Salt Spring Island Watershed Protection Alliance

TECHNICAL WORKING GROUP MEETING
1:00 – 4:00 pm Monday April 11th, 2022
By Zoom Video Conferencing

AGENDA

1. CALL TO ORDER

2. APPROVAL OF AGENDA

3. APPROVAL OF MINUTES

Draft Minutes of the Regular Meeting of the Salt Spring Island Watershed Protection Alliance (SSIWPA) Technical Working Group (TWG) held January 17, 2022 are attached for approval - pp. 3-7.

4. BUSINESS ITEMS

4.1 TWG Membership

Introduce two potential new members: Ken Nentwig, Lewis Muirhead

4.2 Review Action List – attached p.8

4.3 SSIWPA Workplan and Other Projects

4.2.1 Volume of Potable Water for Secondary Suites and Cottages – refer to attached remainder of package pages

4.2.2 Weston Lake Water Availability Project – status update (Member Green)

4.2.3 Groundwater Recharge Mapping Discussion

GW Consultants project deliverables
FWC surface water data integration
absence of areal water sustainability and groundwater budget mapping in SSI plan for 2022-2023

4.2.4 "Know your Freshwater" Educational Material Discussion of Next Steps

4.2.4 FreshWater Catalogue Data Availability (Chair Millson, Water Preservation Society)

4.2.6 SSI Watersheds Stewardship Documentary Film Update (Chair Millson, Water Preservation Society)

5. OTHER BUSINESS

5.1 Comments or questions from observers

5.2 Short discussion of potential new members

6. NEXT MEETINGS

Monday June 6, 2022 1:00 – 3:00 pm
Monday Sept 12, 2022 1:00 – 3:00 pm
Monday Nov 14, 2022 1:00 – 3:00 pm

7. ADJOURNMENT

***Draft Minutes* of the**
Salt Spring Island Watershed Protection Alliance (SSIWPA)
TECHNICAL WORKING GROUP (TWG) MEETING

Date of Meeting: Monday, January 17, 2022, 1:00 – 3:00 pm
Location: via Zoom web conferencing

Members Present: Dale Green, Capital Regional District
John Millson, Chair
Ian Peace, Member at-large
William Shulba, Islands Trust Senior Freshwater Specialist

Regrets: Jos Lussenburg, Member at-large, Robin Annschild, Member at-large

Staff Present: Shannon Cowan, Coordinator, Recorder (via web conferencing)

Others Present: Sylvia Barroso, SSIWPA Member and Regional Hydrogeologist (FLNR)
Louisa Garbo, Islands Trust Planner

These minutes follow the order of the agenda although the sequence may have varied.

1. The meeting was called to order at 1:02 pm.

2. The agenda was approved.

3. Addition to the minutes 4.1.1 Big – change to bid.

By general consent, the draft minutes of the meeting of the Salt Spring Island Watershed Protection Alliance Technical Working Group held November 8, 2021 were approved, as amended.

4. BUSINESS ITEMS

4.1 Election of chair

Member Peace nominated Member Millson. Member Millson accepted the nomination.

By general consent, it was agreed that Member Millson would serve for the calendar year 2022 as Chair of the Technical Working Group.

The Role of TWG Chair as identified in the Terms of Reference was reviewed as the following actions:

- Liaison with Steering Committee
- Sets Agenda with support from Coordinator
- Reviews Minutes
- New proposed role of TWG Chair:
    - Overview of the technical roles of the group and direction of the group. (i.e. Does Steering advise TWG or does TWG advise Steering?)
- Second new proposed role of TWG Chair that is not in the Terms of Reference, currently:
    - Support/steer volunteer recruitment on TWG, makeup of the committee

It was suggested that the new proposed roles for the TWG Chair position are currently being practiced and if it's desired that the group have leadership that includes these roles, then these should be in Terms of Reference scope for the position.

It was suggested that the current Econics Watershed Stewardship and Protection project will include a review of Technical Working Group structure and function within the entire scope of watershed protection and stewardship on Salt Spring Island.

4.2 Action List

The action list items in process were under review and the following suggestions were noted:

- The Salt Spring Island Groundwater Recharge Mapping project (with updated analysis tools) has a potential completion of September, 2022.
- The Know your Freshwater brochure (potentially completed this year).
- The timeframe for development of public communication materials about ongoing studies needs to account for time required for completion of science and analysis steps within member agencies.

- TWG member concerns were raised about the absence of Local Trust Committee commitment to support areal water sustainability (and water budget) mapping work in 2022-23.
- The SSI Groundwater Monitoring project is ongoing.
- Groundwater Sustainability Planning on Salt Spring Island is not proceeding at present.
- Levels of technical input to educational materials should be a consideration. Data layers and maps may not appeal to all readers. The brochure language is intended to be summary, with more graphics and less reliant on Geographical Information Systems.
- It was clarified that the goal for the next brochure was to share watershed visuals with the public in a format they could find and grasp and discuss easily.
- Support was expressed to complete the "Shulba-Millson" summary of mapping projects underway and completed.
- Watershed maps for Know Your Freshwater public education materials was removed from the Action List.

