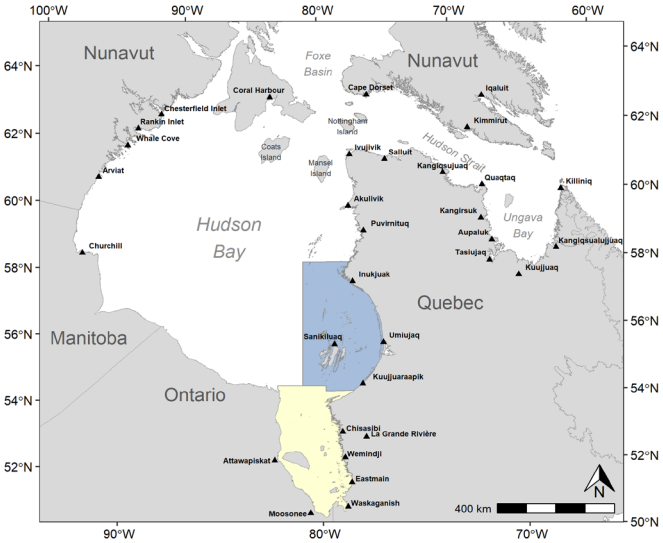
Fisheries and Oceans Canada | Pêches et Océans Canada
Ecosystems and Oceans Science | Sciences des écosystèmes et des océans

National Capital Region

Canadian Science Advisory Secretariat
Science Advisory Report 2022/024

ᐊᓐᓂᑐᕐᓂᐅᒐᔭᕐᑐᒧᑦ ᐃᒫᖕᓂᕈᑏᑦ ᐅᑯᓂᖓ ᑰᒃᔪᐊᕋᓗᑉ ᓴᒥᓯ ᐯᓪᓗ ᕿᓚᓗᒐᖕᒋᓐᓂᒃ (*DELPHINAPTERUS LEUCAS*)[1]



ᕿᓚᓗᒍᑦ (Delphinapterus leucas).ᐊᕐᔨᓕᐅᕆ ᔪᕕᓂᖅ ᕕᓗᔅᔫᔭ (DFO)

ᐊᕐᔨᖑᐊᖅ 1.ᓄᓇᖕᖑᐊᖅ ᓄᐃᑕᑎᕐᔪᖅ ᓴᒥᓯ ᐯᒥᒃ ᑕᓯᐅᔭᕐᔪᐊᒥᒃ, ᓄᕗᒻᒥᒃ, ᐅᖓᕙᒥᓪᓗ) ᓄᓇᓖᑦ ᓄᐃᑕᑎᑕᐅᕐᓱᑎᒃ. ᑐᖑᔪᕐᑕᒥᒃ ᑕᐅᑦᑐᓕᒃ ᓄᐃᑕᑎᕐᔪᖅ ᓴᓂᑭᓗᐊᒥ ᐅᐱᕐᖏᒥ ᕿᓚᓗᒐᖕᒋᓐᓂᒃ ᐅᐊᓐᓂᐸᓯᖓᓂᓪᓗ ᑕᓯᐅᔭᕐᔪᐊᑉ (ᓴᓂᑭᓗᐊᖅ ᐅᐊᓐᓂᖓᓗ ᑕᓯᐅᔭᕐᔪᐊᑉ) ᕿᓚᓗᒍᑦ. ᕐᑯᕐᓯᑕᒥᒃ ᑕᐅᑦᑐᓕᒃ ᓄᐃᑕᑎᕐᔪᖅ ᐱᑕᖃᕐᓂᕆᔨᖕᒋᓐᓂᒃ ᐅᐱᕐᖏᒥ ᓴᒥᓯ ᐯ ᐃᒪᖓᓂ. ᓴᓂᑭᓗᐊᖅ ᓄᓇᓕᒃ ᕿᑭᕐᑕᓃᕐᓱᓂ (ᓄᓇᕗᑦ).

ᐊᒃᓚᓯᒪᔪᕐᑕᖕᒋᑦ

[1] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᑖᒃᑯᐊ ᑕᒻᒪᑕᐅᓯᒪᔪᑦ ᐋᕐᕿᒋᐊᕐᑕᐅᒍᑎᖕᒋᑦ ᒥᑦᓴᐅᓴᕈᑎᐅᓯᒪᔪᓂᒃ ᐊᒻᒪᓗ; ᖃᑦᓯᐅᓂᖕᒋᓐᓂᒃ ᐆᑦᑐᕋᐅᑎᐅᓚᐅᔪᔪᑦ ᐱᓇᓱᐊᕐᑕᐅᓯᒪᔪᓂ "ᐊᔪᕿᒋᐊᕈᑎᓂᒃ ᕿᓚᓗᒐᕐᑕᐅᒍᓐᓇᑐᓂᒃ ᑕᓯᐅᔭᕐᔪᐊᕐ ᐅᐊᓐᓂᖓᓂ ᓴᒥᓯ ᐯᒥᓗ (*Delphinapterus leucas*)" ᐊᑐᐊᒐᓃᓚᐅᔪᔪᑦ ᐊᓪᓚᖑᑎᕐᑕᐅᓯᒪᔪᓂ ᔫᓂ 2022-ᒥ. ᐋᕐᕿᒋᐊᕐᑕᐅᒋᐊᖃᕐᓯᒪᔪᑦ ᓇᐅᑦᓯᑐᕐᑕᐅᒋᐊᖕᖒᒐᕈᑎᖕᒋᓐᓂ, ᕿᓚᓗᒐᕐᓂᒃ ᑕᑯᔭᐅᔪᖃᕐᓯᒪᒻᒪᑦ ᑭᖑᓪᓕᐅᓯᓂ ᕿᒥᕐᕈᔪᕕᓂᕐᒧᑦ (ᑖᒃᑯᓂᖓᑦᓴᓇᖅ ᑕᑯᔪᕕᓂᐅᒻᒪᑦ) ᓴᒥᓯ ᐯᒦᑦᑐᓂᒃ ᐊᓪᓚᖑᕐᑎᑕᐅᔪᑦ ᑕᒻᒪᓯᒪᓚᐅᔪᒻᒪᑕ ᓇᐅᑦᓯᑐᕈᑎᐅᓯᒪᔪᑦ ᐅᓄᕐᓂᖕᒋᓐᓂᒃ. ᑖᒃᑯᐊ ᑕᑯᓂᕋᕈᑎᐅᓯᒪᔪᑦ ᐲᕐᑕᐅᓯᒪᓕᕐᑎᓗᒋᑦ ᖃᑦᓯᐅᓂᖕᒋᑦᑕ ᑭᓯᑕᐅᒍᑎᖕᒋᑦ ᐊᓯᑦᔨᓯᒪᔪᑦ ᑕᒪᒋᓐᓂ 2021-ᒥ, ᓇᓃᓐᓂᖕᒋᓐᓂᒃ ᖃᐅᔨᒪᒍᑏᑦ ᐋᕐᕿᑕᐅᓯᒪᒍᑎᖕᒋᓐᓂᒃ. ᖃᓇᑕᐅᔭᑎᒍᑦ ᐅᖓᓯᑦᑕᓇᓐᓂᖕᒋᓐᓂᒃ ᖃᐅᔨᒪᒐᓯᐊᕈᑏᑦ ᑕᒻᒪᓯᒪᔪᕐᑕᖃᓚᐅᔪᑦ ᑖᒃᑯᓇᓂ ᐊᓪᓚᕐᑯᑎᓂ ᐋᕐᕿᒋᐊᕐᑕᐅᓯᒪᓕᕐᑐᑦ. ᑖᒃᑯᐊ ᐋᕐᕿᒋᐊᓇᒍᑏᑦ ᐊᓯᑦᔨᖕᒋᑦᑐᑦ ᖃᓄᐃᑦᑑᓂᖕᒋᓐᓂᒃ ᐱᓇᓱᒍᓯᕐᒥᓗᓐᓃᑦ ᐊᖕᒋᖃᑎᒌᒍᑎᐅᓯᒪᔪᒥᒃ ᑲᓇᑕᒥ ᓂᕐᔪᑎᓂᒃ ᑕᓇᐅᕐᒥᐅᑕᓂᒃ ᕿᒥᕐᕈᔨᑦ ᑲᑎᖕᖓᔨᖕᒋᓐᓄᑦ (NMMPRC) ᑲᑎᒪᓂᖃᕐᓱᑎᒃ ᕕᕗᐊᓇ 14-18, 2022-ᒥ; ᖃᑦᓯᐅᓂᖕᒋᑦ ᐊᓯᑦᔨᓯᒪᔪᑐᐊᑦ. ᐋᕐᕿᒋᐊᓇᒍᑏᑦ ᒪᑉᐱᒐᕐᓃᑐᑦ 3-4 ᐊᒻᒪᓗ 8-15 ᑖᒃᑯᓇᓂ ᐊᓪᓚᕐᑯᑎᓂ.

*ᒪᕿᑏᑦ ᓄᓇᓯᒪᔪᑦ ᑯᐯᒃ ᑕᕐᕋᖕᒐᓂ (ᓄᓇᕗᒃ) ᕿᓚᓗᒐᕐᓂᒃ ᐊᓐᓂᑐᓱᑦ (*Delphinapterus leucas*) ᓯᑕᒥᓂᑦ ᕿᓚᓗᒐᕐᓂᑦ ᓄᕗᒃᑯᓱᓂᑦ ᐃᖏᕐᕋᕕᒋᒥᓯᒍᑦ:ᑰᒃᔪᐊᕋᓗᑉ ᐸᑎᕐᑑᓗ ᕿᓚᓗᒐᕐᕋᔭᖏᑦ ᐅᐱᕐᓗᒥ ᑕᒡᑕᑦ ᑕᓯᐅᔭᕐᔪᐊᒥᓱᑦ, ᐅᑭᐅᒥ ᑲᑎᒪᑦᓱᑎᒃ ᓄᕗᒻᒥ, ᓘᐸᑐᐊᓪᓗ ᐃᒪᖕᒐᓂ. ᐅᖕᒐᕙᒥᓱᑦ ᕿᓚᓗᒐᑦ ᖃᐅᔨᒪᓇᕐᓯᐊᖏᑦᑐᒥᒃ ᐊᐅᓚᓂᖃᓱᑦ ᑭᓯᐊᓂ ᐅᑭᐅᕐᓯᐅᖃᑎᖃᓱᖑᑐᐃᓐᓇᕆᐊᓖᑦ ᑕᓯᐅᔭᕐᔪᐊᒥᓱᓂᒃ. ᑖᒃᑯᐊᓐᓇᐅᖏᑦᑐᑦ ᕿᓚᓗᒐᑦ ᓴᒥᓯ ᐯᒥᓱᑦ ᐅᐱᕐᓗᒥ ᐅᑭᐅᒥᓗ ᓅᓱᖑᑐᐃᓐᓇᕆᐊᖃᕐᒥᓱᑎᒃ ᓯᑯᕐᖃᔭᖕᖏᑐᒧᑦ ᓴᒥᓯ ᐯᒥ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ.2020ᐅᑎᓪᓗᒍ, ᑲᑎᖕᖓᓅᑦ ᐆᒪᔪᐃᑦ ᓄᖑᐃᓐᓇᑐᐃᓐᓇᓂᐊᖕᖑᓇᔭᐅᓕᕐᑐᑦ ᐱᓪᓗᒋᑦ ᑲᓇᑕᒥ (COSEWIC) ᓇᓗᓂᕐᓯᓚᐅᔪᑦ ᑰᒃᔪᐊᕋᓗᑉ ᕿᓚᓗᒐᕐᕋᔭᖏᑦ ᓴᒥᓯ ᐯᓪᓗ ᐃᓱᒪᓗᓐᓇ ᖏᓐᓂᕋᕐᓱᑦ, ᐸᑎᕐᑑᑉ ᕿᓚᓗᒐᕐᕋᔭᖏᑦ ᐃᓱᒪᓗᓐᓇᑎᓪᓗᒋᑦ, ᐊᒻᒪᓗ ᐅᖕᒐᕙᐅᑉ ᕿᓚᓗᒐᖏᑦ ᓄᖑᐃᓐᓇᕆᐊᖃᓕᕐᓂᕋᕐᓱᑦ.*

ᐊᓐᓂᑐᕋᓱᐊᕐᓂᐅᓱᖅ ᑰᒃᔪᐊᕋᓗᑉ ᕿᓚᓗᒐᕐᕋᔭᖏᓐᓂᒃ ᓄᓇᕗᒻᒥ ᓄᓇᓕᓐᓄᑦ ᐊᐅᓚᑕᐅᒍᑎᑕᓕᒃ ᐊᕐᕌᒍᓄᑦ ᐊᒥᓱᓄᑦ ᐃᓂᓪᓚᓱᒪᑦᓱᓂ ᐸᕐᓇᑕᐅᓯᒪᑦᓱᑎᒃ ᓄᐃᑕᐅᑦᓱᑎᓪᓗ ᓄᓇᕗᒻᒥ ᑕᕆᐅᕐᒥᐅᑕᓕᕆᔨᓄᑦ ᐃᔅᑑ ᐊᓪᓗᑦ ᑕᕆᐅᕐᒥᐅᑕᓕᕆᔨᖏᓐᓄᓗ ᐊᖏᕐᖃᐅᓯᒪᑦᓱᑎᒃ ᑐᕐᖃᑕᕐᕕᒍᑦ ᐃᒪᕐᐱᓕᕆᓂᕐᒧᑦ ᐃᖃᓗᓕᕆᓂᕐᒧᓗ ᑕᕆᐅᒦᑦᑐᓂᒃ. ᒫᓇᐅᑎᓪᓗᒍ ᐊᐅᓚᓯᒍᑎᖃᕐᓂᐅᑉ ᐱᑦᔪᑎᖏᑦ ᓱᕐᕋᓗᐊᕐᑕᐅᒍᓐᓂᑎᓪᓗᒋᑦ ᐅᓄᕐᓂᖏᑦ 3400 ᐊᕐᕌᒍᐃᑦ ᑕᓪᓕᒪᑦ ᐊᓂᒍᕐᑎᓗᒋᑦ. ᑕᒪᑦᓱᒥᖓ ᐱᔭᖃᕋᓱᐊᕈᑕᐅᑦᓱᓂ ᐊᓐᓂᑐᕈᓐᓇᓂᖅ ᐃᓱᓕᑦᑕᕕᓕᐅᑦᑕᐅᓯᒪᔪᖅ ᐅᓄᕐᓂᓕᐅᑦᑕᐅᓯᒪᖕᖏᒃᑲᓗᐊᕐᑎᓗᒋᑦ ᐱᕐᑯᔭᑎᒍᑦ (ᓄᓇᕗᒻᒥ ᓇᓪᓕᐅᑎᑦᑕᑐᒥᓪᓗ ᓄᕐᖃᖓᑎᕐᓯᖃᑦᑕᓂᖅ ᕿᓚᓗᒐᕐᓂᐊᑐᓂᒃ) ᐊᒻᒪᓗ ᐱᕐᑯᔭᑎᒍᑦ ᐃᓱᓕᑦᑕᕕᓕᐊᖑᓯᒪᔪᑦ.

ᐊᐅᓚᑕᐅᒍᑎᑕᖃᕈᑎᖏᑦ ᕿᓚᓗᒐᑦ ᓄᓇᕗᒻᒥ ᑐᖕᖓᕕᖃᓱᑦ ᒥᑦᓴᐅᓴᕐᑕᐅᒍᑎᒋᓯᒪᔭᖏᓐᓂᒃ ᐱᑕᖃᕐᓂᖏᑦᑕ ᕿᓚᓗᒐᑦ ᐅᐱᕐᕋᕕᒋᓱᒥᓐᓂ, ᐊᒻᒪᓗ ᑐᕈᓯᒪᓂᕐᒥᒃ ᐊᓐᓂᑐᕋᓱᐊᕐᓂᒥᒃ ᓇᓪᓕᖏᐅᒻᒪᖕᒐᑕ ᕿᓚᓗᒐᑦ, ᑕᒥᑕ ᖃᖓᒃᑰᓂᖓ ᒪᓕᑦᓱᒍ ᐊᕐᔪᒋᓱᖑᖕᖏᑦ ᐃᓂᖏᑦᑕᓗ ᓇᓃᓐᓂᖏᑦ ᒪᓕᑦᓱᒋᑦ. ᑰᒃᔪᐊᕋᓗᑉ ᓴᒥᓯ ᐯᓪᓗ ᕿᓚᓗᒐᖏᑦ ᑭᓯᑕᐅᓯᒪᔪᑦ ᔪᓐᓗ ᐊᐅᒃᒍᓯᒥᓗ 2015ᒥ. ᓄᑖᑦ ᑭᓯᑦᓱᒍᑎᕕᓃᑦ ᑖᒃᑯᓈᓂ ᒪᕐᑑᓂ ᐃᓃᓐᓂ ᖃᖓᑦᑕᔪᒃᑯᑦ ᐊᑑᑎᔭᕕᓂᖅ ᔪᓐᓗ-ᐊᐅᒃᒍᓯᒍ 2021.

ᐱᑦᔪᑏᑦ

ᐱᑦᔪᑎᐅᓚᐅᔪᔪᑦ ᕿᒥᕐᕈᓂᕐᒧᑦ ᑲᑎᖕᖓᓂᖃᕐᑎᓗᒋᑦ ᐅᑯᐊᖑᓯᒪᔪᑦ:

- *ᕿᒥᕐᕈᓱᑎᒃ 2021ᒥ ᖃᖓᑦᑕᔪᒃᑯᑦ ᑭᓯᑦᓱᒍᑎᕕᓂᕐᓂᒃ ᕿᓚᓗᒐᕐᓂᒃ, ᖃᐅᔨᔭᐅᒍᑎᕕᓃᑦ ᒥᑦᓴᐅᓴᕈᑏᓪᓗ ᑑᒃᔪᐊᕋᓗᑉ ᓴᒥᓯ ᐯᓪᓗ ᕿᓚᓗᒐᖏᑦᑕ ᐱᑕᖃᕐᓂᖏᓐᓂᒃ.*
- *ᕿᒥᕐᕐᑯᓱᒋᑦ ᐱᑕᖃᕐᓂᖏᑦᑕ ᖃᓄᐃᓕᖓᓂᖏᑦ ᐃᓕᖓᔪᑦ ᑰᒃᔪᐊᕋᓗᑉ ᕿᓚᓗᒐᕐᓂᖏᓐᓄᑦ ᐊᒻᒪᓗ ᐃᒫᖕᒥᑎᒋᑦᓱᒋᑦ ᓄᖑᐃᓐᓇᑎᑦᓱᒍᑎᓕᕐᓂᐅᖏᓐᓇᓗᓂᓗ ᐊᓐᓂᑐᕋᓱᐊᕈᓯᕐᒥᒃ ᓱᕐᑯᐃᑐᒥᒃ ᐃᑭᓕᕝᓕᐊᕐᑯᓇᒋᑦ ᑖᒃᑯᐊ 3400 ᐆᒪᔪᐃᑦ ᐅᖕᒐᑖᕐᒐᓕᓗᓂ 50% ᐊᕐᕌᒍᓂ ᑕᓪᓕᒪᓂ, ᐃᓱᒪᒋᓗᒋᑦ ᓇᓃᓐᓂᖏᑦ ᖃᖓᒃᑰᓂᖓᓗ ᕿᓚᓗᒐᕐᓂᐊᓃᑦ, ᐃᓚᐅᒻᒥᑎᓪᓗᒍ ᐊᐅᖃᑎᒌᑦᑕᔭᐅᖕᖏᑐᑦ ᑲᑎᒪᓱᖑᓂᖏᑦ.*
- *ᒥᑦᓴᐅᓴᕐᓯᒪᓗᒋᑦ ᐊᓐᓂᑐᑦᑕᐅᒍᓐᓇᑐᑦ ᐅᓄᕐᓂᐸᐅᒍᓐᓇᓂᓇᒍᓐᓇᑕᖏᑦ ᑰᒃᔪᐊᕋᓗᑉ ᕿᓚᓗᒐᑦᑕᔭᖏᓐᓂᑦ ᐃᓂᓂ ᓇᓪᓕᑐᐃᓐᓇ ᖏᓐᓂ ᐅᓄᕐᓯᒋᐊᕋᔭᕐᓗᑎᓪᓗ ᐊᕐᕌᒍᓂ 10ᓂ.*
- *ᓇᓗᓂᕐᓗᒋᑦ ᐱᑕᖃᕐᓂᖏᑦᑕ ᖃᓄᐃᓕᖓᓂᖏᑎᒍᑦ ᐊᑐᕐᑕᐅᒍᓐᓇᓯᒍᓐᓇᒪᖕᒐᑦ ᓴᒥᓯ ᐯᒥ ᐱᑕᖃᕐᓂᖏᑦᑕ ᒥᑦᓴᐅᓴᕐᓯᒪᐅᑎᑦᓴᖏᓐᓄᑦ ᐃᒫᖕᒥᑎᐅᒍᓐᓇᓗᓂᓗ ᐊᓐᓂᑐᕐᑕᐅᔪᑦᓴᑦ ᑲᒪᒋᔭᐅᓕᕐᐸᑕ*
- *ᓇᓗᓂᕐᓗᒋᑦ ᐊᓐᓂᑐᕋᓱᐊᕐᓂᒍᑦ ᐱᐅᓱᑦ ᐊᕐᕌᒍᕐᕕᖏᓂᖏᑦ ᐱᕕᓴᖅ ᒪᓕᑦᓱᒍ ᖃᖓᐅᓂᖓᓗ ᐊᕐᕌᒍᒥ ᐊᑐᕐᓗᑎᒃ ᐊᖏᕐᑕᐅᓯᒪᔪᓂᒃ ᖃᐅᔨᓴᓱᐊᕈᑎᓂᒃ ᓇᑭᕐᓴᓂᑕᕐᓴᔭᐅᖕᒪᖔᑦ ᖓᑕ;*
- *ᓄᐃᑕᑎᓗᒋᑦ ᐊᑑᑎᑐᐃᓐᓇᕆᐊᓖᑦ ᐃᑭᓕᒋᐊᕐᑎᓯᓂᕐᒧᑦ ᓇᑭᕐᓴᓂᑕᕐᓴᔭᐅᓂᖏᑎᒍᑦ ᒪᓕᓪᓗᒋᑦ(PBR) ᖃᕐᓱᒦᓐᓂᖏᑦ ᑰᒃᔪᐊᕋᓗᑉ ᕿᓚᓗᒐᕐᓴᔭᖏᑦ ᓴᒥᓯ ᐯᓗ, ᐅᖕᒐᕙᐅᓪᓗ.*

ᑖᒃᑯᐊ ᖃᐅᔨᒪᑎᕐᓴᓕᐊᖑᓯᒪᔪᑦ ᐃᑲᔪᕐᓱᒪᓚᖓᔪᑦ ᓴᐳᒻᒥᓂᕐᒧᑦ ᐱᑦᔪᕕᒻᒥᒃ ᐱᒍᓐᓇᓯᒍᑎᒋᓗᒋᑦ ᐱᑕᖃᓇᐊᖃᕐᑎᑕᐅᓯᒪᔪᓂᒃ ᓄᑕᐅᓯᓕᑎᕐᓱᒪᓗᑎᒃ ᕿᒥᕐᕈᒍᑎᐅᓯᒪᔪᑦ ᓄᓇᕗᐅᑉ ᕿᓚᓗᒐᖏᓐᓂᒃ ᑐᕐᓱᕋᐅᑕᐅᓯᒪᓂᖏᑦ ᐱᑕᖃᓇᐊᖃᕐᒪᑕ ᐊᒥᓇᑲᒥ ᑕᓇᐅᕐᒥᐅᑕᓕᕆᔨᑦ ᒪᓕᓪᓗᒋᑦ ᖃᕐᕌᒍᑎᖓᓂ ᓴᐳᒻᒥᓂᕐᒧᑦ ᐊᓐᓂᑐᕐᑕᐅᒍᓐᓇᑐᑦ ᐱᒍᓐᓇᑎᑕᐅᒍᑎᖏᑎᒍᑦ (ᑖᒃᑯᐊᓕ ᑰᒃᔪᐊᕋᓗᑉ ᕿᓚᓗᒐᕐᓴᔭᖏᑦ ᓴᒥᓯ ᐯᓪᓗᓂᑦ ᓇᓗᓂᔭᕐᑕᐅᓯᑦ ᐊᓐᓂᑐᕐᑕᐅᔪᑦ ᑕᑯᕐᓱᒋᑦ).

