PRE Evaluation Report -- Spiraea japonica

Plant Risk Evaluator -- PRE™
Evaluation Report

Spiraea japonica -- Illinois

2017 Farm Bill PRE Project

PRE Score: 17 -- Reject (high risk of invasiveness)
Confidence: 71 / 100
Questions answered: 20 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Submitted

Evaluation Date: October 22, 2017

This PDF was created on June 15, 2018
Plant Evaluated

*Spiraea japonica*

Image by Leslie J. Mehrhoff, University of Connecticut, Bugwood.org
Evaluation Overview

A PRE™ screener conducted a literature review for this plant (Spiraea japonica) in an effort to understand the invasive history, reproductive strategies, and the impact, if any, on the region's native plants and animals. This research reflects the data available at the time this evaluation was conducted.

Summary

Spiraea japonica is included on invasive lists in six states, four of which have a similar climate to Illinois. However, there was not much information in the literature on the impacts of this plant as an invasive species. Most datasheets recycled the same text as the Plant Conservation Alliance fact sheet, and no distinct corroborating sources could be found. It seems more research is needed. According to one journal article, "Available evidence suggests that many populations of Japanese spirea are in the initial establishment and/or lag phases of invasion both in North America (Bowen et al., 2002; Garrett, 2007; Jog and Delong, 2005; USDA Forest Service, 2007) and Europe (Essl, 2005)." (Wilson and Hoch) This screening places Spiraea japonica in the high risk category of invasiveness due to its ability to spread vegetatively or by seed, long flowering time, and dispersal by wind or contaminated soil.

General Information

Status: Submitted  
Screener: Emily Russell  
Evaluation Date: October 22, 2017

Plant Information

Plant: Spiraea japonica

Regional Information

Region Name: Illinois
Climate Matching Map

To answer four of the PRE questions for a regional evaluation, a climate map with three climate data layers (Precipitation, UN EcoZones, and Plant Hardiness) is needed. These maps were built using a toolkit created in collaboration with GreenInfo Network, USDA, PlantRight, California-Invasive Plant Council, and The Information Center for the Environment at UC Davis.

Click [here](#) to see the generated climate matching map for this region. This climate match database is hosted by GreenInfo Network and publicly accessible.
Evaluation Questions

These questions are based in an original article published at the University of California, Davis, and can be found on the PLOS One website, here: https://doi.org/10.1371/journal.pone.0121053

Invasive History and Climate Matching (Questions 1 - 6)

1. Has the species (or cultivar or variety, if applicable; applies to subsequent "species" questions) become naturalized where it is not native?

   • Answer: Yes, which contributes 1 points to the total PRE score.
   • The screener has a Very High confidence in this answer based on the available literature.

   Answer / Justification:

   Spiraea japonica is naturalized in the Eastern United States and Ontario.

   Reference(s):


2. Is the species (or cultivar or variety) noted as being naturalized in the US or world in a similar climate?

   • Answer: Yes, which contributes 2 points to the total PRE score.
   • The screener has a Very High confidence in this answer based on the available literature.

   Answer / Justification:

   Spiraea japonica is naturalized in Illinois and similar climates in the Midwest, Northeast, Mid-Atlantic, Virginia, Kentucky, Tennessee, and Arkansas, as well as Ontario.

   Reference(s):

3. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

- Answer: Yes, which contributes 2 points to the total PRE score.
- The screener has a Very High confidence in this answer based on the available literature.

Answer / Justification:

Spiraea japonica is invasive in Pennsylvania, Virginia, Kentucky, Tennessee, Georgia, and North Carolina. Also listed as invasive in New Zealand, and as a weed in Europe.

Reference(s):

- Pennsylvania Department of Conservation and Natural Resources (0). DCNR Invasive Plants.
- Center for Invasive Species and Ecosystem Health, University of Georgia (0). Georgia Exotic Pest Plant Council List of Non-native Invasive Plants in Georgia.

4. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

- Answer: Yes, which contributes 3 points to the total PRE score.
- The screener has a Very High confidence in this answer based on the available literature.