Action: Member Shulba will share the SGI Groundwater Recharge and Availability Study Briefing Note with the TWG when it is completed.

4.3 SSIWPA Workplan Projects and TWG Actions

4.3.1 Weston Lake Water Availability Project

The project milestones were outlined:

- Coordination of data agreements with the contractor for data-sharing is under way. The contractor is GW Solutions.
- Project coordinator will liaise with the Water Preservation Society Freshwater Catalogue coordinator regarding transfer of the Freshwater Catalogue field data for this project.
- This project includes two phases.
    - Phase 1: Assessment about suitability of data to complete phase 2

- Phase 2 – Water Availability Analysis and reporting. Proposed completion April 2022.

4.3.2 Groundwater Projects & Datasets

Member Shulba provided an update on the Southern Gulf Islands Groundwater Recharge and Availability project. All the reviews and input from TWG and others have been incorporated to the GW Solutions final project that is nearing completion this winter. The report will be published at the end of January 2022 on the Islands Trust website with a briefing note.

It was noted that the Salt Spring Island Aquifer Mapping and Groundwater Budget study (Gorski and Sacré, 2019) indicated more data are needed for decision-making (such as licensing, groundwater use). Maybe the focus for multi-agency coordinated effort could turn to collecting surface water datasets, as Golder's report indicated.

4.3.3 Volume of Potable Water for Secondary Suites

Planner Garbo gave a short description of the background for the request. The planning staff are currently considering a recommended volume of water for secondary suites at 1,600 L/day. It was requested whether the query was for secondary suites for the whole of the island. The Affordable Housing Task Force is proposing the entire island, but the Planning Staff are developing region-specific recommendations. The latter are in-line with perspectives developing from ongoing, and prior groundwater sustainability studies. Planning staff have currently mapped identified areas where they will propose restrictions on rainwater systems for secondary suites.

It was suggested that saltwater intrusion vulnerability areas should be included in the rainwater systems for secondary suites mapped zones.

Would the proximity to the water district source, or indicators that the district has a shortage be a consideration?

It would be helpful to know where SS Water Co. has been delivering water.

ACTION: The Technical Working Group will meet in the next couple of weeks on the topic of water volume and the appropriate water availability data impacts on location for secondary suites. TWG will invite guest expertise from SSIWPA Member Ungerson and Matt Nowell as local experts in rainwater storage systems, volumes and usage.

ACTION: SSIWPA Coordinator will liaise with Planner Garbo on the recommendations that TWG produces regarding secondary suites from the dedicated meeting regarding water volume requirements for secondary suites.

4.3.4 Groundwater Education II was not discussed this meeting.

4.4 Other Projects

4.4.1 Freshwater Catalogue Update

The opportunity and importance of integration of catalogue field data with ongoing member agency projects, such as the Weston Lake Water Availability study, was noted.

5. OTHER BUSINESS

5.1 Comments or questions from observers

There were none.

6. NEXT MEETING

The special meeting will be scheduled in the coming couple of weeks by the coordinator.

The next regular quarterly meeting will be held April 11, 2022 from 1:00 – 3:00 pm.

7. ADJOURNMENT

The meeting was adjourned at 3:15 pm.

_____

John Millson, Chair

CERTIFIED CORRECT:

_____

Shannon Cowan, Recorder

Salt Spring Island Watershed Protection Alliance
TECHNICAL WORKING GROUP
Action List

Action	Who	Status	Timeline
Review various existing resources for use as content for the "Know Your Freshwater" public education materials, and report back. Subcommittee for informal: Shulba, Peace, Lussenburg, Millson	Member Lussenburg	Minutes November 2021 **In process**	*June Quarterly*
Create a visual or memorandum of the input datasets that have contributed to each of the groundwater projects underway, completed and planned by Islands Trust and report back to TWG at its next quarterly meeting.	Member Shulba (with Chair Millson)	Minutes August 2021 **In process**	*June Quarterly*
Bring maps to TWG meeting for discussion of "Know your Freshwater" public education.	Member Shulba	Minutes April 2021 **In process**	*June Quarterly*
Report out on Land Cover Classification report by CRD	Member Green	Minutes April 2021 **In process**	*June Quarterly*

- *Italicized timelines* are suggested by coordinator and not agreed by the TWG

Technical Working Group April 11, 2022
Item 4.3.4

Secondary Suites Bylaw Recommendations

1. Discuss map(s) prepared by William, and proposed decision tree with emails from William and Sylvia (February 25, 2022) in attached package contents.

2. William to report on his investigation of Saltwater Intrusion (SWI) indicator for the decision tree draft.

3. Discuss and agree final set of criteria and recommendations.

Recommendations will be considered in quarterly TWG meeting held April 11, 2022 and forwarded to Steering Committee and Local Trust Planning Staff (Planner Garbo).