ᓐᓪᓕᑎᕐᓯᒪᔪᑦ

- ᖃᓄᐃᑦᑐᓴᔭᐅᓂᖏᓐᓂᒃ ᖃᐅᔨᓴᕈᑏᑦ 3000 ᒥᑦᓯᑎᓐᓂᑐᓂᒃ ᕿᓚᓗᒐᕐᓂᒃ ᑕᓯᐅᔭᕐᔪᐊᒥᑦ ᖃᐅᔨᒍᑎᐅᓯᒪᔪᖅ ᓯᑕᒥᖑᓂᖏᓐᓂᒃ ᕿᓚᓗᒐᑦ (ᑕᓯᐅᔭᕐᔪᐊᑉ ᐅᐊᓐᓂᖓᓂᑦ, ᑕᓯᐅᔭᕐᔪᐊᒥᑦ, ᓴᒥᓯ ᐯᒥᑦ, ᐃᑭᕋᓴᕐᔪᐊᒥᓗ) ᐊᒻᒪᓗ ᖃᐅᔨᒻᒥᓱᑎᒃ ᐊᓯᖃᕐᒥᒋᐊᖏᓐᓂᑦ ᓴᓂᑭᓗᐊᒥ.

- ᓴᓂᑭᓗᐊᒦᓱᑦ ᕿᓚᓗᒍᑦ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ ᐅᐊᕈᑎᒌᓱᑦ ᐅᐱᕐᖓᒥᓗ ᓇᓗᓇᕐᓱᓂ ᓇᓪᓕᖏᑦ ᐆᒪᔪᐃᑦ ᓇᓪᓕᐊᓂᑦ ᐱᓯᒪᒻᒪᖕᒐᑕ ᕿᓚᓗᒐᕐᓯᐅᓇᐅᓂᖓᓂ ᐅᕝᕙᓗᓗᓐᓃᑦ ᑭᓯᑕᐅᓂᖏᓐᓂ ᖃᖓᑦᑕᔫᑯᑦ. ᒐᒥᒻᒪᑦ, ᑖᒃᑯᐊ ᕿᓚᓗᒍᑦ ᖃᐅᔨᓴᕐᑕᐅᓂᖏᓐᓂ ᒪᕐᕉᒃ ᑲᑎᑎᑕᐅᓯᒪᔫᒃ ᓴᓂᑭᓗᐊᒦᓱᑦ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ.
- ᑲᑎᑦᓱᒋᑦ ᕿᓚᓗᒐᕐᑕᐅᔪᕕᓃᑦ ᓄᓇᕕᒻᒥ 344/ᐊᕐᕌᒍᑕᒫᑦ 2016-ᒥᑦ 2021-ᒧᑦ. 366 ᕿᓚᓗᒐᕐᑕᐅᔪᕕᓂᐅᑎᓪᓗᒋᑦ 2021-2022-ᒥ.
- ᓄᑖᑦ ᖃᐅᔨᓴᕈᑏᑦ ᐊᑐᕐᓱᒋᑦ ᕿᓚᓗᒐᕐᓂᐊᓇᖅ ᐋᕐᕿᒋᐊᕐᑕᐅᓚᐅᔪᔪᖅ ᐊᒥᓱᖕᖑᕆᐊᕐᑎᓯᑦᓱᓂ ᓴᓂᑭᓗᐊᒥ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ ᕿᓚᓗᒐᕐᑕᐅᔪᓂᒃ. ᐊᓯᑦᔨᕈᑎᒻᒪᕆᐅᑎᓪᓗᒋᑦ ᖃᐅᔨᔭᐅᓯᒪᔪᑦ ᑕᓯᐅᔭᕐᔪᐊᒥ ᐅᑭᐊᒥ, ᑕᓯᐅᔭᕐᔪᐊᑉ ᑕᕐᕋᖓᓂ ᐅᑭᐊᒥ ᓴᓂᑭᓗᐊᒥᓗ (ᓴᓂᑭᓗᐊᖅ ᓄᓇᕗᑦ) ᕿᓚᓗᒐᕐᓂᐊᑐᓂ.
- ᓄᕗᒻᒥᐅᓂ, ᐅᓄᕐᓂᓴᐅᒻᒥᔪᑦ ᑕᓯᐅᔭᕐᔪᐊᒥ ᓴᓂᑭᓗᐊᒥᓗ ᕿᓚᓗᒐᕐᑕᐅᔪᑦ ᐅᑭᐊᒥ, ᐅᐱᕐᖓᓴᒥ ᐃᑭᓐᓂᓴᐅᑦᓱᑎᒃ. ᐆᒃᑑᐱᕆᒥ ᓅᕕᒻᐱᕆᒥᓗ. ᑕᓯᐅᔭᕐᔪᐊᒥ ᓴᓂᑭᓗᐊᒥᓗ ᕿᓚᓗᒐᕐᑕᐅᔪᑦ 50% ᑭᓯᐊᓂ ᐃᑭᓪᓕᐅᒻᒥᒥᓱᓂ 10%-ᒧᑦ ᓅᕕᒻᐱᕆᐅᑉ ᐱᓇᓱᐊᕈᓯᖓᑕ ᐱᖓᔪᐊᓂ.
- ᑖᒃᑯᐊ ᓄᑖᑦ ᖃᐅᔨᒪᓕᕐᓱᒋᑦ ᓴᓂᑭᓗᐊᒥ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ ᐊᕐᕌᒍᑕᒫᑦ ᕿᓚ;ᒐᖃᑦᑕᓯᒪᔪᑦ 95-ᓂᒃ 2016-ᒥᑦ 2021-ᒧᑦ ᓄᓇᕕᒻᒥᐅᑦ ᐊᖑᓇᓱᑦᑎᖏᓐᓄᑦ. ᒥᑦᓴᐅᔭᕐᓱᒋᑦ 139 ᕿᓚᓗᒐᕐᑕᐅᔪᕕᓃᑦ 202-21-ᒥ ᓴᓂᑭᓗᐊᒥ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ.
- ᓴᓂᑭᓗᐊᒥ, ᑖᒃᑯᐊ ᑭᓯᑕᐅᒍᑏᑦ ᖃᐅᔨᒪᓕᕐᓱᒋᑦ ᓄᑖᓪᓗ ᑕᓯᐅᔭᕐᔪᐊᒦᑦᑐᑦ ᓴᓂᑭᓗᐊᒥᓗ ᕿᓚᓗᒍᑦ, 24-ᓂᒃ ᐆᒪᔪᖃᑦᑕᓯᒪᔪᑦ ᐊᕐᕌᒍᑕᒫᑦ ᓴᓂᑭᓗᐊᒥ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ 2016-ᒥᑦ 2021-ᒧᑦ. ᒥᑦᓴᐅᔭᕐᓱᒋᑦ 19[2] ᕿᓚᓗᒐᕐᑕᐅᔪᕕᓃᑦ 2020-21-ᒥ.
- ᐊᑑᑎᖃᑦᑕᓚᐅᔪᑎᒍᑦ, ᑭᓯᑦᓯᖃᑦᑕᓚᐅᔪᒻᒪᑕ ᑐᑭᒧᐊᑯᑖᑦᑐᓂᒃ ᒪᓕᑦᓱᑎᒃ ᔪᓗᒥ ᐊᐅᒡᒍᓯᒥᓗ 2021 ᑭᓯᑦᓯᓱᑎᒃ ᕿᓚᓗᒐᕐᓂᒃ ᑕᓯᐅᔭᕐᔪᐊᒦᑦᑐᓂᒃ ᔭᒥᓯ ᐯᒥᓗ. ᐅᖓᕙᒥ ᑭᓯᑦᓯᓂᖃᕆᐊᖃᖏᓐᓇᑐᖅ.
- ᓄᑖᑦ ᖃᐅᔨᓴᕈᑎᓂᒃ ᐋᕐᕿᒋᐊᕆᒍᑎᕕᓃᑦ ᐋᕐᕿᑕᐅᓚᐅᔪᑦ ᐱᑕᖃᕐᓂᖏᓐᓂᒃ ᑐᑭᓯᒪᔭᐅᓂᖏᓐᓂᓗ ᐊᑐᕐᑕᐅᑎᑕᐅᑦᓱᑎᓪᓗ.
- ᑭᓯᑦᓯᓂᖅ ᐋᕐᕿᒋᐊᕐᑕᐅᓚᐅᔪᒻᒪᑦ ᒥᑦᓴᐅᔭᕐᓱᒪᔪᑦ 14,200 (95% CI=9,200-21,900) ᔭᒥᓯ ᐯᒥ 2,500 (95% CI=1,400-4,300)[3] (ᑭᓯᑕᐅᓂᖓ ᖃᓂᓪᓗᑎᕐᓱᒍ 100) ᓴᓂᑭᓗᐊᒥ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ ᕿᓚᓗᒐᕐᓄᑦ.
- 2021-ᒥ ᓴᓂᑭᓗᐊᒥ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ ᑭᓯᑕᐅᔪᑦ ᒥᑦᓴᐅᔭᕐᑕᐅᒍᑎᖏᑦ ᐃᑭᓐᓂᐸᓐᓂᑦᑐᑦ ᐳᕿᐊᓇᕐᓂᐸᐅᓚᕿᑦᓱᑎᒃ.
- ᖃᑦᓯᐅᓂᖏᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ ᖃᖓᑦᑕᔫᑯᑦ ᖃᐅᔨᓴᕈᑎᐅᓂᐊᕐᑐᑦ ᒥᑦᓴᐅᓴᕈᑎᐅᓗᑎᒃ ᐋᕐᕿᒋᐊᕐᑕᐅᓚᐅᔪᔪᑦ ᕿᓚᓗᒐᕐᑕᐅᔪᕕᓃᑦ ᑐᓴᕐᑎᓯᒍᑎᐅᓯᒪᔪᑦ ᖃᑦᓯᐅᓂᖏᓪᓗ ᓴᓂᑭᓗᐊᒥ ᑕᓯᐅᔭᕐᔪᐊᒦᑦᑐᓗ ᒪᓕᑦᓱᒋᑦ ᑐᑭᓯᑎᑦᓯᒍᑎᑖᕐᓱᑎᒃ ᖃᑦᓯᐅᓂᖏᓐᓂᒃ ᐊᒻᒪᓗ ᐆᒪᔪᕐᑕᐅᒍᓐᓇᑐᓂᒃ ᐋᕐᕿᒌᒍᑎᑦᓴᓂᒃ.
- ᓴᓂᑭᓗᐊᒦᑦᑐᑦ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ ᕿᓚᓗᒍᑦ, 2015-ᒥ ᒥᑦᓴᐅᓴᕈᑎᐅᓯᒪᔪᑦ 3,600 ᐃᑭᓪᓕᐅᒥᓯᒪᔪᑦ 2,900-ᒧᑦ (95% CI=1,700-3,900) ᕿᓚᓗᒍᑦ 2021-ᒥ ᐃᑭᓪᓕᐸᓪᓕᐊᓱᒃ 3%-ᒧᑦ ᐊᕐᕌᒍᑕᒫᑦ[4].

[2] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕐᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᕐᖃᑐᕕᓃᑦ ᐃᒣᓕᖓᔪᑦ: ᒥᑦᓴᐅᓵᕐᓱᒋᑦ 24.

[3] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕐᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᕐᖃᑐᕕᓃᑦ ᐃᒣᓕᖓᔪᑦ: 16,300-ᖑᔪᑦ (95% CI=9,800-27,200) ᑕᓯᐅᔭᕐᔪᐊᒥᑦ ᐊᒻᒪᓗ2,300 (95% CI=1,300-4,200).

[4] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕐᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᕐᖃᑐᕕᓃᑦ ᐃᒣᓕᖓᔪᑦ: ᒥᑦᓴᐅᓵᕐᓱᒋᑦ 2015-ᒥᑦ ᐅᓄᕐᑑᓱᑎᒃ 3,500 ᐅᒪᔪᐃᑦ ᐃᑭᓪᓕᐸᓪᓕᐊᔪᑦ 2,700-ᖑᓕᕐᓱᑎᒃ (95% CI=1,500-3,700) ᕿᓚᓗᑏᑦ 2021-ᒥᑦ ᐃᑭᓪᓕᕙᓪᓕᐊᔪᑦ for an 4%-ᒧᑦ ᐊᕐᕌᒍᑕᒫᑦ.

- ᓴᓂᑭᓗᐊᒥ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ ᖃᐅᔨᓴᕈᑏᑦ 2021-ᒥ ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᒍᑎᐅᓚᐅᔪᑦ ᐊᒥᓲᓈᕐᑎᓂᖏᑎᒍᑦ 40%. ᑖᒃᑯᐊ ᒥᑦᓴᐅᓴᕈᑎᐅᓚᐅᔪᔪᑦ 3,900-ᓂᒃ 2015-ᖑᑎᓪᓗᒍ, ᐃᑭᓪᓕᒋᐊᕐᓯᒪᔪᑦ 3,200-ᕈᕐᓯᑎᒃ (95% CI=1,800-4,600) ᕿᓚᓗᒐᑦ 2021-ᒥ ᐊᕐᕌᒍᑕᒫᑦ ᐃᑭᓪᓕᒋᐊᕐᓯᑎᒃ 2.5%-ᓄᑦ[5].
- ᑖᒃᑯᐊ ᐃᑭᓪᓕᕙᓪᓕᐊᔪᑦ ᐆᒪᔪᕐᑕᐅᒍᓐᓇᑐᑦ ᐅᖓᑖᓄᖃᑦᑕᓂᖏᓐᓄᑦ ᑭᓯᑕᐅᑦᓯᐊᓯᒪᔪᕕᓂᐅᖕᖏᓂᖏᓐᓄᓗ ᓴᓂᑭᓗᐊᒥ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ ᕿᓚᓗᒐᑦ ᐆᒪᔪᕐᑕᐅᔪᑦ.
- ᔪᒥᓯ ᐯᒥ, 2021-ᒥ ᑭᓯᑕᐅᓯᒪᔪᑦ 16,700 (95% CI=11,600-21,300). ᑭᖑᓪᓕᐹᒦ ᑭᓯᑕᐅᓚᐅᔪᑦᓱᑎᓂᑦ ᐅᓄᕐᓯᒋᐊᕐᓯᒪᔪᑦ. ᑖᒃᑯᐊ ᕿᓚᓗᒐᕐᕕᐅᖃᑦᑕᓲᑦ 296-ᓂᒃ ᐊᕐᕌᒍᑕᒫᑦ[6].
- ᓴᓂᑭᓗᐊᒦᑦᑐᑦ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ ᐊᐅᓚᑕᐅᒍᑎᖏᑦ 50%-ᖏᓐᓂᒃ ᐅᓄᕐᓂᓴᐅᑎᑦᓯᒐᓱᐊᕐᑐᑦ 2015-ᒥ ᑭᓯᑕᐅᓚᐅᕐᓯᒪᔪᓂᑦ 3,400-ᓂᒃ ᐊᕐᕌᒍᐃᑦ ᑕᓪᓕᒪᑦ ᐊᒻᒪᓗ ᖁᓖᑦ ᑭᖑᓂᖓᒍᑦ. ᑖᒃᑯᐊ ᒥᑦᓴᐅᓴᕈᓲᑦ ᐆᒪᔪᕐᑕᐅᖃᑦᑕᑎᓐᓇᒋᑦ 0 ᐊᒻᒪᓗ 38 ᕿᓚᓗᒐᑦ ᑖᒃᑯᓂᖓ ᑐᕌᒐᐅᔪᓂᒃ ᒪᓕᒐᔭᕐᑐᑦ. ᐊᓯᐊᒍᖕᒐᖅ ᑭᓯᑦᓯᒍᓯᕐᑎᒍᑦ, 2021-ᒥ 40%-ᒧᑦ ᐊᒥᓲᓂᖏᒍᑦ, 60-ᓂᑦ 70-ᓄᑦ ᕿᓚᓗᒐᖃᑦᑕᐸᑕ[7] ᓱᓱᑦᓴᓯᐊᕋᔭᕐᑐᑦ ᐊᐅᓚᑕᐅᒍᑎᖏᓐᓂᒃ ᐊᕐᕌᒍᐃᑦ ᑕᓪᓕᒪᑦ ᑯᓖᓪᓗ ᑭᖑᓂᖓᒍᑦ.
- ᒐᒃᒐᓗᐊᕐᑎᓗᒍ, ᑭᖑᓪᓕᐹᒥ ᖃᐅᔨᓴᕐᓂᖃᓚᐅᔪᑎᓪᓗᒍ, ᓄᑖᑦ ᐱᕕᑦᓴᐅᔪᑦ ᐋᕐᕿᒋᐊᕆᒍᑏᓪᓗ ᐊᑐᓕᕐᑎᑕᐅᓯᒪᓕᕐᑐᑦ ᓄᑖᓂᒃ ᖃᐅᔨᓴᕈᑎᕕᓂᕐᓂᒃ ᒥᑦᓴᐅᓴᕈᑎᐅᓯᒪᔪᓂᒃ ᐱᑕᖃᓕᕐᑐᖅ. ᑖᒃᑯᐊᓕᒫᑦ ᐊᓯᑦᔨᒍᑎᐅᓯᒪᔪᑦ ᒥᑦᓴᐅᓴᕈᑎᐅᓯᒪᔪᓂᒃ 2015-ᒥ 3,600 -ᖑᓂᓗᓯᒪᒻᒪᑕ ᐅᕝᕙᓗᓗᓐᓃᑦ 3,900 ᓇᓪᓕᐊ ᐊᑐᕐᑎᑕᐅᓂᖓ ᒪᓕᑦᓱᒍ. ᓄᑖᑦ ᑎᑭᑦᑕᕕᓕᐊᖑᓯᒪᔪᑦ ᐊᑐᕐᓗᒋᑦ (3,600 ᐅᕝᕙᓗᓗᓐᓃᑦ 3,900), ᐆᒪᔪᕐᑕᐅᒍᓐᓇᑐᑦ ᐃᑭᓪᓕᒋᐊᕐᑕᐅᒋᐊᖃᓛᕐᑐᑦ 0-35-ᒧᑦ[8] ᓴᓂᑭᓗᐊᒥ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ ᐋᕐᕿᖓᐅᓲᑦ ᒪᓕᓪᓗᒋᑦ ᐱᕕᑦᓴᖓᓗ. ᓄᖑᑕᐅᕙᓪᓕᐊᓂᖏᑦ 5 ᐆᒪᔪᐃᑦ/ᐊᕐᕌᒍᑕᒫᑦ ᐅᑎᕐᐸᓕᐊᓂᑦᓴᖃᕐᓯᓂ 0.1-ᒥᒃ.

ᖃᓄᐃᑦᑑᓂᖏᑦ

ᕿᓚᓗᒐᑦ ᐊᖏᔪᕐᔪᐊᕋᓗᖏᑐᑦ ᑭᒍᑎᖃᕐᓯᑎᒃ ᐊᒻᒪᓗ ᑕᕐᕋᒦᓲᖑᑦᓯᑎᒃ. ᕿᑐᕐᖓᓴᓕᐅᓯᓲᒃ ᐅᑭᐅᒥ ᐅᐱᕐᖓᓴᕐᖃᒥᐅᑎᓪᓗᒍᓗᓐᓃᑦ. ᕿᓚᓗᒐᓛᓚᑦ ᐃᓄᓛᓲᑦ ᑕᕐᕿᓂ 14 ᓂ ᐃᓪᓕᐊᖑᓚᐅᑲᑦᓯᑎᒃ ᐊᒫᒪᓲᖑᑦᓯᑎᒃ ᑕᕐᕿᓂ 18ᓂ. ᕿᓚᓗᒐᓛᓚᑦ ᐊᓈᓇᒥᓃᓲᑦ ᐊᕐᕌᒍᓐᓂ ᒪᕐᕉᓂ ᐱᖓᓱᓄᑦ ᑎᑭᑦᓱᒋᑦ ᐊᓈᓇᒥᓃᓐᓂᒥᓂ ᐃᓚᐅᖃᑦᑕᓲᑦ ᐊᐅᓚᑎᓪᓗᒋᑦ ᕿᓚᓗᒋᑦ ᐃᖏᕐᕋᓇᕐᓯᐅᓕᑐᐊᕋᒥᒃ ᐊᕐᕌᒍᒥ ᓇᓪᓕᐅᑎᒻᒪᑦ. ᐃᓱᒪᒋᔭᐅᓯᒪᔪᖅ ᑖᒃᑯᐊ ᐊᓈᓇᒥᓃᓲᖑᒻᒪᑕ ᐊᑯᓂ ᖃᐅᔨᒍᑎᐅᒍᓐᓇᕋᔭᕐᓂᐊᖑᓇᔭᐅᑦᓯᑎᒃ ᐃᖏᕐᕋᕕᒋᓲᖏᓐᓂᒃ ᓇᐅᒃᑰᓲᖑᒻᒪᖔᑕ. ᐊᕐᕌᒍᐃᑦ ᐱᖓᓱᑦ ᑕᒫᑦ ᑭᓯᐊᓂ ᕿᓚᓇᒋᖔᕐᕋᕐᑖᓲᑦ. ᕿᑐᕐᖏᓐᓇᓱᓲᖑᓂᐊᖑᓇᔭᐅᑦᓯᑎᒃ ᐅᑭᐅᖃᓕᕋᒥᒃ ᐊᑯᓐᓂᖏᓐᓂ 8-14, ᐆᒪᒍᓐᓇᓂᐊᖑᓇᔭᐅᑦᓯᑎᓪᓗ ᐊᕐᕌᒍᓂ 60 ᐅᖓᑖᓄᓪᓗ. ᕿᓚᓗᒐᑦ ᐱᐅᓯᖏᑦ ᐃᖏᕐᕋᓕᕋᒥᓪᓗ ᐱᐅᓯᖏᑦ

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[5] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᕐᖃᑐᕕᓃᑦ ᐃᒣᓕᖓᔪᑦ: 48%.-ᒧᑦ ᒥᑦᓴᐅᓵᕐᑕᐅᒍᓇᓂᖓ ᓱᕐᕐᑯᐃᑕᐅᒍᓐᓇᖏᑦᑐᖅ . ᕿᓚᓗᒋᑦ ᒥᑦᓴᐅᓵᕐᓯᒋᑦ 3,900-ᖑᓯᒪᔪᑦ 2015-ᒥᑦ, ᐃᑭᓪᓕᓕᐅᒥᓯᒪᑦᓯᑎᒃ 3,200-ᓄᑦ (95% CI=1,600-4,600) ᕿᓚᓗᒋᑦ 2021-ᒥᑦ ᐃᑭᓪᓕᕙᓪᓕᐊᓯᑎᒃ 3%-ᒧᑦ ᐊᕐᕌᒍᑕᒫᑦ.

