consultation and modifications to the proposed project.
- Evaluate whether CHD will require additional compliance with state or local laws.
- Estimate indirect impacts such as delay and stigma associated with CHD.
- Measure fraction of total Section 7 costs attributable solely to CHD.

- Describe impacts on certain entities such as small businesses and energy firms.

Modeling of the Housing Market

From the perspective of economic theory and practice, the most serious shortcomings of the EPS/IE report lie in its assumptions about price determination and equilibrium in the housing market. Their analysis is inconsistent with basic concepts in urban economics, uses inappropriate and irrelevant data, and repeats errors they had supposedly corrected in earlier work on CHD.

The EPS/IE consultants assert that “the scale and intensity of the additional project modification requirements associated with Section 7 and CHD are not sufficient to affect regional real estate market dynamics. As a result, the cost burden of project modifications falls on the regulated landowners.” That is, they assume that CHD has no impact on the size or quality of the housing stock at all, and that all costs of CHD are borne by landowners with no housing price implications at all. The only evidence cited for this assumption is that while much or all new development in a particular city or neighborhood can be affected by CHD, gnatcatcher CH comprises only a few percent of the total amount of land expected to be developed by 2025 in the six impacted counties.

As a threshold matter, I note that while the EPS/IE report purports to be an economic analysis of CHD, it actually contains no formal economic model or technical definition of an impact framework as such. The analysis would benefit greatly from writing down a model, justifying assumptions and citing to the academic literature on the economics of urban growth and land use.

That said, there are several major mistakes underlying the analysis in the EPS/IE report. Their method rests on the notion that if CHD places some land off-limits to development, then development will simply move to other areas that consumers view as equivalent. To the contrary, projections developed by the California Department of Housing and Community Development indicate that Los Angeles and Orange Counties lack sufficient land to accommodate projected housing demand by 2010 and the agency predicts that San Diego and Ventura Counties will run out of developable land around 2020.¹ Further, the assumption of a huge supply of alternate development sites is also contradicted by observed land prices in the study area. In the world assumed in the EPS/IE report, one would expect to see land prices at very low levels. This is not the case in much of the CH area, as the authors admit.

Part of the problem is that the authors appear to believe that housing prices are determined at the county level, as opposed to a more localized one. What the authors assume, in effect, is that home prices in Santa Monica are influenced just as much by regulation in Pomona as they are by regulation in Santa Monica, and that consumers view the two locations as perfect substitutes. Clearly they are not. It is irrelevant that CH may

¹ *Raising the Roof: California Housing Development and Constraints, 1997 – 2020*. California Department of Housing and Community Development. May 2000.

comprise a small share of all land to be developed in a particular county since consumers have preferences for local public goods and proximity to employment, and housing prices are determined at a more localized level. This point is supported by decades of research in housing economics.²

To arrive at a more satisfactory approach to measuring the impacts of CHD on the housing industry, it helps to take a step back and consider how economists have approached the question of housing demand and price determination. There are two basic types of equilibrium in the housing market. The traditional equilibrium occurs when the price of housing at a particular location reflects the marginal cost of construction and development. In this view, commonly called the Alonso-Muth-Mills or neoclassical approach to housing market equilibrium, density will adjust to equate the price of land with its marginal value to consumers.³

An alternative approach stresses the importance of non-market factors such as zoning and density controls that limit the supply of housing.⁴ In this approach, the marginal cost of construction and development can be far below the market price of housing since homes are, in effect, rationed among a number of consumers and their price is bid up accordingly. Thus, in the regulation-focused approach, housing prices reflect regulation-induced scarcity in addition to costs of production. In this view, the value of land with a house on it can be far above the willingness of consumers to pay for an additional unit of lot size.

Recently, Aaron Swoboda and I developed and implemented a statistical test to identify regulation-constrained housing markets.⁵ The approach exploits a fact alluded to in the discussion above, namely that in regulation-constrained markets the price of housing is above the costs of construction and development. In such situations, the value of land with a house on it (called the “extensive margin” value) will exceed the marginal willingness of consumers to pay for an additional unit of land (the “intensive margin” value). This line of reasoning suggests a formal test of housing price formation: if the intensive and extensive margin values of land are equal, then the neoclassical model best describes the housing market. If, however, the extensive margin value exceeds the intensive margin value, then the market is constrained by regulation.

