Perpetuating the myth of the return of native forests

Tracy Van Holt1,2* and Francis Edward Putz3

Viña et al. imply that native forests account for China’s marked increase in tree cover and that tree plantations play a minimal role. All 71 tweets linked to the article reinforce the idea that China’s native forests are returning, whereas a review of their methodology indicates that it is not likely accurate. Referring news articles (n = 19) were dominated by terms associated with native forests, whereas tree plantations were rarely mentioned.

The results presented by Viña et al. (1) relating to China’s marked forest recovery are interesting but beg many questions. Surprisingly, the authors use “tree cover” and “forest cover” interchangeably, and they do not mention “plantations” at all in their paper, which implies that the increased forest cover is entirely recovered native forests. However, we know that this cannot be true. It is possible for Viña et al. (1) to make this claim because they use the Food and Agriculture Organization (FAO) definition of forest that aggregates tree plantations and native forests, because FAO does not classify tree plantations as an “agricultural” land use (2). This aggregation is worrisome and even more so because it was not explicitly explained in the article by Viña et al. (1). We are not the only scientists concerned about China’s reforestation efforts and the focus on plantations to replace tree cover that was originally natural forests (3).

Fig. 1. Classification of tweets associated with Viña et al. (1). All tweets (n = 71) refer to forest regrowth, forest recovery, reforestation, and forest conservation, and there was no mention of tree plantations. [Note: percentage of tweets per category shown]

![Diagram showing tweet categories: Forest recovery, Forest regrowth, Forest conservation, Reforestation]

Table 1. All the tweets associated with Viña et al. (1) were associated with native forests and not tree plantations.

<table>
<thead>
<tr>
<th>Tweets classified by category</th>
<th>Number of tweets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest regrowth</td>
<td>44</td>
</tr>
<tr>
<td>Logging bans are helping to boost China’s forest regrowth</td>
<td>42</td>
</tr>
<tr>
<td>China’s forest regrowth may be receiving a boost from logging bans via @ScienceAdvances</td>
<td>1</td>
</tr>
<tr>
<td>Logging bans are helping to boost China’s forest regrowth</td>
<td>1</td>
</tr>
<tr>
<td>Forest recovery</td>
<td>20</td>
</tr>
<tr>
<td>#Effects of conservation policy on China’s forest recovery</td>
<td>3</td>
</tr>
<tr>
<td>China is increasing tree cover. Effects of conservation policy on China’s forest recovery</td>
<td>15</td>
</tr>
<tr>
<td>Conservation policy has increased forest recovery in 1.6% of China’s territory via @ScienceAdvances</td>
<td>1</td>
</tr>
<tr>
<td>China gov logging bans &amp; monitoring to prevent illegal logging has been instrumental in enhancing forest recovery</td>
<td>1</td>
</tr>
<tr>
<td>Reforestation</td>
<td>3</td>
</tr>
<tr>
<td>Encouraging on China’s reforestation gains since 2000</td>
<td>2</td>
</tr>
<tr>
<td>Dinamiche di ricostituzione della foresta in Cina</td>
<td>1</td>
</tr>
<tr>
<td>Forest conservation</td>
<td>3</td>
</tr>
<tr>
<td>Look at the #forests conservation policy in China over the past decade plus #IntForestDay</td>
<td>3</td>
</tr>
<tr>
<td>In #China, #forest conservation policy appears to be working. Important @ScienceAdvances study</td>
<td>1</td>
</tr>
</tbody>
</table>

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Even a plantation with a very large number of trees and a closed canopy does not make a forest. Given that monocultural plantations are so distinct from native forests in terms of their role in the biosphere, and the important ecosystem services that native forests provide to human beings that are not provided by plantations, these two
Definitions matter, which has compelled many scientists to call for greater consistency in the use of words like “forest” (4–6). Van Holt et al. (7) showed that ecological models can be wrong when these two classes are aggregated. Many researchers acknowledge the problem—even experts such as Hansen et al. (8) aggregate these tree farms and forests in one category because separating these classes at large scales is problematic. In response, researchers interested in the theories that explain the recovery of native forests have begun to address this basic methodological issue (9–12). The lack of clarity in the Viña et al. (1) paper about the distinction between tree plantations and native forests led to misinterpretation by the public, specifically the public that is tracked by Science’s AltMetrics tool.

MATERIALS AND METHODS

We classified the content of the 71 tweets available as of Friday, 15 April 2016, that linked to this article, which, according to Science’s AltMetrics tool, had an upper bound of 783,000 followers. We then recorded for the presence of tree cover (a neutral term that can include native forests and/or plantations), native forest (including forest conservation, forest cover, forest, forest recovery, reforestation, and forest regeneration), and plantation (tree plantation, tree crops, and tree farm) in the news articles linked to Viña et al. (1). We also searched for afforestation and regeneration, although these terms are ambiguous.

RESULTS

Most media coverage of the work of Viña et al. (1) reported that native forests are recovering in China. All the tweets implied that this article refers to the return of China’s native forests (Table 1 and Fig. 1). Of the 71 tweets, 44 referred to “forest regrowth,” 20 were about “forest recovery,” and 3 each were about “reforestation” and “forest conservation.”

News articles referring to Viña et al. (1) (Table 2 and Fig. 2) only referred to tree plantations 4 times in total, whereas native forest terms were far more prominent (41 times); tree cover, a more general term that can refer to native forests or tree plantations, was mentioned 14 times, and afforestation, an ambiguous term, was mentioned once. The few that mentioned that plantations were also likely part of the story included the well-known tropical forest scientist, William Laurance, and the former director of forests from World Wildlife Fund (WWF) International, Rod Taylor.
CONCLUSIONS
Fiber farms are farms, not “recovering forests.” We need tree plantations, but if we lump them with forests, then we are incorrectly modeling, studying, and analyzing forest and landscape change dynamics, and their effects on people and the environment. To develop and test improved approaches, we need to know the conditions under which incentives to regenerate native forests fail and when tree-planting programs succeed (13). If native forests are not differentiated from plantations in official definitions and research, we will fail to address challenges in the Anthropocene, which require us to understand linkages across different components of the biosphere.

REFERENCES AND NOTES
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Acknowledgments
Competing interests: The authors declare that they have no competing interests. Data and materials availability: All data needed to evaluate the conclusions in the paper are present in the Info & Metrics section of Viña et al. (1) on advances.sciencemag.org. Additional data related to this paper may be requested from the authors.

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