

AVCA Elk-LD 10-year Vegetation Monitoring

Lia Ossanna

Originally presented 1/28/2022; updated 9/12/2022



COLLEGE OF AGRICULTURE & LIFE SCIENCES

Natural Resources
& the Environment

Four channels monitored

- Channel 12
 - No rock treatments
- Channel 19
 - Upland rock treatments only
 - Upstream media lunas and one rock dams in tributaries
- Channels 13 & 21
 - In-channel treatments
 - One rock dams and baffles



Vegetation monitoring over 10 years

- Species cover and ground cover data collected seven times from 2012 to 2021
- Project goals included increasing vegetation density and diversity in stream channels





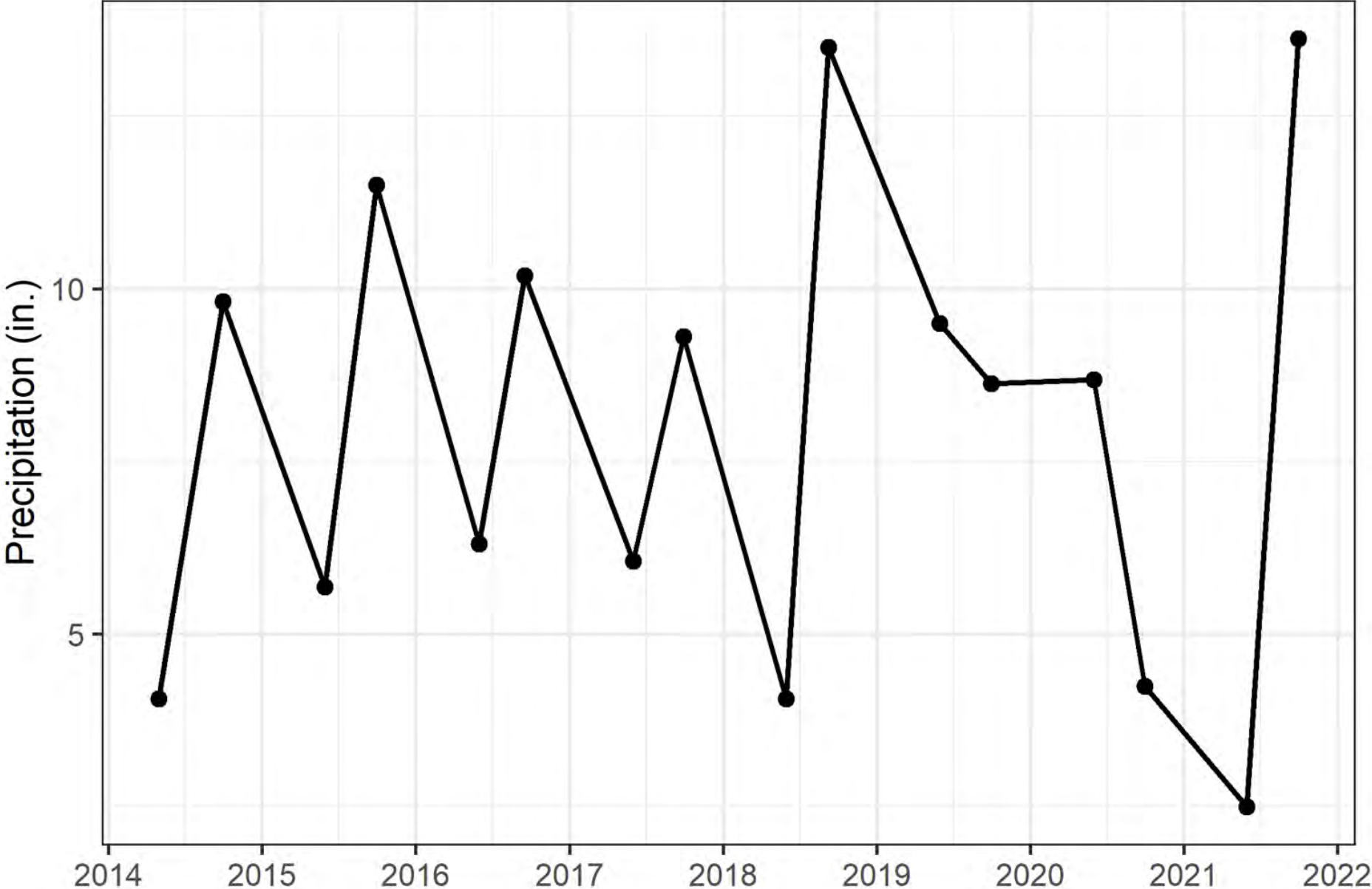
Common plant species

- Velvet mesquite (*Prosopis velutina*)
- False mesquite (*Calliandra eriophylla*)
- Sideoats grama (*Bouteloua curtipendula*)
- Lehmann lovegrass (*Eragrostis lehmanniana*)
- Snakeweed (*Gutierrezia sarothrae*)
- Slender grama (*Bouteloua repens*)
- Tanglehead (*Heteropogon contortus*)
- Brickellia (*Brickellia coulteri*)
- Needle grama (*Bouteloua aristidoides*)