[6] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᕐᖃᑐᕕᓃᑦ ᐃᒣᓕᖓᔪᑦ:: 19,200-ᖏᓐᓂᑦ (95% CI=12,500-25,100) 2021-ᒥᑦ. ᖃᑦᓯᐅᓂᖏᑦ ᐃᑭᓪᓕᓕᐅᒥᓯᒪᓕᕐᑎᑐᑦ ᖃᐅᔨᓴᕐᑕᐅᓚᐅᕐᓯᒪᑦᓯᑎᒃ ᑭᖑᓪᓕᐹᒥᑦ. ᐱᑦᔪᑎᐅᑐᐃᓐᓇᓇᐊᓕᒃ ᐃᑭᓪᓕᓯᒪᓕᕐᓂᖏᓐᓄᑦ ᐊᕐᕌᒍᑕᒫᑦ ᕿᓚᓗᒐᕐᑕᐅᒍᓐᓇᑐᑦ 335-ᖑᓕᕐᒪᑕ.

[7] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: - ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᕐᖃᑐᕕᓃᑦ ᐃᒣᓕᖓᔪᑦ: 0-ᒥᑦ ᐊᒻᒪᓗ 20-ᓄᑦ ᕿᓚᓗᒐᑦ ᓈᒻᒪᓯᑕᐅᒪᒐᔭᖕᖑᐊᑐᑦ ᑐᕌᕐᓂᓕᐊᖑᓯᒪᔪᒥᑦ. ᐊᓯᐊᒍᕐᑎᑕᐅᓯᒪᓂᖓ ᐊᑐᕐᓯᒍ, 2021-ᒥᑦ ᑭᓯᑕᐅᔪᕕᓂᐅᑉᐸᑕ, 48% ᖑᒐᔭᕐᑐᖅ, ᕿᓚᓗᒐᕐᑕᐅᔪᑦ 48 ᐊᒻᒪᓗ 65.

[8] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᕐᖃᑐᕕᓃᑦ ᐃᒣᓕᖓᔪᑦ: 2015-ᒥᑦ 3,500 ᐅᕝᕙᓗᓗᓐᓃᑦ 3,900 ᐆᒪᔪᐃᑦ ᒪᓕᑦᓱᒍ ᓇᓪᓕᐊ ᒪᓕᒐᖅ ᐊᑐᕐᑕᐅᑎᑕᐅᔪᖅ. ᓱᓱᒋᔭᐅᓂᐊᕐᒪᑕ ᒪᓕᒐᖕᖑᑎᑕᐅᔪᑦ ᖃᑦᓯᕋᕈᓐᓇᓂᕐᒧᑦ (3,500 or 3,900), ᐆᒪᔪᕐᑕᐅᒍᓐᓇᑐᑦ ᖃᑦᓯᐅᓂᖏᑦ ᐃᑭᓪᓕᓕᐅᒥᐊᓕᒃ 0-65-ᒧᑦ[9] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ:: ᑭᓯᑕᐅᒍᓯᐅᓯᒪᔪᑦ ᐊᓯᑦᔨᒋᐊᓖᑦ ᑖᒃᑯᓄᖓᓕᒫᖅ.[10] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᕐᖃᑐᕕᓃᑦ ᐃᒣᓕᖓᔪᑦ: ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᓃᑦ ᖃᐅᔨᓯᒪᔪᑦ 16,300-ᖑᓕᕐᑐᓂᒃ (95% CI=9,800-27,200.

ᐊᑕᐊᐅᓯᐅᓕᖓᔫᒃ. ᐃᓚᖏᑦ ᐆᒪᔪᐃᑦ ᐊᐅᓪᓚᓲᖑᖕᖏᑐᑦ ᖃᖓᓗᓐᓃᑦ ᐃᓂᒥᓐᓂᑦ, ᐃᓚᖏᓪᓗ ᓇᓪᓕᐅᑎᑦᑕᑐᒥᒃ ᐱᐅᓯᖃᓲᑦ ᐊᕐᕌᒍᖅ ᒪᓕᑦᓱᒍ ᐊᐅᓚᓯᖃᑦᑕᓱᑎᒃ ᓅᑦᓱᑎᒃ.

ᐊᓐᓂᑐᕋᓱᐊᕐᓂᖅ

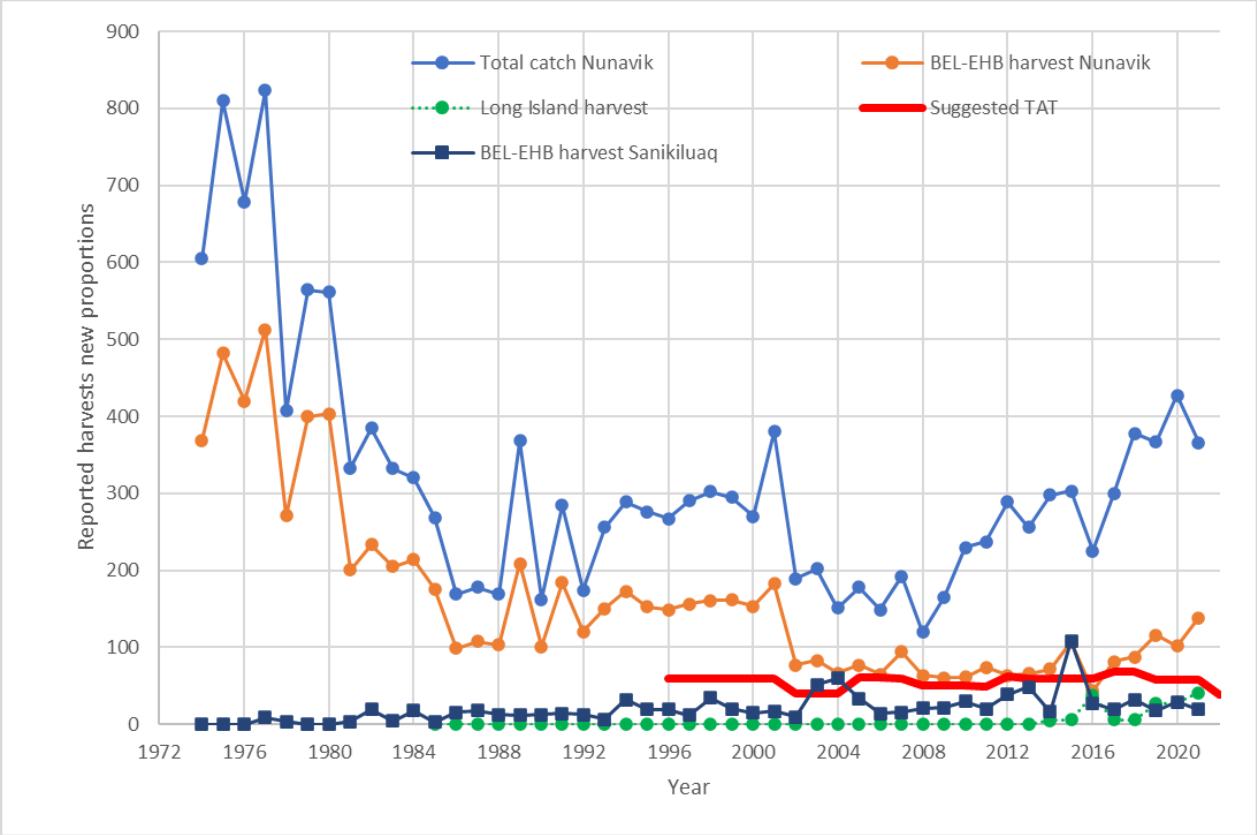
ᓴᒥᓯ ᐯᒦᑦᑐᑦ ᕿᓚᓗᒍᑦ (JAM)

ᐊᑑᑎᖃᑦᑕᓯᒪᔪᑦ ᑕᑯᑦᓱᒋᑦ, ᐊᔪᐃᓐᓇᕈᑕᐅᖃᑦᑕᓯᒪᔪᑦ ᐱᒋᐊᕐᑎᓯᒐᓱᐊᕐᓱᑎᒃ ᐊᑭᓖᓗᑎᒃ ᐃᖃᓗᓐᓂᐊᖃᑦᑕᕋᔭᕐᑐᓂᒃ ᑲᔪᓯᒍᓐᓇᓯᒪᖕᖏᒪᑕ ᐃᓚᖕᖏᑕᐅᓯᒪᓂᖏᑦ ᐃᐸᐱᓇᓪᓗᐊᖏᓚᕿᔪᑦ. ᑕᒪᓐᓇ ᐱᑦᔪᑕᐅᑎᓪᓗᒍ, ᓴᒥᓯᐯᒦᑦᑐᑦ ᕿᓚᓗᒍᑦ ᐃᑭᓕᔭᐅᓚᐅᕐᓯᒪᖕᖏᓚᕿᔪᑦ ᑎᒥᖃᑦᑕᓯᒪᑎᓪᓗᒋᑦ ᐊᓯᖏᓐᓂ ᐃᓂᓖᑦ. ᐃᐸᐱᓇᓪᓚᕆᑦᑐᒥᒃ ᐃᓂᒋᓲᖏᑦ ᐊᓯᑦᔨᓯᒪᓪᓚᕆᑦᑐᑦ ᐊᓯᑦᔨᑎᑕᐅᓚᕿᓯᒪᑦᓱᑎᒃ ᐃᑯᒪᐅᑎᓕᐅᕐᑎᓄᑦ ᐅᐊᓐᓂᖓᓂ ᓴᒥᓯ ᐯ, ᑭᓯᐊᓂ ᖃᓄᑎᒋ ᓱᕐᖑᓯᒪᓲᖑᒻᒪᖔᑕ ᖃᐅᔨᒪᔭᐅᖕᖏᑐᑦ.ᖃᒻᒥᑯᑦ ᐃᓱᓕᑦᑕᕕᓕᓐᓂᒃ ᐊᓐᓂᑐᕋᓱᐊᕈᓐᓇᐅᑎᑖᕐᓯᒪᔪᑦ, ᐊᓐᓂᑐᕐᑕᐅᔪᕕᓃᑦ ᑐᓴᕐᑎᓯᐅᑎᐅᓯᒪᔪᑦ 2021 41ᑖᕐᑐᕕᓂᐅᒋᐊᖏᑦ (ᐊᑦᔨᖑᐊᖅ 2).

ᓴᓂᑭᓗᐊᒥ ᐊᒻᒪᓗ ᑕᓯᐅᔭᕐᔪᐊᑉ ᐊᑐᐊᕐᓂᖓᓂ (BEL-EHB) ᕿᓚᓗᒍᑦ

ᑮᓇᐅᔭᓕᐅᕈᑎᒋᑦᓱᒍ ᐃᖃᓗᒐᓱᐊᕐᓂᐅᖃᑦᑕᓯᒪᔪᖅ 1900 ᐊᕐᕌᒍᖏᓐᓂ ᐊᑑᑎᑎᑦᓯᓯᒪᔪᖅ ᐃᑭᓕᑎᑦᓯᓯᓂ ᕿᓚᓗᒐᕐᓂᒃ ᑕᓯᐅᔭᕐᔪᐊᑉ ᐊᑐᐊᕐᓂᖓᓃᑦᑐᓂᒃ. ᒪᓐᓇᓗ ᐊᓐᓂᑐᕐᑕᐅᕙᓐᓂᑯᖏᓐᓄᑦ ᐊᒥᓱᖑᖃᔭᒪᓚᕿᔪᕕᓂᐅᒍᓐᓇᒥᑦᓱᑎᒃ. ᐊᕐᕌᒍᖏᑦ 1980 ᐊᑐᓕᕐᑎᓗᒋᑦ, ᐃᓱᓕᑦᑕᕕᓕᐅᕐᑕᐅᓚᐅᕐᓯᒪᔪᑦ ᐱᕐᑯᔭᑎᒍᑦ ᐊᓐᓂᑐᕐᑕᐅᒍᓐᓇᓂᖏᑦ ᒪᓕᒻᒥᑎᓪᓗᒋᑦ ᐃᓱᓕᑦᑕᕕᑦ ᐅᓄᕐᓂᖏᓐᓄᑦ ᐊᓐᓂᑐᕐᑕᐅᒍᓐᓇᑐᑦ(TAT) ᐊᒻᒪᓗ ᓄᓇᕕᓕᒫᖅ ᐊᕐᕌᒎᓪᓗ ᓇᓪᓕᐅᓂᖏᑦ ᒪᓕᑦᓱᒋᑦ ᕿᓚᓗᒐᕐᓂᐊᖃᓴᕐᑎᑕᐅᓯᒪᑦᓱᑎᒃ ᐅᑯᓇᓂ ᐸᑎᕐᑐᖅ, ᕿᓚᓗᒐᕐᓯᐅᕕᒻᒥᓗ. ᐊᓐᓂᑐᕋᓱᐊᓂᖅ ᐅᐊᓐᓂᖓᓂ ᑕᓯᐅᔭᕐᔪᐊᑉ ᓄᕐᖃᖓᑎᑕᐅᓯᒪᔪᖅ ᐱᒋᐊᕐᓱᓂ 2001ᒥ ᑎᑭᑦᓱᒍ 2006, ᐊᒻᒪᓗ ᐸᑎᕐᑑᖅ ᕿᓚᓗᒐᕐᓯᐅᕕᓪᓗ ᐅᒃᑯᐊᓯᒪᖏᓐᓇᑐᐃᓐᓇᑑᒃ ᒐᒪᖕᖓᓂᑦ ᐊᓐᓂᑐᕋᓱᐊᕈᓐᓇᓯᓚᐅᕐᓯᒪᑎᓪᓗᒋᑦ 2007ᒥᓂᑦ.

366 ᕿᓚᓗᒐᕐᑕᐅᓯᒪᒋᐊᖏᑦ ᑐᓴᕐᑎᓯᐅᑎᐅᓯᒪᔪᑦ ᓄᓇᕕᒻᒥᐅᓄᑦ ᐃᓚᐅᑎᓪᓗᒋᑦ 41 ᕐᑰᒻᒥᐅᑕᓂᑦ 2021-2022 ᕿᓚᓗᒐᕐᓂᐊᓇᐅᑎᓪᓗᒍ (ᐊᑦᔨᖑᐊᖅ 2). ᐊᓯᒋᐊᓪᓚᖏᓪᓗ ᕿᓚᓗᒍᑦ 30 ᐊᓐᓂᑐᕐᑕᕕᓂᐅᑦᓱᑎᒃ ᓴᓂᑭᓗᐊᒥ (ᓄᓇᕗᑦ)(ᐊᑦᔨᖑᐊᖅ 2). 2021ᒥ ᐊᓐᓂᑐᕐᓂᖅ ᓄᓇᕕᒻᒥ ᐅᖓᑖᓄᕐᑐᕕᓂᖅ ᐊᓐᓂᑐᕐᑕᐅᒐᔪᓲᑦ 344 ᐊᕐᕌᒍᑕᒫᑦ ᑕᑯᑦᓱᒋᑦ 2016-2021ᒧᑦ ᑎᑭᑦᑐᑦ ᑭᓯᑕᐅᒪᐅᑏᑦ.

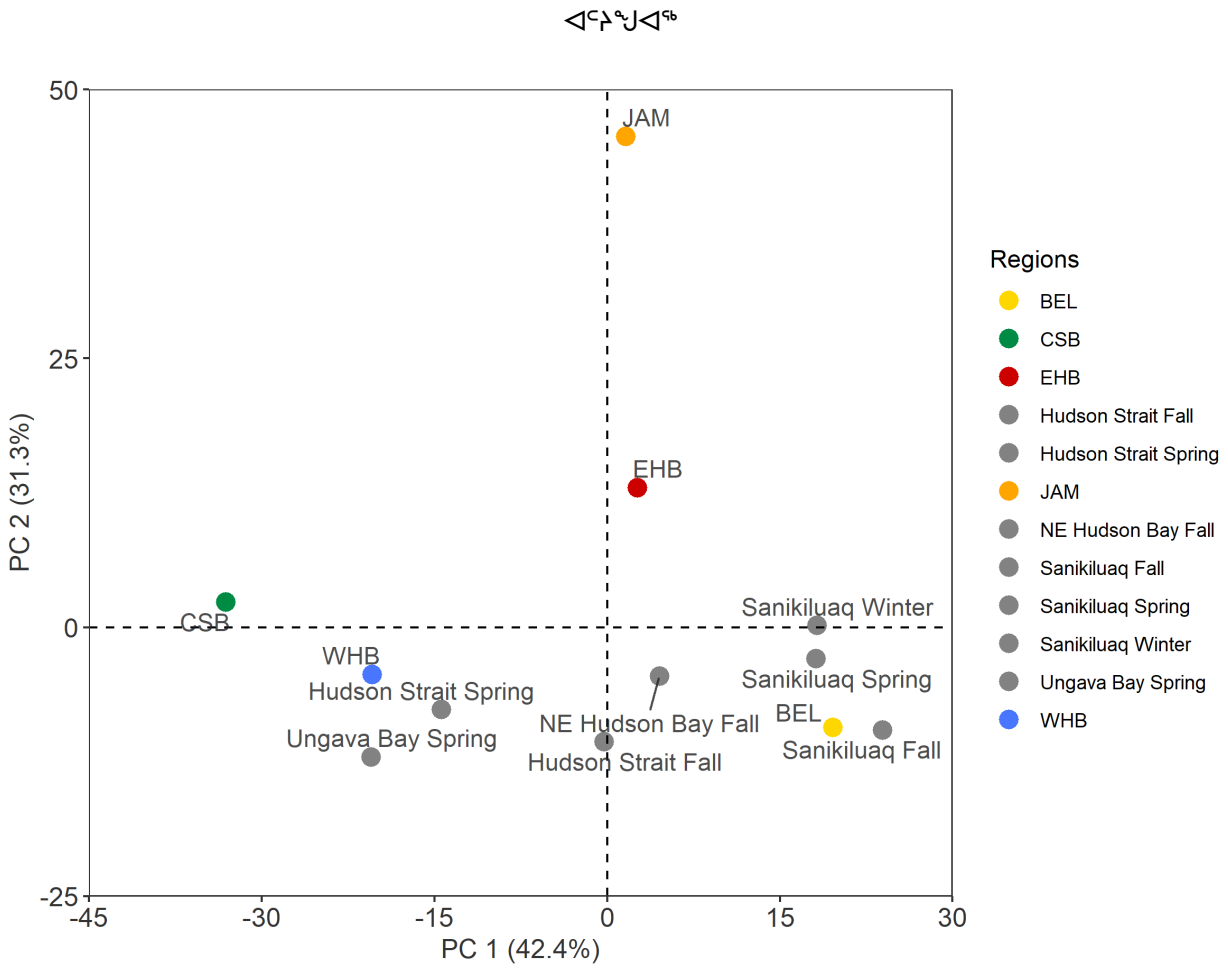


ᐊᑦᓴᖑᐊᖅ 2. ᐊᓐᓂᑐᑦᑕᐅᓯᒪᓂᖏᑦᑕ ᕿᓚᓗᒍᑦ ᐅᓄᑦᓂᖏᑦ ᑐᓴᑦᑎᓯᐅᑎᐅᓯᒪᔪᑦ ᓄᓇᕕᒻᒥ (ᑐᖑᔪᑦᑕᒧᑦ ᐊᕙᓗᓯᒪᔪᖅ), ᒥᑦᓴᐅᔅᑦᑕᐅᓯᒪᐅᑎᖏᑦ ᐊᓐᓂᑐᑦᑕᐅᓯᒪᔪᑦ ᓴᓂᑭᓗᐊᒥ ᐅᐊᓐᓂᖓᓂᓗ ᑕᓯᐅᔭᑦᔪᐊᑉ ᕿᓚᓗᒐᖏᑦᑕ ᓄᓇᕕᒻᒥ (ᐊᐅᐸᓛᖓᔪᖅ) ᒥᑦᓴᐅᔅᑦᑕᐅᓯᒪᐅᑎᖏᑦ ᐊᓐᓂᑐᑦᑕᐅᓯᒪᔪᑦ ᓴᓂᑭᓗᐊᒥ BEL-EHB ᕿᓚᓗᒍᑦ ᓴᓂᑭᓗᐊᒥ (ᓄᓇᕗᑦ ᑐᖑᔪᑦᑕᐅᓯᑎᒃ ᓯᒃᑭᒐᑦ), ᐊᒻᒪᓗ ᐊᓐᓂᑐᑦᑕᐅᓯᒪᒋᐊᖏᑦ ᑐᓴᑦᑎᓯᐅᑎᐅᓯᒪᔪᖅ ᖁᒻᒥᐅᑕᓂ (ᓄᓇᐅᔭᖅ). BEL-EHB ᕿᓚᓗᒍᑦ ᐊᓐᓂᑐᑦᑕᐅᓯᒪᔪᖅ ᑐᖕᖓᕕᓖᑦ ᑐᓴᑦᑎᓯᐅᑎᐅᓯᒪᔪᓂᒃ ᐃᓂᖏᑎᒍᑦ ᒪᓕᑦᓱᒋᑦ ᐃᓚᖏᓪᓗ ᐱᓯᒪᑦᓱᑎᒃ ᐊᐅᖏᑎᒍᑦ ᖃᐅᔨᓴᑦᑕᐅᒍᑎᒋᓯᒪᔭᖏᓐᓂᑦ. ᐊᐅᐸᑦᑐᖅ ᑎᑦᑕᖅ ᐱᖁᔨᒍᑎᐅᓯᒪᔪᑦ ᐊᓐᓂᑐᑦᑕᐅᒐᔭᑦᐸᑕ (TAT) BEL-EHB ᕿᓚᓗᒐᖏᑦ. ᐅᓄᑦᓂᕆᒐᔪᑦᑕᖏᑦ ᕿᓚᓗᒐᑦᑕᐅᔪᑦ ᑖᒃᑯᓈᓂ ᐃᓂᓐᓃ BEL-EHBᕿᓚᓗᒐᑦᑕᐅᔪᕕᓃᑦ ᓄᓇᕕᒻᒥ 344 ᐊᒻᒪᓗ 95 ᐊᑯᓐᓂᖏᓐᓂ 2016-2021.