The main difficulty in executing the test to categorize housing markets is how to measure consumers’ willingness to pay for land (or, alternatively, the equilibrium price of land). My colleague and I collected information on over 18,000 new home sales in the “Inland

² The failure to consider consumer impacts also biases the calculation of delay costs, and in a very serious way. Delay affects producers and consumers together in that all economic welfare resulting from housing development is lost during the period of delay. For consumers, this means that they must live in a suboptimal location for some period of time. By failing to account for consumer surplus, the authors underestimate the true costs of delay.

³ This model is developed in standard graduate texts such as Fujita, M., *Urban Economic Theory: Land Use and City Size*, Cambridge: Cambridge University Press, 1989.

⁴ See, for example, Glaeser, E. and J. Gyorko, *The Impact of Zoning on Housing Affordability*. Harvard Institute for Economic Research Working Paper, 2002.

⁵ Sunding, D. and A. Swoboda, *Does Regulation Ration Housing?* UC Berkeley Working Paper, 2004.

Empire” region of Southern California that comprises a large share of land designated as CH for the gnatcatcher. The study area was divided into 14 subregions along lines used by the regional metropolitan planning agencies. Controlling for other factors, we estimated the contribution of a unit of lot size to the sales price of a home separately for each subregion. In 11 of the 14 areas considered, the extensive margin value of land was above the intensive margin value at a high level of statistical significance. The neoclassical model held only in the most remote, least politically organized areas with the smallest amount of projected development. Thus, in the most important parts of gnatcatcher CH, housing is already rationed by regulation.

The fact that housing is supply-constrained in gnatcatcher CH is important. As noted by the EPS/IE report, CHD perturbs the housing market in three basic ways: it increases the cost of development, it reduces the output of the project, and it delays completion and delivery of the housing units. In markets where housing prices reflect marginal costs, the impact of regulation on costs of construction and development will be of most importance; the marginal welfare costs of output restrictions are negligible since marginal cost equals marginal utility in the pre-regulation equilibrium. When housing supply is limited and houses are rationed as a result, the supply-reducing effect of CHD can be very significant. By taking more land out of production and further restricting the supply of new housing, CHD can raise housing prices and imposes costs on consumers, landowners and developers. As I pointed out in my earlier report, what matters is the elasticity of demand for housing at the local level, and the fraction of land identified as CH in various locations.⁶

These observations also imply that the marginal welfare loss from eliminating reducing the supply of new housing should be measured as price minus costs of construction and development (exclusive of land assembly costs) divided by the size of the lot (again, the “extensive margin” value of land). This value of land is measured incorrectly in the EPS/IE report. The authors take county-average housing prices as a proxy for the price of a newly constructed home in CH, an assumption that clearly biases results downward. Then, without justification, they assume that the price of land is 10 percent of the total value of housing built on it. This 10 percent is taken to be the total welfare gain from construction of new housing.

Leaving aside the larger questions about housing market impacts and the assumption of substitute sites for development, the authors seriously underestimate the actual marginal welfare gains from housing. Table 1 of my report shows median prices of newly constructed homes in each of the 13 CH units. Median prices average \$400,000 across all 13 units, and exceed \$500,000 in 6 units.⁷ Construction and development costs average 70 percent of home value across the gnatcatcher CH (Figure 4), implying that the marginal welfare gain from housing development is well above the 10 percent figure cited in the EPS/IE report.

⁶ I chose census tracts as the basic unit of analysis in my report.

⁷ Higher quality and more relevant data on new home prices and construction costs are readily available and are used in my report. One would expect more of a study as expensive as the Final Draft.