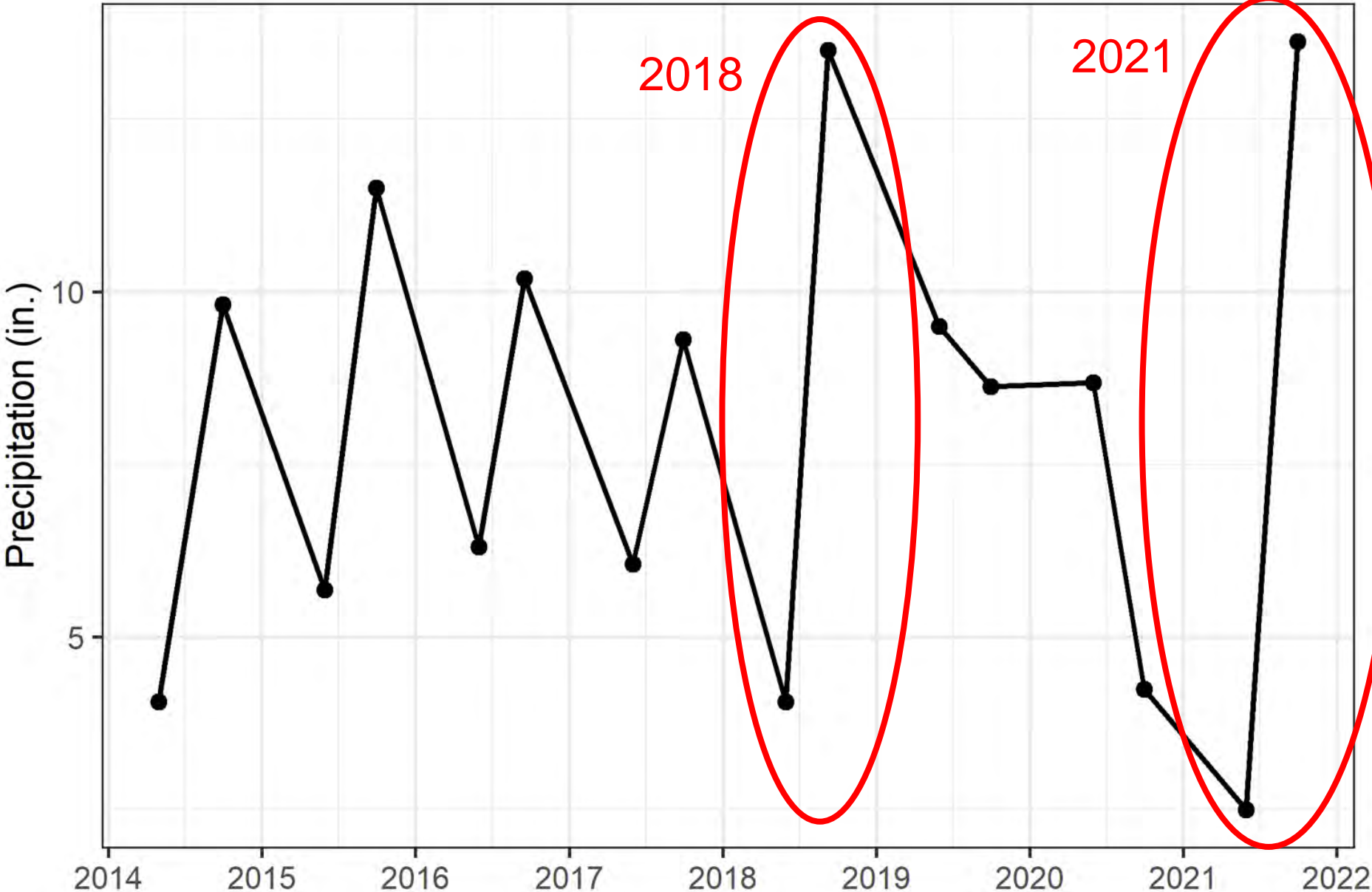


Rainfall

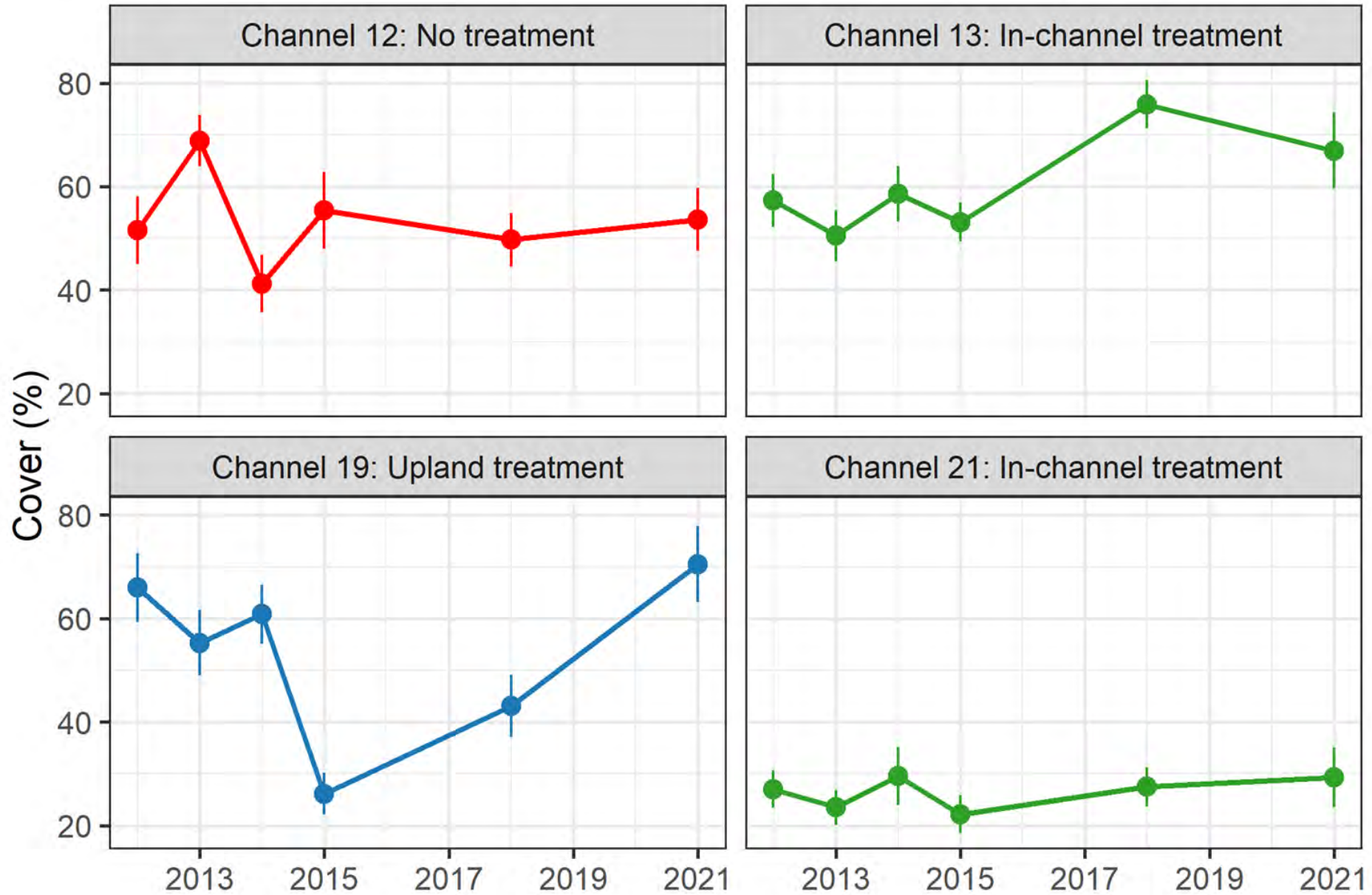
Precipitation measured in May and Sept



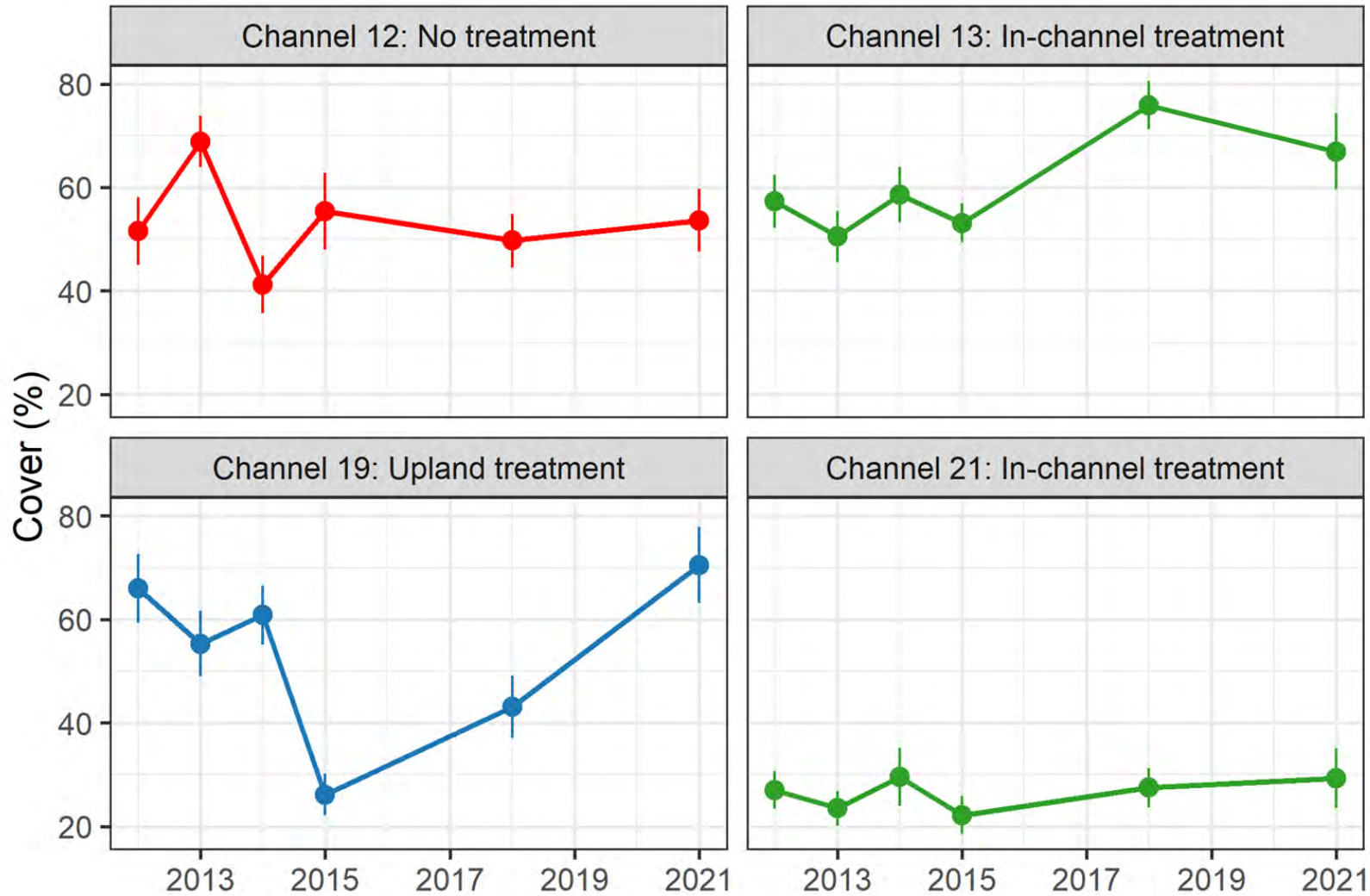
Rainfall



Total plant cover



Total plant cover

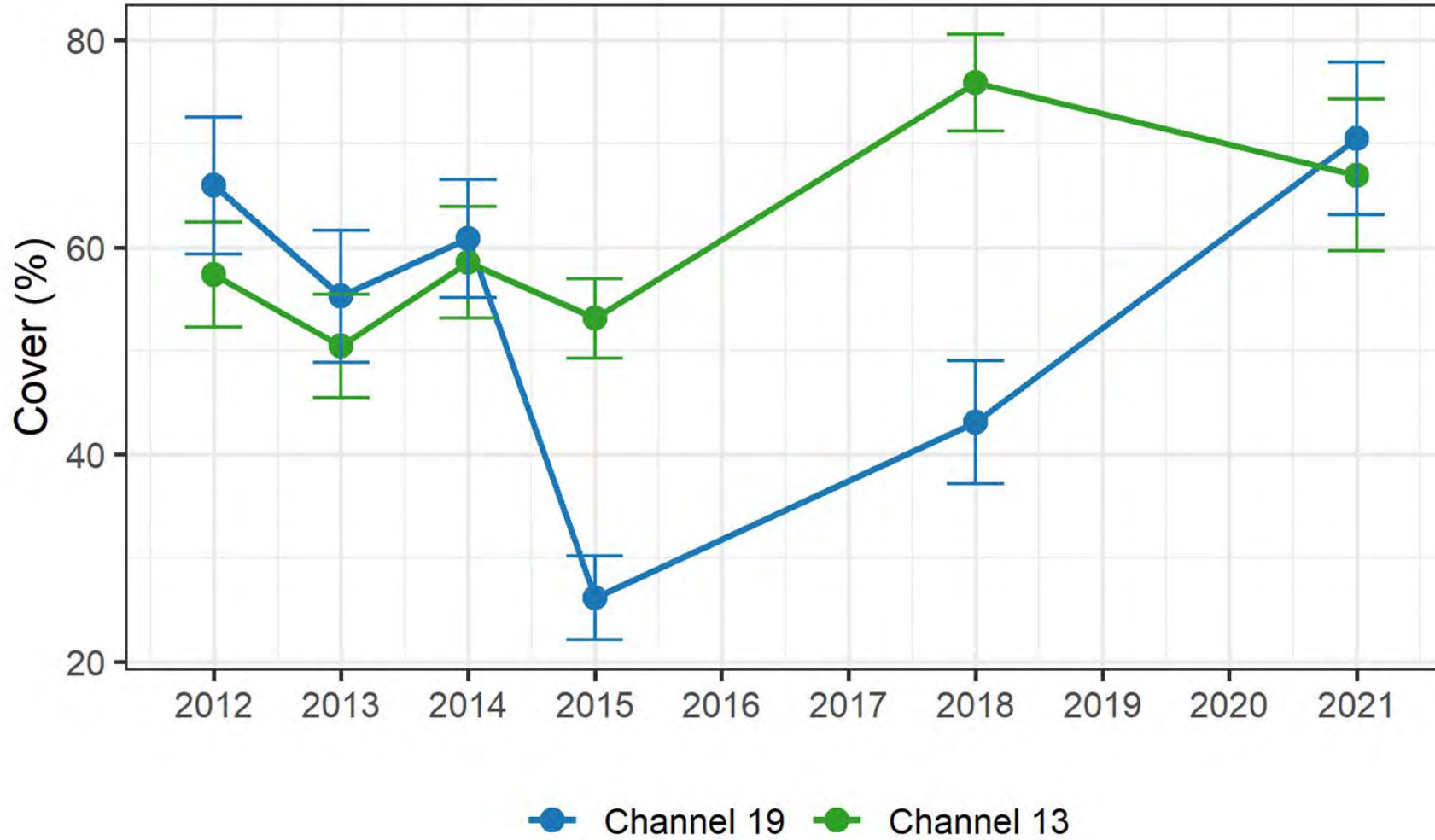


Channel	2012 Cover	2021 Cover
Channel 12	52%	54%
Channel 19	66%	71%