Answer / Justification:

Spiraea japonica is invasive in Pennsylvania, Virginia, Kentucky, and Tennessee, which have some climate overlap with Illinois.
5. Are other species of the same genus (or closely related genera) invasive in a similar climate?

- Answer: Yes, which contributes 1 points to the total PRE score.
- The screener has a Medium confidence in this answer based on the available literature.

Answer / Justification:

No other species of Spiraea are invasive in similar climates in the United States. There are many species of Spiraea listed in the Global Compendium of Weeds. S. chamaedryfolia and S. alba appear to be invasive in similar climates in Northern Europe.

Reference(s):

- European Commission (0). DAISIE (Delivering Alien Invasive Species Inventories for Europe).

6. Is the species (or cultivar or variety) found predominately in a climate matching the region of concern?

- Answer: No, which contributes 0 points to the total PRE score.
- The screener has a Very High confidence in this answer based on the available literature.

Answer / Justification:

Spiraea japonica grows in many climates.
Impact on Native Plants and Animals (Questions 7 - 10)

7. Does this plant displace native plants and dominate (overtop or smother) the plant community in areas where it has established?

- Answer: Yes, which contributes 1 points to the total PRE score.
- The screener has a High confidence in this answer based on the available literature.

Answer / Justification:

"Japanese spiraea can rapidly take over disturbed areas. Growing populations creep into meadows, forest openings, and other sites. Once established, spiraea grows rapidly and forms dense stands that outcompete much of the existing native herbs and shrubs."

Reference(s):

8. Is the plant noted as promoting fire and/or changing fire regimes?

- Answer: No, which contributes 0 points to the total PRE score.
- The screener has a Medium confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence of changing fire regimes.

Reference(s):
- [Anonymous].
9. Is the plant a health risk to humans or animals/fish? Has the species been noted as impacting grazing systems?

- Answer: No, which contributes 0 points to the total PRE score.
- The screener has a Medium confidence in this answer based on the available literature.

Answer / Justification:
No reports of health risks to humans or animals.

Reference(s):
- [Anonymous].

10. Does the plant produce impenetrable thickets, blocking or slowing movement of animals, livestock, or humans?

- Answer: No, which contributes 0 points to the total PRE score.
- The screener has a Low confidence in this answer based on the available literature.

Answer / Justification:
There are reports of dense stands, but not impenetrable thickets that block movement.

Reference(s):
- [Anonymous].
Reproductive Strategies (Questions 11 - 17)

11. Does this species (or cultivar or variety) reproduce and spread vegetatively?

- Answer: Yes, which contributes 1 points to the total PRE score.
- The screener has a High confidence in this answer based on the available literature.

Answer / Justification:

Spiraea japonica spreads vegetatively via root suckers. It will resprout vigorously after cutting. It may also be propagated by layering.

Reference(s):


12. If naturally detached fragments from this plant are capable of producing new plants, is this a common method of reproduction for the plant?

- Answer: No, which contributes 0 points to the total PRE score.
- The screener has a Low confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence of reproducing from fragments in the wild.

Reference(s):

- [Anonymous].
13. **Does the species (or cultivar or variety) commonly produce viable seed?**

   - **Answer:** Yes, which contributes 1 points to the total PRE score.
   - The *screener* has a **High** confidence in this answer based on the available literature.

**Answer / Justification:**

"A single Japanese spiraea plant produces hundreds of small seeds" "Spreads: by seed which is produced in abundance"

**Reference(s):**


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14. **Does this plant produce copious viable seeds each year (> 1000)?**

   - **Answer:** No, which contributes 0 points to the total PRE score.
   - The *screener* has a **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

"A single Japanese spiraea plant produces hundreds of small seeds." "Spreads: by seed which is produced in abundance." Confidence is lowered since an authoritative reference quantifying seed production could not be found.

**Reference(s):**

15. Is there significant germination (>25%) of seeds the next growing season, with no requirement of an infrequent environmental condition for seeds to germinate (i.e. fire) or long dormancy period?