ᕿᒥᑦᕈᔭᐅᓯᒪᐅᑎᖏᑦ

ᐱᑕᖃᑦᓂᖏᑦᑕ ᐃᓂᓪᓚᓯᒪᒍᓯᖏᑦ

ᐱᑕᖃᑦᓂᖏᑦᑕ ᐃᓂᓪᓚᓯᒪᒍᓯᖏᑦ ᕿᓚᓗᒍᑦ ᐅᐱᕐᖓᒥ ᑕᓯᐅᔭᑦᔪᐊᒦᓲᑦ-ᓄᕗᒻᒥᓗ ᖃᐅᔨᔭᐅᓯᒪᔪᑦ ᐊᑐᑦᓱᑎᒃ ᐊᐅᖏᑎᒍᑦ ᖃᐅᔨᓴᐅᑎᓂᒃ(mtDNA) ᐊᐅᓚᑕᐅᔪᖅ ᓄᓇ(615 nucleotides). ᖃᐅᔨᓴᑦᑎ ᒥᑦᓯᒋᑦᓴᓯᒪᔪᖅ WHB ᐊᒻᒪᓗ EHB ᕿᓚᓗᒐᖏᑦ ᒻᒪᓗ ᓇᓗᓐᑦᓯᒍᓐᓇᓯᑦᓱᓂ ᐊᑐᑦᓱᓂ ᖃᐅᔨᔭᐅᒍᑎᐅᖃᑦᑕᓯᒪᔪᓂᒃ ᑭᖑᓂᕐᒥ (234 nucleotides). ᑖᒃᑯᐊ ᑕᑭᔫᑦᓱᑎᒃ ᖃᐅᔨᓴᐅᑏᑦ ᓇᓗᓐᑦᓯᒍᑎᐅᓯᒪᒻᒥᔪᑦ ᐱᑕᖃᓇᐊᖏᑦ ᐊᒥᓱ ᐯᒥ (JAM), ᓯᑯᓲᓚᕐᒥᓗ ᕿᓚᓗᒍᑦ (CSB) ᓇᓗᓐᑦᓯᖃᒻᒥᐅᒥᑦᓱᑎᓪᓗ ᓴᓂᑭᓗᐊᒥ, (BEL) ᕿᓚᓗᒐᑦᓂᒃ (ᐊᔨᖑᐊᖅ 3).



ᐊᑦᔨᖑᐊᖅ 3. ᑐᓐᖓᕕᒻᒪᕆᑦ ᖃᐅᔨᓴᕐᑕᐅᓯᒪᔪᓄᑦ (PCA)ᐊᑐᕐᓱᑎᒃ ᑕᑭᔪᓂᒃ ᐊᐅᖏᑎᒍᑦ ᖃᐅᔨᓴᐅᑎᓂᒃ (615 nucleotides)ᐃᓕᖓᔪᑦ ᐊᐅᖏᑎᒍᑦ ᖃᐅᔨᓴᕐᑕᐅᒍᑎᓄᑦ ᓯᐊᒻᒪᓯᒪᑎᓪᓗᒋᑦ ᐊᐅᓚᑕᐅᒍᑎᓕᑦᑕᖏᑎᒍᑦ ᕿᓚᓗᒐᕐᓂᒃ ᐊᑦᔨᓱᖕᖏᑑᑦᓱᑎᒃ ᑕᓪᓕᒥᖑᑦᓱᑎᒃ ᑕᐅᑦᑐᖏᑎᒍᑦ; WHB, JAM, EHB, BEL, CSB) ᐊᓐᓂᑐᕐᑕᐅᓯᒪᔪᓂᓪᓗ ᓄᓇᕕᒻᒥ ᓴᓂᑭᓗᐊᒥᓪᓗ ᐊᐅᓚᑕᐅᒍᑎᖏᑎᒍᑦ (ᓱᓇᕐᓇᖅ). ᐅᖓᓯᑦᑕᓈᓐᓂᖏᑦ ᐱᑕᖃᕐᓂᖏᑦᑕ ᕿᓚᓗᒍᑦ ᐃᓂᖏᑎᒍᑦ ᐊᐅᓚᑦᓯᒍᑎᑕᓕᓐᓂᓗᓐᓃᑦ ᐊᑑᑎᔪᑦ ᒪᓕᑦᐅᓯᐊᓕᒻᒥᒃ ᑭᓯᑦᓯᒍᑎᑎᒍᑦ ᐊᑦᔨᓱᖕᖏᓂᖏᑦ ᒪᓕᑦᓱᑦ ᐊᐅᖏᑎᒍᑦ ᓇᑭᕐᖓᓂᑕᑦᓴᔭᐅᓂᖏᑦᑕ ᐊᕕᑦᑐᑕᐅᓯᒪᐅᑎᖏᑎᒍᑦ.

ᑐᓐᖓᕕᒋᑦᓱᒋᑦ ᖃᒻᒥᓂᑕᐅᓂᕐᐸᑦ ᖃᐅᔨᓴᕈᑎᐅᓯᒪᔪᑦ ᐱᓯᒪᑦᓱᑎᒃ ᓴᓂᑭᓗᐊᒥᑦ, ᐃᒻᒥᒎᕐᑐᑦ ᓇᓗᓐᕐᑕᐅᓯᒪᓕᕐᒪᑕ ᕿᓚᓗᒐᐅᖃᑎᒌᑦᑖᖃᒻᒥᓂᒃ ᐅᐟᕝᓗᓐᓃᑦ ᐊᓯᑦᔨᐸᓪᓕᐊᓂᐅᓲᖅ ᐱᐅᓯᐅᑦᓱᓂ ᑕᒪᓐᓇᐅᓴᕐᐸᑦ. ᖃᐅᔨᓴᕐᑕᐅᖃᑦᑕᓯᒪᔪᑦ ᑭᖑᓂᕐᒥ ᐊᑐᕐᓱᒋᑦ ᐊᐅᓐᓂᐊᕈᑏᑦ, ᓴᓂᑭᓗᐊᑉ ᕿᓚᓗᒐᖏᑦ ᐃᓚᒋᓕᐅᑦᔭᐅᓯᒪᔪᑦ ᑕᓯᐅᔭᕐᔪᐊᑉ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᓐᓄᑦ, ᐱᑦᔪᑕᐅᓗᐊᖕᖑᐊᑎᓪᓗᒍ ᐊᑦᔨᑏᓂᒃ ᐊᐅᒻᒥᑎᒍᑦ ᖃᐅᔨᔭᐅᒍᑎᖃᕐᓯᒪᒻᒪᑕ ᐱᑕᖃᓇᐊᖏᑦ.ᕋᓗᐊᕐᑎᓗᒍ, ᐊᑯᓂ ᐊᐅᖏᑎᒍᑦ ᖃᐅᔨᔭᐅᒐᓱᐊᕈᑎᐅᓯᒪᔪᑦ ᖃᐅᔨᔭᐅᓯᒪᐅᑎᖏᑦ ᐊᑐᕐᓱᒋᑦ ᓄᐃᑦᓯᓯᒪᒻᒪᑕ ᐱᑕᖃᕐᓂᐸᐅᒋᐊᖏᑦ ᐱᓯᒪᔪᑦ ᐅᐊᓐᓂᒥᑦ ᐊᑦᔨᐅᖏᑦᑑᓱᑎᒃ ᑖᒃᑯᓇᖕᖓᑦ.ᓴᓂᑭᓗᐊᑉ ᕿᓚᓗᒐᖏᑦ ᐊᑦᔨᖃᕐᓂᖏᑦᑐᑦ ᐊᐅᖏᑎᒍᑦ ᑕᓯᐅᔭᕐᔪᐊᑉ ᐅᐊᓐᓂᖓᓂᓲᑦ ᕿᓚᓗᒍᑦ ᐊᐅᖏᓐᓂᒃ, ᕋᓗᐊᕐᑎᓗᒍ ᑕᒪᕐᒥᒃ ᑕᓯᐅᔭᕐᔪᐊᒥ ᐃᓂᖃᓲᖏᓐᓈᒃ.

ᐃᒻᒥᓂᕿᑦᓱᑎᒃ ᐱᓇᓱᓐᓂᐅᒋᐊᓕᕕᓃᑦ ᐃᑭᑦᑐᕕᓃᑦ ᐱᓇᓱᑦᑕᐅᒍᑎᖏᑦ(19.7%) ᓴᓂᑭᓗᐊᒧᑦ ᐱᑕᖃᕐᓂᖏᑦ ᐃᓱᒪᓗᓐᓇᖏᓐᓂᖏᓪᓗ (69.4%) ᑕᓯᐅᔭᕐᔪᐊᑉ ᐅᐊᓐᓂᖓᓄᑦ ᐱᑕᖃᕐᓂᖏᑦ ᐃᓱᒪᒋᑦᓱᒋᑦ ᑕᓪᓕᒥᖑᓂᖏᑦ.ᑕᒪᓐᓇ ᐱᒍᓐᓇᐅᑎᖃᕈᑎᐅᔪᖅ ᐊᕕᖃᑎᒌᒍᑎᐅᓗᑎᒃ ᑖᒃᑯᐊ ᒪᕐᕈᐃᑦ ᕿᓚᓗᒐᑦ ᐊᐅᒥᑎᒍᑦ ᐊᒥᓲᖕᖏᑐᑦ ᐱᓯᒪᑦᓱᑎᒃ

ᑕᓯᐅᔭᕐᔪᐊᑉ ᐅᐊᓐᓂᖓᓂᑦ. ᑕᓯᐅᔭᕐᔪᐊᑉ ᐅᐊᓐᓂᖓᓃᓱᑦ ᓴᓂᑭᓗᐊᒥᓗ ᐅᐱᕐᖓᒥ ᒥᕐᕿᓯᓕᕋᒥᒃ ᒪᕐᕈᐃᖑᒋᐊᖏᑦ ᐊᕕᑦᑐᑕᐅᓯᒪᐅᑎᓖᒃ, ᑕᒪᓐᓇ ᓄᐃᑦᓯᓯᒪᔪᖅ ᐱᐅᓯᐅᒥᓯᒪᒋᐊᖓ ᓇᒻᒥᓂᖅ ᐊᐅᓚᑦᓱᒍ ᐱᓇᓱᓐᓂᖅ ᖃᐅᔨᒪᒐᓱᐊᕐᓂᓂᒃ (84.7%). ᒐᒥᒻᒪᑦ,ᓯᑕᒥᖑᓂᖏᑦ ᐊᐅᖏᑎᒍᑦ ᖃᐅᔨᔭᐅᓯᒪᐅᑎᖏᑦ ᒪᓕᑦᓱᒋᑦ ᑐᑭᖃᕐᑎᑕᐅᔪᑦᓴᐅᕗᑦ ᐊᐅᖏᑎᒍᑦ ᐊᑦᔨᒌᖕᖏᑑᒋᐊᖏᑦ,ᐅᑯᐊᖑᑦᓱᑎᒃ ᐅᐊᓐᓂᖓ ᑕᓯᐅᔭᕐᔪᐊᑉ, ᐊᒥᓯ V, ᓴᓂᑭᓗᐊᓪᓗ, ᕿᓚᓗᒐᖏᑦ ᐊᒻᒪᓗ ᓴᓂᑭᓗᐊᑉ-ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦ.

ᐃᓚᖏᑦ ᓴᓂᑭᓗᐊᑉ-ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦ ᐊᓐᓂᑐᕐᑕᐅᖃᑦᑕᓯᒪᔪᑦ ᐊᒃᓚᑕᐅᓯᒪᐅᑎᖏᑦ ᐊᐅᓚᑦᓯᒍᑎᑕᓕᓐᓂ ᒪᓕᑦᓱᒋᑦ ᐊᒻᒪᓗ ᐅᐱᖓᓴᓂᑌᑦ(ᕕᕈᐊᕆ-1ᐊᐅᒃᒍᓯ 31) ᐊᒻᒪᓗ ᐅᑭᐊᒥ (1ᓯᐸᑎᒻᐱᕆ-ᔭᓄᐊᕆ 31) ᐊᓐᓂᑐᕋᓱᐊᓇᖅ ᒥᑦᓴᐅᓵᕐᑕᐅᓲᖅ ᐊᑐᕐᓱᒋᑦ ᕿᓚᓗᒐᐅᑉ ᓄᑭᖏᑦ ᖃᐅᔨᒐᓱᐊᕈᑎᑦᓴᑖᖑᓯᒪᔪᑦ ᕿᓚᓗᒐᕐᓂᐊᑐᓂᑦ. ᓴᓂᑭᓗᐊᒥ, ᕿᓚᓗᒐᕐᓂᐊᓇᖅ ᐊᕕᑦᑐᑕᐅᓯᒪᓲᖅ ᓯᑕᒥᓕᖓᑦᓱᓂ ᐊᕐᕌᒍᒥ; ᐅᐱᕐᖓᓴᖅ (ᐁᕆᓕ 1, ᔫᓂ 3ᔭ), ᐅᐱᕐᖓᒥ (ᔪᓐ 1-ᐊᐅᒃᒍᓯ 31), ᐅᑭᐊᒥ (ᓯᐸᑎᒻᐱᕆ 1-ᓈᕕᒻᐱᕆ 30) ᐅᑭᐅᒥᓗ (ᑏᓯᒻᐱᕆ 1-ᒫᑦᑲ 31) (ᐊᕕᑦᑐᓯᒪᕕᒃ ᑕᑯᓗᒍ 1).

ᐊᕕᑦᑐᓯᒪᕕᒃ 1. ᐊᐅᖏᑎᒍᑦ ᐊᑦᔨᒌᖕᖏᓂᖓᑕ ᖃᐅᔨᓴᕐᑕᐅᒍᑎᒋᓯᒪᔭᖏᑦ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦᑕ ᐊᓐᓂᑐᕐᑕᐅᖃᑦᑕᓯᒪᔪᑦ ᓄᓇᕕᒻᒥ ᐊᒻᒪᓗ ᓴᓂᑭᓗᐊᑉ ᐊᐅᓚᑕᐅᕕᖓᓂ ᐊᕕᑦᑐᓯᒪᓂᖏᑎᒍᑦ ᑕᕐᕋᐸᓯᖓ ᑕᓯᐅᔭᕐᔪᐊᑉ (NE): ; Ns: ᐅᓄᕐᓂᖏᑦ ᖃᐅᔨᓴᐅᑎᐅᓯᒪᔪᑦ; Nv:ᐅᓄᕐᓂᖏᑦ ᐅᓪᓗᖏᑦᑕ ᐊᓐᓂᑐᕋᓱᐊᕐᓃᑦ ᑕᒃᓂᑦᓴᓇᐅᖕᖏᑐᖅ (ᐊᑑᑎᔪᑦ) ; P: ᐱᑕᖃᕐᓂᖏᑦ; 95% CI: 95% ᐃᓱᒫᓗᓐᓇᖏᑦᑐᑦ. [1] ᐱᑕᖃᕐᓂᖏᑦ ᓄᕗᒻᒥ ᐅᐱᕐᖓᓴᒥ ᐊᑐᕐᑕᐅᔪᑦ ᐱᑦᔪᑕᐅᑎᓪᓗᒍ ᖃᐅᔨᓴᐅᑏᑦ ᐊᑑᑎᑦᓯᐊᓯᒪᖕᖏᓂᖏᓐᓄᑦᐅᕝᕙᓗᓐᓂᑦ ᐊᓐᓂᑐᕋᓱᐊᕐᑐᕕᓃᑦ ᐱᐅᓯᕕᓂᖓ ᑐᑭᓯᓇᑦᓯᐊᕋᓂ; [2] ᐱᓯᒪᔪᑦ ᓄᕗᒻᒥᑦ ᐅᑭᐊᒥ ᐊᑐᕐᑕᐅᓚᑭᓯᒪᔪᑦ ᓈᒻᒪᓈᑦᓯᐊᓂᖏᒪᑕ ᖃᐅᔨᓴᐅᑏᑦ ᕿᒥᕐᕈᔭᐅᑎᖏᑦ ᖃᐅᔨᓴᕐᑕᐅᖃᑦᑕᑐᕕᓂᕐᓂ ᐊᑯᓐᓂᖏᓐᓂ 1994-2021.

ᐊᐅᓚᑦᓯᒍᑎᑕᓖᑦ		BEL-EHB ᐱᑕᖃᕐᓂᖏᑦ (%)	
ᐊᕕᑦᑐᓯᒪᑦᓯᑎᒃ	Ns/Nv	P	95% CI
ᓄᓇᕕᒃ			
ᐅᐱᕐᖓᓴᒥ			
ᓄᕗᒃ	824/364	12.3	8.6-16.5
NE ᑕᓯᐅᔭᕐᔪᐊᖅ[1]	2/1	12.3	8.6-16.5
ᐅᖓᕙ	143/87	4.7	0.8-11.8
ᐅᑭᐊᒥ			
ᓄᕗᒃ	512/202	44.0	35.1-53.0
NE ᑕᓯᐅᔭᕐᔪᐊᖅ	45/19	50.1	23.9-76.2
ᐅᖓᕙ [2]	6/6	44.0	35.1-53.0
ᓴᓂᑭᓗᐊᖅ			
ᐅᐱᕐᖓᓴᖅ	229/99	62.8	51.5-73.4
ᐅᑭᐊᖅ	49/35	61.0	35.1-83.9
ᐅᑭᐅᖅ	76/11	39.9	13.0-70.8

ᒪᕐᕕᑏᑦ ᐅᖃᕐᓯᒪᔪ5 ᑖᒃᑯᐊ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦ ᐃᖏᕐᕋᓯᑦᓴᐅᑎᒋᓂᕐᓴᐅᓲᑦ ᓄᕗᒃᑰᓱᑎᒃ ᐊᓯᖏᓐᓂ ᕿᓚᓗᒐᕐᓂᑦ ᐸᑎᕐᑑᑉ ᕿᓚᓗᒐᑦᓴᔭᖏᓐᓂᑦ.ᑕᒪᓐᓇᐅᑐᐃᓐᓇᕆᐊᖃᕐᓂᖓ ᖃᐅᔨᒐᓱᐊᕐᑕᐅᓯᒪᔪᖅ ᐃᖏᕐᕋᓕᕐᒪᑕ ᖃᐅᔨᒪᒐᓱᐊᓲᓄᑦ ᕿᓚᓗᒐᕐᓂᒃ/ ᐊᓐᓂᑐᕐᑕᐅᓯᒪᔪᑦ (ᑕᑯᓗᒍ ᑭᓯᑦᓯᕕᐅᓯᒪᔪᖅ 2). ᐃᓚᖏᑦ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦ ᐊᒥᓱᐊᓘᓚᐅᔪᑦ ᐅᑦᑑᐱᕿᐅᑎᓪᓗᒍ ᓈᕕᒻᐱᕆᓗ ᐱᒋᐊᕐᖃᒥᐅᑎᓪᓗᒍ, ᐃᑭᓕᓯᓚᐅᔪᒻᒥᔪᑦ ᓈᕕᒻᐱᕆᐅᑉ ᑕᕐᕿᖓᑕ ᕿᑎᖓᓂ ᐃᒥᓪᓗᐊᑐᓂᒃ 10.4% ᑕᕐᕿᖅ ᐊᑐᕐᑐᑐᖃᐅᓕᕐᑎᓗᒍ.

ᑭᓯᑦᓯᕕᐅᓯᒪᔪᖅ 2. ᐊᐅᖏᑎᒍᑦ ᐊᕐᔪᒌᖕᖏᓂᖕᒐᑕ ᕿᒥᕐᕈᔭᐅᓯᒪᐅᑎᖏᑦ ᑖᒃᑯᐊ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖕᒐᑕ ᕿᓚᓗᒐᖏᑦᑕ ᐊᓐᓂᑐᕐᑕᐅᓯᒪᔪᑦ ᓄᑦᓴᒥ ᐊᕐᕋᒍᓕᒫᒥ. Ns: ᐅᓄᕐᓂᖏᑦ ᖃᐅᔨᓴᕈᑏᑦ ᐊᑐᕐᑕᐅᓯᒪᔪᑦ; Nv:ᖃᕐᓯᐅᓂᖏᑦ ᐅᓪᓗᐃᑦ ᐊᓐᓂᑐᕋᓯᐊᕐᕕᐅᓯᒪᔪᑦ (ᐊᑑᑎᔪᕕᓃᑦ) P: ;ᖃᕐᓯᐅᓂᖕᒐ 95% CI: 95%ᐃᓱᒫᓗᓐᓇ ᖏᑦᑐᖅ ᑎᑭᐅᑎᕕᐅᓯᒪᓂᖕᒐ; ND: ᓇᓗᓄᕐᑕᐅᓯᒪᖕᖏᑐᑦ (ᖃᕐᓯᐅᓂᖏᑦ ᖃᐅᔨᓴᕈᑎᐅᓯᒪᔪᑦ ᖃᕐᓯᓂᓪᓗ ᐅᓪᓗᓂ ᐊᓐᓂᑐᕋᑐᐊᕐᓂᒪᖕᒐᑕ <10). ᖃᐅᔨᓴᐅᑎᑦᓴᐅᑎᓪᓗᒋᑦ ᓄᐊᑕᐅᖃᑦᑕᑐᕕᓃᑦ ᐊᑯᓐᓂᖏᓐᓂ ᐊᕐᕌᒍᖏᑦᑕ 1994-2021.

ᖃᖕᒐᐅᓂᖕᒐ		ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖕᒐᑕ ᕿᓚᓗᒐᖏᑦ(%)	
	Ns/Nv	P	95% CI
ᒥ	6/6	ND	-
ᔫᓂ	577/230	12.4	7.9-17.7
ᔪᓐ	223/114	11.0	5.6-18.0
ᐊᐅᒃᒍᓯ	18/14	13.7	0.0-57.4
ᓯᐸᑎᒻᐱᕆ	26/7	ND	-
ᐅᑦᑑᐱᕆ	223/104	47.3	34.7-60.1
ᓅᕕᒻᐱᕆ	263/91	45.1	33.0-57.6
ᓅᕕᒻᐱᕆ. 1-10	167/62	51.5	39.0-63.9
ᓅᕕᒻᐱᕆ 11-20	96/29	33.9	13.9-57.6
ᓅᕕᒻᐱᕆ. 21-30	49/13	10.4	0.9-29.5

ᖃᖕᒐᑦᑕᔫᕐᑐᓄᑦ ᑭᓯᑕᕕᓃᑦ

Vᑕᑯᔭᒥᓂᒃ ᖃᖕᒐᑕᑦᓱᑎᒃ ᑎᑦᑕᑕᐅᓯᒪᔪᒃᑯᑦ ᑭᓯᑦᓯᔪᑦ ᐊᑑᑎᔭᐅᓚᐅᔪᔪᖅ ᔪᓐ-ᐊᐅᒃᒍᓯᒥᓗ 2021 ᖁᓚᐅᖃᑦᑕᓱᒋᑦ ᔭᒥᓯ V ᐅᐊᓐᓂᖕᒐᓗ ᑕᓯᐅᔭᕐᔪᐊᑉ ᓯᑦᔭᑎᒎᕐᓱᑎᒃ ᓄᓇᖕᖑᐊᒥ ᓇᓗᓐᒃᑯᑕᖕᒐ 81°W of longitude, ᐅᖕᒐᓯᓐᓂᓕᒃ 60 ᑭᓚᒦᑕᓂᒃ ᓴᓂᑭᓗᐊᒥᑦ (ᑕᑯᓗᒍ ᑭᓯᑕᐅᒪᐅᑎ 1.). ᓯᑦᔭᐅᑉ ᑭᓪᓕᖕᒐᒎᕐᓱᑎᒃ ᖃᖕᒐᑕᖃᑦᑕᓚᐅᔪᔪᑦ ᐱᖕᒐᓱᕕᑦᓱᑎᒃ ᕿᓂᕐᓱᑎᒃ ᕿᓚᓗᒐᕐᓂᒃ ᑲᑎᒪᔪᓂᒃ ᓯᑦᔭᑯᑦ ᑲᖏᕐᓱᑎᒍᓪᓗ. ᐅᐊᓐᓂᖕᒐᓂ ᑕᓯᐅᔭᕐᔪᐊᑉ, ᕿᓚᓗᒐᕐᓯᐅᕕᒃ ᐸᑎᕐᑑᓗ ᑰᖏᒃ ᑭᓯᑦᓯᕕᐅᒍᒪᓗᐊᖕᖑᐊᓚᐅᔪᔫᒃ ᐊᕐᕐᑰᕐᑕᐅᖏᓐᓇᓕᒫᖃᑦᑕᓚᐅᔪᔫᒃ ᒐᒪᖕᖕᒐᑕᒫᑦ ᖃᖕᒐᑕᓕᕐᒪᑕ (ᖃᖕᒐᑕᑲᑕᑦᓱᑕ ᑕᒪᒃᑯᑎᒎᓇ ᑎᑦᑕᑕᐅᓯᒪᔪᒃᑯᑦ ᐅᕝᕙᓗᒍᓐᓂᑦ ᒥᓚᐅᕐᑐᖃᑦᑕᓱᑕ ᒥᕝᕕᑎᒎᒋᐊᖃᖃᑦᑕᓱᑕ). ᓯᓚ ᐱᕕᑦᓴᐅᓂᖕᒐ ᒪᓕᑦᓱᒍ.