Channel 13	57%	67%
Channel 21	27%	29%

Increases in cover from 2012 to 2021 are not statistically significant.

(ANOVA and Kruskal-Wallis tests)

Total plant cover: 19 & 13



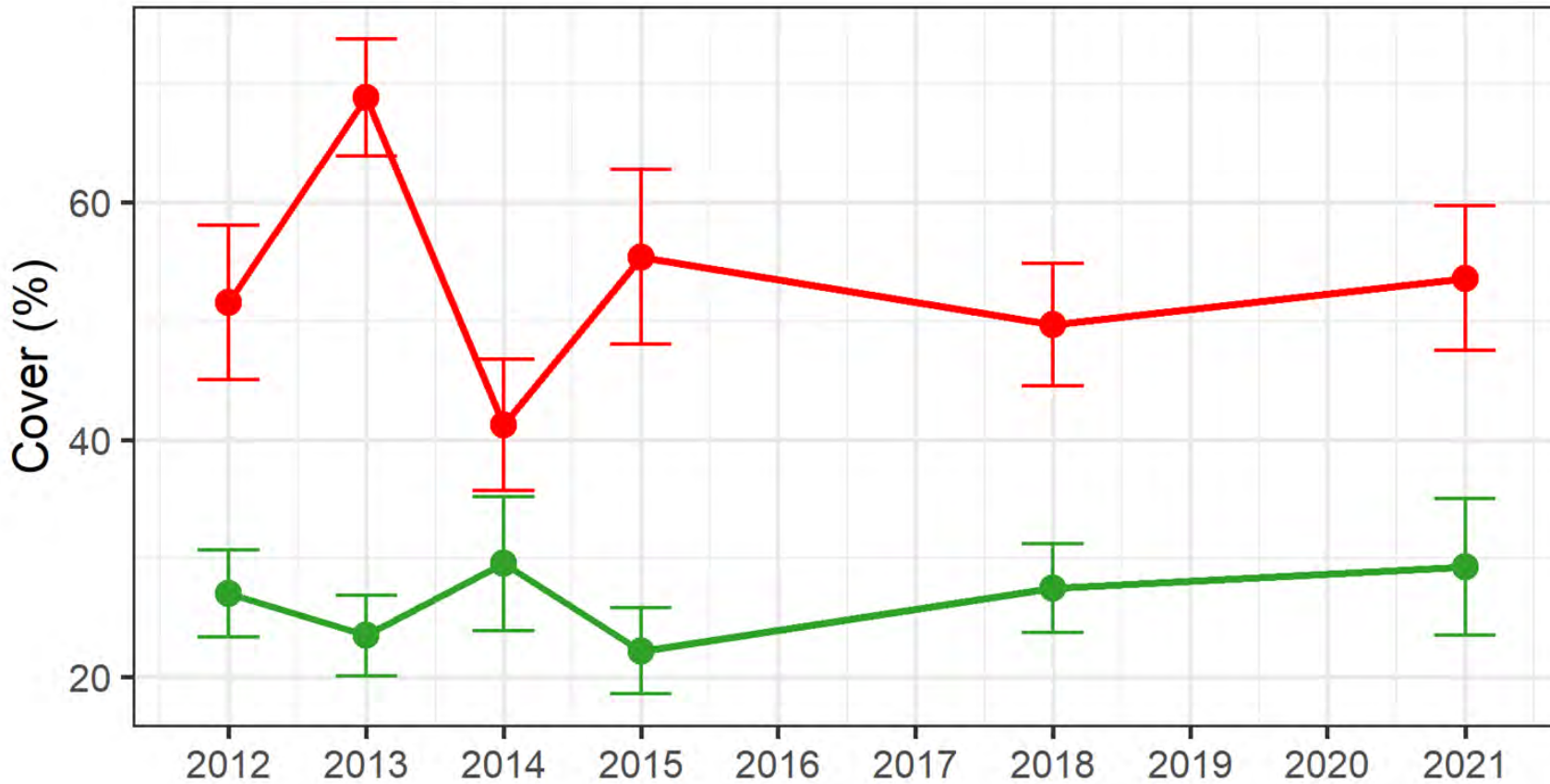
Upland treatment

In-channel treatment

However, Channel 19 is significantly more variable than Channel 13.