- Answer: **Yes**, which contributes 1 points to the total PRE score.
- The **screener** has a **High** confidence in this answer based on the available literature.

**Answer / Justification:**

"Seed requires no special treatment and will germinate readily when directly sown although, if dried, a one-month cold stratification is beneficial."

**Reference(s):**


16. Does this plant produce viable seed within the first three years (for an herbaceous species) to five years (for a woody species) after germination?

- Answer: **Yes**, which contributes 1 points to the total PRE score.
- The **screener** has a **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

"From personal experience as a plant propagator and breeder of Spirea japonica, plants will flower and develop seeds in the second or third year after germination in a landscape setting. In the wild they would likely take a year or two longer depending on the situation but would certainly be fruiting within 5 years of germination." (Michael Yanny, Johnson's Nursery)

**Reference(s):**

- [Anonymous]
17. Does this plant continuously produce seed for >3 months each year or does seed production occur more than once a year?

- **Answer:** Yes, which contributes 1 point to the total PRE score.
- The *screener* has a Medium confidence in this answer based on the available literature.

**Answer / Justification:**

"Tiny pink flowers in flat-topped clusters (corymbs) cover the foliage from late spring to mid-summer, with sparse and intermittent repeat bloom sometimes occurring." Chicago Botanic Garden says bloom time is "May - June, July - August... Most offer a secondary bloom after the initial display."

**Reference(s):**


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**Dispersal (Questions 18 - 20)**

18. Are the plant’s propagules frequently dispersed long distance (>100 m) by mammals or birds or via domestic animals?

- **Answer:** No, which contributes 0 points to the total PRE score.
- The *screener* has a Medium confidence in this answer based on the available literature.

**Answer / Justification:**

There is no evidence of dispersal by animals.

**Reference(s):**

- [Anonymous]  .
19. Are the plant’s propagules frequently dispersed long distance (>100 m) by wind or water?

- Answer: Yes, which contributes 1 points to the total PRE score.
- The screener has a High confidence in this answer based on the available literature.

Answer / Justification:

"A single Japanese spiraea plant produces hundreds of small seeds that are naturally dispersed by water and deposited along stream banks."

Reference(s):

20. Are the plant’s propagules frequently dispersed via contaminated seed (agriculture or wildflower packets), equipment, vehicles, boats or clothing/shoes?

- Answer: Yes, which contributes 1 points to the total PRE score.
- The screener has a Low confidence in this answer based on the available literature.

Answer / Justification:

"Seeds may also be carried in fill dirt and establish new populations in the highly disturbed soil of construction sites." Could not find an original corroborating source for this claim, lowering confidence.

Reference(s):
Total PRE Score

PRE Score: 17 -- Reject (high risk of invasiveness)
Confidence: 71 / 100
Questions answered: 20 of 20 -- Valid (80% or more questions answered)

PRE Score Legend

The PRE Score is calculated by adding the point totals for each (answered) question.
< 13 : accept (low risk of invasiveness)
13 - 15 : evaluate further
> 15 : reject (high risk of invasiveness)

Questions Answered Legend

It is important to answer at least 16 questions to consider a PRE Score as "valid".
>= 16 : valid (80% or more questions answered)
<= 15 : invalid (not enough questions answered)

Organization Ownership and Content Privacy

Organization: 2017 Farm Bill PRE Project
Content Privacy: Public
Evaluation Reviewers

The PRE approach is to base decisions on science and make decisions by consensus of diverse horticultural stakeholders. The literature review and process of answering PRE's questions are based on science; the decisions of which plants to prioritize are based on consensus. To ensure this process is in place and that PRE is collaborative, volunteer stakeholders are recruited from each region to review evaluations. The following experts in their profession (plant science, conservation, or horticultural trade) have participated as volunteer PRE reviewers for this evaluation:

• Steve Worth December 21, 2017
• Michael Yanny December 6, 2017
• Kim Shearer November 16, 2017

This evaluation has a total of 3 reviewer(s).
Evaluation Issues

The following section lists all public issues for this evaluation. Issues provide a way for stakeholder reviewers to communicate any concerns or suggestions they might have with the plant or evaluation. Please email PlantRight@suscon.org if additional action is required to resolve open issues.