> **By general consent,** the Salt Spring Island Watershed Protection Alliance Steering Committee directs its Technical Working Group to recommend:
> 1. The volume of potable water (Litres per day) that would be "sufficient" for daily requirements of occupancy of a secondary suite on Salt Spring Island, with supporting evidence; and
> 2. How many days' worth of rainwater storage should be required for occupancy of a secondary suite serviced by a potable rainwater system, with supporting evidence.

SSIWPA Technical Working Group

Proof of Water, Secondary Suites - Decision Tree & CRS Mapping

ANY DOMESTIC WATER LICENCE > 2,000L — Y → **PROCEED**

N ↓

SECONDARY SUITE WITHIN 2,000 L/DAY CONSUMPTION — N → **4. Rainwater harvesting for potable use**

Qualified professional, Engineer
CSA B805-18

N

Y ↓

1. Proceed — N → **2. Variance Required** — N → **3. No – or More Evidence**

Criteria:
- Low well density
- Low aquifer vulnerability
- Low saltwater intrusion risk
- > 250m of coast

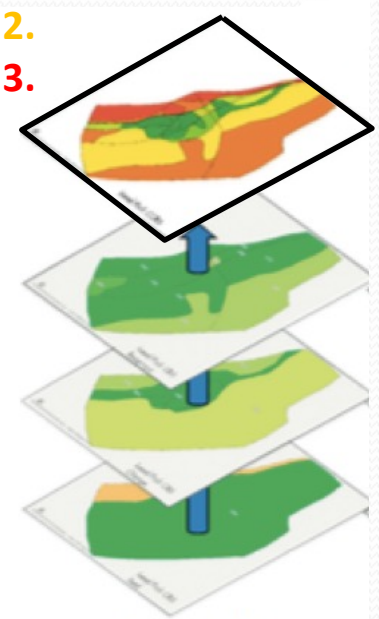
Criteria:
- Moderate well density
- Mod aquifer vulnerability
- Mod saltwater intrusion risk
- Within 250m coast

Input data/maps:
- High well density
- H aquifer vulnerability
- High SWI risk, <250m coast

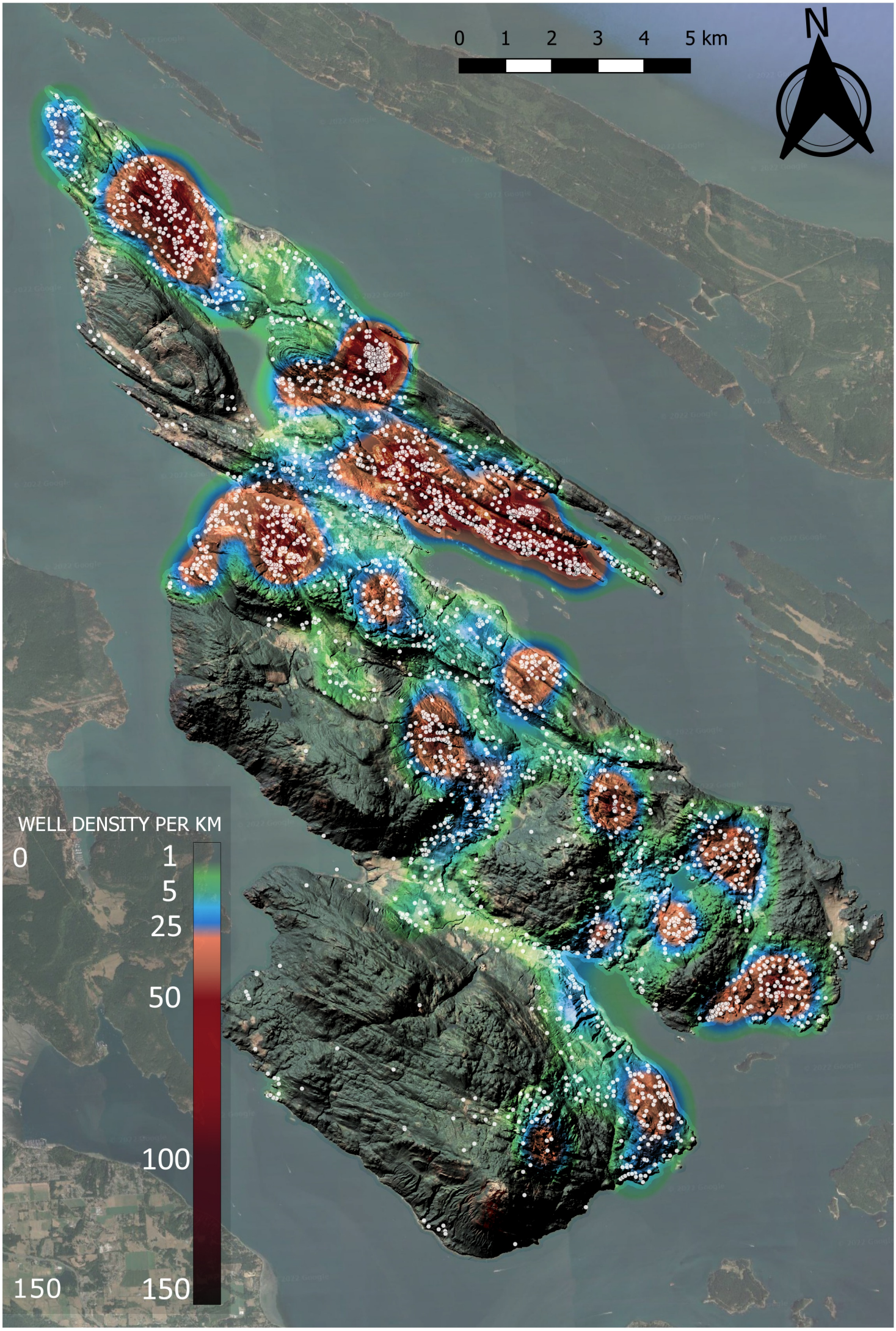
Input data/maps:
- Well density (100m radius heatmap)
- Well density (1000m radius heatmap)
- Aquifer vulnerability
- DRASTIC
- Distance from coast (50m,100m,250m)
- GW regions
- Reality check – dry creeksheds, zoning