(Feltz and Miller's asymptotic test to compare coefficient of variation)

Total plant cover: 12 & 21



● Channel 12 ● Channel 21

No treatment

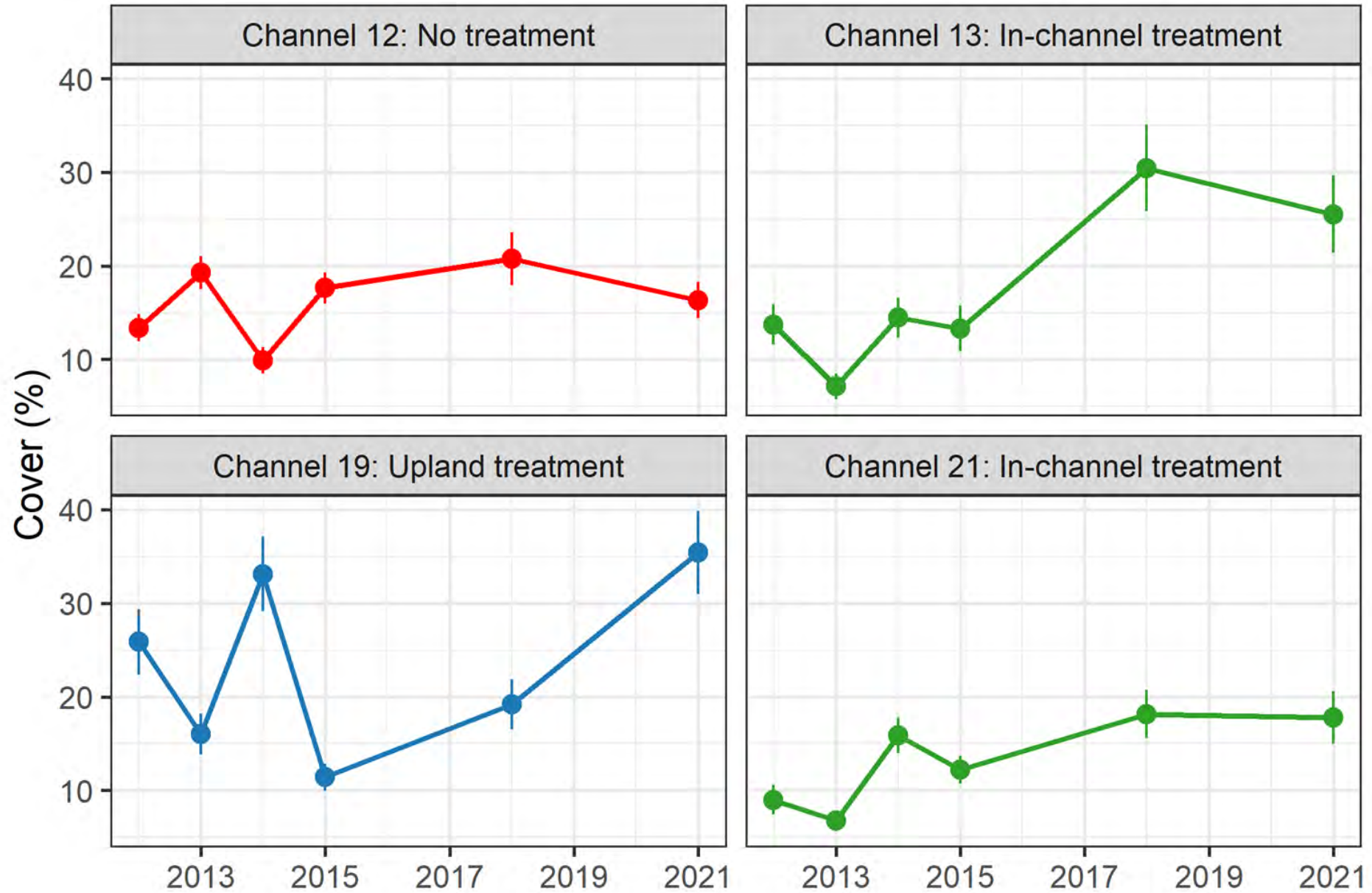
In-channel treatment

Channel 12 is also significantly more variable than Channel 21.

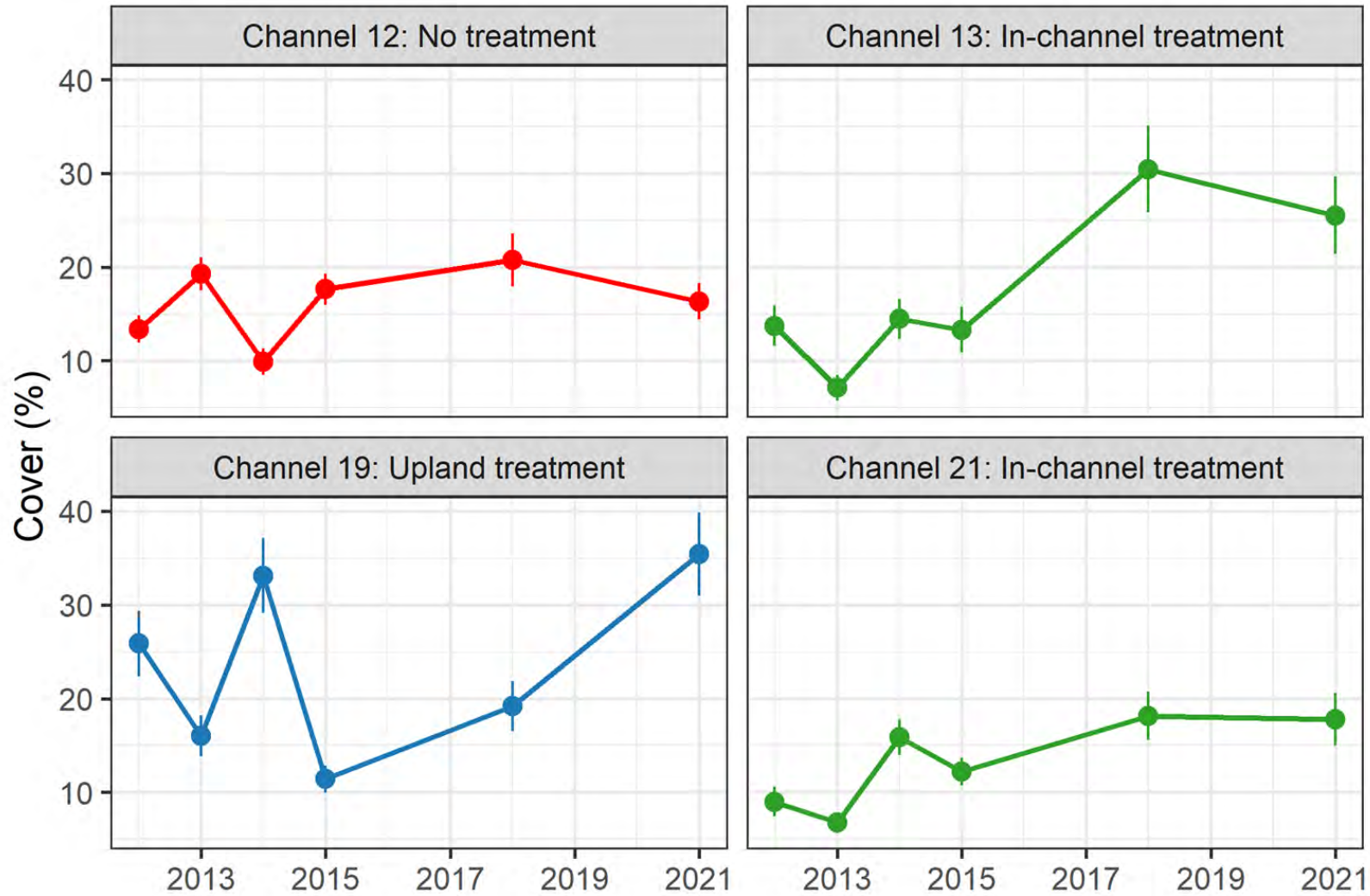
(Feltz and Miller's asymptotic test to compare coefficient of variation)

In-channel treatments could be increasing resiliency and buffering against drastic change.