2021ᖕᒍᑎᓪᓗᒍ ᑭᓯᑦᓯᔪᖃᓚᐅᔪᖕᖏᑐᖅ ᖃᖕᒐᑦᑕᔫᒃᑯᑦ ᐅᖕᒐᕙᒥ ᑕᓯᐅᔭᕐᔪᐊᒥᓗ.

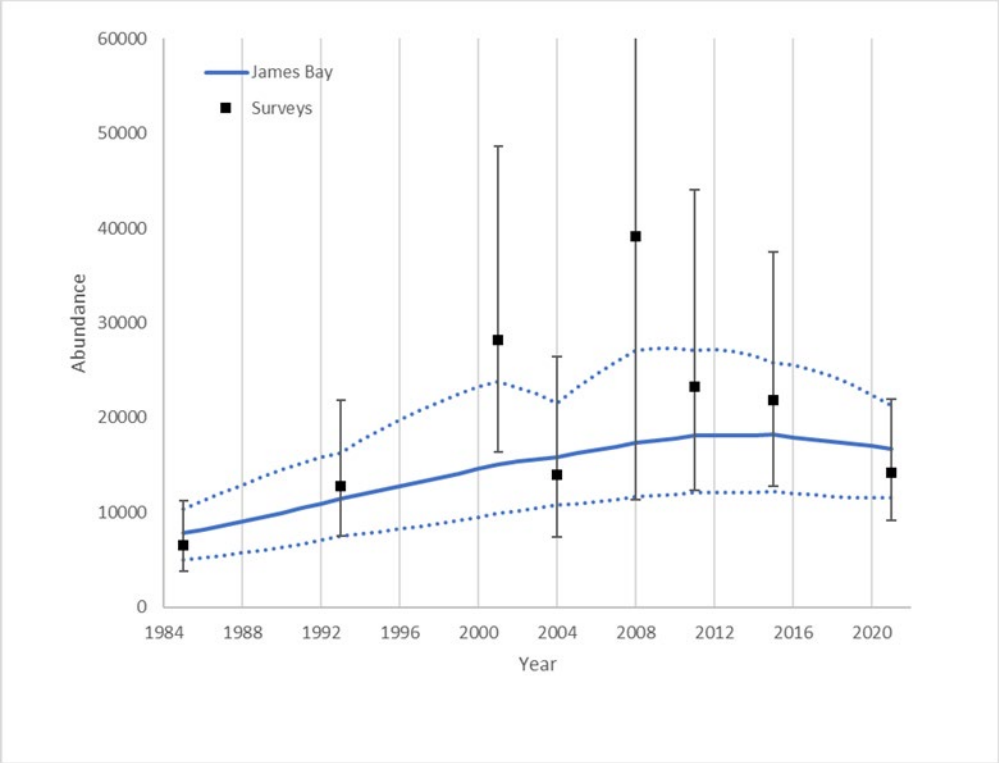
ᑭᓯᑕᐅᒪᐅᑎ 3. ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑕᐅᒪᐅᑏᑦ ᒪᑦᑕᐅᒍᑎᒋᐊᓕᖏᑦᑕ ᑕᒻᒪᓯᒪᓂᕕᓂᖏᑦ (SE)ᒥᑦᓴᐅᓵᕐᑕᐅᓯᒪᐅᑎᖏᑦ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦᑕ, ᐊᒻᒪᓗ Western Hudson Bay (WHB), ᔪᒥᓯ V (JAM) ᐊᒻᒪᓗ ᐅᖓᕙ(UB) ᕿᓚᓗᒍᑦ ᐱᑕᖃᕐᓂᖏᑦ ᑕᑯᔭᐅᓯᒪᔪᑦ ᖃᖓᑦᑕᔫᕐᑐᓄᑦᒪᓕᑦᑕᐅᓱᑎᒃ ᐋᕐᕿᒋᐊᕐᑕᐅᓯᒪᔪᑦ ᐊᑐᐃᓐᓇᓕᐊᕆᔭᐅᑦᓱᑎᒃ ᓈᒻᒪᓈᕐᑐᓕᐊᕆᔭᐅᑦᓱᑎᓪᓗ.

ᐊᕐᕌᒍᖓ	ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦ ᒥᑦᓴᐅᓵᕐᑕᐅᓯᒪᐅᑎᖏᑦ (SE)	WHB ᒥᑦᓴᐅᓵᕐᑕᐅᓯᒪᐅᑎᖏᑦ (SE) [1]	JAM ᒥᑦᓴᐅᓵᕐᑕᐅᓯᒪᐅᑎ ᖏᑦ(SE)[9]	UNG
1985	6,711 (1,936)	-	6,511 (1,842)	*
1987	-	31,124 (6967)	-	-
1993	4,163 (1,760)	-	12,811 (3,569)	*
2001	4,570 (2,265)	-	28,242 (7,971)	*
2004	7,368 (2,899)	51,761 (15,875)	14,021 (4,667)	-
2008	4,764 (1,404)	-	39,152 (27,296)	*
2011	5,001 (2,350)	-	23,324 (7,768)	-
2015	7,841 (3,687)	54,473 (5,329)	21,860 (6,126)	-
2021	2,501 (719)	-	14,213 (3,187)	-
-	-	-	-	<100

[1] ᑭᖑᓪᓕᐹᒥ ᑭᓯᑕᐅᒍᑎᕕᓃᑦ 2015.
* ᕿᓚᓗᒐᕐᓯᓯᒪᖕᖏᑐᑦ ᐅᖓᕙᐅᑉ ᑎᑎᕐᑕᐅᓯᒪᓂᖓᒍᑦ. ᖃᒻᒥᓂᑕᐅᓂᕐᐹᑦ ᒥᑦᓴᐅᓵᕐᑕᐅᓯᒪᐅᑎᓂ ᐅᖓᕙᒥ ᐃᑭᓐᓂᓴᐅᓂᕋᕐᑕᐅᔪᑦ 100ᓂᑦ

ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᓂᐅᓯᒪᔪᑦ ᔪᒥᓯ Vᒥ ᐊᒻᒪᓗ ᐅᐊᓐᓂᖓᓂ ᑕᓯᐅᔭᕐᔪᐊᑉ ᐋᕐᕿᒋᐊᕐᑕᐅᓯᒪᔪᑦ ᑕᑯᓗᒍ ᑭᓯᑕᐅᒪᐅᑎ 1) ᕿᓚᓗᒐᕐᓄᑦ ᖃᐅᔨᔭᐅᓐᓂᖏᑦᑐᓄᑦ ᖃᐅᔨᔭᐅᖕᖏᓚᕿᑦᓱᑎᒃ ᐊᕐᖃᐅᒪᒐᒥᒃ ᕐᑯᓚᐅᑕᐅᓕᕐᓱᑎᒃ (ᐱᑕᖃᕆᐊᖏᑦ ᖃᐅᔨᔭᐅᑦᓯᐊᓯᒪᖕᖏᑐᑦ), ᐊᒻᒪᓗ 2) ᕿᓚᓗᒐᕐᓄᑦ ᐳᐃᒪᔪᓄᑦ ᑕᑯᔭᐅᓐᓂᖏᑦᑐᓄᑦ ᑭᓯᑦᓯᔪᓄᑦ (ᖃᐅᔨᒪᓇᕐᓯᐊᖏᑦᑐᖅ). ᒥᑦᓴᐅᓵᕐᑕᐅᓯᒪᐅᑎᖏᑦ ᔪᒥᓯ V ᕿᓚᓗᒐᖏᑦᑕ 2021ᒥ ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑕᐅᑦᓱᑎᒃ ᐃᒃᓪᓗᐊᑐᕕᓃᑦ 14,200 (95% CI=9,200-21,900,[10] ᖃᓂᓐᓂᐸᐅᒍᓐᓇᕕᓕᒫᖓᓄᑦ 100) (ᑭᓯᑕᐅᒪᕕᒃ 4).

[9] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ:: ᑭᓯᑕᐅᒍᓯᐅᓯᒪᔪᑦ ᐊᓯᑦᔨᒋᐊᓖᑦ ᑖᒃᑯᓄᖓᓕᒫᖅ.[10] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᕐᖃᑐᕕᓃᑦ ᐃᒃᓕᖓᔪᑦ: ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᓃᑦ ᖃᐅᔨᓯᒪᔪᑦ 16,300-ᖑᓕᕐᑐᓂᒃ (95% CI=9,800-27,200.
[10] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᕐᖃᑐᕕᓃᑦ ᐃᒃᓕᖓᔪᑦ: ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᓃᑦ ᖃᐅᔨᓯᒪᔪᑦ 16,300-ᖑᓕᕐᑐᓂᒃ (95% CI=9,800-27,200.



ᑭᓯᑕᐅᒪᕕᒃ 4[11]. ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᒍᑎᕕᓃᑦ ᐊᒻᒪᓗ ᖃᓄᖅ ᐱᑕᖃᕐᓂᖏᑦ ᖃᐅᔨᔭᐅᓲᖕᒻᒪ ᖓᑕ ᒥᑦᓴᐅᔨᕐᑕᐅᓯᒪᐅᑎᖏᑦ ᔪᒥᓯ ᐯᒥ ᕿᓚᓗᒍᑦ 95% ᐱᑕᖃᕐᓂᖏᑦᑕ ᐊᕕᑦᑐᓯᒪᓂᖏᑦ 1985-2021.

ᒥᑦᓴᐅᔨᕐᑕᐅᓯᒪᐅᑎᖏᑦ ᐱᑕᖃᕐᓂᖏᑦᑕ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦᑕ ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑕᐅᑦᓱᑎᒃ ᐃᒥᓪᓗᐊᑐᕕᓃᑦ 2,500 (95% CI=1400-4,300)[12] (ᑭᓯᑕᐅᒪᕕᒃ 3; ᐊᑦᔨᖑᐊᖅ 4). ᐊᒃᓚᓯᒪᔪᓂᑦ, ᐊᑑᑎᖃᑦᑕᑎᓪᓗᒋᑦ ᐱᖓᓱᕕᑦᓱᑎᒃ ᑭᓯᑦᓯᓱᑎᒃ ᖃᖓᑦᑕᔫᑯᑦ ᐸᑎᕐᑑᑉ ᐃᒪᖓᓂ (6, 17, 20 ᐊᐅᒃᒍᓯ) ᕿᓚᓗᒐᕐᓱᕕᐅᓐᓂᖏᑦᑐᖅ;ᑭᓯᐊᓂᓕ, 200-300 ᑕᑯᔭᐅᔪᕕᓃᑦ ᐱᖓᓲᔪᕐᑐᕕᑦᓱᑎᒃ ᖃᖓᑕᑦᓱᑎᒃ ᐱᖓᓱᕕᑦᓱᑎᒃ ᕿᓚᓗᒐᕐᓱᐅᕕᒃᑰᓱᑎᒃ ᔪᓐᓗ 27, ᐊᐅᒃᒍᓯ 6,12,**15,16**,17; ᕿᓂᓪᓚᕆᑦᓱᑎᒃ).

ᑕᑯᑦᓴᐅᑎᑦᓯᒍᑏᑦ ᐱᑕᖃᕐᓂᖏᓐᓂᒃ ᕿᓚᓗᒍᑦ ᐊᒻᒪᓗ ᓱᕐᖑᓯᒪᐅᑎᖏᑦ ᐊᓐᓂᑐᖃᑦᑕᓃᑦ

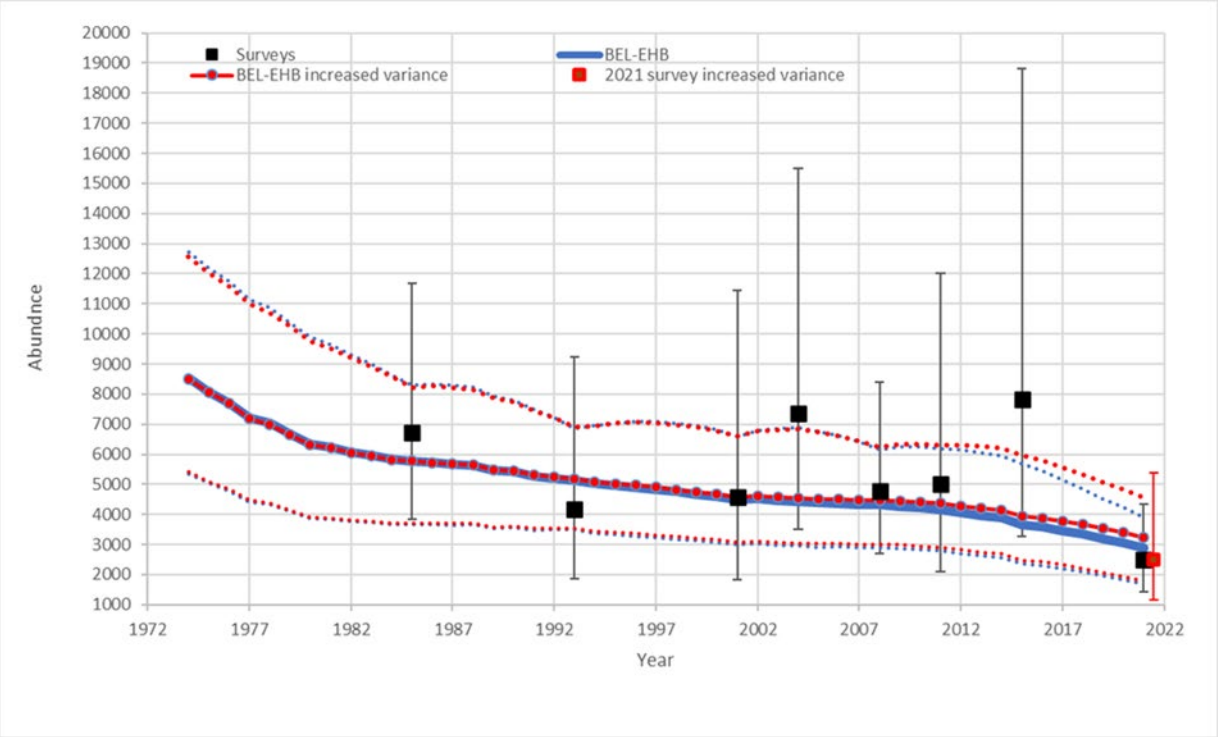
ᐱᑕᖃᕐᓂᖏᑦ ᖃᓄᐃᓕᖓᒻᒪᖔᑕ ᐊᑐᓕᕐᑎᑕᐅᓯᒪᔪᑦ ᓄᑕᐅᓯᓕᑎᕐᓯᒪᑦᓱᑎᒃ ᖃᐅᔨᒪᒍᑎᑦᓴᑦ ᐊᓐᓂᑐᕐᓂᐅᓲᑦ ᐱᓪᓗᒋᑦ ᑭᓯᑕᐅᒪᐅᑏᑦ ᐊᒻᒪᓗ ᓇᓪᓕᖏᐅᓂᖏᑦ ᕿᓚᓗᒐᑦ ᐃᓚᒋᓕᐅᑦᔭᐅᓯᒪᔪᖅ ᔪᒥᓯ ᐯ ᕿᓚᓗᒐᒋᓐᓄᑦ ᐊᒻᒪᓗ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᓐᓄᑦ ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑕᐅᒍᑎᕕᓂᖏᑎᒍᑦ ᐱᑕᖃᕐᓂᖏᑦ (ᑭᓯᑕᐅᔭᕕᒃ 4, 5). ᕿᓚᓗᒐᕐᑕᐅᖃᑦᑕᓯᒪᔪᑦ ᕐᑰᒻᒥᐅᑐᑦ ᓴᓂᐊᓂ ᐃᓚᒋᓕᐅᑦᔭᐅᓯᒪᔪᑦ ᔪᒥᓯ ᐯᒥ ᕿᓚᓗᒐᕐᑕᕕᓃᑦ ᑭᓯᑕᐅᒪᐅᑎᖏᓐᓄᑦ (ᑭᓯᑕᐅᒪᐅᑎ 2).

ᐃᓚᒋᓕᐅᑦᔨᓂᖅ ᑭᓯᑕᐅᒪᐅᑎᓂᒃ ᔪᒥᓯ ᐯ ᕿᓚᓗᒐᖏᓐᓄᑦ ᐱᑕᖃᕐᓂᖏᓐᓂᒃ ᒥᑦᓴᐅᔨᕐᓱᖏᑦ ᐃᒥᓪᓗᐊᑐᒧᑦ ᑎᑭᐅᑎᓯᒪᔪᑦ 7,800 (95% CI=5,000-10,400) 1985ᖑᑎᓪᓗᒍ ᐅᓄᕐᓱᖏᐊᕐᑐᕕᓃᑦ ᐃᒥᓪᓗᐊᑐᖕᖑᓱᑎᒃ, 18,200 2015ᖑᑎᓪᓗᒍ ᓯᕗᓂᖓᒍᑦ ᑎᑭᐅᑎᓚᐅᕋᑎᒃ ᓱᓕ16,700 (95% CI=11,500-21,300) 2021ᖑᑎᓪᓗᒍ ᑕᑯᓗᒍ (ᑭᓯᑕᐅᒪᐅᑎ 4,). ᐃᓚᒋᓕᐅᑦᔨᓂᖅ ᑭᓯᑦᓯᓂᕐᒧᑦ ᐱᐅᓯᕐᒥᒃ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᓐᓄᑦ, ᐱᑕᖃᕐᓂᖏᑦ ᒥᑦᓴᐅᔨᕐᑕᐅᓯᒪᑦᓱᑎᒃ 9,000 (95% CI=5,800-13,200) 1974ᖑᑎᓪᓗᒍ, ᐃᑭᓕᒋᐊᕐᑐᕕᓃᑦ ᐃᒥᓪᓗᐊᑐᖕᖑᓱᑎᒃ 2,900

[11] ᐊᐅᒡᒎᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᑭᓯᑕᐅᔪᕕᓂᕐᓄᑦ ᐊᑦᔨᖑᐊᖅ ᓄᑕᐅᓯᓕᕐᑎᑕᐅᒪᔪᖅ ᐃᓗᐊᓃᑦᑐᖅ.

[12] ᐊᐅᒡᒎᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᕐᖃᑐᕕᓃᑦ ᐃᒥᓕᖓᔪᑦ: ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᓂᖅ ᖃᐅᔨᓯᒪᔪᑦ 2,300-ᓂᑦ (95% CI=1,200-3,400.

(95% CI=11,700-3,900) 2021ᖫᑎᓪᓗᒍ (ᑭᓯᑕᐅᒪᐅᑎ 5). ᖃᓄᐃᓪᓗᐊᑐᒥᒃ ᐃᑭᓕᒋᐊᕐᒪᖔᑦᑕ ᖃᐅᔨᒪᒍᑎ ᖃᐅᔨᒪᓇᕐᓯᑎᑦᓯᓯᒪᓕᕐᑐᖅ ᐃᑭᓕᐅᒥᓯᒪᒋᐊᖏᑦ ᐊᕐᕌᒍᑕᒫᑦ ᐃᒣᓪᓗᐊᑑᒐᔪᑦᓯᓂin 2021 1.1% ᐊᑯᓐᓂᖏᓐᓂ 2004-2014, ᐊᕐᕌᒍᑕᒫᑦ ᐃᒣᓪᓗᐊᑑᒐᔪᓕᕐᑐᕕᓂᖅ 3% ᐊᑯᓐᓂᖏᓐᓂ 2015 ᐊᒻᒪᓗ 2021. 2021ᒥ ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᓂᕕᓂᖅ ᒥᑦᓴᐅᔫᕐᑕᐅᒍᑎᖏᑦ ᐃᑭᓐᓂᓴᓪᓚᑎᐅᓯᒪᔪᑦ ᓈᒻᒪᓈᑦᓯᐊᓂᕐᓴᐅᓯᑎᓪᓗ ᑭᖑᓂᕐᒥ ᑭᓯᑦᓯᓂᐅᖃᑦᑕᓯᒪᔪᓂᑦ. ᑖᓐᓇ ᑭᓯᑦᓯᓂᕕᓂᖅ ᓱᕐᖁᓚᓇᑦᑐᖅ ᐱᑕᖃᕐᓂᖏᓐᓂᒃ. ᑐᑭᓯᔭᐅᑎᓗᒍ ᓱᕐᖁᓂᖓ ᑕᒪᑦᓱᒪ ᑭᓯᑦᓯᓂᐅᑉ ᐱᐅᓯᖓᑕ, ᑐᖓᓕᐊᓂ ᑭᓯᑦᓯᓯᓕᕐᒥᓱᑎᒃ ᐅᕿᓕᐅᒥᑎᑦᓯᔪᕕᓂᐅᒐᓗᐊᑦ ᑭᓯᑕᐅᒍᑎᕕᓃᑦ ᑭᖑᓪᓕᓂᑕᕐᓂᒃ ᐊᑑᑎᔭᐅᓕᑐᐊᕐᒪᑦ ᑭᓯᑕᐅᒪᐅᑎᓂᒃ ᑲᑎᒪᑎᑦᓯᓂᖅ ᐊᒥᓱᖕᖑᒥᓯᒪᔪᓂᒃ ᓄᐃᑕᑎᑦᓯᓯᓂ ᐊᕐᔨᒌᖕᖏᓕᕐᑕᓱᑎᒃ 29%ᓂᑦ ᑎᑭᑦᓱᒋᑦ 40%. ᑭᓯᑦᓯᒍᓯᖅ ᑲᓱᕐᑎᑕᐅᑦᓯᓂ ᐃᓚᒋᓕᐅᔭᐅᓱᑎᒃ ᓄᑖᑦ ᑭᓯᑕᐅᒪᐅᑏᑦ 2021ᒥᓂᒌᑦ ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᒍᑎᕕᓃᑦ ᕿᓚᓗᒐᕐᓂᒃ. ᑕᒪᓐᓇ ᓄᐃᑦᓯᓯᒪᔪᖅ ᒥᑦᓴᐅᔫᕐᓯᒋᑦ 2021ᒥ ᐃᒣᓪᓗᐊᑐᑦ 3,200 (95%= 1,800--4,600) (ᑭᓯᑕᐅᒪᐅᑎ 5). ᖃᓄᐃᓪᓗᐊᑐᒥᒃ ᐃᑭᓕᕝᓕᐊᒪᖔᑦ ᑕᒃᒐᓂ ᑭᓯᑦᓯᓂᕕᓂᐅᑉ ᓄᐃᓯᒪᔭᖓᓂ ᐊᒥᓱᖕᖑᕆᐊᕐᑐᕕᓂᖅ 1% ᐊᕐᕌᒍᑕᒫᑦ ᐊᑯᓐᓂᖏᓐᓂ 2004-2014 ᐃᒣᓪᓗᐊᑐᖕᖑᓯᓂ 2.5% ᐊᕐᕌᒍᑕᒫᑦ ᐊᑯᓐᓂᖏᓐᓂ 2015-2021[13]. ᐃᑭᓕᒋᐊᕐᓯᒪᓚᕿᐅᑎᖏᑦ ᐊᓐᓂᑐᕐᑕᐅᓲᖑᓕᕐᒪᑕ ᐊᒥᓱᑦ ᐅᖓᑖᓄᑦ ᐊᓐᓂᑐᕈᓐᓇᐅᑎᑖᕐᑎᓯᒍᑎᐅᓯᒪᔪᑦ ᐊᕐᕌᒍᓂ ᐊᒥᓱᓂ ᐊᓂᒍᕐᑐᓂ ᐊᒻᒪᓗ ᐃᑭᓗᐊᕐᑐᓂᒃ ᒥᑦᓴᐅᔫᕐᑕᐅᓯᒪᐅᑎᖃᕐᓂᒪᑕ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦ ᑖᒃᑯᓇᓂ ᐊᓐᓂᑐᐊᓐᓇᓯᐅᕐᑎᓗᒋᑦ.