"CRS" Areas:

1.
2.
3.



CRS = Common Risk Segment Mapping


0 1 2 3 4 5 km
N
WELL DENSITY PER KM
0
1
5
25
50
100
150
150

Subject: RE: TWG Feb 16 Suites Decision Tree
Date: Wednesday, February 23, 2022 at 4:12:12 PM Pacific Standard Time
From: Barroso, Sylvia L FLNR:EX
To: SSIWPA, William Shulba, SSI FWC, Dale Green, Ian Peace, Jos Lussenburg
Attachments: image001.jpg

Hi all,

Re: Salt Spring Island secondary suites policy recommendation

Further thoughts on the approach and discussions thus far:

a. Identification of the correct criteria for screening impacts in different areas requires a more thorough articulation the perceived/potential impacts related to secondary suites.
    - Increase in water use - This is likely the most significant impact but the scale of impact is likely to be small in comparison to other types of density increase, such as accessory dwellings or subdivision. In consideration of the scale of impacts, the approach should be permissive overall, with higher thresholds to indicate a caution (orange) or exclusion (red). Can we quantify this using the water survey data or other information?
    - Increase in septic discharge – also likely to be small, as above – the Sewerage System Manual could be used to estimate relative increase in discharge based on occupancy, number of bathrooms, etc. A practical approach to reduce impacts is to require treatment to a higher level (secondary or tertiary) prior to discharge to ground, such as in areas of highest well/septic density, but this is likely beyond scope of the policy.
        i. Both the water use and septic discharge issue are linked to parcel size, i.e. if the parcel size is adequately large, impacts to adjacent parcels are likely to be negligible (unmeasurable), whereas in areas with much smaller lots each with their own well and septic the potential for impacts arising from increased occupancy may be more likely. Could a GIS analysis be completed to identify the range in lot sizes (min, max) and base recommendations on a review of that?
    - Increase in land clearing, changes in building footprint, impacts to riparian areas – not applicable?
    - Increase in traffic? – minimal direct impact on water (not associated with increased road infrastructure, for example)
    - Others?

a. Simplified approach (fewer criteria) is likely to be more straightforward to implement, and potentially more defensible and understandable for the public.

Criteria	Core criteria for water impact (yes, no, maybe)	Rationale
Recharge	No	Not applicable – increased occupancy in a secondary suite within the primary dwellling does not affect recharge. Water availability in an area does not depend solely on local recharge potential on that parcel. Q: How does recharge potential indicate the boundaries between recharge or discharge zones within an aquifer?

GW Region	Maybe	GW availability does likely vary by region, but this is partly a function of the density of wells (and lots) and availability of shared water supplies (local water service) in each region, in addition to the hydrogeologic characteristics (watershed size, groundwater flux). Possibly not a core criteria, but an indicator?
Well density	Yes	Higher number of wells per area is correlated (in general) to higher groundwater demand. Groundwater availability also linked to well properties (depth, lithology, aquifer sub-type, elevation, and location in a recharge or discharge zone).
Seawater intrusion vulnerability	Maybe	Simplify to distance from coast threshold (because well density already considered, above)
Distance from the coast	Yes	Use as a proxy for seawater intrusion risk. Two, rather than three buffer sizes. Need to clarify (for the policy) whether this is considering the well distance from the coast or the lot boundary relative to coast. 50 m buffer (well distance from coast) should be exclusion (red) criteria with no allowance for variance. Between 50 and 100 could caution=orange, requiring applicants to provide more info (water quality sample, seawater intrusion risk assessment from a QP). Green > 100 m from coast (plus in consideration of well density or lot size criteria) Note that with some minor exceptions (e.g. Ganges Harbour, due to higher coastal hazard from storm overtopping) most of the highest risk sites for sea water intrusion mapped on SSI are within 100 m of the coast, including on peninsulas such as Scott Point.
DRASTIC (intrinsic aquifer susceptibility to contamination from the land surface)	No	DRASTIC mapping is intended for use at a regional scale, not applicable for use within individual site (lot scale) assessments. Impacts to groundwater quality from increased septic discharges are more likely where there is a high density (or higher volume in one location) of sewage waste discharge to ground however this links more readily to the lot size criteria. The depth of overburden or soil can influence the efficiency of treatment in a septic system (embedded in the DRASTIC analysis, but could also be obtained from soil mapping). If still considered relevant, need to clarify the link between secondary suite permitting and impacts due to higher aquifer intrinsic susceptibility?