Herbaceous cover



Herbaceous cover

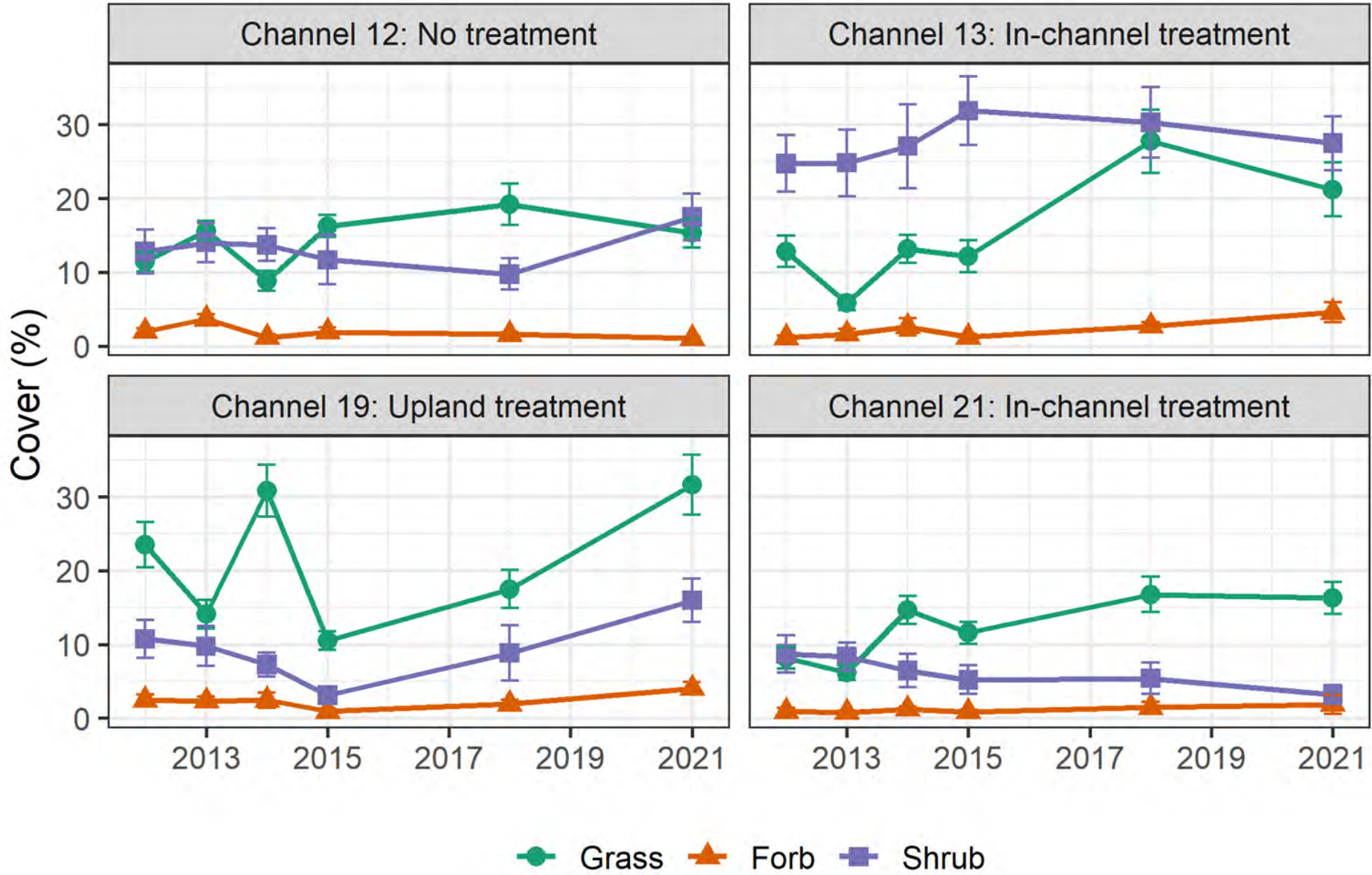


Channel	2012 Cover	2021 Cover
Channel 12	13%	16%
Channel 19	26%	35%
Channel 13	14%	26%
Channel 21*	9%	18%

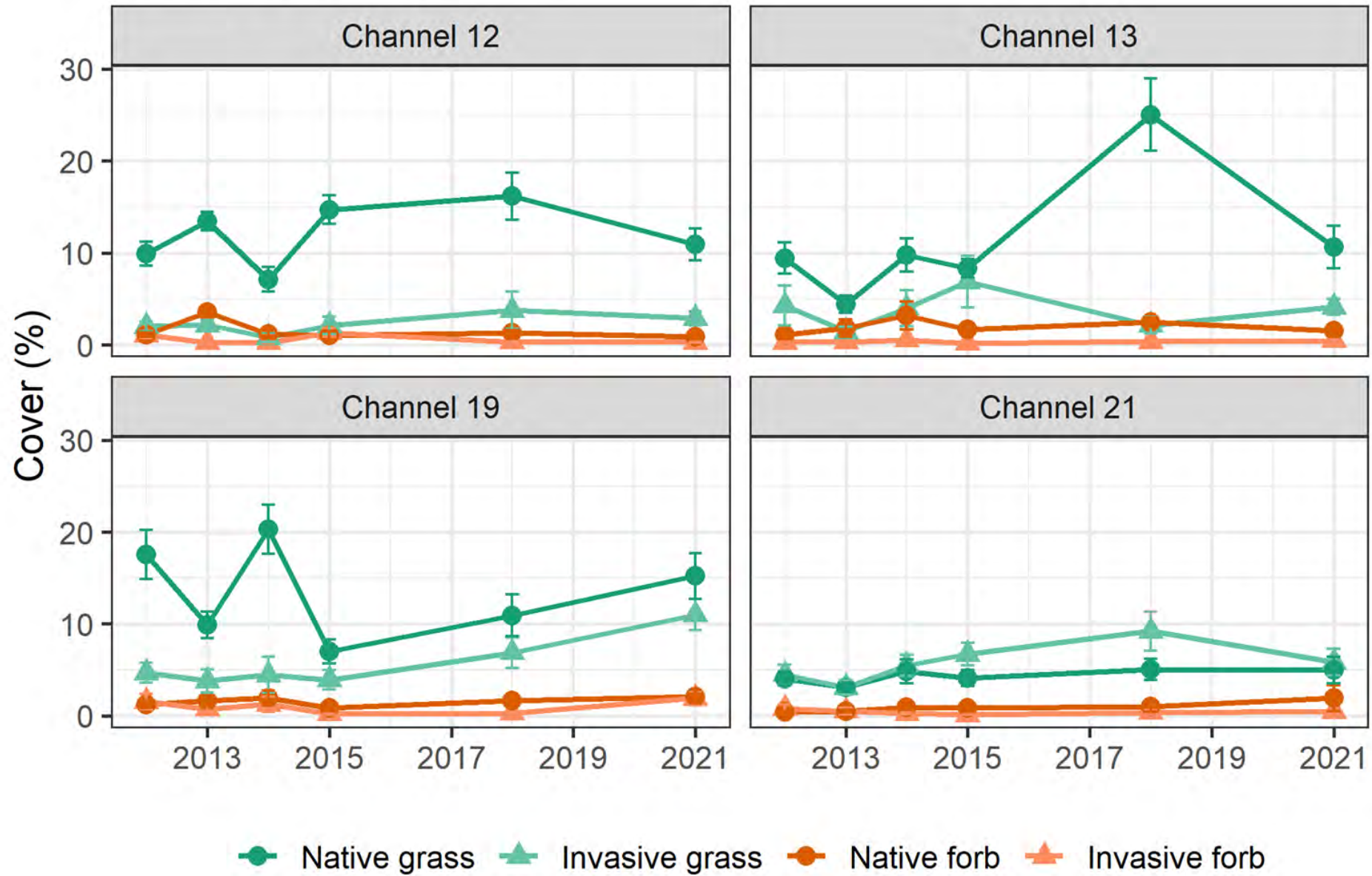
Herbaceous cover of Channel 21 increased significantly from 2012 to 2021, with Channel 13 trending towards significance