[13] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᕐᖃᑐᕕᓃᑦ ᐃᒣᓕᖓᔪᑦ: JAM ᐆᒪᔪᖏᑦ ᒥᑦᓴᐅᔫᕐᓯᒋᑦ 8,500-ᖑᔪᕕᓃᑦ (95% CI=5,100-12,000) 1985-ᒥᑦ, ᐅᓄᕐᓯᓯᑎᒃ 19,700-ᓄᑦ 2015-ᒥᑦ ᐃᑭᓪᓕᓕᐅᒥᓯᑦᓯᑎᒃ 19,200-ᓄᑦ (95% CI=12,500-25,100) 2021-ᒥᑦ (ᐊᑦᔨᖑᐊᖅ 4). ᒪᓕᒐᖅ ᐊᑐᕐᓯᒍ BEL-EHB ᐆᒪᔪᖏᓐᓄᑦ, ᒥᑦᓴᐅᔫᕐᓯᒋ 8,500-ᖑᔪᕕᓃᑦ (95% CI=5,200-12,900) 1974-ᒥᑦ, ᐃᑭᓪᓕᓕᐅᒥᑦᒧᑎᒃ 2,700-ᓄᑦ (95% CI=1,500-3,700) 2021-ᒥᑦ (ᐊᑦᔨᖑᐊᖅ 5). ᐃᑭᓪᓕᕝᓕᐊᓂᖏᑦ ᐊᕐᕌᒍᑕᒫᑦ 1.3%-ᒦᑦᑐᖅ ᐊᑯᓐᓂᖏᓐᓂᑦ 2004 ᐊᒻᒪᓗ 2014, ᐊᕐᕌᒍᑕᒫᑦ 4%-ᒧᕐᓯᓂ ᐊᑯᓐᓂᖏᓐᓂᑦ 2015 ᐊᒻᒪᓗ 2021. 2021-ᒥᑦ ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᓂᖅ ᒥᑦᓴᐅᔫᕆᓯᒪᔪᖅ ᐃᑭᓐᓂᓴᓪᓚᑎᐅᓕᕐᓂᖏᓐᓂᑦ ᓱᑉᐸᕐᑯᐃᑕᐅᒍᓐᓇᓂᕐᓴᐅᓕᕐᓯᑎᓗ ᑭᓯᑦᓯᓂᐅᖃᑦᑕᓯᒪᔪᓂᑦ. ᑭᓯᑦᓯᓂᐅᓚᐅᕐᑐᖅ ᓱᕐᖁᓯᒪᓪᓚᑎᑦᑐᖅ ᖃᑦᓯᓗᑑᓂᖏᓐᓂᑦ ᖃᓄᐃᓕᖓᓪᓚᑎᓕᕐᓂᖏᓐᓂᓗᓗ ᕿᓚᓗᒋᑦ. ᑐᑭᓯᒪᓂᐊᕋᑦᑕ ᑭᓯᑦᓯᓂᐅᑉ ᓱᕐᖁᒍᓐᓇᓂᖓᓂᑦ, ᑐᖓᓕᐅᒍᑎᖓᓂᑦ ᑭᓯᑦᓯᓂᖃᕐᓂᖅ ᑐᑭᓯᑎᑦᓯᒍᓐᓇᓚᐅᕐᑐᖅ 32%-ᒥᑦ 48%-ᒧᑦ ᓱᕐᕐᑯᐃᓯᓂᕐᒥᒃ. ᑖᓐᓇ ᐊᑐᕐᓯᒍ 2021-ᒥᑦ ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᓂᖅ ᒥᑦᓴᐅᔫᕆᒍᑎᓂᑦ ᓄᐃᑦᓯᓯᒪᔪᖅ. 2021-ᒥᑦ ᑭᓯᑕᐅᓯᒪᔪᑦ ᐅᓄᕐᑑᓂᖏᓐᓂᑦ ᓄᐃᑦᓯᓯᒪᔪᖅ 3,200-ᖑᓕᕐᑐᓂᒃ (95%= 1,600-4,600) (ᐊᑦᔨᖑᐊᖅ 5). ᐃᑭᓪᓕᕝᓕᐊᓂᖏᑦ ᐊᕐᕌᒍᑕᒫᑦ 1%-ᖑᓯᒪᔪᖅ ᐊᑯᓐᓂᖏᓐᓂᑦ 2004- 2014, 3%-ᒧᑦ ᐊᕐᕌᒍᑕᒫᑦ ᐊᑯᓐᓂᖏᓐᓂᑦ 2015-2021.[14] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ:: ᑭᓯᒍᑎᕕᓃᑦ ᐅᓪᓗᒥᓂᑕᐅᓂᕐᐸᑦ ᐃᓗᐊᓃᑦᑐᑦ.

ᑭᓯᑕᐅᒪᐅᑎ5[14]. ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᓂᖅ (ᕿᕐᓂᑕᖅ) ᓄᐃᑕᑎᑦᓯᓯᓂ95% ᐃᓱᒪᓗᓐᓇ ᖏᓐᓂᖏᓐᓂᒃ, ᐱᑕᖃᕐᓂᖏᑦᑕ ᖃᓄᐃᓕᖓᓂᖏᑦᑕ ᒥᑦᓴᐅᓴᕐᑕᐅᓯᒪᐅᑎᖏᑦ ᑖᒃᑯᐊ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦᑕ ᐱᑕᖃᕐᓂᖏᑦ ᐊᒻᒪᓗ95%ᐃᓱᒪᓗᓐᓇ ᖏᓐᓂᕋᕐᑕᐅᓯᒪᓂᖏᑦ 1974-2021ᒧᑦ. ᒪᕿᐃᓕᖓᔪᒥᒃ ᑭᓯᑦᓯᓂᕕᓃᒃ ᐱᔭᕇᕐᑕᐅᓯᒪᔫᒃ. ᓯᕗᓪᓕᒥ ᑭᓯᑦᓯᓂᕕᓂᖅ ᖃᖓᑦᑕᔫᑯᑦ ᑐᖑᔪᕐᑕᒥᒃ ᑕᐅᑦᑐᓕᒃ). ᑐᖓᓕᐊᓂ ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᓂᕕᓂᕐᒥᒃ ᓄᐃᑕᑎᑦᓯᔪᖅ (ᕿᕐᓇᑕᐅᑦᓱᑎᒃ ᓯᒃᑭᒐᑦ) ᐊᒥᓱᓐᖑᕆᐊᕐᓯᒪᔪᓂᒃ ᓄᐃᑦᓯᓯᒪᔪᖅ ᐊᕐᔪᒋᓐᖏᓂᖏᑎᒍᑦ 2021ᖑᒋᐊᕕᓐᓂᓴᐅᓕᕐᑎᓗᒍ ᑭᓯᑕᐅᑦᓱᑎᒃ ᒥᑦᓴᐅᓴᕐᑕᐅᔪᕕᓃᑦ 29% ᓂᑦ ᑎᑭᑦᓱᒋᑦ 40%[15] (ᐊᐅᐸᕐᑐᖅ ᓯᒃᑭᑕᖅ).

ᐊᓐᓂᑐᕋᓱᐊᕐᓂᒧᑦ ᐃᒫᖕᒥᕈᑏᑦ

ᐊᐅᓚᑦᓯᒍᑎᑕᖃᕆᐊᖓ ᖃᐅᔨᒪᓇᖕᖏᑐᖅ ᕿᓚᓗᒐᕐᓄᑦ ᔪᒥᓯ V ᐃᒪᖓᓃᓱᓄᑦ. ᒪᓐᓇᐅᓂᐊᖕᖑᕆᔭᐅᔪᖅ ᐊᐅᖏᑎᒍᑦ ᐃᓚᖕᖏᑕᐅᓯᒪᓂᖏᑦᑦᑕ ᖃᐅᔨᒪᒍᑕᐅᒍᓐᓇᓂᐊᖕᖑᕆᔭᐅᔪᑦ ᐃᒥᓪᓗᐊᑑᒍᓇᐅᑦᓱᒃ ᐊᓐᓂᑐᕐᑕᐅᓯᒪᔪᑦ 296 ᕿᓚᓗᒥᑦ ᑲᑎᓕᒫᕐᓱᑎᒃ 14,800[16]ᐊᒻᒪᓗ ᐅᓄᕐᓯᑎᑦᓯᒋᐊᕐᓚᕈᒪᓂᕐᒧᑦ ᐱᑦᔪᑎ 1.

ᐊᐅᓚᑦᓯᒍᑎᑕᖃᕐᑎᓯᓂᕐᒧᑦ ᐱᑦᔪᑏᑦ ᐃᓕᖓᔪᑦ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᓐᓄᑦ ᐃᑭᓕᒋᐊᕐᑎᓯᑦᑐᓕᒍᑎᐅᑦᓱᓂ 3,400 ᓂᒃ ᕿᓚᓗᒐᕐᓂᒃ ᐅᖓᑖᓄᓪᓗᓃᑦ ᐊᕐᕋᒍᐃᑦ ᑕᓪᓕᒪᑦ ᐊᓂᒍᕋᓱᐊᕐᓂᖏᓐᓂ. ᐊᓐᓂᑐᕐᑕᐅᒍᓐᓇᑐᑦ ᑎᑭᐅᑎᑦᑕᕕᖏᑦ ᐋᕐᕿᑕᐅᓯᒪᔪᑦ ᖃᐅᔨᒪᑦᓱᒋᑦ ᐃᑭᓕᒋᐊᓚᕿᒍᓐᓇᕆᐊᖏᑦ ᐊᓐᓂᑐᕐᑕᐅᖃᑦᑕᓂᕐᒥᓄᑦ ᑎᑭᐅᑎᑦᑕᕕᓕᐅᕐᑕᐅᓯᒪᑦᓱᓂ 50% ᐅᖓᑖᓅᕐᒐᓕᒋᐊᖃᕐᓱᓂ. ᐊᕐᕋᒍᐃᑦ ᑕᓪᓕᒪᑦ ᐊᓂᒍᕋᓱᐊᕐᓂᖏᓐᓂ, ᐊᓐᓂᑐᕐᑕᐅᖃᑦᑕᑐᕐᓴᐅᖏᑦᑐᑦ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦ ᓱᓱᑦᓴᕈᑕᐅᓗᓂ ᐊᐅᓚᑦᓯᒍᑎᑕᖃᓚᕿᓂᐅᑉ ᑐᖕᖓᕕᖏᓐᓂᒃ. ᐊᕐᕋᒍᐃᑦ ᕐᑯᓕᑦ ᐊᓂᒍᕋᓱᐊᕐᓂᖏᓐᓂ, ᐊᓐᓂᑐᕈᓐᓇᓂᖅ 38ᓂᒃ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ[17] ᕿᓚᓗᒐᖏᓐᓂᒃ ᓱᓱᑦᓴᓂᐅᒐᔭᕐᑐᖅ ᐊᐅᓚᑦᓯᒍᑎᐅᑉ ᑐᖕᖓᕕᖏᓐᓂᒃ. ᕋᓗᐊᕐᑎᓗᒍ ᐃᓱᓕᕝᕕᐅᓂᕋᕐᑕᐅᔪᑦ 3,400 ᑐᖕᖓᕕᓖᑦ ᐃᓂᓪᓚᓯᒪᐅᑎᒧᑦ ᐊᑐᕐᑕᐅᑏᕐᑐᕕᓂᕐᒧᑦ 2015ᒥ ᑭᓯᑦᓯᔪᕕᓂᐅᓕᕐᑎᓗᒋᑦ ᑭᖑᓂᖓᒍᑦ ᐊᒻᒪᓗ ᒥᑦᓴᐅᓵᕐᑕᐅᒍᑎᖏᑦ ᐊᓯᐊᒍᑦ ᐊᑐᕐᑕᐅᖃᑦᑕᓯᒪᔪᑦ ᒥᑦᓴᐅᓵᕆᒍᑕᐅᑦᓱᑎᒃ ᐋᕐᕿᒋᐊᕐᑕᐅᒍᑎᖏᑦ ᑖᒃᑯᓂᖓᑦᓴᓇᖅ ᐊᑐᐃᓐᓇᐅᑏᕐᑐᓂᒃ ᖃᐅᔨᒪᒍᑎᑦᓴᓂᒃ ᐊᑐᕈᑕᐅᓯᒪᒐᑎᒃ ᐊᒻᒪᓗ ᖃᓄᐃᓕᖓᓂᐊᖕᖑᕆᔭᐅᒍᑎᖏᑦ ᐋᕐᕿᒋᐊᕐᑕᐅᒍᑎᖏᑦᑕ ᐱᑦᔪᑎᖏᑦ ᐃᑐᓕᖓᔪᑦ ᐊᑐᕐᑕᐅᓯᒪᐅᑎᖏᑎᑐᑦ ᑕᒃᓴᓂ ᖃᐅᔨᒪᓯᐊᕐᓂᒥ. ᓈᒻᒪᓈᕐᑎᓯᓂᕐᒧᑦ ᐃᓂᓪᓚᓯᒪᐅᑎᒥᒃ ᐊᑐᕐᓗᒋᑦ ᓄᑖᑦ ᖃᐅᔨᒪᔭᐅᒍᑎᐅᓕᕐᑐᑦ ᖃᓄᐃᓕᖓᓂᐊᖕᖑᕆᔭᐅᒍᑎᖏᑦ ᐋᕐᕿᒋᐊᕐᑕᐅᒍᑎᖏᑦᑕ ᐱᑦᔪᑎᖏᑦ 2021ᒥᓗ ᑭᓯᑕᐅᒍᑎᕕᓃᑦ ᒥᑦᓴᐅᓴᕐᑕᐅᓯᑎᒃ ᖃᐅᔨᔭᐅᒍᑎᕕᓃᑦ 2015ᒥ 3,600 ᕿᓚᓗᒥᑦ. ᐊᑑᑎᑦᓯᐊᑕᐅᓚᖓᑉᐸᑕ ᐊᐅᓚᑦᓯᒍᑎᐅᑉ ᐱᑦᔪᑎᖏᑦ ᐊᕐᕋᒍᓂ ᑕᓪᓕᒪᓂ, ᐊᓐᓂᑐᕐᑕᐅᒋᐊᖃᕐᓂᐊᖏᑦᑐᑦ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦ ᕿᓚᓗᒥᑦ ᐱᒍᓐᓇᕕᖃᕐᑎᑕᐅᔪᑦᓴᐅᕗᑦ, ᐊᑐᕐᓗᒍ ᑎᐅᑎᑦᑕᕕᒃ 3,600 ᕿᓚᓗᒥᑦ. ᐊᓂᒍᕐᐸᑕ ᐊᕐᕋᒍᐃᑦ ᕐᑯᓕᑦ 10 ᐱᕕᑦᓴᓕᐅᕐᑕᐅᓯᒪᐅᑎᕕᓂᖏᑦ, ᐊᓐᓂᑐᕐᑕᐅᔪᕕᓃᑦ ᑐᓴᕐᑎᓯᐅᑏᑦ ᓄᐃᑕᐅᓕᕐᐸᑕ 20 ᐅᖓᑖᓅᕆᐊᖃᕋᔭᖕᖏᑐᑦ[18] (ᑭᓯᑕᐅᒪᐅᑎ 6).

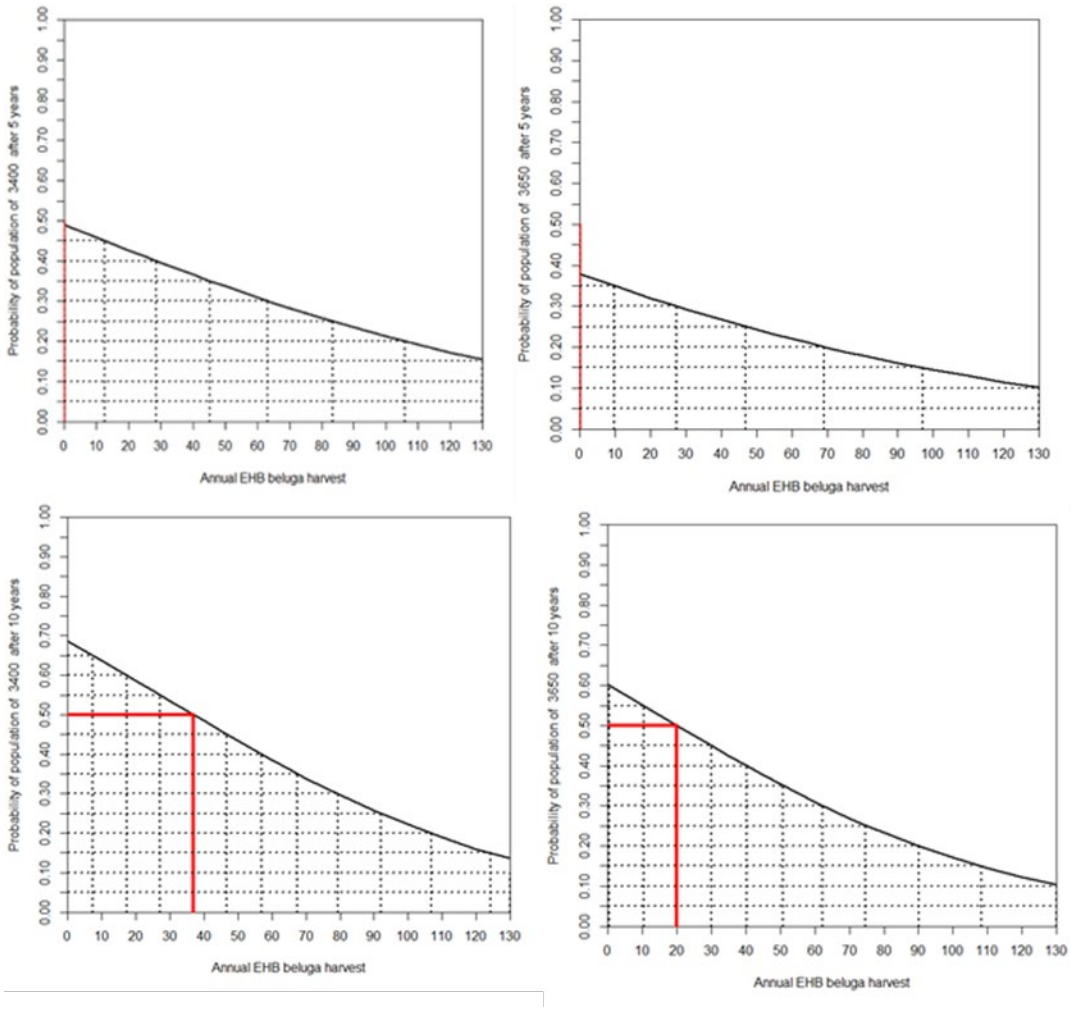
[14] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ:: ᑭᓯᒍᑎᕕᓃᑦ ᐅᓪᓗᒥᓂᑕᐅᓂᕐᐹᑦ ᐃᓗᐊᓃᑦᑐᑦ.

[15] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᒍᒋᐊᖕᖓᑐᕕᓃᑦ ᐃᒥᓕᖓᔪᑦ: 2021-ᒥᑦ ᑭᓯᑦᓯᓂᖅ ᒥᑦᓴᐅᓵᕆᓯᒪᔪᖅ 32%-ᒥᑦ 48%-ᒧᑦ.

[16] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᒍᒋᐊᖕᖓᑐᕕᓃᑦ ᐃᒥᓕᖓᔪᑦ: 335 ᕿᓚᓗᒐᕐᑕᐅᒍᓐᓇᑐᑦ, N_{min} 16,800.

[17] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ:: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᒍᒋᐊᖕᖓᑐᕕᓃᑦ ᐃᒥᓕᖓᔪᑦ: ᐊᕐᕋᒍᐃᑦ ᕐᑯᓕᑦ ᐃᓗᐊᓂ, ᐆᒪᔪᕐᑕᐅᔪᑦ 20 BEL-EHB.

[18] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓯᒪᔪᖕᖑᑎᑕᐅᒍᒋᐊᖕᖓᑐᕕᓃᑦ ᐃᒥᓕᖓᔪᑦ: 2015-ᒥᑦ ᒥᑦᓴᐅᓵᕐᑕᐅᓯᒪᔪᑦ 3,500 ᕿᓚᓗᒥᑦ. ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᑐᕋᓕᐊᖑᓯᒪᔪᑦ ᐊᕐᕋᒍᓄᑦ ᑕᓪᓕᒪᓄᑦ, ᕿᓚᓗᒐᕐᑐᖃᕆᐊᖃᖕᖏᑐᖅ BEL-EHB ᐆᒪᔪᖕᖏᓐᓂᑦ. ᕐᑯᓕᑦ ᐊᕐᕋᒍᐃᑦ ᒪᓕᒐᓕᐊᖑᐸᑕ ᕿᓚᓗᒐᕆᐊᖃᖕᖏᑐᑦ 18 ᐅᖓᑖᓅᑦ.