c. Rainwater harvesting:
   - What are the water use needs for a secondary suite? How could this be measured or verified? Is there any control on water use once the higher occupancy is in place?
   - Would ability to store and use rainwater reduce the impacts identified (i.e. reduced water availability in a specific area for existing residents/users) – would it change a caution (orange) to an allowance (green) for example
   - How much storage is required? Is this to replace groundwater use or to augment?
   - It is likely not feasible to store sufficient rainwater to provide for all use in a secondary suite for an entire dry season, are they not permitted to use the well at all?
   - Requires significant investment in storage and infrastructure (alternate plumbing, etc.) which

affects fairness and equity, economic inclusiveness. What is the cost-benefit?

I like the latest decision tree except for use of aquifer vulnerability (SWI and DRASTIC) and three coastal buffers (see rationale above).

I hope these thoughts are helpful and am open to further discussion.

Kind regards,

Sylvia Barroso, MSc, PGeo
Regional Hydrogeologist, Water Protection, West Coast Region
Ministry of Forests, Lands, Natural Resource Operations and Rural Development
2080A Labieux Rd Nanaimo BC V9T 6J9
Ph: (250) 739-8390 Fax: (250) 751-3103
Email: sylvia.barroso@gov.bc.ca

~I respectfully acknowledge and am grateful to live and work in the traditional territory of the Coast Salish, Snuneymuwx, Snaw-naw-as, and Stz'uminus Nations.~

From: SSIWPA <ssiwpa@islandstrust.bc.ca>
Sent: February 23, 2022 10:33 AM
To: William Shulba <wshulba@islandstrust.bc.ca>; SSI FWC <jamssiwater@gmail.com>; Barroso, Sylvia L FLNR:EX <Sylvia.Barroso@gov.bc.ca>; Dale Green <dgreen@crd.bc.ca>; Ian Peace <airtime@telusplanet.net>; Jos Lussenburg <yosl@me.com>
Subject: Re: TWG Feb 16 Suites Decision Tree

Hello TWG

Thanks for the input, William and discussion both William and John.

Please find attached the most updated version of the Decision Tree with William's suggestions incorporated: for your comments if anything is still incorrect.

We can tweak or make this pretty and more in line with the GW Solutions reports on methodology, outcomes

of the method as per William's suggestion.

In response:

- When referring to rainwater harvesting it would be up to the engineer to design appropriate storage/system ?
- Yes, William, that is what I believe TWG discussed and agreed. According to my notes from TWG Feb 16, volume of storage depends on occupancy, fixture number, whether greywater reuse or any other supplementary system for indoor water use is in place. We can circle back one more time to this in the upcoming final session to see if there is agreement on what to send back to Planner Garbon on the rainwater questions, along with all of the input from the rainwater experts that was received at TWG. (or instead of that input if it's deemed too much)

Doodle: Please answer this poll for another final meeting once the maps are ready (please click all that you are available, and once maps are ready, we'll confirm a date to meet to discuss).
https://doodle.com/poll/prdp4yeexvh5vhct?utm_source=poll&utm_medium=link

Thank you,
Shannon

From: William Shulba <wshulba@islandstrust.bc.ca>
Date: Tuesday, February 22, 2022 at 1:04 PM
To: SSIWPA <ssiwpa@islandstrust.bc.ca>, SSI FWC <jamssiwater@gmail.com>, Sylvia Barroso <sylvia.barroso@gov.bc.ca>, Dale Green <dgreen@crd.bc.ca>, Ian Peace <airtime@telusplanet.net>, Jos Lussenburg <yosl@me.com>
Subject: RE: TWG Feb 16 Suites Decision Tree

Hi TWG.
Thanks for pulling this together, I am not in agreement with the decision tree at this time. I find it confusing. Some thoughts/questions:

Volume

- I though we discussed in depth that we are not concerned with volume since there is an existing dwelling?
- When referring to rainwater harvesting it would be up to the engineer to design appropriate storage/system ?
- Why 2273L/d?
    - I don't under stand where this came from. I get that it is 500usgal, but this isn't in a regulation.
    - The MOTI, rural subdivision guideline is 2500 L/d/dwelling as per 2.3.1.01 Water Supply.
    - *"If there is no subdivision bylaw regulating proof of water supply, the Approving Officer may require proof of 2500 litres per day per dwelling unit, as well as a statement from a*

laboratory regarding the water's quality. "
    - https://www2.gov.bc.ca/assets/gov/driving-and-transportation/funding-engagement-permits/subdividing-land/rural_subdivision_guide.pdf
- The *WSA* states that a domestic dwelling is 2000L/d (or more) and this is consistent with the new SSI Proof of Water Bylaw.
- "Surface Water Licence" – This should read any water license that is for domestic purposes that is greater than 2000L/d.