Issue ID # 6184

Date Created: December 21, 2017 - 9:25am  
Date Updated: January 29, 2018 - 7:07am

Submitted by: Steve Worth

Status: Fixed  
Type: Comment  
Severity: Major  
Scope: Q07. Does this plant displace native plants and dominate the plant community in areas where it has been established?

Issue Description

The cultivars of spirea japonica are extremely important to the nursery and landscape trade in Illinois and the midwest. I do not see a study of this plants invasive qualities which focuses on our region of the country. I have seen very little evidence of invasiveness in my personal experience. The economic impact of removing these cultivars would be very detrimental to the health of the nursery/landscape industry in the midwest.

Issue Resolution (Screener's Response to Issue)

Thank you for your comment. I agree that there is little solid evidence on this species and its cultivars and that this screening alone should not determine the fate of Spiraea japonica in our landscapes. The screening does show, however, that this plant has some risk associated with it, that evidence is sparse, and further study is warranted.
Issue ID # 6056

Date Created: December 6, 2017 - 12:04pm
Date Updated: December 10, 2017 - 11:39am

Submitted by: Michael Yanny

Status: Fixed
Type: Comment
Severity: Minor
Scope: Q16. Does this plant produce viable seed within the first three years (for an herbaceous species) to five years (for a woody species) after germination?

Issue Description

From personal experience as a plant propagator and breeder of Spirea japonica, plants will flower and develop seeds in the second or third year after germination in a landscape setting. In the wild they would likely take a year or two longer depending on the situation but would certainly be fruiting within 5 years of germination.

Issue Resolution (Screener's Response to Issue)

Changed the answer to Yes, with medium confidence, and added these comments, citing Mike Yanny. Thank you for the valuable information.

Issue ID # 5887

Date Created: November 16, 2017 - 9:21am
Date Updated: December 10, 2017 - 10:53am

Submitted by: Kim Shearer

Status: Fixed
Type: Suggestion
Severity: Major
Scope: Q20. Are the plant’s propagules frequently dispersed via contaminated seed, equipment, vehicles, boats or clothing/shoes?

Issue Description
PCA link not found.

**Issue Resolution (Screener's Response to Issue)**

It appears that the Plant Conservation Alliance fact sheets are no longer available on the National Park Service website. I reference these publications in evaluations for other plants as well and hope they will come back online soon as they are a valuable resource. However, a broken web link does not make a reference invalid and need not be considered a "major" issue. I prefer to keep this citation in place since it is referenced on the fact sheets produced by other organizations, such as this Pennsylvania DNCNR one, which contains much of the same information: http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_010259.pdf. For now, the 2005 version of the PCA fact sheet can also be found via google, hosted on invasive.org.

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**Issue ID # 5886**

**Date Created:** November 16, 2017 - 9:20am  
**Date Updated:** December 10, 2017 - 10:52am

**Submitted by:** Kim Shearer

**Status:** Fixed  
**Type:** Suggestion  
**Severity:** Major  
**Scope:** Q19. Are the plant’s propagules frequently dispersed long distance (>100 m) by wind or water?

**Issue Description**

PCA link not found.

**Issue Resolution (Screener's Response to Issue)**

It appears that the Plant Conservation Alliance fact sheets are no longer available on the National Park Service website. I reference these publications in evaluations for other plants as well and hope they will come back online soon as they are a valuable resource. However, a broken web link does not make a reference invalid and need not be considered a "major" issue. I prefer to keep this citation in place since it is referenced on the fact sheets produced by other organizations, such as this Pennsylvania DNCNR one, which contains much of the same information: http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_010259.pdf. For now, the 2005 version of the PCA fact sheet can also be found via google, hosted on invasive.org.
Issue ID # 5885

Date Created: November 16, 2017 - 9:20am  
Date Updated: December 10, 2017 - 11:35am

Submitted by: Kim Shearer

Status: Fixed  
Type: Suggestion  
Severity: Minor  
Scope: Q15. Is there significant germination (>25%) of seeds the next growing season, with no requirement of an infrequent environmental condition for seeds to germinate (i.e. fire) or long dormancy period?

