Supplementary material: Private-Land Control and Deforestation Dynamics in the context of implementing the Native Forest Law in the Northern Argentinian Dry Chaco

**Annex 1 (A.1):** Study region

Argentina is the third largest global producer of soybeans after the USA and Brazil (USDA 2019). Of the *c*. 38 million hectares of cropland in Argentina in 2018, *c*. 45% were represented by soybean crops (MAGyP 2020). The stimulation of agricultural production since the 1990s (Pengue 2014; Baumann et al. 2016; Piquer-Rodríguez et al. 2018) is evident in the Dry Chaco Forests (Gasparri and Grau 2009; Grau et al. 2005; Volante et al. 2016). We focus on the Northern Argentinian Dry Chaco (i.e. NADC), at the center of the American Gran Chaco, which comprises an area of 175,785 km2 (Fig. S.2).

Seventeen departments (equivalent to ‘districts’ or ‘Municipalities’) are included in the study area, distributed across five provinces: western Formosa province, eastern Salta province, northwestern part of Chaco province, northern Santiago del Estero and northeastern Tucumán province (Fig. S.2). The mean annual temperature range is 19-24°C and rainfall is 400-700 mm/yr, except for two moister fringes in the ecotones with the Humid Chaco ecoregion, to the East, and with the Yungas ecoregion, to the West. With a monsoon regime, *c*. 80% of the rain falls between October and March (Morello et al. 2012). Typical landscape in the NADC is represented by xerophytic vegetation in mosaics dominated by semi-deciduous forests of *Aspidosperma quebracho-blanco, Schinopsis lorentzii*, and species of the genus *Acacia*, *Mimosa*, *Prosopis*, *Celtis*, *Opuntia* and *Cereus* (Bucher 1983). These dry forests harbor high levels of biodiversity, including endemic and threatened species of different biological groups (TNC et al. 2005; Torres et al. 2011).

References

Baumann M, Gasparri NI, Piquer-Rodríguez M, Gavier Pizarro G, Griﬃths P, Hostert P, et al. (2016) Carbon emissions from agricultural expansion and intensiﬁcation in the Chaco. *Global Change Biology*. http://dx.doi.org/10.1111/gcb.13521.

Bucher EH (1983) Chaco and Caatinga: South American arid savannas, woodlands and thickets Ecology of Tropical Savannas, Ecological Studies 42 ed B Huntley and B Walker (Berlin, Germany: Springer-Verlag) pp 105–63.

Gasparri NI, Grau HR (2009) Deforestation and fragmentation of Chaco dry forest in NW Argentina 1972–2007 *Forest Ecology and Management* (258) 913–921 doi:10.1016/j.foreco.2009.02.024

Grau HR, Gasparri NI, Aide TM (2005) Agriculture expansion and deforestation in seasonally dry forests of north-west Argentina. *Environmental Conservation* 32(2) : 140–148 https://doi.org/10.1017/S0376892905002092

MAGyP (Argentinian Ministry of Agriculture, Livestock and Fisheries) (2020) Last access: July 14th, 2020. <https://www.magyp.gob.ar/datosabiertos/>

Morello J, Rodríguez A, Silva M (2012) Ecorregión del Chaco Seco. In: *Ecorregiones y complejos ecosistémicos argentinos* (pp151-203)*, Eds.* Morello J, Mateucci SD, Rodríguez AF, Silva ME. 1°ed. Buenos Aires, Orientación Gráfica Editora. 752pp.

Pengue W (2014) Cambios y escenarios en la agricultura argentina del siglo XXI. Fundación Heinrich Böll.

Piquer-Rodríguez M, Butsic V, Gärtner P, Macchi L, Baumann M, Gavier Pizarro G. et al. (2018) Drivers of agricultural land-use change in the Argentine Pampas and Chaco regions *Applied Geography* 91 (2018) 111–122 https://doi.org/10.1016/j.apgeog.2018.01.004

The Nature Conservancy (TNC), Fundación Vida Silvestre Argentina (FVSA),

Fundación para el Desarrollo Sustentable del Chaco (DeSdel Chaco), Wildife

Conservation Society Bolivia (WCS) (2005). Evaluación Ecorregional del Gran

Chaco Americano/Gran Chaco Americano Ecoregional Assessment. Fundación

Vida Silvestre Argentina, Buenos Aires, 28 pp.

Torres R, Gasparri NI, Blendinger P, Grau HR (2014) Land use and land cover effects on regional biodiversity distribution in a subtropical dry forest: a hierarchical integrative multi-taxa study. *Regional Environmental Change* (14): 1549–1561

USDA (United States Department of Agriculture) (2019) World Agricultural Production. Office of Global Analysis, FAS, USDA. Circular Series WAP 4- 2019.

Volante JN, Mosciaro MJ, Gavier-Pizarro GI, Paruelo JM (2016) Agricultural

expansion in the Semiarid Chaco: Poorly selective contagious advance. *Land Use Policy*, 55, 154–165 http://dx.doi.org/10.1016/j.landusepol.2016.03.025