GW Regions
Core GW Regions vs. Subregions vs. sub-sub regions. This is super confusing.
There is only GW Regions. It is possible that there can be areas of those regions that are not favourable for development, but we should stick with the simple terminology and not make new terms.

GW Recharge
I see that GW recharge is located on the slide for a data source, but I am sure we discussed that this will not be included for several reasons. The new GW Recharge SSI will not be complete on SSI until next fiscal. And it is mainly a land-use (terrain) issue when not related to GW Availability. Since we are discussing water supply issues for a secondary suite that is located within an existing dwelling, impacts to terrain is limited and GW recharge is not much of concern here.

Map Layers
I am bringing together the following layers:
1. Well Density Heatmap (100m radius) (Kernel Density Estimation) – Took about 4 hours to run on my new mapping computer
2. Well Density Heatmap (1000m radius) (Kernel Density Estimation) - Currently running, likely will take the entire day - will compare which is more realistic
3. SFU SWI Aquifer Vulnerability (Combined Moderate, Highly Moderate, and High into one class)
4. DRASTIC (Combined Moderate, Highly Moderate, and High into one class)
5. Distance from the Coast (50m, 100m, 250m) – if we choose this over SFU-SWI.
6. GW Regions

Any others?

CRS Matrix Weighting
We didn't discuss the weighting of the layers for the risk map. Would it be - Well Density (50%), SWI(25%), DRASTIC (25%) ?
I will then put this into a raster calculator once we agree on a weighting.

Conclusions
Overall the flow diagram should resemble the methodology in the GW Solutions reports here. Simple, describing the methodology and the outcome of the method.

https://islandstrust.bc.ca/programs/freshwater-sustainability/

Let me know if you have any questions.
Thanks,

William Shulba, P.Geo.
Sr. Freshwater Specialist | Islands Trust
Licensed Science Officer | BC Public Service Agency
Member of the Professional Employees Association

From: SSIWPA <ssiwpa@islandstrust.bc.ca>
Sent: Monday, February 21, 2022 19:26
To: SSI FWC <jamssiwater@gmail.com>; Sylvia Barroso <sylvia.barroso@gov.bc.ca>; William Shulba <wshulba@islandstrust.bc.ca>; Dale Green <dgreen@crd.bc.ca>; Ian Peace <airtime@telusplanet.net>; Jos Lussenburg <yosl@me.com>
Subject: TWG Feb 16 Suites Decision Tree

Hello TWG,

Thank you for the time you gave to the informal discussion of Suites mapping parameters last week (Feb. 16th).

Attached for info and comments if you have them is a Decision Tree as per the discussion, based on John's draft.

Action underway: Member Shulba is developing the map layers with GIS staff at Islands Trust.

Your Chair has reiterated to me that this is tree (attached) is intended only to guide the development of the map, and the decision tree will be forwarded with the results of the mapping to Planning staff.

Please stay tuned for another Ad Hoc informal discussion once Member Shulba has the map prepared to share.

Thank you,

Shannon Cowan

Coordinator,
Salt Spring Island Watershed Protection Alliance
ssiwpa@islandstrust.bc.ca
www.ssiwpa.org
604-839-3964

19

Subject: RE: Well inventory
Date: Friday, February 25, 2022 at 9:53:54 AM Pacific Standard Time
From: William Shulba
To: Barroso, Sylvia L FLNR:EX, 'SSI FWC'
CC: Dale Green, Freshwater Specialist, SSIWPA, Ian Peace, Jos Lussenburg

Hi,
Thanks Sylvia.

From the subdivision wells search in the SSI office in 2017 that a co-op student did - the intersection of those wells with GWELLS discovered that those un-registered was less than 20%.
Note, that took an entire 2 months of a co-op time to go through the subdiv files and georeferenced wells from plan documents. It is really time consuming and likely not that feasible on other islands due to records management not being as obtainable as SSI.

Since that project, I think that the groundwater protection officers at FLNR have done a good job on tracking down historical well records from drillers. For example in 2017 skywater, juniper, and other subdivisions on SSI were not registered and now they are in the 2020 update.
I could dig up that old subdivision data from 2017 and re-run the intersection analysis on the new GWELLS data however, it is really time consuming to cross-reference/filter and I imagine it would likely identify more abandoned/misplaced wells than not.

In the case of undertaking well density that re-analysis is out of scope and to me the spatial distribution of the wells look like reality. If the SSI-LTC chooses to undertake the GW Regional Availability Assessments, I could add this analysis to that project for the consultant to consider as it may make a difference for those budget. There is likely a lack of dug-wells registered on GWELLS, but SSI does not have many dug wells in comparison to other islands like Denman or places on the main island like black creek/ merville. .