Issue Description

Could also include a seed germination experiment demonstrating viability of seeds. [Here](#) is one that compares seed germination in a group of cultivars (Wilson and Hoch, 2009)

Issue Resolution (Screener's Response to Issue)

Added the Wilson and Hoch 2009 study as an additional citation for this answer.

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Issue ID # 5884

Date Created: November 16, 2017 - 9:15am  
Date Updated: December 10, 2017 - 10:35am

Submitted by: Kim Shearer

Status: Fixed  
Type: Suggestion  
Severity: Major  
Scope: Q14. Does this plant produce copious viable seeds each year (>1000)?
Issue Description

PCA link not found.

Issue Resolution (Screener's Response to Issue)

Added a Floridata citation as well as Plant Invaders of Mid-Atlantic Natural Areas. Changed confidence level to "low." Would definitely welcome a citation quantifying viable seed production, but was unable to locate one within a reasonable amount of time.

Issue ID # 5883

Date Created: November 16, 2017 - 9:13am
Date Updated: December 10, 2017 - 10:30am

Submitted by: Kim Shearer

Status: Fixed
Type: Suggestion
Severity: Major
Scope: Q13. Does the species (or cultivar or variety) commonly produce viable seed?

Issue Description

PCA link not found. They definitely produce viable seed. There is a likely a horticultural reference regarding this.

Issue Resolution (Screener's Response to Issue)

Added a Floridata citation as well as Plant Invaders of Mid-Atlantic Natural Areas. Would definitely welcome a citation quantifying viable seed production, but was unable to locate one within a reasonable amount of time.

Issue ID # 5882
Pre Evaluation Report -- Spiraea japonica

Date Created: November 16, 2017 - 9:10am
Date Updated: December 10, 2017 - 10:31am

Submitted by: Kim Shearer

Status: Fixed
Type: Suggestion
Severity: Major
Scope: Q13. Does the species (or cultivar or variety) commonly produce viable seed?

Issue Description

The PCA link is not found. Spiraea japonica definitely produces lots of viable seed. There is likely a horticultural reference that can be used.

Issue Resolution (Screener's Response to Issue)

Added a Floridata citation as well as Plant Invaders of Mid-Atlantic Natural Areas. Would definitely welcome a citation quantifying viable seed production, but was unable to locate one within a reasonable amount of time.

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Issue ID # 5881

Date Created: November 16, 2017 - 9:09am
Date Updated: December 10, 2017 - 11:33am

Submitted by: Kim Shearer

Status: Fixed
Type: Comment
Severity: Minor
Scope: Q11. Does this species (or cultivar or variety) reproduce and spread vegetatively?

Issue Description

PCA link not found

Issue Resolution (Screener's Response to Issue)
It appears that the Plant Conservation Alliance fact sheets are no longer available on the National Park Service website. I reference these publications in evaluations for other plants as well and hope they will come back online soon as they are a valuable resource. However, a broken web link does not make a reference invalid. I prefer to keep this citation in place since it is referenced on the fact sheets produced by other organizations, such as this Pennsylvania DNCNR one, which contains much of the same information: http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_010259.pdf. For now, the 2005 version of the PCA fact sheet can also be found via google, hosted on invasive.org.

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**Issue ID # 5880**

**Date Created:** November 16, 2017 - 9:08am  
**Date Updated:** December 10, 2017 - 10:51am

**Submitted by:** Kim Shearer

**Status:** Fixed  
**Type:** Suggestion  
**Severity:** Major

**Scope:** Q07. Does this plant displace native plants and dominate the plant community in areas where it has been established?

**Issue Description**

The link used for the reference is not found/not working.