(ANOVA and Kruskal-Wallis tests)

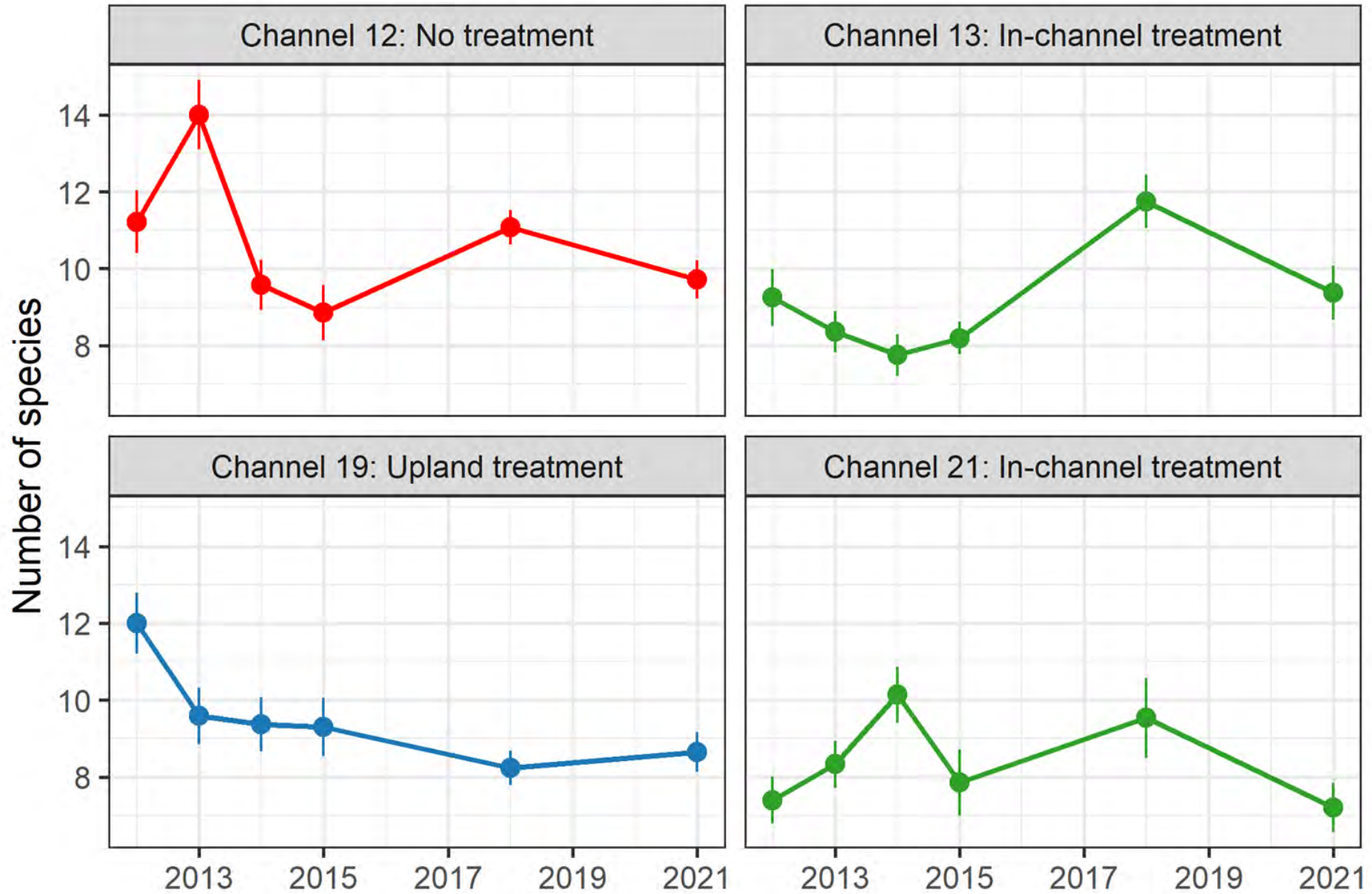
Grass, forb, and shrub cover



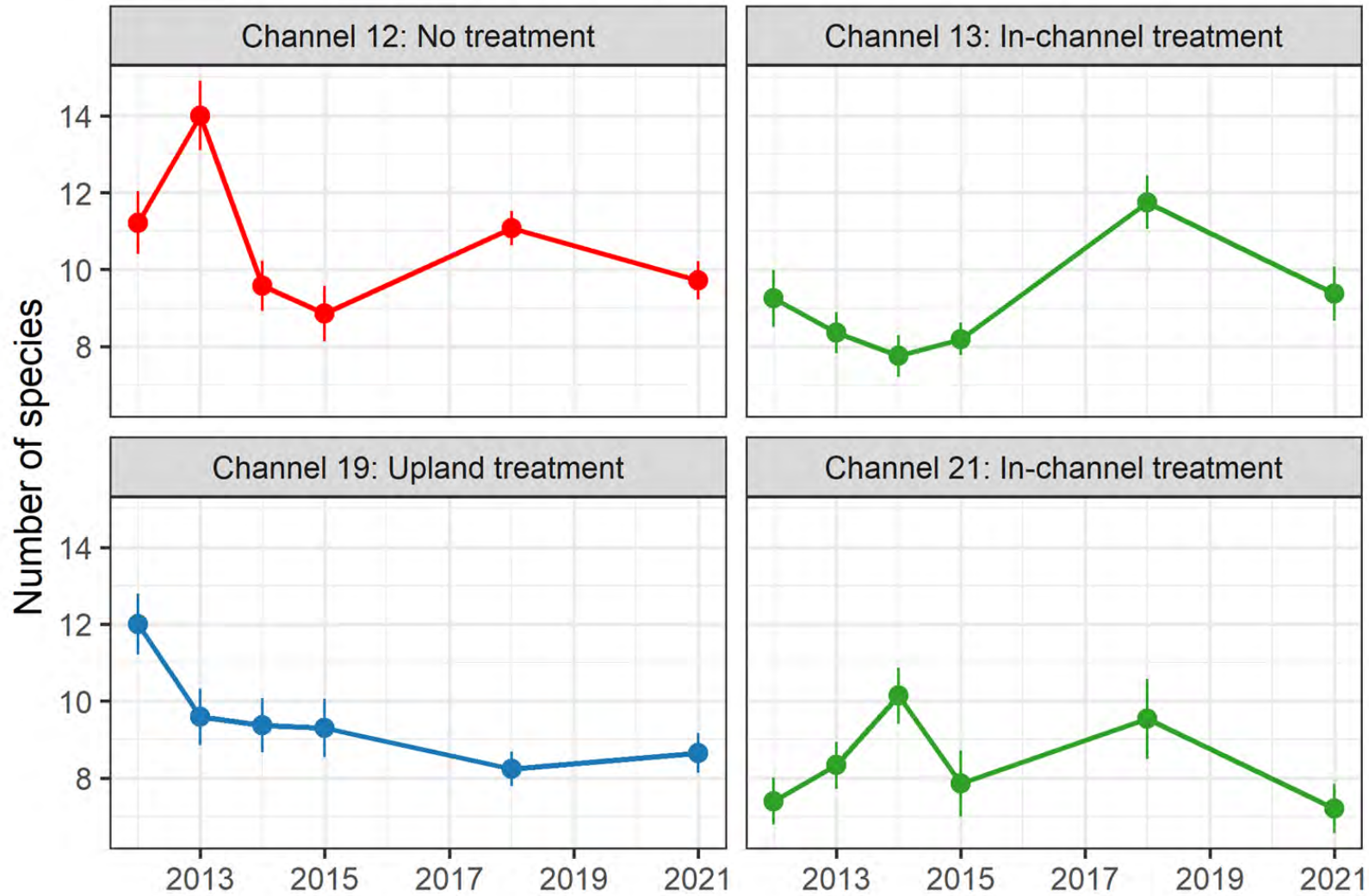
Grass and forb cover



Perennial species richness



Perennial species richness