Onward!

William

From: Barroso, Sylvia L FLNR:EX <Sylvia.Barroso@gov.bc.ca>
Sent: Friday, February 25, 2022 09:37
To: 'SSI FWC' <jamssiwater@gmail.com>; William Shulba <wshulba@islandstrust.bc.ca>
Cc: Dale Green <dgreen@crd.bc.ca>; Freshwater Specialist <freshwater@islandstrust.bc.ca>; SSIWPA <ssiwpa@islandstrust.bc.ca>; Ian Peace <airtime@telusplanet.net>; Jos Lussenburg <yosl@me.com>
Subject: RE: Well inventory

Thanks for sharing this map analysis, William!

- Regarding the core data set, I think it important to move forward on solutions for the “missing wells” or let it go.
- The initial analysis that was done for the water budget project (attached) identified approximately 830 non-vacant lots outside of a service area, and lacking a surface water point of diversion, suggesting the water source could be a well. I believe this is probably an overestimation of the number of missing records for active wells due to duplicate records, unused/decommissioned wells that are in GWELLS, and lots using bulk hauling, rainwater or not using water.

- One mechanism to improve the well inventory is Islands Trust sharing/allowing the records to be entered to GWELLS from historical development approvals.
- Another would be to implement a well smart/well education program with students or summer staff that visits properties in targeted areas in order to register domestic wells and improve the well inventory.
- Many GWELLS corrections are being completed in the groundwater licensing process and domestic well owners registering their wells voluntarily.
- Shannon is also working on an information campaign to promote domestic well registration, to implement after the WSA deadline.
- For the well density estimate, the lot analysis workflow could be employed and a point assigned to a parcel representing an "inferred well." However, such an approach should be used with caution.

Happy Friday,

-Sylvia

Sylvia Barroso, MSc, PGeo
Regional Hydrogeologist, Water Protection, West Coast Region
Ministry of Forests, Lands, Natural Resource Operations and Rural Development
2080A Labieux Rd Nanaimo BC V9T 6J9
Ph: (250) 739-8390 Fax: (250) 751-3103
Email: sylvia.barroso@gov.bc.ca

~I respectfully acknowledge and am grateful to live and work in the traditional territory of the Coast Salish, Snuneymuwx, Snaw-naw-as, and Stz'uminus Nations.~

From: SSI FWC <jamssiwater@gmail.com>
Sent: February 25, 2022 7:58 AM
To: William Shulba <wshulba@islandstrust.bc.ca>
Cc: Dale Green <dgreen@crd.bc.ca>; Freshwater Specialist <freshwater@islandstrust.bc.ca>; islandstrustssiwpa <ssiwpa@islandstrust.bc.ca>; Barroso, Sylvia L FLNR:EX <Sylvia.Barroso@gov.bc.ca>; Ian Peace <airtime@telusplanet.net>; Jos Lussenburg <yosl@me.com>
Subject: Re: SSI_Wells_Kernel_Density_1000m, well density/km

Great map (and art!), it nicely identifies that Walkers Hook aquifer abstraction (and others!). I guess the map would not change that much if there was a mechanism for including the other 1000+ unregistered SSI wells?

Thank you for doing this!
J

On Feb 24, 2022, at 8:42 PM, William Shulba <wshulba@islandstrust.bc.ca> wrote:

Attached is the map for well density per km.
More to come.

From: Dale Green <dgreen@crd.bc.ca>
Sent: February 24, 2022 4:03 PM
To: William Shulba; SSI FWC; Freshwater Specialist
Cc: SSIWPA; Sylvia Barroso; Ian Peace; Jos Lussenburg
Subject: RE: SSI_Wells_Kernel_Density_1000m

Very nice!

Dale

Dale Green, B.Sc., P.Chem. | **Supervisor, Regional Source Control Programs**

Environmental Protection | Capital Regional District
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From: William Shulba [mailto:wshulba@islandstrust.bc.ca]
Sent: Thursday, February 24, 2022 4:01 PM
To: SSI FWC <jamssiwater@gmail.com>; Freshwater Specialist <freshwater@islandstrust.bc.ca>
Cc: SSIWPA <ssiwpa@islandstrust.bc.ca>; Sylvia Barroso <sylvia.barroso@gov.bc.ca>; Dale Green <dgreen@crd.bc.ca>; Ian Peace <airtime@telusplanet.net>; Jos Lussenburg <yosl@me.com>
Subject: SSI_Wells_Kernel_Density_1000m

SSI_Wells_Kernel_Density_1000m
Good Day TWG - Here is a clip of my SSI_Wells density map per kilometer.