ᑯᓯᑕᐅᒪᐅᑎ 6[19]. ᐃᒥᑐᐃᓐᓇᕆᐊᓖᑦ (y-axis) ᑖᒃᑯᐊ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦ ᐊᒥᓲᓂᕐᓴᐅᓗᑎᒃ 3,600ᓂᑦ[20] (ᑐᖕᖓᕕᒋᑦᓱᒋᑦ ᒥᑦᓴᐅᓵᕿᑕᐅᓯᒪᔪᑦ 2015ᒥ ᐱᑕᖃᕐᓂᖏᑦ ᑭᖑᓪᓕᐹᒥ ᑭᓯᑕᕕᓂᐅᓕᕐᓱᑎᒃ) ᐅᕝᕙᓗᓐᓃᑦ ᒥᑦᓴᐅᓵᕐᑕᐅᓯᒪᔪᑦ ᐱᑕᖃᓇᐊᖏᑦ 3,500 (ᖃᓂᓐᓂᐸᐅᑎᓪᓗᒋᑦ 100ᒧᑦ) ᕿᓚᓗᒃᑦ 2015ᖑᑎᓪᓗᒍ ᐊᑐᕐᓱᒋᑦ ᖃᒻᒥᓂᑕᐅᓂᕐᐹᑦ ᑭᓯᑦᓯᒍᑎᕕᓃᑦ ᐊᒻᒪᓗ ᐋᕐᕿᒋᐊᓇᓂᕐᒧᑦ ᐱᑦᔪᑕᐅᖃᑦᑕᓯᒪᔪᑦ ᐊᕐᕋᒍᐃᑦ ᑕᓪᓕᒪᑦ ᐊᓂᒍᕋᓱᐊᕐᓂᖏᓐᓂ (ᖃᓪᓕᐹᖅ ᑎᑦᑕ), ᐅᕝᕙᓗᓐᓃᑦ ᐊᕐᕋᒍᐃᑦ 10 (ᐊᓪᓕᖅ ᑎᑦᑕᖅ). X-axisᐊᓐᓂᑐᕐᑕᐅᓯᒪᔪᑦ ᑐᓴᕐᑎᓯᐅᑎᐅᖃᑦᑕᓯᒪᓂᖏᑦ. ᐊᐅᐸᕐᑐᖅ ᑎᑦᑕᖅ ᐊᓐᓂᑐᕐᓂᐅᓯᒪᔪᑦ ᐃᑭᓕᒋᐊᓚ ᕿᑐᐃᓐᓇᕆᐊᖃᓕᕐᑎᓗᒋᑦ 50%[21].

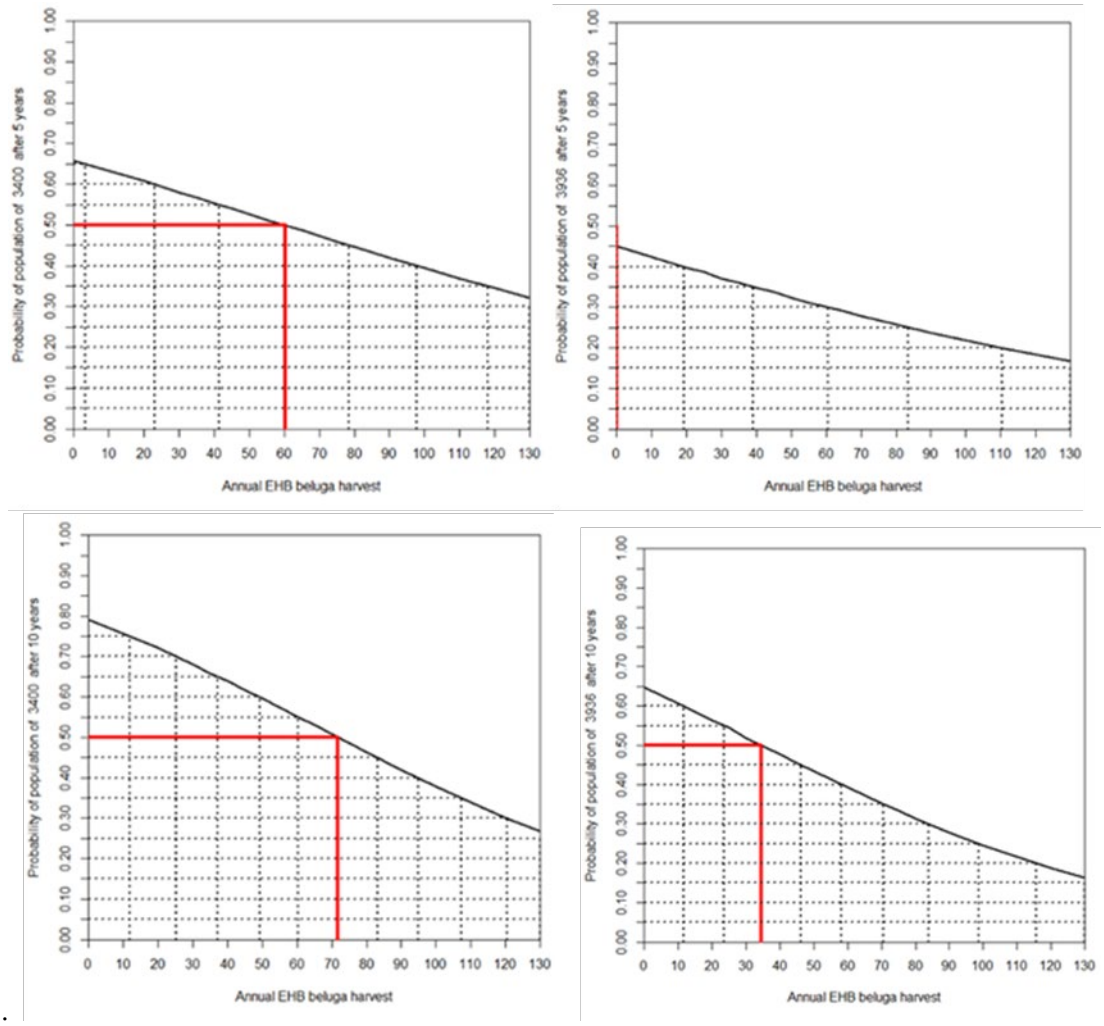
ᓈᒻᒪᓈᕐᑎᓯᓂᖅ ᐊᑐᕐᑕᐅᒋᐊᓕᒻᒥᒃ ᐊᑦᔨᒌᖕᖏᓂᖏᑦ ᐱᓕᐅᒥᓯᒪᓕᕐᑎᓗᒋᑦ ᐃᒣᓪᓗᐊᑐᒧᑦ 40% ᐊᑐᓕᕐᑎᑕᐅᑦᓱᑎᒃ 2021ᒧᑦ ᑭᓯᑕᐅᒍᑎᕕᓃᑦ ᖃᐅᔨᔭᐅᒍᑎᖏᓐᓄᑦ 2015ᖑᑎᓪᓗᒍ ᒥᑦᓴᐅᓵᕐᑕᐅᓱᑎᒃ 3,900. ᕿᒥᕐᕈᔭᐅᒍᓂ ᐊᕐᕋᒍᐃᑦ ᑕᓪᓕᒪᑦ ᐊᓂᒍᕋᓱᐊᕐᓂᖏᓐᓂ ᐊᓐᓂᑐᕐᕕᐅᖃᑦᑕᑐᑦᓴᐅᖏᑦᑐᑦ ᐊᑐᕐᓗᒍ ᐃᓱᓕᑦᑕᕕᖏᑦ 3,900 ᕿᓚᓗᒃᑦ. ᐊᑐᕐᓱᒋᑦ ᐃᓱᓕᑦᑕᕖᑦ 3,400 ᕿᓚᓗᒃᑦ, ᐊᓐᓂᑐᕐᑕᐅᒍᑎᒃ 60 ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᓐᓂᑦ ᓲᓱᑦᓴᓂᐅᒐᔭᕐᑐᖅ ᐊᐅᓚᑦᓯᒍᑎᐅᑉ ᐱᑦᔪᑎᖏᓐᓂᒃ.ᐊᕐᕋᒍᐃᑦ ᕐᑯᓕᑦ ᐊᓂᒍᕋᓱᐊᕐᑎᓗᒋᑦ, ᐊᓐᓂᑐᕐᓂᖅ 70ᓂᒃ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᓐᓂᒃ ᓲᓱᑦᓴᓂᐅᒐᔭᕐᑐᖅ 3,400ᓂᒃ ᑲᑕᒋᐊᕐᑎᑕᐅᑦᑐᓕᔪᓂᒃ,

[19] ᐊᐅᒡᒍᓱᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᑭᓯᒍᑎᕕᓃᑦ ᐅᓪᓗᒥᓂᑕᐅᓂᕐᐹᑦ ᐃᓗᐊᓃᑦᑐᑦ.

[20] ᐊᐅᒡᒍᓱᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓱᒪᔪᖕᖓᑎᑕᐅᒋᐊᖕᖓᑐᕕᓃᑦ ᐃᒣᓕᖓᔪᑦ: ᐅᕝᕙᓗᓐᓃᑦ ᐅᓄᕐᑑᓂᖏᓐᓂᑦ ᒥᑦᓴᐅᓵᕆᓂᖅ 3,500-ᓂᒃ.

[21] ᐊᐅᒡᒍᓱᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓱᒪᔪᖕᖓᑎᑕᐅᒋᐊᖕᖓᑐᕕᓃᑦ ᐃᒣᓕᖓᔪᑦ: ᐊᐅᐸᕐᑐᒥᒃ ᑕᕐᓴᓕᒃ ᐆᒪᔪᕐᑕᐅᔪᕕᓂᕐᓂᒃ ᓄᐃᑕᑎᑦᓱᔪᖅ ᐃᑭᓪᓕᓕᐅᒥᓱᒪᔪᓂᓪᓗ 50%-ᒧᑦ.

ᐊᓐᓂᑐᕐᑕᐅᐸᑕᓗ 35 ᓲᓱᑦᓴᓂᐅᒐᔭᕐᓱᓂ ᐃᓱᓕᑦᑕᕝᒥᒃ ᐃᑭᓕᒋᐊᕐᑎᓱᑦᑐᓕᓂᕐᒧᑦ 3,900ᓂᒃ[22] (ᑭᓱᑕᐅᒪᐅᑎ 7). ᐊᑑᑎᑐᐃᓐᓇᕆᐊᓕᒃ ᐊᓐᓂᑐᕐᑕᐅᑎᓪᓗᒋᑦ ᓴᓂᑭᓗᐊᑉ ᑕᓱᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦ 5 ᕿᓚᓗᒍᑦ ᐊᕐᕋᒍᒥ ᐃᓱᒪᒋᓗᒍ ᐊᒥᓱᖕᖑᕆᐊᓪᓚᑎᑦᑕᓱᐊᕐᓂᖅ 0.1.



[22] ᐊᐅᒡᒍᓱᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐊᓪᓚᓱᒪᔪᖕᖑᑎᑕᐅᒍᒋᐊᖕᖓᑐᕕᓃᑦ ᐃᒣᓕᖓᔪᑦ: ᓈᒻᒪᓈᕐᑎᓱᓂᖅ ᐊᑐᕐᑕᐅᒋᐊᓕᒻᒥᒃ ᐊᑦᔨᒌᖕᖏᓂᖏᑦ ᐱᓕᐅᒥᓱᒪᓕᕐᑎᓗᒋᑦ ᐃᒣᓪᓗᐊᑐᒧᑦ 48% ᐊᑐᓕᕐᑎᑕᐅᑦᓱᑎᒃ 2021ᒧᑦ ᑭᓱᑕᐅᒍᑎᕕᓃᑦ ᖃᐅᔨᔭᐅᒍᑎᖏᓐᓄᑦ 2015ᖑᑎᓪᓗᒍ ᒥᑦᓴᐅᓵᕐᑕᐅᓱᑎᒃ 3,900. ᕿᒥᕐᕈᔭᐅᒍᓂ ᐊᕐᕋᒍᐃᑦ ᑕᓪᓕᒪᑦ ᐊᓂᒍᕋᓱᐊᕐᓂᖏᓐᓂ ᐊᓐᓂᑐᕐᕕᐅᖃᑦᑕᑐᑦᓴᐅᖏᑦᑐᑦ ᐊᑐᕐᓗᒍ ᐃᓱᓕᑦᑕᕝᕙᖏᑦ 3,900 ᕿᓚᓗᒍᑦ. ᐊᑐᕐᓱᒋᑦ ᐃᓱᓕᑦᑕᕝᕗᑦ 3,400 ᕿᓚᓗᒍᑦ, ᐊᓐᓂᑐᕐᑕᐅᒍᑎᒃ 48 ᓴᓂᑭᓗᐊᑉ ᑕᓱᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᓐᓂᑦ ᓲᓱᑦᓴᓂᐅᒐᔭᕐᑐᖅ ᐊᐅᓚᑦᓱᒍᑎᐅᑉ ᐱᑦᔪᑎᖏᓐᓂᒃ.ᐊᕐᕋᒍᐃᑦ ᕐᑯᓕᑦ ᐊᓂᒍᕋᓱᐊᕐᑎᓗᒋᑦ, ᐊᓐᓂᑐᕐᓂᖅ 65ᓂᒃ ᓴᓂᑭᓗᐊᑉ ᑕᓱᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᓐᓂᒃ ᓲᓱᑦᓴᓂᐅᒐᔭᕐᑐᖅ 3,400ᓂᒃ ᑲᑕᒋᐊᕐᑎᑕᐅᑦᑐᓕᔪᓂᒃ, ᐊᓐᓂᑐᕐᑕᐅᐸᑕᓗ 34 ᓲᓱᑦᓴᓂᐅᒐᔭᕐᓱᓂ ᐃᓱᓕᑦᑕᕝᕙᖏᑦ ᐃᑭᓕᒋᐊᕐᑎᓱᑦᑐᓕᓂᕐᒧᑦ 3,900ᓂᒃ.

ᑭᓯᑕᐅᒪᐅᑎ 7[23]. ᑐᐃᓐᓇᕆᐊᓕᒃ(y-axis) ᑖᒃᑯᐊ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᖏᑦ ᐊᒥᓲᓂᕐᓴᐅᓗᑎᒃ 3,400ᓂᒃ (ᓴᐅᒥᒻᒥ) ᐅᕝᕙᓗᓐᓃᑦ ᒥᑦᓴᐅᔾᕐᑕᐅᓯᒪᓂᖏᑦ ᐱᑕᖃᕆᐊᖏᑦᑕ 3,900 (ᑕᓕᕐᐱᐊᓂ) ᕿᓚᓗᒍᑦ 2015ᖑᑎᓪᓗᒍ ᐊᑐᕐᓯᑎᒃ ᖃᒻᒥᓂᑕᐅᓂᕐᐹᓂᒃ ᐋᕐᕿᒋᐊᕐᕆᒍᑎᒋᑦᓯᒋᑦ ᒥᑦᓴᐅᔾᕐᑕᐅᓯᒪᒍᑎᖏᓐᓂᒃ 2021ᒥ ᑭᓯᑦᓯᓂᖃᕐᑎᓗᒍ 40% (ᑕᓕᕐᐱᐊᓂ) ᐊᕐᕌᒍᐃᑦ ᑕᓪᓕᒪᑦ ᐊᓂᒍᕋᓯᐊᕐᓂᖏᓐᓂ (ᖃᖓᓂ) ᐅᕝᕙᓗᓐᓃᑦ 10ᐊᕐᕌᒍᐃᑦ (ᐊᑖᓂ). ᐊᓐᓂᑐᕐᑕᐅᔪᑦ ᑎᑭᐅᑎᑦᑕᕕᖓᓂᒃ (X-axis) ᑎᑎᕋᖅᓯᒪᔪᖅ ᐅᓂᒃᑲᒥ.. ᐊᐅᐸᕐᑐᖅ ᓄᐃᑕᑎᑦᓯᔪᖅ ᐊᓐᓂᑐᕐᑕᐅᔪᑦ ᑎᑭᐅᑎᑦᑕᕕᖓᓂᒃ ᐃᓚ ᖃᕐᓯᓂ 50% ᐊᑑᑎᑐᐃᓐᓇᕆᐊᓕᒻᒥᒃ ᐅᖓᑕᓄᕐᓗᓂ ᑎᑭᐅᑎᑦᑕᕕᓕᐊᖑᓯᒪᔪᑉ.[24]

ᐱᑦᔪᑎᐅᒍᓐᓇᑐᑦ ᓱᕐᑯᐃᓱᑦᓯᐊᖏᓐᓂᒧᑦ

2021ᒥ ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑕᐅᒍᑎᐅᓯᒪᔪᑦ ᒥᑦᓴᐅᔾᕐᑕᐅᒍᑎᖏᑦ ᐃᑭᑦᑐᐊᐱᕕᓃᑦ, ᐊᒻᒪᓗ ᓈᒻᒪᓈᕐᓯᒪᓂᕐᓴᐅᓯᑎᒃ ᐊᑐᕐᑕᐅᓲᓂᑦ ᑭᓯᑦᓯᓕᑐᐊᕐᒪᑕ ᕿᓚᓗᒐᕐᓂᒃ.ᑕᒪᒃᑯᐊ ᐊᑦᔨᒌᖏᓂᖏᑦ ᐱᑐᑦᓯᒪᔪᑦ ᐊᒥᓱᐃᖑᑦᓯᑎᒃ ᐅᓄᕐᓂᓇᓲᖏᓐᓄᑦ ᐊᒻᒪᓗ ᐊᒥᓲᑦᓯᑎᒃ ᑕᑯᔭᕕᓂᕐᓄᑦ, ᖏᒃᑲᓗᐊᕐᐸᑕᓗᓐᓃᑦ, ᖃᖓᑕᒫᖑᓂᖓᓗ. ᐱᑦᔪᑏᒃ ᖃᐅᔨᒪᔭᐅᖏᑐᑦ ᐊᒥᓱᐃᖑᑦᓯᑎᒃ ᐅᓄᕐᓂᓇᓲᖏ ᑐᑭᓯᒪᔭᐅᑦᓯᐊᖏᒪᑕ, ᑭᓯᐊᓂ ᐱᑐᑦᓯᒪᑐᐃᓐᓇᕆᐊᓕᒃ ᐊᒥᓱᓃᓕᕋᒥᒃ ᐱᐅᓯᖏᓐᓄᑦ, bathymetry, ᐱᐅᔫᑦ ᒪᕐᕿᓐᓂᒧᑦ, ᐊᒻᒪᓗ ᐆᒪᔪᐃᑦ ᐅᓄᕐᓂᖏᑦ. ᐃᓱᒪᒋᑦᓯᒋᑦ ᐊᒥᓱᕕᒐᓚᑦᓯᑎᒃ ᑖᒃᑯᐊ ᑭᓯᑕᐅᖃᑦᑕᓯᒪᓕᕐᒪᑕ ᖃᖓᑦᑕᔫᑯᑦ, ᑐᑭᓯᒪᓂᕐᑖᓇᓯᒪᓕᕐᑕᕗᑦ ᒫᓐᓇᐅᑎᓪᓗᒍ ᕿᓚᓗᒐᕐᓄᑦ ᐃᓱᒫᓗᓐᓇᑐᖅ ᐊᓯᑦᔨᕋᓱᒋᐊᖏᑦ ᑭᖑᓪᓕᐸᒥ ᒥᑦᓴᐅᔾᕈᑎᕕᓃᑦ ᐊᑐᕐᑕᐅᓯᒪᔪᑦ ᐱᐅᓯᖃᕈᑕᐅᑦᓯᑎᒃ.

ᓄᑖᑦ ᑭᓯᑕᐅᒪᐅᑏᑦ ᓄᐃᑕᐅᓚᐅᔪᔪᑦ ᐊᑐᕐᓯᑎᒃ ᐊᑦᔨᓕᐅᕈᑎᓂᒃ ᑭᕕᒪᓲᓂᒃ 2003ᒻ 2004ᒥᓗ. ᓄᑖᑦᑭᓯᑕᐅᒪᐅᑏᑦ ᓄᐃᑕᐅᓚᐅᔪᔪᑦ ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᒍᑎᕕᓃᑦ 2015ᒥ 2021ᒥᓗ. ᐃᓱᒪᒋᓗᒋᑦ ᐊᓯᑦᔨᓯᒪᓪᓗᐊᖏᒋᐊᖏᑦ ᑕᒥᑎᒍᑦ, 6 ᕕᑦᓯᑎᒃ ᖃᖓᑦᑕᔫᑯᑦ ᑭᓯᑦᓯᓂᐅᓯᒪᔪᑦ ᒥᑦᓴᐅᔾᕐᑕᐅᓯᒪᐅᑎᖏᑦ ᐊᑯᓐᓂᖏᓐᓂ 1985, 2011 ᐋᕐᕿᒋᐊᕐᑕᐅᓯᒪᔪᑦ ᐱᐅᓯᐅᒋᐊᓖᑦ ᒪᓕᑦᓯᒋᑦ. ᐊᒃᓚᑕᐅᑉᐸᑕ ᐊᕐᕌᒍᑕᒫᑦ ᐊᑦᔨᕈᖏᓂᕆᓲᖏᑦ ᓱᕐᖑᓛᕐᒥᔪᑦ ᑭᓯᑦᓯᒋᑦ ᒥᑦᓴᐅᔾᕈᑎᑖᕕᓂᕗᓐᓂᒃ.

ᓄᑖᖑᑦᓯᓂ ᐊᐅᖏᑎᒍᑦ ᓇᑭᕐᖓᓂᑕᑦᓴᔭᐅᓂᖏᓐᓂᒃ ᖃᐅᔨᓴᐅᑎ ᐱᕙᓪᓕᑎᑦᓯᓯᒪᓕᕐᑐᖅ ᑐᑭᓯᒪᓂᑦᑎᓂᒃ ᕿᓚᓗᒐᕐᓂᒃ ᐃᓂᓕᓐᓂᒃ ᑖᒃᑯᓂᖓ ᑕᓯᐅᔭᕐᔪᐊᒥ ᓄᕗᒻᒥᔫᓲᓂᒃ.ᕋᓗᐊᕐᑎᓗᒍ, ᓱᕐᕐᑯᐃᓱᑦᓯᐊᖏᑦᑑᖏᓐᓇᑐᒍᑦ ᕿᓚᓗᒐᕐᓂᒃ ᐊᐅᖏᑎᒍᑦ ᖃᐅᔨᓴᐅᑏᑦ ᐊᑐᕐᑕᐅᓯᐊᕐᓯᒪᖕᓂᑯᖏᓐᓄᑦ ᐊᓐᑎᐅᔨᐅᑉ ᓯᑦᔭᖓᓂ ᑕᓯᐅᔭᕐᔪᐊᒦᑦᓯᓂ, ᑕᕐᕋᖓᓂ ᔪᒥᓯ ᐯ, ᐊᒻᒪᓗ ᓯᕿᓂᖓᓂᑦ ᐅᖓᕙᐅᑉ (ᒪᕋᓕᒃ ᑰᒃ). ᖃᐅᔨᓴᕈᑎᑦᓴᒋᐊᓪᓚᐅᒐᔭᕐᑐᑦ ᑭᖑᕐᒫᒪᓇᕐᑐᑦ ᓴᓂᑭᓗᐊᑉ ᕿᓚᓗᒐᖏᓐᓄᓕᖓᔪᑦ ᐊᒻᒪᓗ ᖃᕙᖓᓂᖓᓂᑦ ᑕᓯᐅᔭᕐᔪᐊᑉ, ᐱᕙᓪᓕᑎᑦᓯᒐᔭᕐᓯᑎᒃ ᐊᐅᖏᑎᒍᑦ ᖃᐅᔨᓴᕐᑕᐅᓂᐅᓲᓂᒃ ᓇᑭᕐᖓᓂᑕᑦᓴᔭᐅᒻᒪᖔᑕ.