There is another fact that makes the modeling choices made in the EPS/IE report even more disappointing: they are inconsistent with previous work performed by the very same consultants in earlier studies of CHD. In their draft analysis of economic impacts of CHD for vernal pools in California, Industrial Economics and EPS used the same approach to housing impacts as in the Final Draft gnatcatcher report. In a widely cited study, I pointed out what I have reinforced here: that their method ignores consumer losses and understates actual impacts by failing to calculate the influence of CHD on housing prices.⁸ In their final analysis of vernal pool CH, and based in large part on my comments, Industrial Economics and EPS revised their draft analysis to incorporate housing price changes and concluded that their earlier study had, in fact, understated total impacts of CHD by more than a factor of 10. They also concluded that consumers were the group most impacted by CHD. Why revert now to a simplistic and discredited method?

Regulatory Baseline

The EPS/IE report adopts an approach that attempts to capture the incremental regulatory burden imposed by CHD. This construction is inconsistent with the ruling of the Tenth Circuit in its *New Mexico Cattlegrowers* decision in which it instructed analysts to consider *all* economic impacts that result from the listing decision.⁹ Plaintiffs in the case challenged the Fish & Wildlife Service's designation of critical habitat for the southwestern willow flycatcher arguing, *inter alia*, that the Service's traditional "baseline" approach to measuring the economic impacts of critical habitat designation was an erroneous construction of the ESA. Under this approach, the Service would consider the initial listing of the species to be part of the baseline and thus would not analyze the economic impacts of listing, but only the economic impacts attributable directly to the critical habitat designation. Applying this baseline approach to the critical habitat designation for the flycatcher, the Service relied on its Section 7 regulations to conclude that no economic impacts would have occurred "but for" the critical habitat designation, and that the impacts of critical habitat designation and listing of the flycatcher were co-extensive.

The Tenth Circuit rejected this "baseline" approach, holding that the Service is required to analyze *all* impacts of critical habitat designation, regardless of whether those impacts are co-extensive with those of listing. The court acknowledged that the ESA "clearly bars economic considerations when the listing determination is being made." However, the court stated, the ESA also plainly requires "some kind of consideration of economic impact" at the critical habitat designation phase. The Service's regulatory "definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless." Thus, the court concluded, the baseline approach failed to give effect to the

⁸ Sunding, D., A. Swoboda and D. Zilberman, *The Economic Costs of Critical Habitat Designation: Framework and Application to the Case of California Vernal Pools*, 2003.

⁹ *New Mexico Cattlegrowers Assn. v. U.S. Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

congressional directive that economic impacts be considered at the time of critical habitat designation and was not in accord with the language or intent of the ESA.

The construction of the baseline in the EPS/IE report is somewhat different than the traditional baseline approach, and from the one adopted in the original economic analysis of gnatcatcher CHD completed in 2000. In their 2000 report, the Service's consultants argued that all costs associated with the listing of the species, including impacts resulting co-extensively from the jeopardy provision of Section 7, were part of the baseline.

Following the Tenth Circuit's rejection of this approach, the Service's consultants have now adopted the position that the baseline should include the "currently existing regulatory and socio-economic burden imposed on landowners and managers potentially affected by the designation of CH." They go on to argue that the baseline burden should include Project-Specific HCPs, Regional HCPs and Integrated Natural Resource Management Plans.

While an improvement over their first attempt at defining a baseline, the Service's consultants have still not considered all costs flowing from the listing decision for the simple reason that many regulations they consider to be part of the baseline are themselves the result of the listing of the gnatcatcher. Indeed, the Final Draft report notes that "CSS is the primary habitat type associated with the gnatcatcher, and is the most predominant habitat in the proposed designation. Because the link between CSS, the gnatcatcher, and its habitat is well documented in both biological and regulatory terms, this analysis evaluates CSS development as a proxy for regulation under the Act, when appropriate." To the extent that regional conservation plans, HCPs and other devices are at least in part a result of the decision to list the gnatcatcher, then at least a part of their costs should be included in the calculation of economic impacts of CHD.

Admittedly, there would be less controversy about the construction of the baseline if the economic analysis were being conducted at the time of listing rather than years after the fact. However, another, more practical conclusion seems inescapable: taking the Service's analysis at face value, areas where CHD imposes little incremental cost by virtue of pre-existing regulation should also be excluded from CH on the grounds that such designation will provide little incremental protection to the species, if any. If CHD has little cost, it is only because it also has little benefit. The Service cannot have it both ways.