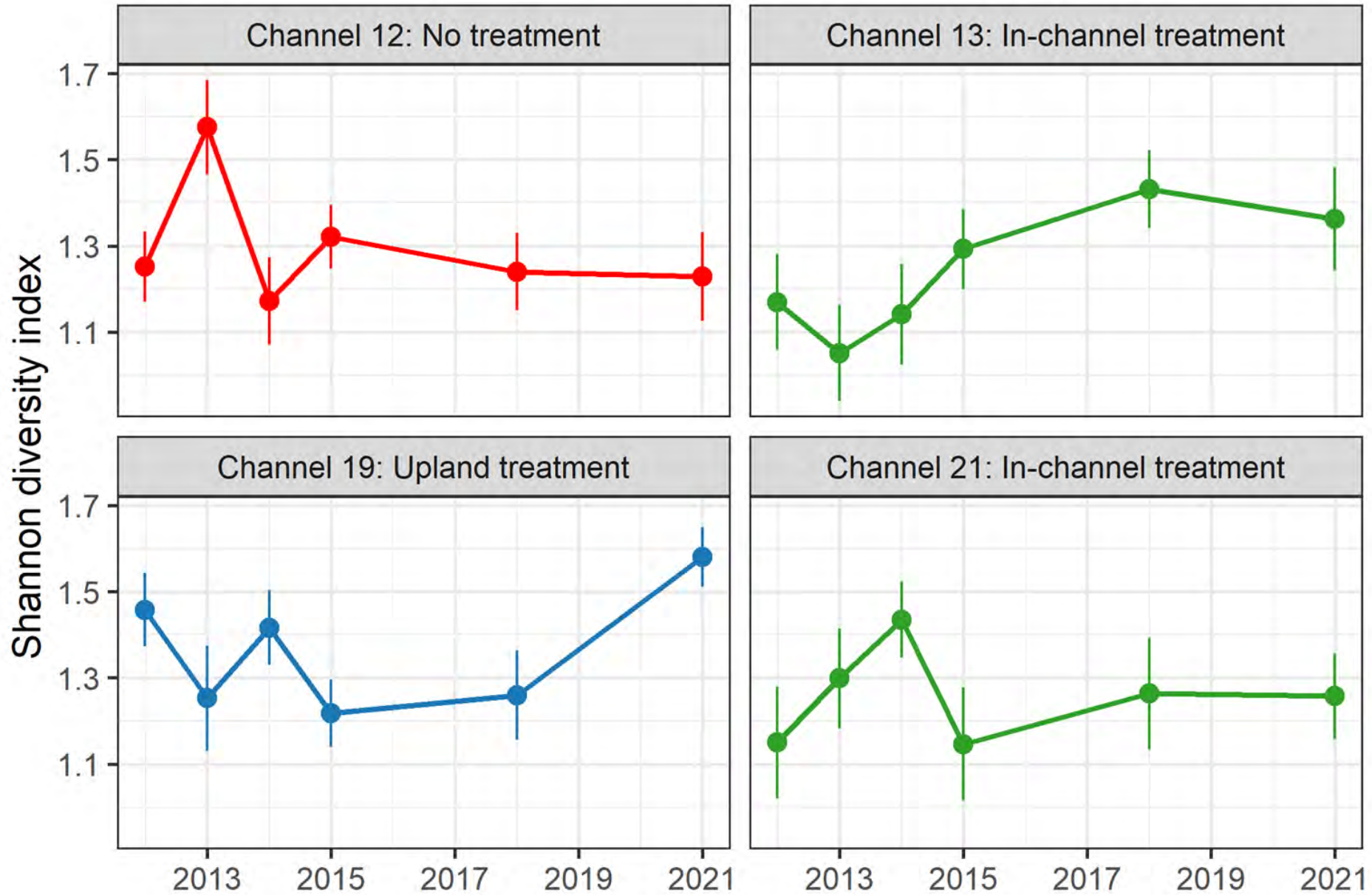


Channel	2012	2021
Channel 12	11	10
Channel 19*	12	9
Channel 13	9	9
Channel 21	7	7

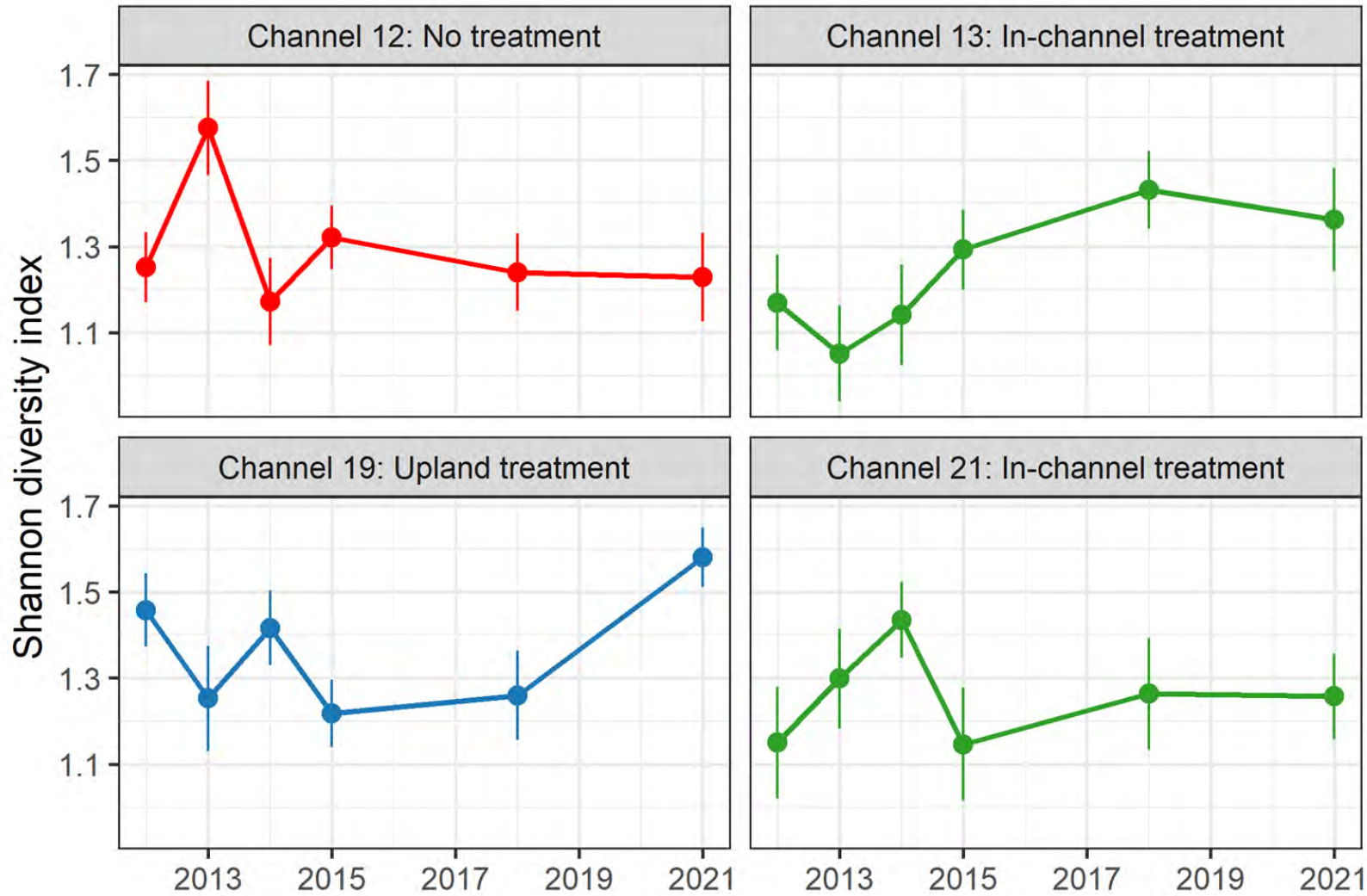
Channel 19 species richness decreased significantly from 2012 to 2021.