ᐊᐅᖏᑎᒍᑦ ᖃᐅᔨᓴᕐᑕᐅᒍᑎᕕᓃᑦ ᓇᓗᓐᕐᓯᒍᑕᐅᓯᒪᔪᑦ ᒪᕐᕈᐃᖑᒋᐊᖏᓐᓂᒃ, ᓴᓂᑭᓗᐊᑉ ᐊᒻᒪᓗ ᑕᓯᐅᔭᕐᔪᐊᑉ ᐅᐊᓐᓂᖓᑕ ᕿᓚᓗᒐᕐᓴᔭᖏᑦ, ᐊᓐᓂᑐᕐᑕᐅᖃᑦᑕᓲᑦ ᑕᓯᐅᔭᕐᔪᐊᑉ ᖃᕙᖓᓂᖓᓂ ᐊᒻᒪᓗ ᓄᕗᒻᒥ. ᕋᓗᐊᕐᑎᓗᒍ, ᓱᕐᕐᑯᐃᑕᐅᓯᒪᑦᓯᐊᖏᑦᑐᑦ ᑎᑭᑦᑕᕕᖏᑦ ᓇᓪᓕᐅᑎᓯᒪᓕᕐᑎᓗᒋᑦ ᓇᓪᓕᖏᐅᑦᓯᐊᓲᖑᒻᒪᖔᑕ,ᖃᓄᐃᓪᓗᐊᑎᒋᔪᒥᒃ ᐅᐊᕈᑎᑖᓲᖑᓂᖏᑦ ᐱᑕᖃᓕᕋᒥᒃ ᐊᒻᒪᓗ ᖃᓄᑎᒋ ᐱᑕᖃᕐᒪᖔᑕ ᐊᑐᓂ ᐊᐅᖏᑎᒍᑦ ᐃᓚᒋᑦᓴᔪᑦ. ᒫᓐᓇᐅᑎᓪᓗᒍ ᓯᑯᑦᓴᔭᕐᑯᑏᑦ ᑭᓯᑦᓯᒍᑎᐅᓯᒪᔪᑦ ᑕᒥᓐᓂᒃ ᐅᐱᕐᖓᒥ ᑕᑯᑦᓴᐅᑎᑦᓯᒍᑏᑦ ᐊᕕᑦᑐᑕᐅᓯᒪᑎᓐᓇᒋᑦ ᐊᐅᖏᑎᒍᑦ ᓇᑭᕐᖓᓂᑕᑦᓴᔭᐅᓂᖏᑦ. ᑐᒥᒻᒪᑦ ᖃᓄᑎᒋ ᐱᑕᖃᕐᒪᖔᑕ ᖃᐅᔨᒪᔭᐅᖏᓚᕿᔪᑦ.

ᓄᓇᒦᑦᑐᓄᑦ ᑕᑯᓐᓇᑕᐅᔪᑦ ᕐᑯᑭᕐᑕᐅᑎᓪᓗᒋᑦ ᑐᕐᑯᑕᐅᑎᓪᓗᒋᓪᓗ, ᐊᓐᓄᔭᐅᔪᑦ, ᑐᓴᕐᑎᓯᒍᑎᐅᓯᒪᖏᖏᑐᓪᓗᓃᑦ ᐱᒻᒪᕆᐅᔪᖅ ᐱᕕᑦᓴᐅᓯᓂ ᖃᐅᔨᒪᓇᖏᑐᓄᑦ.

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[23] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᒫᓐᓇᓂᑕᐅᓂᕐᐹᖅ ᐊᑦᔨᖑᐊ ᐃᓗᐊᓃᑦᑐᖅ.

[24] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: 3,900 ᕿᓚᓗᒍᑦ 2015-ᒥᑦ ᐊᑐᕐᓯᒋᑦ ᒫᓐᓇᓂᑕᐅᓂᕐᐹᑦ ᑭᓯᑦᓯᒍᑎᐅᓯᒪᔪᑦ 2021-ᒥᑦ ᑭᓯᑦᓯᓂᖃᕐᑎᓗᒍ ᒥᑦᓴᐅᔾᕐᓯᒋᑦ 2021-ᒥᑦ ᑭᓯᑦᓯᒍᑎᕕᓃᑦ 48%-ᒧᑦ 48% (ᑕᓕᕐᐱᐊᓂᑦ), ᐊᕐᕌᒍᐃᑦ 5 ᐃᓗᐊᓂ (ᕐᑯᓛᓃᑦᑐᑎᑦ) ᐅᕝᕙᓗᓐᓃᑦ 10 ᐊᕐᕌᒍᑦ (ᐊᑖᓂᑦ). ᐊᐅᐸᕐᑐᖅ ᑕᕐᓴᖅ ᓄᐃᑕᑎᑦᓯᔪᖅ ᐆᒪᔪᕐᑕᐅᔪᕕᓂᕐᓂᒃ (x-axis) 50%-ᒥᓪᓗ ᐆᒪᔪᕐᑕᐅᒍᓐᓇᑎᑕᐅᔪᑦ ᐅᖓᑖᓃᑦᓯᑎᒃ.[25] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᓴᒥᓯ ᐯ ᕿᓚᓗᒐᑦ ᐅᓄᕐᓯᒋᐊᕐᓯᒪᔪᑦ 19,700 ᕈᕐᓯᑎᒃ 2015ᖑᑎᓪᓗᒍ ᒐᒪᖔᖓᓂᒃ ᐃᑭᓕᒋᐊᕐᓯᒪᔪᑦ 19,200 ᖑᓕᕐᓯᑎᒃ 2021ᒥ.

ᓄᕐᖃᓇᐊᕈᑏᑦ ᐃᒫᖕᓂᕈᑏᓪᓗ

ᐊᐅᖏᑎᒍᑦ ᖃᐅᔨᓴᓇᐊᑦᓯᐊᑕᐅᓂᖅ ᐊᑐᕐᑕᐅᖃᑦᑕᓯᒪᔪᓂᒃ ᐊᐅᖏᑎᒍᑦ ᖃᐅᔨᓴᕐᓂᒧᑦ ᓄᐃᑦᓯᓯᒪᒻᒪᑕ ᓄᑖᓂᒃ ᓴᓂᑭᓗᐊᑉ ᕿᓚᓗᒐᖏᓐᓂᒃ ᑖᒃᑯᐊ ᖃᐅᔨᒪᓇᖕᖏᓚᓇᓱᑦ ᖃᑦᓯᐅᒍᓇᐅᒻᒪᖔᑕ ᑕᓯᐅᔭᕐᔪᐊᑉ ᐅᐊᓐᓂᖔᑕ ᕿᓚᓗᒐᖏᓐᓄᑦ ᐅᐱᕐᒐᒥ ᐅᐊᕈᑎᐅᓕᕋᒥᒃ.

ᓴᒥᓯ ᐯ ᕿᓚᓗᒐᑦ ᐅᓄᕐᓯᐊᕐᓯᒪᔪᑦ 18,200 ᕈᕐᓱᑎᒃ 2015ᖑᑎᓪᓗᒍ ᐅᒪᖕᖔᓂᒃ ᐃᑭᓕᒋᐊᕐᓯᒪᔪᑦ 16,700 ᖑᓕᕐᓱᑎᒃ 2021ᒥ[25].

ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖔᑕ ᕿᓚᓗᒐᖏᑦ ᐃᑭᓕᕙᓪᓕᐊᔪᑦ. ᐊᓐᓂᑐᕐᑕᐅᓂᓇᓱᖏᑦᑕ ᐅᓄᕐᓂᖏᑦ ᑕᓯᐅᔭᕐᔪᐊᑉ ᐅᐊᓐᓂᖔᑕ ᕿᓚᓗᒐᖏᓐᓂᒃ ᐅᖔᑖᓄᐊᓗᒃ ᕿᓚᓗᒐᕈᓐᓇᑕᒥᑕ ᒐᒪᖕᖔᑦ ᐊᓐᓂᑐᕐᕕᐅᓱᑦ. ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖔᑕ ᕿᓚᓗᒐᖏᓐᓂᒃ ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖔᑕ ᕿᓚᓗᒐᖏᓐᓂᒃ ᐃᑭᓕᒋᐊᕐᓯᒪᓕᕐᑐᑦ 2,900- 3,200 ᑭᖑᓂᖔᒍᑦ ᑭᓯᑕᕕᓂᐅᓕᕐᑎᓗᒋᑦ 2015, ᐅᓪᓗᒥ ᐱᑕᖃᕐᓂᕋᕐᑕᐅᓂᖏᑦ ᐃᒧᓪᓗᐊᓕᕐᑐᑦ 2,900-3,200 ᐱᑦᔪᑎᒋᑦᓱᒍ ᒪᓕᑦᓱᒍ ᐃᓂᓪᓚᑕᐅᓯᒪᐅᑎᖔ. ᐊᒥᓱᖕᖑᓇᐊᕐᓂᐊᐸᑕ ᐊᓐᓂᑐᕐᑕᐅᓗᐊᕈᓐᓄᓕᐅᒥᒋᐊᓖᑦ 0-70 ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖔᑕ ᕿᓚᓗᒐᖏᓐᓂᒃ[26], ᒪᓕᓪᓗᒋᑦ,ᐊᐅᓚᑦᓯᒍᑎᐅᑉ ᑐᖕᖔᕕᖏᑦ ᐊᒻᒪᓗ ᐱᕕᑦᓴᓕᐅᕐᑕᐅᓯᒪᐅᑎᖏᑦ.

ᐊᓯᖏᑦ ᐃᓱᒪᒋᔭᑦᓴᐅᒥᔪᑦ

ᕿᓚᓗᒍᑦ ᐊᐅᓚᒐᔪᑦᑐᑦ ᑲᑎᒪᑦᓱᑎᒃ.ᐊᑦᔨᒌᖕᖏᑑᑦᓱᑎᒃ ᐱᐅᓯᖏᑦ ᐊᓐᓂᑐᕐᑕᐅᓂᖏᑦᑕ ᐊᑦᔨᒌᓱᖑᖕᖏᒪᑕ ᐊᕐᕋᒍᑕᒫᑦ ᐃᓱᒫᓗᓐᓇᓚᓇᑦᑐᖅ ᐃᓘᓐᓇᒋᓐᓂᒃ ᓄᖑᐃᓐᓇᑎᑦᓯᑐᐃᓐᓇᓂᐊᖕᖑᓇᔭᐅᑦᓱᑎᒃ, ᑕᒪᓐᓇᓗ ᓱᕐᖑᒍᓐᓇᓱᓂ ᐊᐅᖏᑎᒍᑦ ᐊᑦᔨᒌᖕᖏᒋᐊᖏᑦ ᐃᓚᐅᒻᒥᑎᓪᓗᒍ ᖃᐅᔨᒪᐅᓯᖅ ᑭᖑᕝᕕᑐᐃᒍᑎᐅᒋᐊᖃᕐᓂᖔ. ᓄᐃᑕᐅᓚᕿᓯᒪᔪᑦ ᐱᓇᓱᒍᑎᑦᓴᐅᓂᐊᕐᑎᓗᒋᑦ ᑲᔪᓯᔪᒥᒃ ᐱᑕᕐᑭᓇᓂᐊᕐᑯᓪᓗᒋᑦ. ᐊᓐᓂᑐᕐᑕᐅᒍᓐᓇᑐᑦ ᐅᓄᕐᓂᓇᒍᓐᓇᑕᖏᑦ ᐋᕐᕿᑕᐅᓯᒪᔪᑦ 50% ᐃᑭᓕᒋᐊᑐᐃᓐᓇᓇᐊᖃᕐᓂᖏᑦ ᕿᓚᓗᒍᑦ ᐊᕐᕌᒍᓂ ᑕᓪᓕᒪᓂ ᖁᓕᓂᓘᓐᓃᑦ. ᑕᒪᒻᓇ ᐱᐅᓯᓕᐊᖑᓯᒪᔪᖅ ᐊᒥᓱᖕᖑᓇᐊᓇᓂᐅᖕᖏᑐᑦ ᕿᓚᓗᒐᕐᓂᒃ ᐊᒻᒪᓗ ᐱᕕᑦᓴᖃᕐᑎᓯᒐᓂ ᕿᑲᐅᑦᔭᐅᕐᓇᓂᕐᒥᒃ ᐱᕕᑦᓴᖃᕐᕕᐅᓚᕿᒐᕐᒪᑕ ᖃᐅᔨᒪᒐᓱᐊᓇᐊᑦᓯᐊᓂᕐᒥᒃ, ᖃᓄᖅ ᐊᓐᓂᑐᕋᓱᐊᖃᑦᑕᒪᖔᑕ, ᑐᕐᑯᐃᓐᓇᓱᒪᔪᑦ ᖃᓄᐃᓕᓐᓂᒪᖔᑕ, ᐅᕝᕙᓗᓘᓐᓃᑦ ᐊᕙᑎ ᐱᑦᔪᑕᐅᑎᓪᓗᒍ. ᐃᑭᑦᑐᑦ ᐊᑑᑎᓚᕿᑎᑦᓯᒍᓐᓇᒥᔪᑦ ᓱᒃᑭᑐᒥᒃ ᐊᒥᓱᖕᖑᐸᓪᓕᐊᓂᖏᓐᓂᒃ (i.e. Allee effects) ᑕᒪᓐᓇ ᐱᐅᖕᖏᓕᐅᒥᑎᑦᓯᒍᓐᓇᑐᑦ ᐊᒥᓱᖕᖑᑎᑕᐅᒐᓱᐊᕐᓂᖏᓐᓂᒃ ᓱᒃᑭᓕᐅᒥᑎᑦᓯᓗᑎᒃ.

ᐊᑎᖏᑦ ᑲᑎᖕᖔᔪᓄᑦ ᐃᓚᐅᔪᕕᓃᑦ

ᐊᑎᖔ	ᐱᑐᑦᓯᒪᕕᖔ
ᐁᐸᔭᕐᑳ, ᑯᓇᔅᑏᓐ	ᐃᒪᕐᐱᓕᓇᔨ ᓱᑯᐃᔭᔨ
ᐸᔅᑐᕕᐅᓪ, ᒫᒃ	ᓄᓇᕕᒻᒥ ᑕᓇᐅᕐᒥᐅᑕᓕᓇᔩᑦ
ᐸᑭᖕ ᐸᑉ	LGL Ltd.
ᐸᓂ, ᑲᓚᐅᑎ	ᐃᒪᕐᐱᓕᓇᔨ ᓱᑯᐃᔭᔨ

[25] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᓴᒥᓯ ᐯ ᕿᓚᓗᒐᑦ ᐅᓄᕐᓯᐊᕐᓯᒪᔪᑦ 19,700 ᕈᕐᓱᑎᒃ 2015ᖑᑎᓪᓗᒍ ᐅᒪᖕᖔᓂᒃ ᐃᑭᓕᒋᐊᕐᓯᒪᔪᑦ 19,200 ᖑᓕᕐᓱᑎᒃ 2021ᒥ.

[26] ᐊᐅᒡᒍᓯᐅ ᐊᑦᑑᕝᕙ 2024-ᒥᑦ: ᐃᒧᓪᓗᐊᓕᕐᑐᑦ 2,700-3,200 ᐱᑦᔪᑎᒋᑦᓱᒍ ᒪᓕᑦᓱᒍ ᐃᓂᓪᓚᑕᐅᓯᒪᐅᑎᖔ. ᐊᒥᓱᖕᖑᓇᐊᕐᓂᐊᐸᑕ ᐊᓐᓂᑐᕐᑕᐅᓗᐊᕈᓐᓄᓕᐅᒥᒋᐊᓖᑦ 0-65 ᓴᓂᑭᓗᐊᑉ ᑕᓯᐅᔭᕐᔪᐊᓗ ᐅᐊᓐᓂᖔᑕ ᕿᓚᓗᒐᖏᓐᓂᒃ.

ᐊᑎᖓ	ᐱᑐᑦᓯᒪᕕᖓ
ᐳᐊᑐᓘ,ᔭᕕᔫ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᔅᐳᕙᓐ, ᑖᓐ	ᑖᓪᖃᐅᓯ ᐃᓕᓐᓂᐊᕕᕐᔪᐊᖅ
ᑲᐸᔅᓐ, ᐋᓐ ᒪᕆ	ᓄᓇᕕᒻᒥ ᑕᕆᐅᕐᒥᐅᑕᓕᕆᔨᑦ
ᑯᑎᕆᐋᔅ, ᐸᔅ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ ᐱᑦᔅᑖᕐᕕᐅᒍᓐᓇᑐᓂᒃ ᐊᐅᓚᑦᓱᔨ
ᑎᓐ ᕿᔪ, ᑯᐊᓃᓕᐊ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᑑᓂᐅᔮ-ᕙᔮᑯᔫ, ᑖᒪᔅ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᕗᑲᔭᓐ, ᓯᑏᑦ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᑲᔅᓗᓐ, ᔭᓐ ᕙᕋᓐᓯᐊ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᑯᔫ, ᐱᐋᕐ ᓗ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᖃᒥᐋᔅ, ᒥᒃ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᖃᕐᕕ-ᕙᓗᔨ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᖄᑉ, ᕋᑐᕆᒃ	ᐃᒻᒥᒍᕐᑐᖅ
ᖃᑦᔭᔅ,ᔭᔅᑏᓐ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᔭᓐ, ᓛᔨ	NCN ᐃᒪᕐᐱᒥᐅᔭᑦ ᓂᕿᑦ
ᔭᓐᑕᓐ, ᑎᐋᓐ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ CSAS
ᓛᖕ, ᓯᓕ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᓛᔭᒡ, ᔭᒃ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᓖ, ᑕᕕᑦ	ᓄᓇᕗᑦ ᑐᖕᖓᕕᒃ
ᓚᔭᔅ, ᕕᕈᓂᒃ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᒫᑯᓈᑦᓯ, ᓵᓐ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ

ᐊᑎᖓ	ᐱᑐᑦᓯᒪᕕᖓ
ᒪᔨᐅᔅᑭ, ᓲᓇ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᒪᕐᑰ ᒪᕆᐊᓐ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᒫᓯᐅᔅ, ᑰᕆ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᒫᓐᑖᓇ,ᓗᑲ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᒪᔅᓃ, ᐊᕐᓄ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᓂᑰᓪ, ᓕᓐᑕ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᓄᐊᑦᓯᑐᕋᒻ, ᓵᑦ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᐸᕋᓐ ᔨᓂᕕᐊᑉ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᐆᔅᒪ, ᓕᐊᓇ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᐳᕈᑉᓐᓯ ᓲᓐ ᐱᐊᑦ, ᐊᓐ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᓯᑎᕙᓂ ᕋᑎᐊᓪ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᕆᕕᐊᑦ, ᐊᓐᑐᐊᓐ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ ᐊᐅᓚᑦᓯᓂᓕᕆᕕᖓ
ᓵᑦᔭᑭ ᓵᓐᑎᐊᓪ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᓯᑎᐅᕆᖕᑕᓐ, ᓖᔅ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ CSAS
ᓯᑎᐊᓐᔅᓐ ᑭᐊᔨ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᑎᖕᑯ, ᑎᒻ	ᐃᒻᒥᒍᕐᑐᖅ
ᑐᕈᓯᖕᑭ, ᑰᑦ	ᐃᒻᒥᒍᕐᑐᖅ
ᑕᑯ, ᓯᑐᕋᕐᑲᓐ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᕙᓐᑐᓛᓐ ᐊᓐᔨᓕᐊ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᕗᐊᑦ (ᕗᐃᓗ), ᑯᐊᑦᓂ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ
ᕗᒡᑦ, ᐳᕆᐊᓇ	ᐃᒪᕐᐱᓕᕆᔨ ᓱᑯᐃᔭᔨ

ᖃᐅᔨᒋᐊᕐᕕᐅᒍᓐᓇᑐᑦ ᑐᑭᓯᒪᒍᑎᑦᓴᓂᒃ

ᑖᓐᓇ ᓱᑯᐃᔭᒍᑎᐅᓯᒪᑦᓱᓂ ᑐᓴᕐᑎᓯᐅᑎ ᓄᐃᑕᕝᕕᓂᖅ ᕝᕕᐊᓇ 14-18, 2022 ᑲᓇᑕᒥ ᐃᒪᕐᐱᒥᐅᑕᓂᒃ ᐆᒪᔪᓂᒃ ᕿᒥᕐᕈᔨᑦ ᑲᑎᖕᖓᔨᖕᒋᑦ (NMMPRC) ᑲᑎᖕᖓᑎᓪᓗᒋᑦ ᖃᐅᔨᒐᓯᐊᕐᓱᑎᒃ ᖃᓄᑎᒋ ᕿᓚᓗᒐᖃᕐᒪᖔᑦ ᓄᓇᕗᒻᒥ (ᑯᐯᒃ ᑕᕐᕋᖓ). ᐊᓯᒋᐊᓪᓚᖕᒋᑦ ᑐᓴᕐᑎᓯᒍᑏᑦ ᖃᓇᑕᐅᔭᒥ ᑕᑯᑦᓴᐅᑎᑕᐅᓛᕐᑐᑦ ᐅᕙᓂ Fisheries and Oceans Canada (DFO) Science Advisory Schedule ᐊᑐᓐᓇᕈᕐᓯᒪᓕᑐᐊᕐᐸᑕ.

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ᑖᒃᑯᐊ ᑐᓴᕐᑎᓯᐅᑏᑦ ᐊᑐᐃᓐᓇᐅᑎᑕᐅᔪᑦ ᐅᕙᓂ:

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˜ᓈᒻᒪᓈᕐᓯᒪᔪᓂᒃ ᑐᑭᓯᓇᕈᑎᑕᓖᑦ ᑕᒃᒍᖓᓕᖓᔪᓂᒃ:

ᐃᖃᓗᓕᕆᔨᒃᑯᑦ ᐊᒻᒪᓗ ᐃᒪᕕᓕᕆᔨᒃᑯᑦ ᑲᓇᑕ. 2022.ᐊᓐᓂᑐᕐᓂᐅᒐᔭᕐᑐᒧᑦ ᐃᒫᖕᒉᑏᑦ ᐅᑯᓂᖓ ᑰᒃᔪᐊᕐᕌᔪᑉ ᔭᒥᓯ ᐯᓪᓗ ᕿᓚᓗᒐᖕᒋᓐᓂᒃ (*DELPHINAPTERUS LEUCAS*). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2022/024. (Erratum : October 2024)

Aussi disponible en français :

*MPO. 2022. Avis sur le prélèvement de béluga (*Delphinapterus leucas*) dans l'est de la baie d'Hudson et dans la baie James. Secr. can. de consult. sci. du MPO. Avis sci. 2022/024. (Erratum : juin 2024)*

Also available in English:

*DFO. 2022. Harvest advice for eastern Hudson Bay and James Bay beluga (*Delphinapterus leucas*). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2022/024. (Erratum: June 2024)*