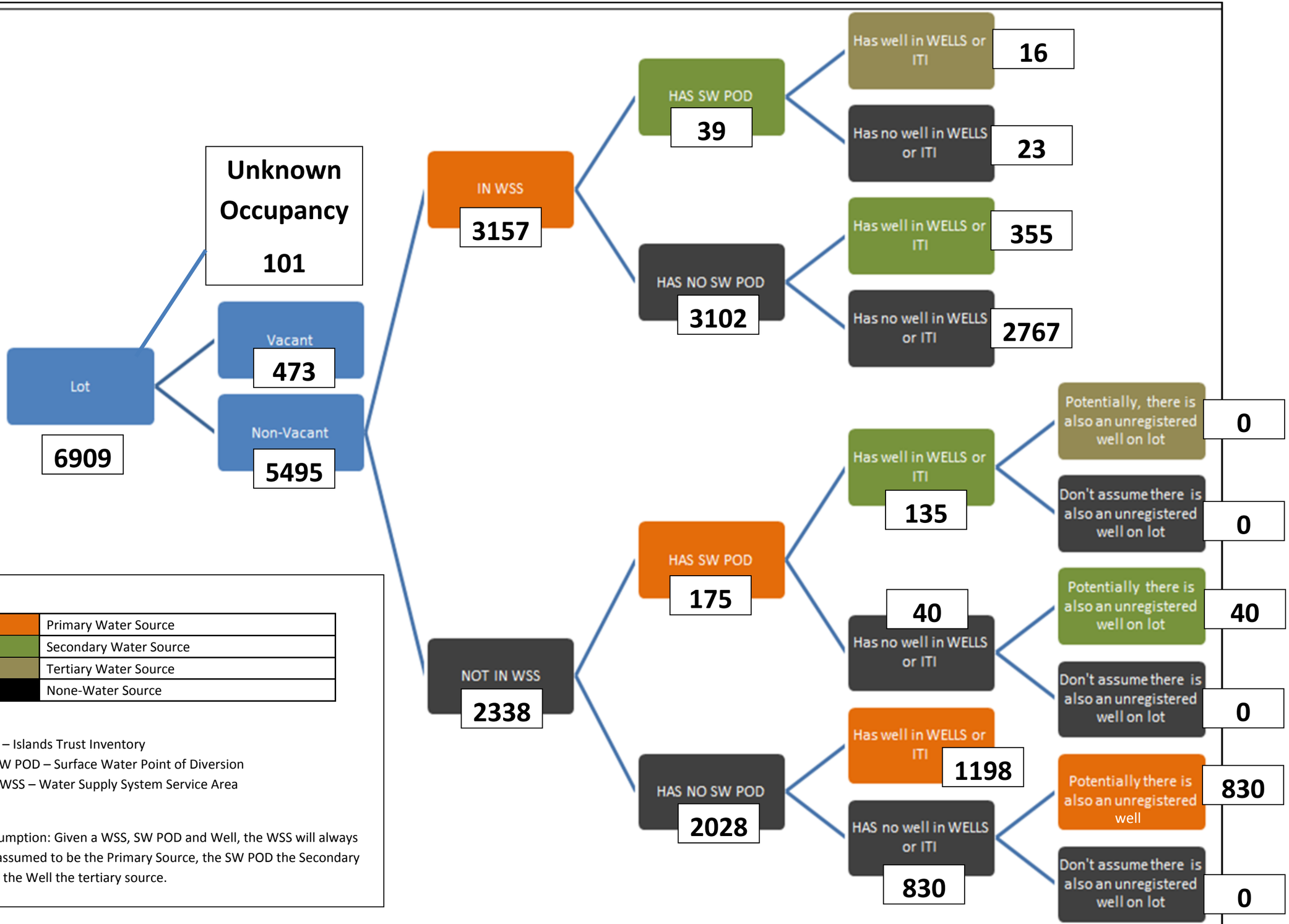
This Kernel Density Estimation Heatmap reiteratively identifies well density in a 1000m radius of each registered groundwater well on Saltspring (N: 2977). Resulting in a true Well Density Per Kilometer raster at 1mx1m resolution. Took 190,000 seconds or 52 hours to run on my new intel alder lake mapping machine i built..... nice data but it is 192 GB!. whoops. good thing i got a few spinner hard drives ;) time to downscale this monster for the raster calculator at 20mx20m (matches GW Recharge raster resolution).
The kernel density 100m radius only took a few hours to process but was really bulleted

and not that useful (screenshot below).

<image001.png>

<image002.png>

<SS_DEM_MAP_100000M_scale.pdf>



	Primary Water Source
	Secondary Water Source
	Tertiary Water Source
	None-Water Source

*ITI – Islands Trust Inventory
**SW POD – Surface Water Point of Diversion
***WSS – Water Supply System Service Area

Assumption: Given a WSS, SW POD and Well, the WSS will always be assumed to be the Primary Source, the SW POD the Secondary and the Well the tertiary source.

Water Source Type	# of lots inferred to be using the given water source type as Primary Water Source	# of lots inferred to be using the given water source type as Secondary Water Source	# of lots inferred to be using the given water source type as Tertiary Water Source
Water Supply System Service Area	3157	0	0
Well	1198	355 + 135	16
Surface Water Point of Diversion	175	39	0
Potential Inferred No. of Lots with Groundwater Usage		830	