(ANOVA and Kruskal-Wallis tests)

Perennial plant diversity



Perennial plant diversity

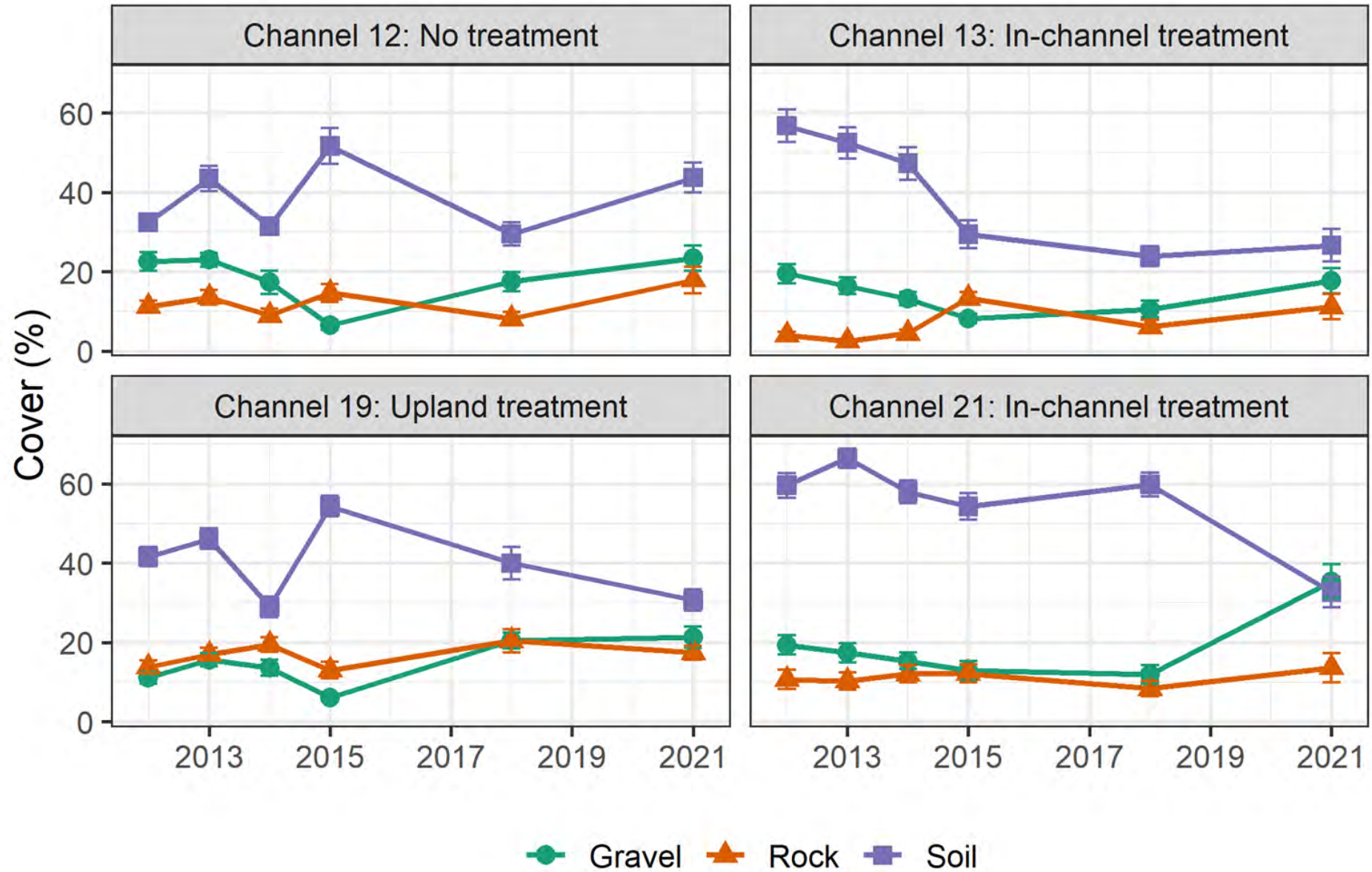


Channel	2012	2021
Channel 12	1.252	1.228
Channel 19	1.458	1.580
Channel 13	1.169	1.362
Channel 21	1.150	1.257

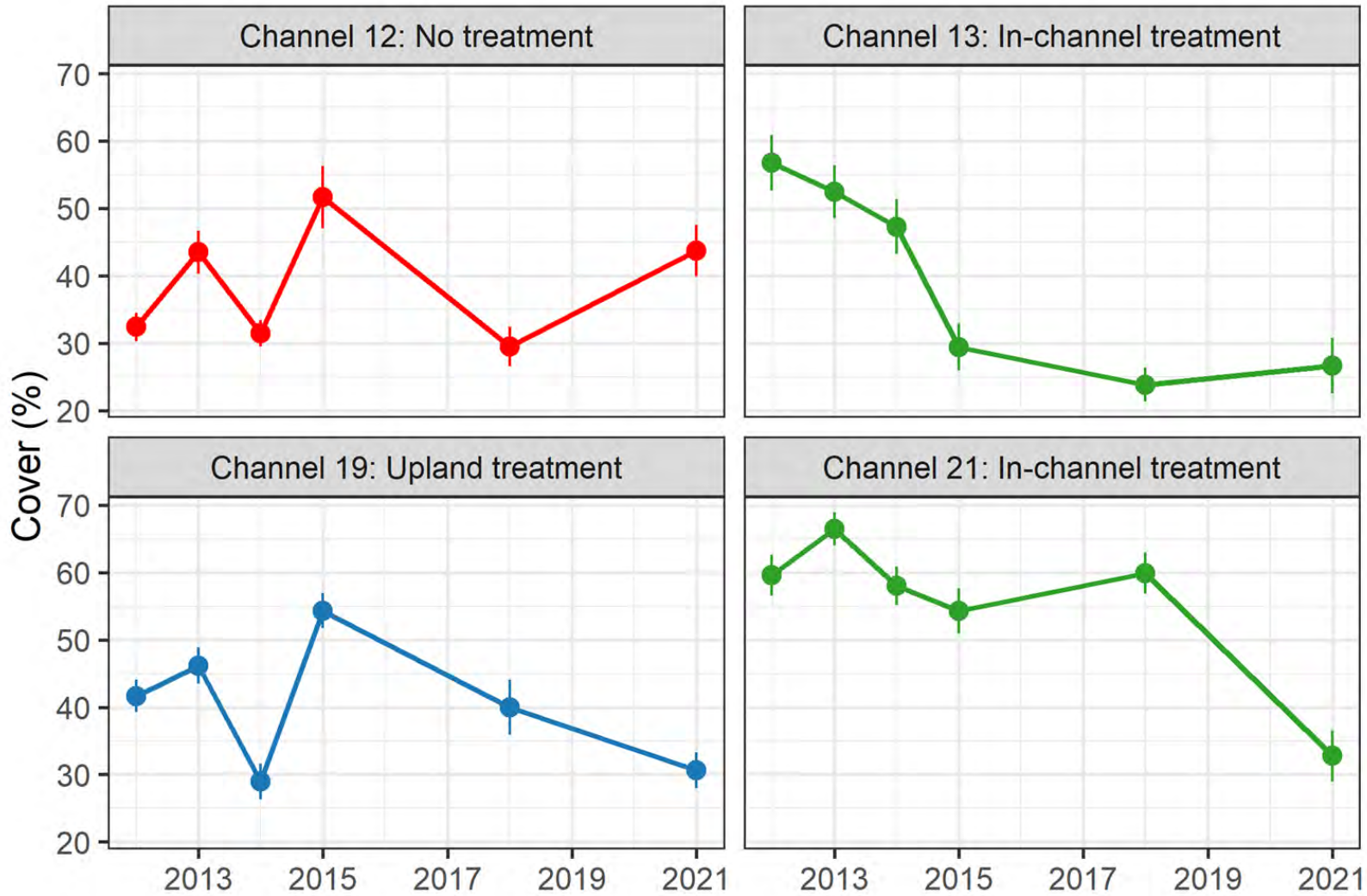
There were no significant changes in diversity from 2012 to 2021.

(ANOVA and Kruskal-Wallis tests)

Gravel, rock, and soil cover



Soil cover



Channel	2012 Cover	2021 Cover
Channel 12*	32%	44%
Channel 19	42%	31%
Channel 13*	57%	27%
Channel 21*	60%	33%

Soil cover of Channels 13 & 21 decreased significantly from 2012 to 2021; Channel 12 soil cover significantly increased.

(ANOVA and Kruskal-Wallis tests)

Conclusions

- Channels with in-channel treatments significantly increased in herbaceous cover.
- Invasive species are under control.
- There was a decrease in soil cover in Channels 13 & 21, but an increase in plant cover.
- There is an increase in Channel 13 plant diversity that is trending towards significance.
- In-channel rock treatments have the potential to increase channel resiliency.