**Issue Resolution (Screener's Response to Issue)**

It appears that the Plant Conservation Alliance fact sheets are no longer available on the National Park Service website. I reference these publications in evaluations for other plants as well and hope they will come back online soon as they are a valuable resource. However, a broken web link does not make a reference invalid and need not be considered a "major" issue. I prefer to keep this citation in place since it is referenced on the fact sheets produced by other organizations, such as this Pennsylvania DNCNR one, which contains much of the same information: http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_010259.pdf. For now, the 2005 version of the PCA fact sheet can also be found via google, hosted on invasive.org.
Issue ID # 5879

Date Created: November 16, 2017 - 9:06am
Date Updated: December 10, 2017 - 11:27am

Submitted by: Kim Shearer

Status: Fixed
Type: Comment
Severity: Minor
Scope: Q04. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

Issue Description

Based on the Kentucky statement regarding S. japonica, I would not say that this species is considered invasive there. I would say that it is considered a potential threat, and may become an invasive plant. Here is a direct quote regarding the KY Exotic Pest Plant Council:

Exotic plant species which possess some invasive characteristics, but have less impact on native plant communities; may have the capacity to invade natural communities along disturbance corridors, or to spread from stands in disturbed sites into undisturbed areas, but have fewer characteristics of invasive species than #1 rank.

Issue Resolution (Screener's Response to Issue)

There is certainly some ambiguity with the classification of Spiraea japonica, and not much scientific documentation of its impacts. See below for descriptions of the three categories on the Kentucky Exotic Pest Plant Council List. Spiraea japonica falls under category 2, Significant Threat. Inclusion on the exotic pest plant list as a significant threat seems to me to meet the PRE definition of "likely to cause environmental harm."

1. Severe Threat
Exotic plant species which possess characteristics of invasive species and spread easily into native plant communities and displace native vegetation; includes species which are or could become widespread in Kentucky.

2. Significant Threat
Exotic plant species which possess some invasive characteristics, but have less impact on native plant communities; may have the capacity to invade natural communities along disturbance corridors, or to spread from stands in disturbed sites into undisturbed areas, but have fewer characteristics of invasive species than #1 rank.

3. Lesser Threat
Exotic plant species which seem to principally spread and remain in disturbed corridors, not readily invading natural areas; also some agronomic weeds.

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**Issue ID # 5877**

**Date Created:** November 16, 2017 - 8:53am  
**Date Updated:** December 10, 2017 - 9:31am

**Submitted by:** Kim Shearer

**Status:** Fixed  
**Type:** Suggestion  
**Severity:** Major  
**Scope:** Q03. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

**Issue Description**

This issue is regarding the references used for this response. The Howell (2008) reference goes directly to website for the New Zealand Department of Conservation. The information being cited here is that S. japonica is invasive in New Zealand. The citation for this needs to at least take the reader to a document that lists S. japonica as invasive. Please update this citation.

For the states of Kentucky, Tennessee, and North Carolina there are no sources listed that take the reader directly to documentation of this species being listed as invasive. The Global Compendium is good for finding references, but there should be references listed relative to the states that are included in this assessment.

**Issue Resolution (Screener's Response to Issue)**

The web link was updated for the Howell citation. However, the screener would like to note that a broken web link need not be considered a "major" issue. A standard citation of title, author, year, publisher, etc. should be enough to constitute a reference. Readers can use that information to find the original source on their own, as they would with a journal article.

The Kentucky and Tennessee lists were added as citations for this answer in addition to Q4 where they were previously available. The North Carolina list was added.
About PRE and this Plant Evaluation Report

The PlantRight Plant Risk Evaluator -- PRE is an online database and platform enabling those involved in non-native, terrestrial plant production to know before they grow if a plant poses a regional invasive risk. This tool offers many benefits, and we encourage you to visit the PRE website (https://pre.ice.ucdavis.edu) for more information.

If you are a nursery trade association, or involved in the research, development or distribution of horticultural plants we invite you to join the PRE community. If you are a plant scientist, affiliated with a horticultural college or botanic garden, and would like to learn more about becoming a PRE Screener, please drop us an email, PlantRight@suscon.org, requesting a PRE Account.

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